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ANTECEDENTS AND BENEFITS OF SOCIAL CAPITAL DEVELOPMENT IN BUSINESS INCUBATORS

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ABSTRACT

In order to determine the effects of social capital in innovative contexts, Nahapiet and Ghoshal's (1998) three dimensions of social capital (structural, relational, and cognitive) are investigated in a business incubator located in a university science park. This paper tries to answer three questions for the incubator context: (1) What are the antecedents of the three dimensions of social capital? (2) What are the benefits of social capital for the tenant firms? (3) How are the dimensions of social capital related to its antecedents and benefits? To answer these questions, the research was designed with a multi-method approach along four steps. In the first step, the selected incubator was observed for a day. In the second stage, a pilot interview was conducted with one of the tenant firms. Next the firms were asked to complete a questionnaire regarding their demographic characteristics. In the last stage, a theoretical sample of nine selected firms' owners and two incubator specialists were interviewed. The interview data collected were analyzed following the grounded theory approach (Strauss and Corbin, 1990) and three propositions were developed to be investigated in further research.

Keywords:

Social capital, business incubators, Turkey.

INTRODUCTION

Since the development of new research/technology-based firms has become increasingly important in today's competitive economies, several entrepreneurial universities are establishing technology incubators in or around the university campuses (Mian, 1996). According to the American National Business Incubator Association's definition, a business incubator is "an economic development tool designed to accelerate the growth and success of entrepreneurial companies through an array of business support resources and services" (www.nbia.com). Gaining access to administrative support and reducing early stage operational costs (rent, service fees, etc.) are the typical challenges that a new start-up must overcome (Bollingtoft et al., 2005). An incubator helps start-ups survive through the liability of newness, increase their competence levels and chances of survival, improve their quality, and encourage their growth (Mc Adam et al., 2006). An incubator is responsible for providing the necessary resources, services, and assistance which are luxuries for other start-ups outside the incubator. Lastly, the incubator provides network access to start-ups (Madsen et al., 2000, Mc Adam et al., 2006) where the firms can develop their ties with other firms in the incubator environment where social capital and synergy is formed. In short, the overall aim of business incubators is to leverage entrepreneurial talent in the region by supporting start-up firms (Bollingtoft et al., 2005).

In Turkey, incubators are also gaining visibility. The Small and Medium Industry Development Organization (KOSGEB) of Turkey aims to bring start-ups together in order to bring together the research and development potential under an incubator system (www.kobitek.com/makale.php?id=38-28k-30 Mar 2007). Incubators have been established in the more established Turkish universities to support the development of new companies. This study goes beyond the tangible support provided by business incubators and aims to understand the incubators' social benefits by focusing on the effects of social capital on tenant firms. The study is based on the three dimensions as described by Nahapiet and Ghoshal (1998) and Ghoshal and Tsai (1998). The *structural dimension* represents the network structure, network configuration, and pattern of linkages. Spatial proximity and network stability are important for the formation

of network ties. The *cognitive dimension* is related to the shared goals and shared culture in a clique. The last dimension is the *relational dimension* which represents trust and trustworthiness between the parties. Nahapiet and Ghoshal (1998) predict that these dimensions are interrelated and indicate that this interrelation should be evaluated in further research. The purpose is to examine the interrelations among the dimensions, and how the dimensions are related to the antecedents and benefits of social capital.

SOCIAL CAPITAL IN THE INCUBATOR CONTEXT

The concept of social capital has grown in popularity in the field of management after being discussed by sociologists, economists, and political scientists (Spence et al., 2003). It is considered the fourth type of capital together with human, financial, and physical capital. While the first three can be found in individuals, social capital is found in the relationships among individuals (Adler and Kwon, 2002). In other words, the source of social capital can be found in the structure and the content of the relations between these individuals (Adler and Kwon, 2002). Individual and collective social networks, ties, and structures compose social capital, helping the individual in these ties to get access to information and know-how. This facet of social capital is said to enhance innovation. Through information sharing, trust, and personal networks (Tsai and Ghoshal, 1998) the embedded ties create trust among actors and triggers information transfer and joint problem solving (Uzzi, 1997).

An important setting for relations among innovative small enterprises to be observed is business incubators. We assume that being a tenant firm in the incubator does not only bring economic benefits like low rent offices or various types of financial support. Working together in the same building with firms in similar sectors and with similar demographics creates synergy in the incubator, which results in the development of social capital (Morten et al., 2000). The incubator context was deemed suitable for the purpose of this study, since it gives the opportunity to observe the relations among small enterprises, the three dimensions (structural, cognitive and relational) of social capital (Tötterman et al., 2005), and the mechanisms related to individuals

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and the construction of the building which facilitate or hinder social capital development (Bollingtoft et al., 2005).

The incubator under study (METU TEKMER) is located in a science park on the campus of a major and one of the most prestigious Turkish universities, Middle East Technical University (METU), in Ankara. METU TEKMER was established in 1992, and is one of the first two incubators established in Turkey. Currently there are 46 firms in 3500m² of incubator space (<http://www.teknonet.org.tr>) which is made up of two separate buildings: one main building with 30 firms, the management units, kitchen and secretarial services, and a secondary building with 10 tenant firms in it. There are seven major services provided by this incubator (<http://www.tekmer.gov.tr/>):

- provision of offices
- consultancy in different fields (technical, financial, administrative, managerial, and marketing)
- intranet and internet services
- laboratory services
- training programs technical or managerial fields.
- office services (secretarial services, video conferencing, access to a fax, a photocopy machine, and computers)
- exhibitions and conferences on the university campus

From 1992 to 2006, a total of 108 firms were incubated in this center, 53 of which successfully graduated, 9 were unsuccessful, and 46 are still part of the incubator. Hence, the overall success rate is 85%. Out of the 108 firms incubated so far, 44% are in the electronics sector and 38% are in software sector (<http://www.tekmer.gov.tr/>). The average age of the company owners is 33 for a total of 205 entrepreneurs; 11% have doctorate degrees, 27% have master's degrees, and the rest are four-year university graduates.

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A questionnaire was conducted to the tenant firms between June and July 2006 in order to understand the general environment in the incubator in the current situation. 26 out of 46 present tenant firms responded to the questionnaire. The respondent firms have between one and ten employees, with an average number of employees of four, including the firm owner. The average age of the firm owners vary between 23 and 51 and the average is 33.2 years. The firms are between one month and three years old. All owners of 62% of the firms (16 firms) are METU graduates. 19% of the firms have both METU and other university graduates as owners. Only 4% of the firm owners are not METU graduates.

After graduation, the tenant firms also have the opportunity to move on to the science park of METU and take advantage of the tax incentives of science parks. Up to now, 19% of all tenant firms have had the chance to be transferred to the science park and continue their life on the university campus, with a higher chance of collaboration with the science park compared to the off-park firms.

METHODOLOGY

In this study, a multi-method approach, with both qualitative and quantitative research tools, was used in order to have a detailed view of the selected context. The methodological steps are described in detail below.

Data Collection

Qualitative research methods were found to be more suitable for this particular study, as social capital development among actors is quite context dependent (Leana and Pil, 2006, Woolcock, 1998, Lalkaka, 2002) and the generalization principle of quantitative methods may oversee some of the details in the data collected (Maxwell, 1996). In order to provide credibility, dependability, transferability, and confirmability (Wallendorf et al., 1989), the qualitative research method tools, observations and interviews, were triangulated with a quantitative research tool (questionnaires).

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The research design can be summarized in four steps:

Step 1: Non-Participant Observation

As a first step, an initial one-day long *non-participant observation* was conducted in the incubator in order to better understand the context. This technique was chosen in order to understand the contribution of the construction and layout of the building to social capital formation, to see how the layout affects the social gatherings and movements in the building, and the general atmosphere in the incubator

Step 2: Pilot Interview

In the second step, a pilot interview was conducted to one of the tenant firm owners in order to test the draft interview instrument.

Step 3: Questionnaire

All tenant firms were asked to complete a questionnaire on the the demographics of the firms and firm managers, their desire in forming relations with the other firms, and the actual relations taking place. 26 firms out of 40 firms participated in this step.

Step 4: Interviews

Nine firms (Firms A, B, C, G, K, V, W, X, Y) were chosen according to their demographic characteristics and questionnaire results gathered in the previous step. The saturation point was reached after the nine interviews. The general criterion for the firm selection was to choose the ones that have been incubated for more than six months, as it is assumed that younger firms do not yet have enough experience. The demographics of each selected firm and firm owner, the reason for the firm's selection according to the questionnaire results, and the duration and the location of the interviews can be seen in Table 1. In addition to the interviews with firm managers, two incubator specialists who were mentioned the most by the firm managers were also interviewed in order to have a second perspective on the interfirm and firm-incubator relations. One specialist was experienced and the other was a newer specialist. All interviews

were semi-structured, lasting from 45 minutes to two and a half hours, and all were recorded and transcribed verbatim.

INSERT TABLE 1 HERE

RESULTS

The data collected through the various methods were analyzed with the grounded theory approach, following open, axial, and selective coding processes (Strauss and Corbin, 1990). Seven antecedents and five benefits of social capital development were found in the incubator context. The antecedents generate the identified benefits through a time-moderated process involving the three dimensions of social capital. The proposed conceptual model can be seen in Figure 1. The model is elaborated below, with supportive quotes from interviews provided to exemplify the links (link numbers in figure given in parentheses).

INSERT FIG 1 HERE

A. Antecedents of Social Capital Development in an Incubator Context

1. Previous Ties

The first antecedent of social capital, previous ties between the tenant firm managers, creates the benefit of old firm-new firm collaboration (link a₄ in Figure 1).

There were firm owners who graduated together with or before us. We have a natural acquaintance with them and trust them. (Firm A)

Firm A explains this relationship with a famous Turkish saying “I know how these braves eat their yogurt”, roughly meaning “I know their *modus operandi*.” This shows that firm owners who knew each other beforehand can form informal relations once in the incubator, but even so the structural dimension of social capital does not emerge directly. The common language

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developed prior to incubation (which constitutes the *cognitive dimension*, a_1) in time creates trust between the parties, forming the *relational dimension* (a_2). Later, the trust among actors facilitates the creation of actual networks, which constitutes the *structural dimension* (a_3) of social capital. The manager of Firm F explains this as follows:

Since we are all similar people, we have a thing that comes from our past: we have a common language. (Firm F)

Since most of the firm managers are METU graduates, their previous ties creates a common language among them. Thus, one can conclude that being a METU graduate is one of the antecedents of cognitive dimension of social capital.

2. Informal Ties

Informal ties constitute a visible antecedent of social capital as they were mentioned by all the respondents. The building layout, conferences, other social activities organized by the incubator management, physical proximity within the incubator, and the previous ties among tenant firm managers prior to being incubated are the factors that affect the creation of informal ties (links b_1, b_2, b_3, b_4). Through the formation of the structural dimension of social capital (b_5), these ties generate the benefits of solidarity, information transfer, and doing complementary jobs among tenant firms (b_6, b_7, b_8).

The proximity of the firms to each other and to the common spaces of the incubator increase their chances of meeting with each other. These meetings form the basis of establishing informal ties, through which the firms develop structural social capital. The manager of Firm V states that firms on the ground floor are closer to the garden (one of the gathering places) which helps them establish more relations with the other firms. For this reason, he thinks proximity to common spaces is critical.

We meet while we are chatting in the corridors. We talk and in time we learn each others' capabilities. Later one of us gets a job and when they ask for our support, we complete a job together. (Firm B).

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The physical layout of the building is also related to the concept of proximity, as seen below:

Think of some little shops in a bazaar. Since they are very small, there is a single gathering space. People see each other there. In time they start to greet each other. By this way kind of a relationship is formed. Later on they start to ask each other questions. (Firm A)

The “neighborhood” metaphor used by the manager of Firm A seems quite appropriate as the firms feel very close, located just like they would be in their apartments. The neighborhood is an important metaphor for the Turkish context since neighbors are considered the people one can easily go for help. This neighboring feeling helps firms facilitates the firms’ approaching each other.

Another factor supporting informal ties is the conferences and other social activities organized by the management. All the firm managers who previously participated in these activities talked about them as drivers of relationship creation. Managers of Firms A, V, and F state that during the meetings set by the management, the firms introduce themselves, thus they get to know each others’ businesses:

KOSGEB organizes barbeque parties from time to time. In these parties we get together and talk to each other about recent events. (Firm C)

Previous ties do not only generate the benefit of old-firm-new-firm collaboration but they also carry a role in the creation of solidarity, information transfer, and doing complementary jobs among tenant firms through the creation of informal ties and thus the *structural dimension* of social capital:

Question: Then...how did you get closer to with the firm you are working with? How did you work with them?

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Answer: Getting closer to that firm... Hmm...We had a friend, again from University B (the university he graduated from). He owns a certified public accounting and auditing firm...He helped us in a project and then we started to do jobs together. (Firm V)

3. Other Tenants are not Competitors

The managers of firms A, C, Y, and the manager participating in the pilot interview state that they do not feel that the other incubator firms are their competitors. They say that all the tenant firms have their own projects and add that the incubator management guarantees the selection of firms with different concentration areas. Moreover, there is an unwritten pact between firms that they do not enter each others' field unless they are asked. This illustrates the cognitive dimension of social capital in the incubator (c_1). For this reason, incubator firms trust each other more than they would trust someone outside the incubator (relational dimension, c_2), which enhances the formation of relations among tenant firms (structural dimension, c_3). This antecedent produces the benefits of solidarity and information transfer between the tenant firms.

In fact we do not compete with each other. The people that we should compete with are the foreign firms that come here and take away the value added. (Firm C)

4. Knowing Other Firms' Businesses

Knowing what the other tenant firms work on is another antecedent of social capital that directly creates the *structural dimension* (d_1). While they are talking with other firm employees, tenant firms get the chance of learning which firms have the skills to complement their deficiencies. This results in solidarity, information transfer, and undertaking joint projects among tenant firms (links d_2 , d_3 , d_4).

I do not have the chance to know everything. And I have to use many things in a project. Libraries are good but finding someone who has done the same thing in practice is a better opportunity. Here, while we chat with each other, we learn what others do. This is one of the best things about the incubator. (Firm A)

5. Amateur Spirit Among Small-Scale Start-Ups

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Some of the firms' managers state that being small brings them together in order to be stronger when facing large and strong firms. The incubator firms also add that as they are new start-ups, they still have an amateur spirit, which makes them more open to believing in each other, enhancing interfirm trust (*relational dimension*).

Question: So do you trust (the others)? If you were to work together, would you trust firms here more than the ones outside (the incubator)?

Answer: Of course, definitely, definitely, because here people have an amateur spirit. I do not know what would be the outcome but trust, I would trust them from the beginning. (Firm C)

The *relational dimension* (e_1) develops into trust generated from the amateur spirit among firms, which in turn transforms into the *structural dimension* (e_2) of social capital when it generates benefits of solidarity and doing complementary jobs with other tenant firms (e_3, e_4).

We are all small firms. These firms are not qualified enough to finish huge projects alone. But when three or four firms come together, by creating a potential of 7-8 people, very successful projects can be developed. This makes us stronger, and this is why I chose to be in this incubator. (Firm A)

6. Trust in the Selection Mechanism

Firms that regard the selection mechanism of the incubator as credible trust each other (*relational dimension*, f_1). They come together more easily to form relationships for further projects (*structural dimension*, f_2) which creates the benefits of solidarity, information transfer, and doing complementary jobs (f_3, f_4, f_5).

If it is a KOSGEB firm, it is perceived as a firm capable of research and development since it has passed a long selection process....The process takes 7-8 months and university professors really tire you, and test if you can do the job technically and if you can reach commercial success. You have to pass this process. (Firm A)

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You can only know if a firm is capable of doing a job from its references. But here I know the selection system is very good. I trust the firms in the incubator more. Since the mechanism is good, the selected firms are not ordinary firms or ordinary people. They have a particular knowledge and vision. (Firm Y)

7. Management Support

Management support is the last factor that creates the *structural dimension* of social capital (g_1) and it is critical for the firms that do not have previous relationships with the other firms. Especially managers of firms who are not used to the environment (managers who are not METU graduates or managers of firms that are new to the incubator) emphasize this factor, since they need the support of the incubator managers and specialists in order to develop their very first contacts (*structural dimension*) with the other tenant firms. More interestingly, they call the specialists “advisors”, which shows they need advisory support to get used to the new environment they have entered. This support prevents them from being alienated (g_2).

The manager of Firm V, who is another university’s graduate, states that his firm needs the support of the specialists through a one-day-long orientation in order to learn about the facilities in the site:

I just learned that there are catering services in the Ikizler Building. All the firms eat in different places...If there is a one-day-long orientation, they can tell us where we can eat, what the transportation facilities are. (Firm V)

The second group of firms who indicate that management support might be useful to get used to the environment is formed of the firm managers who are new to the incubator. The manager of Firm W which has been incubated for six months states that:

Question: When you have a problem in your firm, could you ask for advice easily?

Answer: Actually there has not been a situation that necessitated this. Maybe there will be, I don’t know. I mean I feel like there are people that we can go for advice. But here for example, I prefer asking for help from the management. The reason for this is that:

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The firms are trying to earn money, they do not have time; but it's the management's job to help us. (Firm W)

On the other hand, older firms with managers who are METU graduates do not mention that they need the support of the incubator management. They emphasize that the incubator manager and the specialists do not interfere with what the firms do and that there is no hierarchy between them. They add that they are satisfied with this friendly attitude of the incubator management.

My friends and I are very intimate and sincere with the management. We go and drink coffee and tea with them and chat. (Firm A)

The management specialists agree with this view. The respondent Specialist 1 claims that the people who have previous ties with each other do not need specialist support, but the ones who are new to the environment need their help:

We sometimes organize a barbeque party, or new year party. Here, our aim is to get the firms closer. There are many firms coming in and going out and they can not click with each other unless we are here. I mean the ones who already knew each other get closer, but we try to bring the ones who do not know each other together. (Specialist 1)

B. Benefits of Social Capital in an Incubator Context

As can be seen in Figure 1, there are five observed benefits generated through the different dimensions of social capital.

The first observed benefit is collaboration among old and new firms. Previous ties among firms bring new firm owners and old firm owners together and the older firms help the new firms. This is a tradition developed in the incubator. Most of the firms helped their friends from school, previous interns, or relatives while the latter were entering the incubator, just like they had been helped when they entered.

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Last year we had an intern friend here and then we helped him to establish a firm here.

We give him our reference and did our best to help them. (Firm A)

The second observed benefit of the social capital generated in the incubator is the solidarity between the tenant firms. The firm employees see the other firms as their neighbors and are open to helping each other. They go and ask their neighbors help or try to do their best if their help is needed.

Interviewer: Can you easily go and ask the other tenant firms for help?

Manager: Oh, yes, definitely, definitely! Someone comes and asks us: “Brother, how did you do this?”, next time we go and ask. And this is a very useful thing. For example, if we get a project unrelated to our business, or we have not done something like that before, we can get the job. We get it and then we do it with the help of the others here.

(Pilot interview)

Information transfer is the third stated benefit of social capital in the TEKMER. Once the structural ties among firms are established, firms pass their information (e.g., market information, incubator aids, or bank credits) on various topics to each other. This helps the firms to be more powerful in the market against the off-incubator competitors.

Information should not stop where it is produced. I mean here you earn money anyway.

The important thing here is transferring our information to each other and being stronger. (Firm C)

I, for example, told some of the firms, I mean the firms with whom we are in a dialogue, about the support of the Scientific and Technological Research Council of

Turkey and they applied for funding. It was good for them. (Firm Y)

When the firms get to know each other, they understand which firms can complement their deficiencies in larger projects. One of the benefits of social capital is that it leads the firms to do complementary jobs. By combining their power, they become stronger start-ups in the

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competitive market and are able to do larger projects. As it was indicated above by Firm A, these smaller firms get together in order to accomplish large projects and be able to compete with larger and stronger firms.

The last benefit stated by the respondents is critical for the firms whose owners are not METU graduates and do not know much about the incubator and/or university environment. Through the support of the incubator management and specialists, such firms get used to the environment and form relationships with other firms. With the help of the social capital developed, these firms start to feel as a part of the environment and this prevents alienation of the firm managers coming from other universities.

Propositions

Following the grounded theory approach, three propositions can be developed under the light of the results.

Proposition 1: The structural dimension of social capital is the most instrumental in generating benefits from social capital formation.

Proposition 2: There is a time-moderated process of social capital development among three dimensions of social capital.

Proposition 3: Four of the antecedents of social capital (*previous ties, other tenants are not competitors, amateur spirit among small-scale start-ups, and trust to in the selection mechanism*) first create relational social capital, which in turn develops the structural dimension of social capital.

DISCUSSION

Many of the antecedents and benefits identified in this research have been noted in extant literature. Darr et al. (2005) claim that informal networks based on proximity, being the members of the same society, and personal contacts are critical antecedents of social capital. This research corroborates previous results for a new context. Informal networks are developed

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by the help of the previous ties between the actors, building layout, and conferences and other social activities organized by the management, in addition to the physical proximity between actors. The research confirms Adler and Kwon's (2002) work showing the importance of previous ties in social capital generation among tenant firms. This research is also in line with Bollingtoft et al. (2005) who claim that being in the same building, i.e., geographical proximity, enhances social capital development.

In addition to information transfer among actors (Tsai and Ghoshal, 1997, Nahapiet and Ghoshal, 1997) and access to alliance partners and doing complementary work (Leana and Pil, 2006, Tötterman, 2002), benefits such as collaboration among old and new firms, solidarity among firms, and getting used to the environment due to the incubator management support were unique benefits identified in this study.

As an addition to existing literature, this study underlines a process of social capital development and its relation to obtaining benefits in an innovative context. Nahapiet and Ghoshal (1998) defined three dimensions of social capital and predicted that there might be interrelationships among these dimensions. Our findings verify that there is a process among these dimensions which generates benefits from social capital. The structural dimension, which is the most instrumental dimension in generating benefits, develops through the relational dimension, and the cognitive dimension, in turn, results in the development of the relational dimension. Moreover, the cognitive social capital development between the host university and the tenant firms facilitates the enhancement of the relational dimension of social capital among tenant firms, which can be interpreted as a linkage between the two layers of social capital.

Another point to note about our findings is the impact of incubator management on the development of social capital. Tötterman et al. (2005) claim that incubator personnel and management should help the tenant firms develop external and internal relations. As an addition to the literature, this study suggests that management support is not equally important for all firms and that it is more critical for firms who are new to the environment, i.e., newcomer firms and firms whose owners are not host university graduates. Furthermore, as Darr et al. (2005)

claim, the expectations of firms change over time, and the incubator management should be flexible in providing changeable services.

The skills and characteristics of tenant firm managers are important antecedents of social capital, supporting Burt (1997). To extend this line of inquiry, this study shows that the fit between the employees of different firms, knowing what other firms do, not seeing them as competitors due to having an amateur spirit, and trusting the selection mechanism of the incubator are other important antecedents.

CONCLUSION

Research Implications

In this research, the antecedents and benefits of social capital in the incubator context have been analyzed through qualitative research methods and several propositions have been developed. The present study implies the existence of the relational dimension of social capital as a prerequisite for the formation of structural dimension of social capital, an association warranting further investigation. In order to gain most of the benefits from social capital, developing trust (the relational dimension of social capital) is also found to be critical. However, some of the identified antecedents of social capital directly engender the structural dimension of social capital, which then produces a benefit. As an extension to this line of thinking, the temporal sequence of the dimensions of social capital should be investigated, as time seems to act as a moderator between various dimensions of social capital. Understanding the effect of time is important to develop better strategies, therefore some longitudinal studies may be necessary to observe the transformation among the various dimensions of social capital.

The premise of this study, namely, the assumption that benefits of social capital generate commercial success for incubator firms, was not tested as it was beyond the research scope. The long-term success of the graduated firms can also be evaluated in order to test this. Furthermore,

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what the isolated tenants, especially firms whose owners are not host university graduates, do in order to overcome the obstacles in social capital development should also be studied. It can be the case that the host university graduates and non-graduates create their own separate ties for social capital creation. Lastly, as social capital is perceived as a public good in this research, the personal characteristics of the individuals in the social ties, i.e., tenant firm owners, in social capital formation was not elaborated. Social capital creation can be examined in this perspective since each owner has different perceptions of social capital and their own perception and characteristics can also affect social capital enhancement.

Managerial Implications

In different stages of their lifecycles, firms have different needs and expectations. They might need support to develop their cognitive, relational, or structural dimensions of social capital in order to better take advantage of the social environment in the incubator. The incubator management should be aware of this fact and try to be flexible in its services. Moreover, if establishing relations within the incubator is critical for a firm, the specialists should bring the firm managers together by preparing conferences, barbeque parties, etc., or if external relations with suppliers, customers, producers, marketers become important, this time management should focus on the development of these relations. The specialists should also realize that their support is more critical for incoming firms or firms whose owners are not host university graduates.

The firms participated in this study on a voluntary basis. Inactive tenant firms were not physically present during the study's time frame and hence were not contacted. Thus, there could be the bias in firm selection towards the firms who are more open to social capital creation. However, this cannot be regarded as a limitation of the study. Missing firms do not contribute to or benefit from the social capital development and only appear to be in the incubator. This shows that the management should be more careful in firm selection since some tenant firms do not benefit from the social, technical, or financial inputs of being in the incubator.

Limitations

There were several limitations in the study due to the methodology used. Firstly, we tried to reach three of the extreme cases (as interpreted by the questionnaire results) in order to have a wide variety of cases, but one firm with relations with neither the other firms nor the university refused to join the interview. However, we believe that the saturation point of the data was reached with this sample size. Secondly, only non-obtrusive observations were done. Although non-obtrusive observation is critical in creating the etic view of the research, some obtrusive methods like joining the conferences, barbeque parties, or meetings of the firms could have been useful in providing the chance to observe the relations of the firms more closely. Lastly, it should be kept in mind that qualitative research is partially context dependent, thus the findings cannot be generalized to all incubator contexts. A survey across incubators can be conducted to make generalizations regarding business incubator contexts.

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Table 1: Interviewed Tenant Firms

Case	Firm Demographics	Firm Owner	Questionnaire Results	Duration and Location of the Interview
Firm A	<ul style="list-style-type: none"> - 3 years old - Owners: All METU graduates - 3 owners - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 29 - Education Level: B.Sc. - Graduated from: METU Electrical and Electronics Engineering 	<ul style="list-style-type: none"> - Actual and desired conditions for actual relations above average. 	<ul style="list-style-type: none"> - 99 minutes, manager's office
Firm B	<ul style="list-style-type: none"> - 2 years old - Owners: All METU graduates - 2 owners - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 30 - Education Level: M.Sc. - Graduated from: METU Electrical and Electronics Engineering 	<ul style="list-style-type: none"> - Desired and actual relations with other firms among the highest. 	<ul style="list-style-type: none"> - 122 minutes, manager's office
Firm C	<ul style="list-style-type: none"> - 3 years old - Owner: METU graduate - 1 owner - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 44 - Education Level: M.Sc. - Graduated from: METU Electrical and Electronics Engineering 	<ul style="list-style-type: none"> - High desired relations with other firms but very few actual relations taking place. 	<ul style="list-style-type: none"> - 63 minutes, manager's office
Firm G	<ul style="list-style-type: none"> - 6 months old - Owners: Other university graduates - Owners: All academicians (only one of them is a METU academician) - 3 owners - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 43 - Education Level: Ph.D. - Graduated from: Other university, Education Sciences 	<ul style="list-style-type: none"> - Frequency of usage of science park and university services is lowest. 	<ul style="list-style-type: none"> - 53 minutes, manager's office at METU
Firm K	<ul style="list-style-type: none"> - 2 years old - Owner: METU graduate - 1 owner - The <i>only firm</i> from a different industrial sector - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 24 - Education Level: B.Sc. - Graduated from: METU Industrial Design 	<ul style="list-style-type: none"> - Desired relations with other firms high, frequency of actual relations taking place average. - Highest frequency of usage of services provided by the host university and its science park. 	<ul style="list-style-type: none"> - 61 minutes, manager's office
Firm V	<ul style="list-style-type: none"> - 2 years old - Owners: All other university graduates - 3 owners - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 27 - Education Level: B.Sc. - Graduated from: Other university, Computer Engineering 	<ul style="list-style-type: none"> - Desired relations and frequency of formal relations with other firms is high. 	<ul style="list-style-type: none"> - 38 minutes, manager's office
Firm W	<ul style="list-style-type: none"> - 6 months old - Owners: All METU graduates - 2 owners - Location: Main building 	<ul style="list-style-type: none"> - Male - Age: 26 - Education Level: Ph.D. - Graduated from: METU Electrical and Electronics Engineering 	<ul style="list-style-type: none"> - Actual and desired relations above average. 	<ul style="list-style-type: none"> - 34 minutes, manager's office
Firm X	<ul style="list-style-type: none"> - 2 years old - Owners: All other university graduates - 2 owners - Location: Additional building 	<ul style="list-style-type: none"> - Male - Age: 32 - Education Level: M.Sc. - Graduated from: Other university, Mechanical Engineering 	<ul style="list-style-type: none"> - Desired relations with other firms high. - Frequency of using services of the science park and host university low. 	<ul style="list-style-type: none"> - 55 minutes, entrance hall
Firm Y	<ul style="list-style-type: none"> - 2 years old - Owners: All METU graduates - 2 owners - Location: Additional building 	<ul style="list-style-type: none"> - Male - Age: 29 - Education Level: Ph.D. - Graduated from: METU Electrical and Electronics Engineering 	<ul style="list-style-type: none"> - Desired relations are above average, but actual relations taking place slightly above or below the average. 	<ul style="list-style-type: none"> - 65 minutes, manager's office

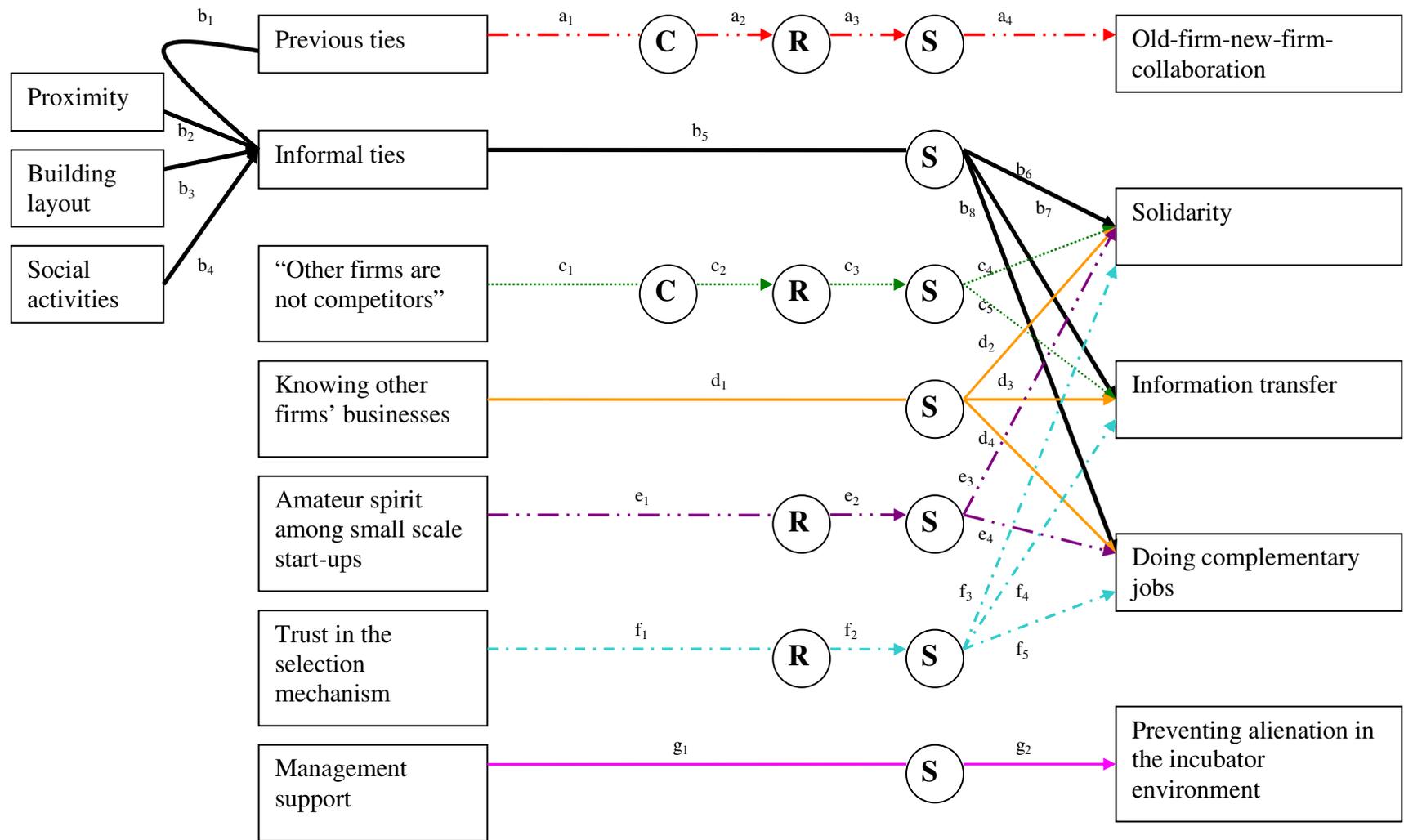


Figure 1. Proposed Conceptual Model