

SOCIAL CAPITAL DEVELOPMENT AMONG TENANT FIRMS AND
BETWEEN TENANT FIRMS AND THE HOST UNIVERSITY IN BUSINESS
INCUBATORS:
A CASE OF A TURKISH BUSINESS INCUBATOR

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

GAMZE KÖSEOĞLU

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

MAY 2007

Approval of the Graduate School of Social Sciences

Prof. Dr. Sencer Ayata
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. F. N. Can Şimşak Muğan
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Assoc. Prof. Dr. S. Nazlı Wasti Pamuksuz
Supervisor

Examining Committee Members

Assoc. Prof. Dr. S. Nazlı Wasti Pamuksuz	(METU, BA)	_____
Prof. Dr. Ahmet Acar	(METU, BA)	_____
Asst. Prof. Dr. Olga Kravets	(Bilkent, MAN)	_____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name : Gamze Köseoğlu

Signature :

ABSTRACT

SOCIAL CAPITAL DEVELOPMENT AMONG TENANT FIRMS AND BETWEEN TENANT FIRMS AND THE HOST UNIVERSITY IN BUSINESS INCUBATORS: A CASE OF A TURKISH BUSINESS INCUBATOR

Köseoğlu, Gamze

Master's Thesis, Department of Business Administration

Supervisor: Assoc. Prof. Dr. S. Nazlı Wasti Pamuksuz

May 2007, 119 pages

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) were investigated in a business incubator located in a university science park. This thesis tries to answer five 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 the antecedents and benefits? (4) What are the effects of being located in a university on social capital development between the firms and the host university? and (5) What is the role of the incubator management/specialists on social capital creation? The research questions were investigated in two layers: (1) Social capital development among tenant firms, and (2) Social capital development between the tenant firms and the host university. 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 were interviewed. All the collected data were analyzed following the

grounded theory approach (Strauss and Corbin, 1990) and seven propositions were developed to be investigated in further research.

Keywords: Social capital, business incubator, university-industry partnership, Turkey

ÖZ

TEKMER'LERDE FİRMALAR ARASI VE FİRMALAR VE ÜNİVERSİTE
ARASI SOSYAL SERMAYE GELİŞİMİ:
TÜRKİYE'DE BİR TEKMER ÖRNEĞİ

Köseoğlu, Gamze

Yüksek Lisans, İşletme Bölümü

Tez Yöneticisi: Doç. Dr. S. Nazlı Wasti Pamuksuz

Mayıs 2007, 119 sayfa

Sosyal sermayenin yenilikçi ortamlardaki etkisini belirleyebilmek için Nahapiet ve Ghoshal'ın (1998) ortaya attığı sosyal sermayenin üç boyutu (yapısal, ilişkisel ve bilişsel) bir üniversite tekno-parkının TEKMER'inde incelenmiştir. Bu tez TEKMER ortamında beş soruya cevap aramaktadır: (1) Sosyal sermayenin üç boyutunun etkenleri nelerdir? (2) TEKMER firmaları için sosyal sermayenin faydaları nelerdir? (3) Sosyal sermayenin boyutları ile etken ve faydalar arasındaki ilişki nedir? (4) Üniversite içerisinde yer almanın TEKMER firmaları ve üniversite arası sosyal sermaye oluşumuna etkisi nedir? ve (5) TEKMER yönetim ve uzmanlarının sosyal sermaye yaratılmasındaki rolü nedir? Bu sorular iki aşamada ele alınacaktır: (1) Firmalar arası sosyal sermaye gelişimi ve (2) Firmalar ve üniversite arası sosyal sermaye gelişimi. Araştırma çok yöntemli bir yaklaşımla dört aşama olarak tasarlanmıştır. İlk aşamada seçilen TEKMER bir gün boyunca gözlemlenmiştir. İkinci aşamada kiracı firmalardan biriyle pilot mülakat düzenlenmiştir. Daha sonra firmalardan demografik özelliklerini sorgulayan bir anket doldurmaları istenmiştir. Son aşamada ise kuramsal bir örneklem olarak seçilen dokuz firma ile mülakatlar yapılmıştır. Toplanan tüm verinin tamamı gömülü teori yaklaşımı (Strauss ve Corbin,

1990) ile analiz edilmiş ve daha sonraki araştırmalarda incelenmek üzere yedi önerme geliştirilmiştir.

Anahtar kelimeler: Sosyal sermaye, TEKMER, üniversite-sanayi işbirliği, Türkiye

To my family and Çağlar, who are always with me.

ACKNOWLEDGEMENTS

I wish to express my deepest gratitude to my supervisor, Assoc. Prof. Dr. S. Nazlı Wasti Pamuksuz, for her guidance, advice, criticism, encouragement, and insight throughout the research.

I am grateful to Prof. Dr. Ahmet Acar and Assist. Prof. Dr. Olga Kravets for serving as my committee members and for meticulously reviewing my thesis manuscripts.

I owe my great appreciation to Prof. Dr. Güliz Ger for her guidance, helpful comments and suggestions and for encouraging me to be a researcher.

I am grateful to the Scientific and Technological Research Council of Turkey (TÜBİTAK) for my scholarship during my master's education.

My special thanks go to the incubator management and specialists, Hayri Bengü Solmaz, Kaan Yücel, and Bilal Erdemir, and all the firm managers who participated my research.

I am indebted to my family, Gülgün, Haluk, and Mehmet Köseoğlu, for their constant support, their belief in my abilities, and for motivating me throughout my studies. I also want to thank to my research assistant colleagues, Gizem Keskin, Tuğba Giray and Özlem Çıragöz, and to my friends, Çağlar Köylü, Özge Ergin, Sanem Yumurtacı, Hikmet Demirkol, Hüseyin Akyol, Ece İdil Reşa, Cihan and Gözde Bahadır, for all their technical and moral support.

TABLE OF CONTENTS

PLAGIARISM	iii
ABSTRACT	iv
ÖZ	vi
ACKNOWLEDGEMENTS	ix
TABLE OF CONTENTS	x
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
CHAPTER	
1. INTRODUCTION	1
1.1. Statement of the Problem	4
1.2. Significance of the Study	4
1.3. Purpose of the Study	6
1.4. Research Objectives	6
1.5. Research Questions	7
1.6. Social Networks and Embeddedness	7
2. LITERATURE REVIEW	9
2.1. What is Social Capital?	9
2.2. Types of Social Capital	11
2.2.1. Internal vs. External Social Capital	11
2.2.2. Horizontal vs. Vertical Social Capital.....	12
2.2.3. Social Capital as a Public Good vs. a Private Good	12
2.3. Social Capital and Innovation	13
2.3.1. Social Capital in the Incubator Context	13
2.3.2. Strength of Weak Ties	17
2.4. Antecedents of Social Capital	18
<i>Trust and Legitimacy</i>	18
<i>Informal Networks</i>	18

<i>Previous Ties/Historical Roots</i>	19
<i>Incubator Manager/Specialists</i>	19
<i>Tenant Firm Managers</i>	20
<i>Time Concept</i>	21
<i>Industry Structure</i>	21
<i>Incubator Building Layout</i>	21
<i>Geographical Proximity</i>	22
2.5. Benefits of Social Capital for Innovation	22
2.6. Summary	25
3. RESEARCH SETTING	
3.1. What is an incubator?	27
3.2. The Incubator Under Study	28
4. METHODOLOGY	
4.1. Data Collection	33
<i>Step 1: Non-Participant Observation</i>	34
<i>Step 2: Pilot Interview</i>	35
<i>Step 3: Questionnaire</i>	37
<i>Step 4: Interviews</i>	38
5. RESULTS	
5.1. Observation	42
5.2. Pilot Interview	47
5.3. Questionnaire	49
5.4. Interview	56
5.4.1. Social Capital Development Among Tenant Firms	56
5.4.1.1. The Conceptual Model	57
5.4.1.2. Antecedents of Social Capital	57
5.4.1.3. Benefits of Social Capital	68
5.4.1.4. Time as a Moderator between the Antecedents and Benefits	70
5.4.1.5. Propositions	71
5.4.2. Social Capital Development Between Tenant Firms and the Host University	71
5.4.2.1. Antecedents of Social Capital	73

5.4.2.2. Benefits of Social Capital	76
5.4.2.3. Propositions.....	80
6. DISCUSSION	
7. CONCLUSION	
7.1. Research Implications	85
7.2. Managerial Implications	86
7.3. Limitations	87
REFERENCES	88
APPENDICES	
A. OBSERVATION GUIDE	94
B. PHOTOGRAPHS OF THE BUILDING.....	95
C. QUESTIONNAIRE FOR TENANT FIRMS (ENGLISH)	98
D. QUESTIONNAIRE FOR TENANT FIRMS (TURKISH).....	100
E. GUIDELINE OF THE INTERVIEW WITH THE TENANT FIRM OWNERS / MANAGERS (ENGLISH)	102
F. GUIDELINE FOR THE INTERVIEW WITH THE TENANT FIRM OWNERS / MANAGERS (TURKISH)	106
G. GUIDELINE OF THE INTERVIEW WITH THE INCUBATOR SPECIALISTS (ENGLISH).....	110
H. GUIDELINE OF THE INTERVIEW WITH THE INCUBATOR SPECIALISTS (TURKISH).....	113
I. GUIDELINE OF THE INTERVIEW WITH THE HOST UNIVERSITY ACADEMICIANS (ENGLISH)	116
J. GUIDELINE OF THE INTERVIEW WITH THE HOST UNIVERSITY ACADEMICIANS (TURKISH).....	117
K. DURATION OF INTERVIEWS	118
L. DEMOGRAPHICS OF INTERVIEWED FIRM MANAGERS.....	118

LIST OF TABLES

Table 1 Gross Domestic Expenditure on R&D as a percentage of GDP (OECD, Science, Technology and Industry Scoreboard, 2005)	2
Table 2 Rotated Component Matrix of Section 1	50
Table 3 Rotated Component Matrix of Section 2	51
Table 4 Factor Scores of the Firms.	53
Table 5 Case Selection Criteria.....	55
Table 6 Examples of Social Capital Dimensions.....	56

LIST OF FIGURES

Figure 1 R&D expenditures in Turkey as a percent of total GDP (OECD, Science, Technology and Industry Scoreboard, 2005).....	3
Figure 2 Dimensions of social capital and their effects on product innovation (Adapted from Tsai and Ghoshal, 1997).....	24
Figure 3 Industrial sectors of tenant firms admitted to Incubator X during 1992-2006 (http://www.tekmer.gov.tr).	29
Figure 4 Average age of firm owners.	30
Figure 5 Universities from which the owners graduated.	30
Figure 6 Age of the present incubator firms.	31
Figure 7 Incubator location on University M campus	43
Figure 8 Plan of University M Incubator (Main Building, Ground Floor).....	43
Figure 9 Proposed conceptual model.....	58

CHAPTER 1

INTRODUCTION

Innovation has become one of the key issues in the economic development of countries since the emergence of the Schumpeterian approach (Çakmakçı, 2003). According to Scumpeter (1943), there have been several waves in capitalist economic development, and each wave of development has defined the economic structure of that term. The most recent wave emerged with the striking development of technology emphasized knowledge and technology transfer within and between different sized companies through networks.

Turkey has had several problems in this area. First of all, Turkey is a late industrializing country and has mostly been the recipient of technology, not the producer. The budget for internal research and development (R&D) processes is very limited (Uzun, 2001). According to the Science, Technology and Industry Scoreboard of OECD (2005), Turkey is one of the lowest ranking countries in research and development expenditure as a percentage of Gross Domestic Product between 1991 and 2002 (Table 1). Therefore, after the industrial revolution Turkey lost its power in dominating markets (Çakmakçı, 2003).

Another problem Turkey has is being “short termist” (Çakmakçı, 2003). As there is low economic stability, companies are afraid to enter long term projects. However, by its nature, R&D shows its impact in the long run. Thirdly, although Turkey gets many licenses and imports technology (Uzun, 2001), there is not enough capacity to adopt and improve this technology (Çakmakçı, 2003). There is a huge university potential that is not being utilized. Turkey is the last country among all OECD countries in number of patents, which shows that the basic research done in the universities cannot be converted into innovations by companies (Uzun, 2001). Lastly, there is a lack of proper legal control on innovation and research and development in Turkey (Çakmakçı, 2003).

Table 1 Gross Domestic Expenditure on R&D as a percentage of GDP

Countries	1991	1995	1996	1997	1998	1999	2000	2001	2002
Turkey	0.53	0.38	0.45	0.49	0.50	0.63	0.64	0.72	0.66
Canada	1.60	1.72	1.68	1.68	1.79	1.82	1.93	2.08	1.96
Mexico	0.22	0.31	0.31	0.34	0.38	0.43	0.37	0.39	..
United States	2.71	2.51	2.55	1.58	2.61	2.65	2.72	2.73	2.66
Australia	1.52	..	1.67	..	1.51	..	1.56	..	1.62
Japan	2.76	2.69	2.78	2.84	2.95	2.96	2.99	3.07	3.12
Korea	1.82	3.37	2.42	2.48	2.34	2.25	2.39	2.59	2.53
New Zealand	0.98	0.96	1.69	1.10	..	1.01	..	1.14	..
Austria	1.44	1.54	1.87	1.69	1.77	1.88	1.91	2.04	2.12
Belgium	1.62	1.72	1.09	1.80	1.90	1.96	2.04	2.17	2.23
Czech Republic	1.90	0.95	1.94	1.09	1.17	1.16	1.23	1.22	1.22
Denmark	1.64	1.84	2.71	1.94	2.06	2.19	..	2.41	2.53
Finland	2.04	2.28	2.54	2.71	2.88	3.23	3.40	3.41	3.44
France	2.37	2.31	2.30	2.22	2.17	2.18	2.18	2.23	2.26
Germany	2.52	2.25	2.25	2.29	2.31	2.44	2.49	2.51	2.53
Greece	0.36	0.49	..	0.51	..	0.67	..	0.65	..
Hungary	1.06	0.73	0.65	0.72	0.68	0.69	0.80	0.95	1.02
Iceland	1.17	1.57	..	1.88	2.07	2.38	2.75	3.06	3.09
Ireland	0.93	1.28	1.32	1.29	1.25	1.19	1.14	1.11	1.12
Italy	1.23	1.00	1.01	1.05	1.07	1.04	1.07	1.11	1.16
Luxembourg	..	..	..	..	..	..	1.71	..	..
Netherlands	1.97	1.99	2.01	2.04	1.94	2.02	1.90	1.88	1.80
Norway	1.64	1.70	..	1.64	..	1.65	..	1.60	1.67
Poland	0.76	0.66	0.67	0.67	0.68	0.70	0.66	0.64	0.58
Portugal	0.57	0.57	0.60	0.62	0.69	0.75	0.80	0.85	0.94
Slovak Republic	2.13	0.93	0.92	1.09	0.79	0.66	0.65	0.64	0.58
Spain	0.84	0.81	0.83	0.89	0.89	0.88	0.94	0.95	1.03
Sweden	2.72	3.35	..	..	..	3.65	..	4.27	..
Switzerland	2.59	..	2.67	..	..	..	2.57	..	..
United Kingdom	2.07	..	1.88	1.81	1.80	1.87	1.86	1.87	1.90

Source: OECD, Science, Technology and Industry Scoreboard, 2005

In order to overcome these problems, strategies for innovation and policy have been developed in Turkey since the 1960s. With the establishment of The Law of Technological Zones, no: 4691, in 1991, this development became faster by investments on science parks and incubators (Annual Innovation Policy Trends and Appraisal Report, European Commission, 2006). The increase in the R&D expenditure compared to the total GDP between the years 1990-2002 can be seen in Figure 1.

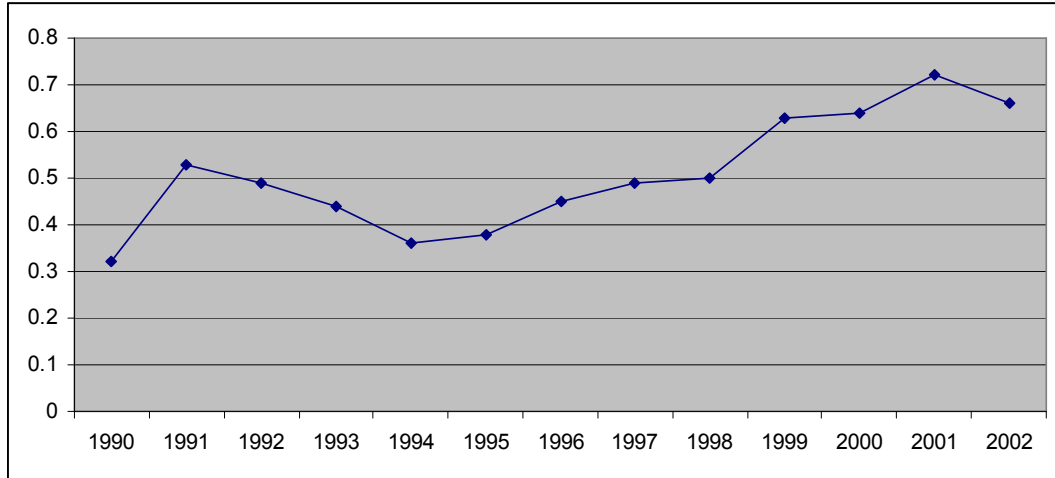


Figure 1 R&D expenditures in Turkey as a percent of total GDP (Source: OECD, Science, Technology and Industry Scoreboard, 2005)

The European Commission Report (2006) states that there are three challenges that Turkey should overcome: Increasing investments in human resources for innovation, enhancing university-industry co-operation, and increasing the innovation activities of the private sector. This research focuses on the second challenge, for which the government developed the following solutions:

- Establishment of incubators (TEKMERS¹) in order to create a favorable environment for the start-up of innovative companies within universities,
- University-Industry Joint Research Programs to facilitate university-industry collaboration for research and innovation,
- Support the establishment of technology parks (the Law of Technology Development Zones) to provide incentives for R&D activities of companies located in techno-parks within universities and research institutes (The European Commission Report, 2006).

This study focuses on an incubator located in a university science park which was established to help solve the problems mentioned above. TEKMER firms are located

¹ Teknoloji Merkezleri.

in university campuses and their research and development projects are supported by the Small and Medium Industry Development Organization of Turkey (KOSGEB) (www.tekmer.gov.tr). KOSGEB was founded in 1990 with the 3624th Law. After the established of this law, a collaboration protocol between KOSGEB and the host university (henceforth, University M) was signed, and the first incubator in Turkey was established (www.kosgeb.gov.tr). Later, 18 more incubators, all located in universities, were founded in order to support university-industry collaboration. The University M Science Park was established after the 1991 Law of Technology Development Zones, (<http://www.metutech.metu.edu.tr/teknokent/teknopark.php>). It is the first such science park and is one of the most successful in Turkey.²

1.1. Statement of the Problem

Up to now, we have dwelt on the importance of incubators and university-industry collaboration for the development of Turkey. In this study, the development and effect of social capital in an innovative milieu will be elaborated for the incubator located in University M's Science Park. In this way, social capital development among incubator firms and between the tenant firms and the host university will be evaluated. Moreover, the effect of incubator management and specialists, host university academicians, and tenant firm managers on social capital generation will be investigated, using a simple survey as a quantitative research tool and observation and in-depth semi-structured interviews as qualitative research tools.

1.2. Significance of the Study

This study hopes to generate significant contributions to the existing literature. Firstly, it combines two separate literatures (relations among incubator firms and university-industry collaboration) under the umbrella of social capital. Up to now, the relations among firms in a locality were perceived as social capital (Anderson and Jack, 2002, Batjargal, 2003, Bollingtoft et al., 2005, Cooke and Willis, 1999, Liao and Welsch, 2005, Neergard and Madsen, 2004, Tötterman et al., 2005, Tsai and Ghoshal, 1998, Uzzi, 1996, Walker et al., 1997). However, researchers have

² Presently there are 17 science parks in Turkey (www.sanayi.gov.tr).

typically focused only on university-industry collaboration (Phan et al., 2005, Rothaermal et al., 2005, Markman et al., 2005, Link et al., 2005, Vedovello, 1997). Nevertheless, relations among the host university and firms located in the campus can also create social capital. This study concentrates on two layers of social capital development: Social capital development among tenant firms, and social capital development between the tenant firms and the host university. Incubators provide tenant firms with technical, business, and social inputs. However, social inputs have not been evaluated enough in the literature (McAdam, 2006). This research will focus on the social input of incubators on firms.

The social capital concept has primarily been analyzed in developed countries (Tsai and Ghoshal, 1998, Anderson and Jack, 2002, Neergard and Madsen, 2004, Tötterman et al., 2005), whereas this study analyzes the situation in a developing country. As mentioned above, the establishment of university science parks and incubators is very critical for the improvement of Turkey in research and development. The study will provide firm managers, incubator specialists, university management, and academicians of Turkey insight about social capital creation, the difficulties the firms might face, and the benefits that can be earned through social capital development.

Lastly, this study investigates the relationship between the three dimensions of social capital and the antecedents and benefits of social capital. In a number of studies researchers mention the antecedents and benefits of social capital (Adler and Kwon, 2002, Lyons, 2002, Neergard and Madsen, 2004, Valentinov, 2004, Liao et al., 2005, Bollingtoft et al., 2005, Tötterman et al., 2005, Cantner and Graf, 2005, Leana and Pil, 2006), and others stress the structural, cognitive, and relational dimensions of social capital (Nahapiet and Ghoshal, 1998, Tsai and Ghoshal, 1998, Tötterman et al., 2005). This study aims to combine these two branches of literature.

1.3. Purpose of the Study

The purpose of the study is to explore two layers of social capital in a university incubator context: (1) Social capital development among firms, (2) Social capital development between the tenant firms and the host university. The incubator firms are start-up firms which have a higher propensity to cooperate with other firms than established firms (Walker et al., 2005). Since a firm's early partner choices have a significant impact on the course of future cooperation (Walker et al., 2005), strategy and policy development for start-up firms on social capital formation is a critical issue. Qualitative research tools were preferred for this study due to the fact that social capital development is context-dependent (Leana, and Pil, 2006, Woolcock, 1998, Lalkaka, 2002, McAdam et al., 2006). However, before the theoretical sample of the interviews was determined, the tenant firms were asked to join a simple survey in order to gain insight about the incubator environment. In addition to the researcher's etic view, gained through observations, the emic view of the tenant firm owners, the host university academicians, and the incubator management/specialists were taken through in-depth, semi-structured interviews in order to triangulate the data collected and increase the transferability of the study. The qualitative research process is a process for finding out the theory grounded in the data (Glaser and Strauss, 1967).

1.4. Research Objectives

The objective of this study is to contribute to the social capital literature by combining the literature on the dimensions of social capital on the literature about how social capital is created and what its benefits are for various firms. The first objective has two sub-objectives: analyzing (a) social capital development among tenant firms, (b) social capital development among the host university and the tenant firms. In order to reach these objectives, a multi-method approach of three qualitative and one quantitative research tools has been used.

1.5. Research Questions

- (1) What are the antecedents of social capital development?
- (2) What are the benefits of social capital development on the tenant firms?
- (3) How are the different dimensions of social capital related to the antecedents and benefits?
- (4) What are the effects of being located in a university on social capital development between the firms and the host university?
- (5) What is the role of the incubator management/specialists on social capital creation?

The above questions guide the firm selection for theoretical sampling, and the questions in the questionnaire, and semi-structured interviews.

1.6. Social Networks and Embeddedness

This section explains how the two key concepts of this research, social networks and embeddedness, are related to social capital. The concept of social capital will be explained in the next section in detail.

Lechner et al. (2006) define social networks³ as the relationships with other firms that stem from relations with friends, relatives, and long-standing colleagues, prior to the foundation of the firm. Social networks have benefits like providing the actors means to acquire information, accessing new ideas and information, and generating collective learning through the exchange of this knowledge. Anderson and Jack (2002) indicate that the social network approach has been used in two ways: to demonstrate personal networks of the owner manager of a new venture, which allows access to resources and information, and to demonstrate social embeddedness and the associated dynamics of economic exchange. This research focuses on the second approach.

³ The terms of “networks”, “ties”, and “relations” are used interchangeably in this study.

Social networks are associated with social capital (Neergard and Madsen, 2004). Social capital is defined as an asset that inheres in social relations and networks (Burt, 1997). Burt (1997) suggests that social capital has the benefit of reaching resources and information through network ties. Burt (1997) also adds that social networks constitute social capital when they contribute to entrepreneurial goals. Furthermore, Walker et al. (1997) claim that the amount of social capital of a firm depends on its position in the network structure.

Embeddedness is the other key concept related to social capital and is defined as the networks between and among firms in a locality (Granovetter, 1998). Economic actions are embedded in the social structure and ongoing social ties among actors (Granovetter, 1985, Uzzi, 1997). The components of an embedded relationship are trust, fine-grained information transfer, and joint problem solving (Uzzi, 1997). Some writers use the concept “embeddedness” instead of “dimensions” while they are evaluating the structural, relational, and cognitive dimensions of social capital (Cooke et al., 2005).

In conclusion, it can be said that *embedded* relations between individuals in *social networks* lead to the development of *social capital* (Tsai and Ghoshal, 1998).

CHAPTER 2

LITERATURE REVIEW

2.1. What is Social Capital?

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). Individuals form relationships between and among each other in social networks, and social capital is the system of these relations (Coleman, 1988). Social capital is communal property (Willis and Cooke, 1999), formed by the reciprocal relations of individuals that depend on trust and reliability in a network. Individual and collective social networks, ties, and structures compose social capital, helping the individual get access to information and know-how. The source of social capital can be found in the structure and the content of the relations between these individuals (Adler and Kwon, 2002).

In order to better understand social capital, the meaning of the term “capital” should be elaborated. In its broadest sense, capital is any asset that is valuable for the production of other assets. Social capital can be accepted as a fourth type of capital together with human capital, financial capital, and physical capital (Lyons, 2002). Adler and Kwon (2002) identify the points where social capital differs from and resembles other sources of capital. The major difference of social capital from other forms of capital is that it is not found in the individuals themselves, but in the relations between individuals. Furthermore, since it does not have quantitative measures and is a long-lived asset which can be invested to gain future benefits, it can only be metaphorically inferred as capital (Adler and Kwon, 2002). Moreover, it is appropriable (Burt, 1988), meaning that it can be used for other purposes, like utilizing the network created for information transfer or sharing experiences. Moreover, social capital can be a complement or substitute to other forms of capital (Adler and Kwon, 2002).

The effect of the relations among actors on the formation of social capital has been discussed since Jane Jacobs suggested that neighborhood networks form the city's social capital, in her famous book "The Life and Death of Great American Cities" (Willis and Cooke, 1999). Spence et al. (2003) indicate that the concept has further been developed by economists like Woolcock and Narayan (2000), sociologists like Coleman (1988), and political scientists such as Putnam (1995). Burt (1997) carried the concept to the management field by focusing on relations beyond and within firms. Since then, the concept has been applied to many industries.

Nahapiet and Ghoshal (1998) and Ghoshal and Tsai (1998) analyzed three dimensions of social capital in the organization context. 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. For example, industrial districts generally have dense and non-hierarchical networks. The *cognitive dimension* is related to the shared goals and shared culture in a clique. Sharing the same competitive position might lead to the creation of a shared industrial recipe among partners. The last dimension is the *relational dimension*. A lack of trust may cause confusion in the network and harm the process of knowledge transfer. In addition, as trust develops, the opportunity for knowledge transfer in a network is enhanced.

Adler and Kwon (2002) contribute to the social capital literature by looking at social capital in three kinds of relations—market, hierarchical, and social relations. *Market relations* are the ones through which products, services, and money are exchanged. *Hierarchical relations* are characterized by obedience to authority. In the last type of relationship, *social relations*, favors and gifts are exchanged. This type of relationships underlies social capital. In addition, social capital acts both as glue, which forms the structure of networks, and at the same time as a lubricant that facilitates the operation of networks (Anderson, et. al. 2002). Consequently, social capital can be both an outcome and a medium for the creation of networks.

2.2. Types of Social Capital

Various researchers have categorized social capital in different ways. The following section will analyze the types of social capital as described in the literature.

2.2.1. Internal Versus External Social Capital

Researchers can be categorized based on whether or not they follow the notion of external or internal social capital, or both (Adler and Kwon, 2002). The first group, consisting of researchers working on external social capital, deal with relations of an individual with outside actors (Bourdieu, 1985, Baker, 1990, Burt, 1992, and Portes, 1993). Here the social network ties the focal actor to others. Researchers who focus on internal social capital, on the other hand, look at relations among actors within a collectivity (Coleman, 1990, Putnam, 1995, and Fukuyama, 1995). The third category of researchers claims that external and internal social capital views are not mutually exclusive and the that distinction between the external and internal views is a matter of perspective and unit of analysis. Adler and Kwon (2002), Nahapiet and Ghoshal (1998), Woolcock (1998), and Tötterman et al. (2005) state that relations between employees in a collectivity can be internal to the firm but external to the individual.

In this study, it is assumed that internal and external social capital theories cannot be examined separately and that the third view is the most appropriate. According to Tötterman et al. (2005), both internal and external networks in an incubator facilitate social capital development. Internal networks ease the building of social capital by bringing various incubator tenants together and encouraging them to share information and resources; external networks focus on forming linkages with tenant firms and external service providers. Since incubators help the generation of both internal ties (e.g., the relations among tenant firms or relations between the firms and incubator management), and external ties (e.g., the relations among tenant firms and firms outside of the incubator or relations with suppliers and customers), this study will focus on both internal and external social capital.

2.2.2. Horizontal Versus Vertical Social Capital

Lyons (2002) identifies two kinds of social capital: horizontal and vertical social capital. Vertical social capital can be seen between different management levels in a hierarchical organizational structure. These relationships are generally formalized with a chain of command among the actors. Horizontal social capital is seen between actors of a cross-functional organizational structure, where the relations are less formal. In this study, since the incubator context does not have a hierarchical structure, the formation of horizontal social capital among similarly sized high-tech firms will be analyzed.

2.2.3. Social Capital as a Public Good vs. a Private Good

Some studies in the social capital literature assume social capital to be a private good and emphasize the personal benefits generated from social capital, such as career opportunities, success in one's career, and increased opportunity for finding jobs (Burt, 1997, Adler and Kwon, 2002). Other studies perceive social capital as a public good and the focus is on group-level benefits (Tsai and Ghoshal, 1998, Nahapiet and Ghoshal, 1998, Valentinov, 2004, Tötterman et al., 2005, Leana and Pil, 2006). The latter studies consider the effect of social capital on information sharing and innovation within a single company or across a group of companies. The synergy created within or among firms acts as a public good, increasing the innovative potential of the whole group by triggering trust and tacit knowledge sharing.

The present study follows Valentinov's (2004) approach which assumes that the two views of social capital are interrelated. For instance, the network of the manager as an individual (individual and private social capital) contributes to the development of social capital of the whole company, which is considered as organizational/group level public social capital (Valentinov, 2004). When the network created by the manager grows, the network of the whole organization also develops. This means that private and public social capital depend on each other and can develop simultaneously.

2.3. Social Capital and Innovation

After Burt (1997) carried the social capital concept to the management field by focusing on the relations beyond and within firms, and Nahapiet and Ghoshal (1998) and Tsai and Ghoshal (1998) concentrate on the effect of social capital on innovation and technology transfer, studies in various contexts such as in public schools (Leana and Pil, 2006), women's better dress industry (Uzzi, 1997), high tech start-ups (Neergard and Madsen, 2004), and business incubators (Tötterman et al., 2005, Bollingtoft et al., 2005) has been conducted. The studies show that since 2004 the focus is on innovative firms.

An important theme of this study is on the effect of social capital on innovation. Social capital, which can be seen as a product of embedded relationships, is said to enhance innovation through information sharing, trust, and personal networking. Tsai and Ghoshal (1998) find that social capital facilitates resource exchanges among actors, which in turn has a significant effect on product innovation. Embedded ties create trust among actors and trigger information transfer and joint problem solving (Uzzi, 1997). Inkpen and Tsang (2005) extend this view and indicate that novel knowledge creation is generated through learning from partners.

2.3.1. Social Capital in the Incubator Context

An important setting to observe relations among innovative small enterprises is business incubators. Incubator firms (also called tenant firms) typically operate in the high-tech sector and are all start-ups facing the liability of newness. My claim is that being a tenant firm in the incubator does not only bring economic benefits like low rent offices or various types of 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 creation of social capital (Hansen et al., 2000). Embedded relations among firms will enhance the firms' innovative capabilities (Hansen et al., 2000). In the social capital literature, Tötterman et al. (2005) and Bollingtoft et al. (2005) use the incubator context to examine social capital formation. Tötterman et al. (2005) found that all three dimensions of social capital,

(structural, cognitive and relational), can be examined in the incubator context. Bollingtoft et al. (2005) conducted a qualitative research on six incubators through in-depth interviews and indicated that social capital development in an incubator depends on two mechanisms: mechanisms connected to individuals and their relations with each other, and mechanisms related to the construction of the incubator.

Industrial districts, science parks, and incubators are sometimes located within or close to university campuses. The reason is the same with locating the firms in one locality: creating synergy among actors, and consequently forming university-industry collaboration through geographical proximity (Phan et al., 2005, Rothaermal et al., 2005, Markman et al., 2005, Link et al., 2005). The results of a survey done by Link et al. (2005) on 88 academic institutions indicate that there is a direct relationship between the proximity of the science park to the university and the probability that the academic curriculum will shift from basic toward applied research. In their study of 45 Italian business incubator firms compared with a control sample of off-park firms, Colombo and Delmastro (2001) claim that proximity to university laboratories and research centers provides on-park firms easier access to scientific expertise and research compared to off-park firms. The authors state that due to the transfer of knowledge between the university and the firms, commercialization of research takes place. Proximity between firms and universities promote the natural exchange of ideas through both formal networks (such as licensing and cooperative alliances) and informal networks (such as informal mobility of scientists and engineers and social meetings) (Löfsten et al., 2005). These relations can be perceived as an extended level of social capital for on-campus incubator firms.

Incubators and science parks can be examined at the national level, university or regional level, science park or incubator level, incubator firm level and the entrepreneurial and team level (Phan et al., 2005). In this study, the focus will be on the university, incubator, and tenant firm levels.

Since an incubator can be considered as a small replica of a large industrial district with co-located innovative firms, the existence of embedded ties in an industrial district should first be understood. Firms in an industrial district have the opportunity to share a large knowledge resource base, primarily tacit knowledge (Inkpen and Tsang, 2005). Anderson and Jack's (2002) study on Silicon Valley claims that social capital can explain the success of industrial districts. Geographical proximity facilitates the transfer of tacit knowledge and consequently supports collaborative interactions such as joint problem solving, formal or informal partnerships, or joint ventures (Cantner and Graf, 2005). Tötterman et al. (2005) indicate that the level of trust and credibility among incubator tenants also depends on physical proximity.

Similar embedded ties can be seen at the incubator level, where a smaller number of firms are located together. Incubators are special contexts where a nurturing environment is provided for start-ups and designed as an economic development tool in order to accelerate growth and success (www.nbia.com). In this study, two layers of external social capital development of the tenant firms will be analyzed. The first layer is based on the relations among the tenant firms. Compared to the financial advantages provided by the incubator, social aspects seem to play a much more important role for the tenant firms (Tötterman, et al., 2005). Bollingtoft et al. (2005) conclude that an incubator is more than a physical arrangement where a start-up can minimize start-up firm costs and the drawbacks of its liability of newness. With the help of incubators, start-up firms not only access resources such as office space, student employees, and financial support easily, but also form networks with others which bring them their competitive advantage (Hansen et al., 2000). The development of close relationships triggers embeddedness (Granovetter, 1985). Since social capital is the product of an embedding process and networks (Anderson and Jack, 2002), it can be understood why the incubator context is suitable to study social capital.

In science parks and incubators, the second layer of social capital is based on the relations the tenant firms and the host university (Chan and Lau, 2005, Mc Adam et al., 2006). University-industry relations are critical for national and economic

development as there is a positive correlation between innovative activity and university research at the state level (Colombo and Delmastro, 2001). It can be seen clearly that both the university and the industry benefit from this relationship. The highest degree of convergence between university and industry is in high technology research, where rapid technology transfer necessitates proximity (Mian, 1996). In this way, university knowledge gets commercialized as faculty members are encouraged to be entrepreneurs. Students and university staff import know-how from industry to academia (Darr et al., 2005). In addition to the transfer of knowledge between these two parties, there are other advantages of forming linkages. Bringing together the practitioners and the academic world results in increased career opportunities for students and enhanced scholarly productivity among academicians, while increasing the rate of applying basic research to industry problems, and increasing the opportunity to utilize university facilities (Camilleri and Humphries, 2005, Löfsten and Lindelöf, 2002).

Vedovello (1997) studied such relations in a mature and stable science park, the Surrey Science Park, founded in a well-developed part of England and owned and run by the University of Surrey. In her study, she defined three types of relations between the science park firms and their host university: informal links, human resources links, and formal links. Informal contact with academic staff, access to university equipment, attendance to seminars, and access to specialized technical support are examples of such *informal ties*. *Human resources links* develop through the involvement of students in various projects, recruitment of recent graduate or more experienced scientists and professors to science park firms, internships in science park firms, and so on. There are also a number of *formal links*; for instance, the engagement of faculty staff for consultancy, analysis, and testing in university departments, or the establishment of joint ventures with the university. The occurrence of such linkages between incubator firms and the host university will be investigated in this study.

2.3.2. Strength of Weak Ties

Up to now, only the positive effects of strong ties between actors have been discussed. However, there is an ongoing debate on the view which indicates that the more social capital is available for the firm; the less the firm can increase it through new relationships (Walker et al., 2005). Networks may trigger development of trust and legitimacy, but may also exclude some actors or information because of group expectations (Anderson and Jack, 2002). Relationships might get so strong that they prohibit the diffusion of outside information and changes into the group (Florida et al., 2002). The closer the relations get, the less independent the firms become (Walker et al., 2005) and the more social capital is available to the firm, the less the firm can increase it through new relationships (Walker et al., 2005). There is also the belief that non-clustered firms develop more breakthrough innovations (Yu, 2002).

Burt (2000) calls the weaker connections between groups which act as buffers among groups in the social structure of the market as “structural holes”, and states that structural holes between groups do not mean that they ignore each other. If an entrepreneur can span these holes, he/she gets competitive advantage. From contacts that are strongly connected, no new information flow takes place, hence structural holes prevent non-redundant information sharing. Some researchers state that actors in social networks of weak ties access novel information easier than actors with strong network ties (Bollingtoft et al., 2005). Therefore, the existence of structural holes increases the absorptive capacity of firms, which is the ability of a firm to recognize the value of new, external information, and to assimilate and commercialize it (Cohen and Levinthal, 1990). This supports Granovetter’s (1985) view that if all firms were embedded, no new information would flow. This means there is a tradeoff between weak and strong ties, where strongly embedded ties increase the level of trust between actors, and weak ties enhance exchange of new knowledge. Uzzi (1996) suggests that strong embedded ties and arm’s length ties should be in balance in order to maximize the benefits that can be generated by both.

2.4. Antecedents of Social Capital

After defining social capital and its interpretations in an innovative environment, the antecedents of social capital will be examined. Adler and Kwon (2002) broadly categorize the antecedents of social capital into two groups: *Macro factors*, such as the rule of law, political regime, legal framework, level of participation in policy making process, and level of decentralization; and *micro factors*, such as structure, size, actors, and attitude similarity of a group of people.

When studies on the conditions that develop social capital are analyzed, many other triggers can be identified. Developing trust through informal networks over time (Inkpen et al., 2005), the effect of management (Tötterman et al., 2005), the type of industry the firm is in (Lyons, 2002), and the entrepreneurial skills of the manager of the firm (Burt, 2000) contribute to the creation of social capital. These antecedents will be explained below.

Trust and Legitimacy

An antecedent of social capital is the development of trust and legitimacy among members of a network. Nahapiet and Ghoshal (1997) argue that trust is an element of the relational dimension of social capital. They define trust as the willingness of members of a group to share their knowledge with others. The presence of trust contributes to the exchange of information since the members of the group do not feel an obligation to protect themselves from other members' opportunistic behaviors (Nahapiet and Ghoshal, 1997, Liao et al., 2005).

Informal Networks

Social capital also depends on informal networks (Granovetter, 1985). Informal networks such as the transfer of knowledge between scientists, researchers, and engineers during trade fairs, conferences or during informal meetings (Cantner and Graf, 2005) are critical in the development of social capital for two reasons. Informal networks based on personal contacts, proximity, being members of the same society,

and socialization (Darr et al., 2005) play an important role in developing trust among actors, which in turn generates social capital. However, formal contacts such as formal partnerships and joint ventures are not found to be a driving force behind networking (Bollingtoft et al., 2005). Secondly, informal linkages suffice for formal relationships (Lyons, 2002). Informal contacts take place in three stages. First opportunities are exchanged accidentally, which is followed by collaboration of the parties (Darr et al., 2002). When a firm first enters the incubator, informal relations such as friendship are critical; however, in time these relations turn to neighboring relations. Eventually informal relations get institutionalized and formal relations such as alliances and joint ventures take place (McAdam, 2006). That is, unplanned informal relationships first turn into planned relationships and eventually into a structured network (Lechner et al., 2006). Indeed, in an industrial district, interpersonal relationships developed through informal contacts constitute the whole network ties in the region (Nahapiet and Ghoshal, 1997, Inkpen and Tsang, 2005).

Previous Ties/Historical Roots

Previous ties and historical roots, which are the bases of embedded relations (Uzzi, 1996), are also antecedents of social capital (Adler and Kwon, 2002). Adler and Kwon claim that like other forms of capital, social capital is a long-lived asset and other resources can be invested in it with an expectation of future benefits. By investing into their networks, actors can augment social capital. The authors state that social capital in larger social aggregates has deep historical roots and so should be traced as an “endowment”. On the other hand, Burt (1997) claims that former relations have no impact on social capital and that prior networks can only be a by-product of the interaction between parties.

Incubator Manager/Specialists

The incubator management has different responsibilities in different incubators, but generally it is responsible for helping tenants through selection procedures, monitoring tenants progress towards set targets, developing and refining a

comprehensive business support program, advising tenants directly on basic business development processes, helping tenants write/refine business plans, advising tenants directly on basic business development processes, helping tenants market products/services, developing and maintaining databases, providing clerical support for the incubator (e.g., typing, faxing, reception services), and managing common area services (http://www.warwicksciencepark.co.uk/information/conferencepapers/documents/Agudietobusinessincubation_000.pdf).

The impact of incubator management on social capital creation cannot be ignored. The incubator personnel and manager should help the start-up tenant firms which do not have enough business experience to develop external and internal relationships (Tötterman et al., 2005). The incubator management can put the tenants into central positions in networks, which would contribute to the structural dimension of social capital (connection patterns between actors) by creating opportunities for tenants to network with each other or the host university. Attempts to create a strong community in the incubator would be expected to improve the cognitive dimension (shared understanding and common goals of actors), and aiding the development of trust among tenants would focus on the relational dimension (behavioral assets rooted in relationships like trust among actors) of social capital (Tötterman et al., 2005).

Tenant Firm Managers

Another antecedent is related with the characteristics of the managers of the tenant firms. Managers of start-ups might have specialized knowledge on the project they are working on. However, due to their lack of experience in running their own business, they generally lack entrepreneurial skills (Bollingtoft et al., 2005). These entrepreneurial skills are building bridges among actors, monitoring information more effectively, moving information quickly and to many people, and shifting network time and energy from one solution to another easily (Burt, 1998). Managers with extended entrepreneurial skills can span structural holes easily and move information faster to more people (Burt, 1988).

There is a debate on whether entrepreneurial skills of tenant firm managers are antecedents or outcomes of social capital. While some writers suggest that entrepreneurial skills of managers create social capital, others claim that social capital is an antecedent of entrepreneurship (Adler and Kwon, 2002) and argue that entrepreneurs must accumulate network capital just as they collect physical resources to enhance the growth of their firms.

Time Concept

Building social capital is not a short term activity for a firm (Lyons, 2002), thus time is also a crucial element for the development of social capital. As time passes, trust will develop between tenants, which will generate social capital (Inkpen and Tsang, 2005). Moreover, empathy towards one another creates social capital since it leads to an appreciation of the other party. This “you show me yours, I show you mine” type of exchange supports the process of negotiating and it takes time to build empathy between the parties.

Industry Structure

The structure of the industry itself is an important antecedent; for instance, in high-tech industries, there is more creation of social capital than in agriculture (Lyons, 2002). Technology ventures place greater emphasis on knowledge accumulation and learning than non-technology-based ventures, which increases the expectation of greater amount of social capital formation among them (Liao et al., 2006).

Incubator Building Layout

Bollingtoft et al. (2005) state that there is another mechanism which hinders or facilitates social capital formation. This mechanism is related to the construction of the incubator and the physical arrangements of the offices. For example, being on the same floor brings firms together more often. Even though the firms are in the same building, their geographical proximity can influence the frequency of their contacts

(McAdam et al., 2006). McAdam et al. (2006) claim that close proximity influences the way the firms relate and disseminate information and knowledge among each other. The size of the incubator is critical as well. As the number of tenants decreases, the probability of getting to know each other increases. Fayard et al. (2007) state that the architecture of the space, which covers the accessibility, ease of entry, enclosure (proportion of windows to walls), and size of the common spaces are also important in creating networks.

Geographical Proximity

An important aspect in creating the relationship between industry and academia is locating them close to each other, since it is believed that the most important trigger for creating and sustaining new technologies and products is providing access to the capabilities of each party (Phan et al., 2005). As the geographical proximity between universities and firms increase, access to scientific expertise, university laboratories, libraries, and other material also becomes easier (Colombo and Delmastro, 2001). In this way, universities turn into catalysts of new venture formation and regional development (Markman et al., 2005). Vedovello (1997) develops a counterargument on the effect of proximity on social capital formation. She argues that science parks that allow firms to come together in the same geography facilitate the development of informal and human resources links. On the other hand, she finds that it is the existence of related research fields that facilitates formal links, not geographical proximity. This means that, only if the research activity in the university has high quality and if it is applied to the industrial sector, formal relations between the host university and tenant firms will be enhanced.

2.5. Benefits of Social Capital for Innovation

High-tech firms that inhabit incubators operate in a fast changing, dynamic environment. In such a tough environment, incubators should focus on creating networks for the tenants in order to develop viable businesses instead of simply providing financial support (Tötterman et al., 2005) so tenants can overcome the liabilities of newness (Liao et al., 2005). As Yu (2002) claims, firms clustered in the

same location (as in the incubator context of this research) do not gain competitive advantage from technological development; the advantage comes from relations that are developed. Social capital among firms increases the predictability of interactions in the environment (Leana and Pil, 2006) and when tacit knowledge transfer between actors takes place, the probability of failure decreases (Rothaermal and Thursby, 2005), which turns into the firms' competitive advantage.

Incubators help tenant firms create relations not only among each other, but also with suppliers, customers, and employees outside the incubator. Social capital helps firms form industry-wide networks (Batjargal, 2003), hence incubator start-ups have a broader base of customers, suppliers, alliances, and employees than start-ups outside the incubator. This enables incubator firms to recover from troubled times more easily (Burt, 1988). Obviously the characteristics of the firm owner should not be ignored in network creation. Entrepreneurs who are rich in social capital can span structural holes, and as a result are more likely to succeed since they can recover ventures that get into trouble. Since such entrepreneurs are aware of trouble sooner, they are more flexible in re-shaping the venture to adapt to change (Burt, 1988).

Nahapiet and Ghoshal (1997), Tsai and Ghoshal (1997), Tötterman et al. (2005), and Batjargal (2003) claim that the basic benefit of social capital is increasing the innovative potential of the firms through resource and information exchange. The three dimensions of social capital (structural, relational, and cognitive) contribute to the exchange and combination of resources, which lead to value creation through product innovation (Nahapiet and Ghoshal, 1997, Tsai and Ghoshal, 1997). This relationship can be seen in Figure 2.

Tsai and Ghoshal (1997) explain the effect of each dimension of social capital on resource exchange and combination, and value creation. The configuration of the network structure constitutes the structural dimension of social capital, which determines the pattern of social ties (hierarchy, density, and connectivity of the network structure) (Inkpen and Tsang, 2005). Social ties are channels of information and resource exchange since through social interaction, an actor may gain access to

other actors' resources (Tsai and Ghoshal, 1997). Entrepreneurial networks provide means of both acquiring information and scarce resources.

Trust is an element of the relational dimension of social capital. Tsai and Ghoshal (1997) and Liao et al. (2005) claim that the more two parties trust each other, the more easily they share their resources and information without being worried that the other party is taking advantage. Trust enhances cooperative activity among parties and increases tacit knowledge sharing among them (Liao et al., 2005).

Tsai and Ghoshal (1997) define the cognitive dimension as shared vision and indicate that a shared vision among actors avoids misunderstandings in communications, which leads to increased opportunities in sharing ideas and resources freely.

The new resources which are gained from partners through new channels are combined to create new or better products (Tsai and Ghoshal, 1997). Utilization of networks in order to exchange knowledge and resources facilitates collective learning (Mc Adam, 2006). Thus, the innovative potential of the firms improves.

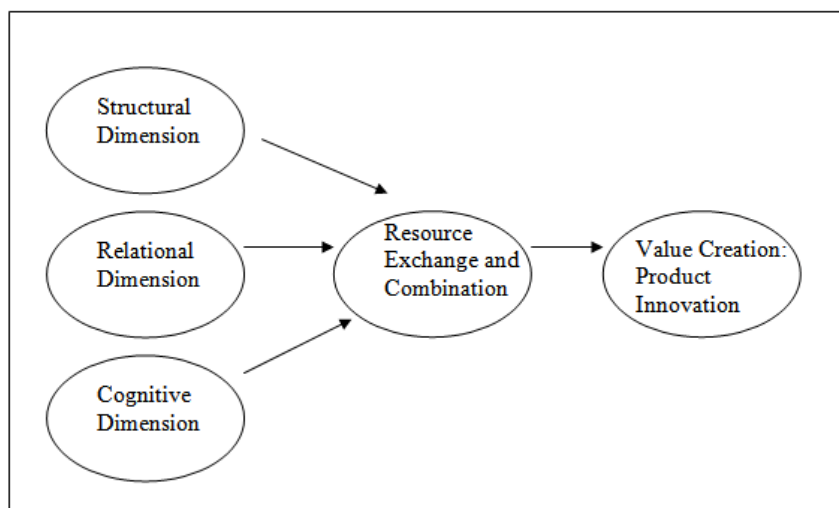


Figure 2 Dimensions of social capital and their effects on product innovation (Adapted from Tsai and Ghoshal, 1997).

Uzzi (1997) explains the benefits of embedded ties with three components of embeddedness. The first component is the development of trust among tenants firms. The second component, constant communication between firms, results in friendly relations between firms, which lead to information transfer. The last component is collaboration, where firms start to jointly solve problems. Firms create novel knowledge through learning from other firms whom they trust and transferring their knowledge to each other with the help of the social capital created (Inkpen and Tsang, 2005)⁴.

The second type of social capital studied in this research takes place between the tenant firms and the host university of the incubator. The relations among these parties give the firms the advantage of high absorptive capacity. Absorptive capacity is an important factor in transferring knowledge from the university (Rothaermal and Thursby, 2005). Incubated start-ups have higher absorptive capacity than non-incubated firms (Colombo and Delmastro, 2001). When the firms have strong relations with the university, knowledge transfer will be enhanced. According to Darr et al. (2005), these strong relations have two benefits. First of all, strong relations encourage faculty members to commercialize their knowledge. Secondly, university members and students import know-how and techniques from the industry to the university. Thus, both parties benefit from industry-university collaboration.

2.6. Summary

In light of the above literature review, the most important points and gaps in the literature can be identified. Firstly, there are several definitions for social capital. In this study, social capital is perceived as a public good, regardless of whether it is developed through internal or external relations. Since the effect of social capital in the innovative milieu is a hot topic in the literature, the incubator context has been chosen for this research. It is assumed that social capital depends on embedded relations among actors, which develop through time as trust among actors emerges.

⁴ Anderson and Jack (2002) take a slightly different view. They argue that the structural and relational dimensions of social capital come together and stimulate trust and trustworthiness. Thus they claim that trust is an outcome of social capital endowment, not an antecedent.

The concentration is on horizontal social capital between incubator firms, and between the incubator firms and the host university. The three dimensions of social capital will be investigated separately in order to understand the existence of social capital in this context, and the focus of the study will be on the antecedents and benefits of social capital.

CHAPTER 3

RESEARCH SETTING

The antecedents and benefits of social capital in high-tech industries can be observed by looking at contexts where firms in similar high-tech industries and similar characteristics gather together, since this similarity is expected to facilitate relationships among actors. In addition to the antecedents and benefits of social capital among firms, the development of a second level of social capital between incubator firms and the host university (university-industry relations) is critical. For this reason, in this study, an incubator which operates in the science park of a well-known university in Turkey has been studied.

3.1. What is an incubator?

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 is a nurturing environment for start-up firms. Incubators are responsible for providing the necessary resources, services, and assistance which are luxuries for start-ups outside the incubator. An incubator helps a start-up to survive through the liability of newness. Incubators aim to support the tenant firms, which means increasing their competence levels by improving their quality, increasing their chances of survival, and encouraging their growth (McAdam et al., 2006). Phan et al. (2005) describe science parks and incubators as "property-based organizations with identifiable administrative centers focused on the mission of business acceleration through knowledge agglomeration and resource sharing." 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).

The advantages generated from incubators can be summarized as sharing resources, consulting services, recognition in the industry, networking advantages, clustering effect, geographical proximity, cost subsidies, and funding support (Chan et al., 2005). Bollingtoft et al. (2005) list the general duties of an incubator. First of all, an incubator provides office space for young and growing firms with affordable rents. Secondly, communication and office services like the internet, telephone, fax, printer, scanner, etc. are provided. Some facilities and equipment services, like conference rooms or laboratories, may be available. Furthermore, some business services can be offered, such as training programs on business and financial planning. Moreover, being in the incubator will probably bring the tenants recognition in the industry, and respect and trust for these firms will automatically increase since they are chosen out of many start-up firms through a selection mechanism. Lastly, the incubator provides network access to start-ups (Madsen et al., 2000, McAdam et al., 2006). The incubator firms can develop their ties with other firms in the incubator environment. However, it should be kept in mind that the needs of a start-up change with its lifecycle stage. Having the rental subsidy and the general resource support is critical at the very beginning, but when the start-up starts selling its product, the support of the incubator in forming a market network or developing a public image becomes more important (Chan et al., 2005). The incubator should therefore adjust its services according to the changing needs of the firms.

3.2. The Incubator Under Study

Each incubator has different characteristics and the commonalities can mainly be seen in some of the services provided, such as providing training, information, network services, hardware, and space facilities (Lalkaka, 2002). The incubator under study (Incubator X) is located in a science park on the campus site of a major university (University M) in Ankara, Turkey. Incubator X was established in 1992 and is one of the first two incubators established in Turkey. Currently there are 40 firms in 3500 m² of incubator space (<http://www.teknonet.org.tr>). 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 in terms of graduation is 85%. Out of the 108 firms incubated, 44% are in the electronics and 38% are in software areas (Figure 3). The average age of the company owners is 33 for a total 205 entrepreneurs; 11% have doctorate degrees, 27% have master's degrees, and the rest are four-year university graduates.

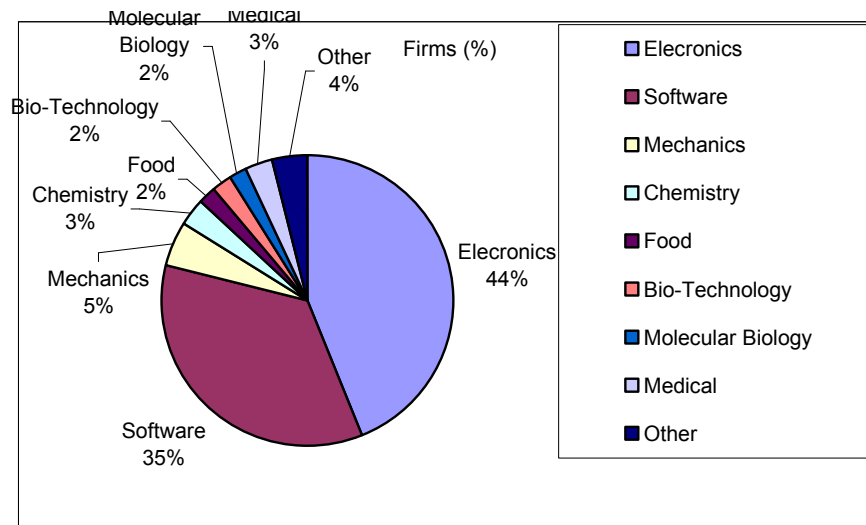


Figure 3 Industrial sectors of tenant firms admitted to Incubator X during 1992-2006 (<http://www.tekmer.gov.tr>).

A survey was conducted to the tenant firms between June and July 2006 in order to understand the present environment in the incubator⁵. 26 tenant firms out of 46 responded to the questionnaire. It was seen that the firms have at least one, and at most ten employees, with an average of four workers (including the firm owner). The average age of the firm owners vary between 23 and 51 with an average of 33.2 years. 58% of all firm owners are younger than 35; thus it can be said that there is a young population in the incubator (Figure 4).

⁵ The questionnaire will be explained in detail in Chapter 3: Research Methods.

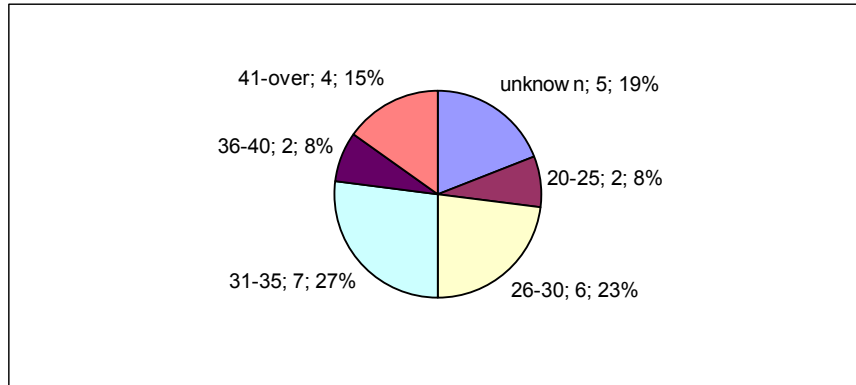


Figure 4 Average age of firm owners (age of owner, number of firms, percent of firms).

Among the tenant firm owners⁶, the majority are University M graduates. The owners of 62% of the firms (16 firms) are University M graduates. 19% of the firms have both University M and other university graduates as owners. Only 4% of the firm owners are not University M graduates (Figure 5).

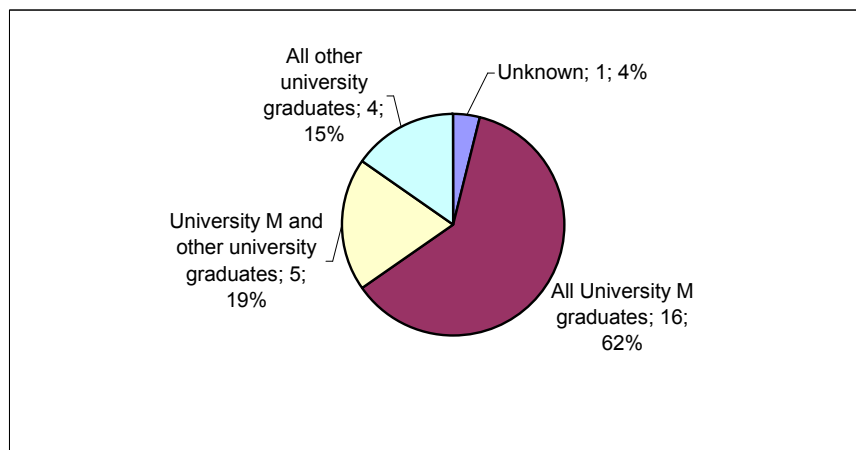


Figure 5 Universities from which the owners graduated (graduated university, number of firms, percent of firms).

The age of the firms vary between one month and three years. There is a balanced distribution of firms in terms of age. 34% of the tenant firms are new entrants (younger than 6 months), and 27% of them are about to graduate (in their third and last year)⁷ (Figure 6)..

⁶ The tenant firms have one to three owners.

⁷ The firms must complete their projects and graduate at the end of the third year in Incubator X.

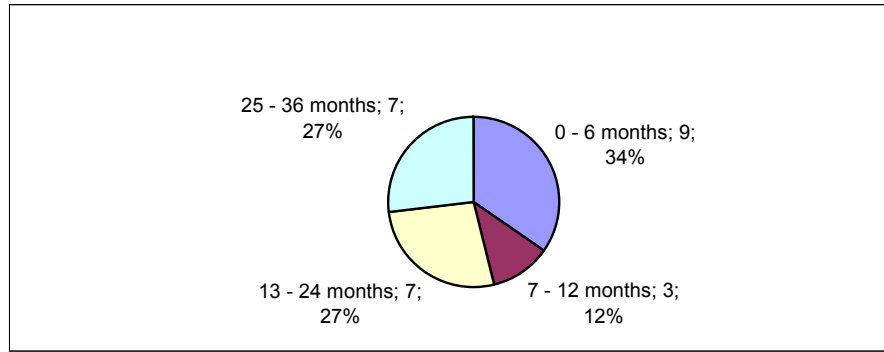


Figure 6 Age of the present incubator firms (age of the tenant firm, number of firms, percent of firms).

There are seven major services provided by this incubator (<http://www.tekmer.gov.tr/>). The provision of offices is the first one. Secondly, consultancy in different fields (technical, financial, administrative, managerial, and marketing) is given to the tenant firms. Intranet systems between tenant firms and internet services to connect the incubator to the outside world are provided as information services. Furthermore, laboratory services are provided for physical and chemical analysis, mechanical testing, prototype development, and electrical experiments. There are also training programs offered on various technical or managerial fields. Furthermore, office services such as secretarial services and access to a fax, a photocopy machine, and computers are provided. Video conferencing is also available in the incubator. Lastly, there are many opportunities for exhibitions and conferences on the university campus during the year. The firms also have the opportunity to move on to the University M's science park and take advantage of its tax incentives for science parks. Up to now, 19% of all tenant firms have 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 firms compared to the off-park firms.

The chosen incubator has many advantages over others in Turkey since it has the support of one of the most prestigious Turkish universities. In fact, it is based on this university's campus and is thus fully integrated with the university. As a result, it has easy access to qualified technical personnel, laboratories, computers with the newest technology, and an extensive library. The firm selection committee of the incubator

has three University M professors on board, and the firms frequently solicit the support of the university staff. These examples show how much the university affects life in the incubator. The support of the incubator specialists to the firms in order to overcoming start-up liabilities and collaborating with each other should not be ignored. Besides, the incubator is located in the capital city of Turkey, where skilled labor is relatively easy to find. This context was thought to be appropriate to investigate the development of social capital both at the “between firms” and “between the firms and the university” levels.

CHAPTER 4

METHODOLOGY

In this section, four stages of the data collection process and the theoretical sampling procedure will be explained.

4.1. Data Collection

In this study, qualitative and quantitative research methods are used together in order to obtain a detailed view of the selected context. Both methods have their strengths and weaknesses, but when used together they provide a wider perspective (Miles and Huberman, 1994). Qualitative research methods are found to be 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). Qualitative research methods provide detailed and in-depth exploration of social phenomena (Vedovello, 1997). Case study methods which do not generalize the findings for populations and universes, but use theoretical propositions on the selected contexts (Yin, 1994) are preferred. Qualitative methods imply that the data collected cannot be analyzed statistically, but provides deep analysis of the case studies for the chosen context (Tötterman et al., 2005).

Tötterman et al. (2005) suggest that a quantitative study cannot highlight the differences between different incubation programs, and since incubation is a new concept, generalizing the findings would not give trustworthy results. It should be kept in mind that qualitative methods can be criticized for being inconsistent. However, as Burt (2000) states, the results depend on what is perceived by the interviewee as to what social capital is. Furthermore, in order to provide credibility, dependability, transferability, and confirmability (Hirschman, 1989), the

observations and interviews were triangulated with a quantitative research tool (questionnaires). The questionnaire served to create a purposeful sample to be used for the qualitative research, in grouping the firms according to their various characteristics through factor analyses, finding the regular and deviant cases, and informed the researchers about the general demographics of the tenant firms.

The research design can be summarized in four steps:

Step 1: Non-Participant Observation

As a first step, an initial *non-participant observation* was conducted in the incubator in order to understand the context.⁸ The observation was done following an observation guideline (Appendix A). This technique was chosen in order to understand the effect of the construction and layout of the building to social capital development, to see how the layout affects the social gatherings and movements in the building, and the general atmosphere in the incubator. “Do employees of different firms smile or talk to each other, how long do they chat, how friendly do they act towards each other, how do they behave when contacting the incubator manager or specialists, are they open to each other’s visits with open doors and happy greetings?” are examples of the questions asked during the observation. Public spaces are especially important for developing social interactions (<http://www.open.ac.uk/hsc/researchsocinteracturban.htm>). The distributions of common spaces, as well as the distribution of firms and management units in the building were observed. The observation helped to understand the informal social relationships that take place during the day.

The observation provides only an etic view, but for high quality research, the etic view of the researcher (the outsider) and the emic view of the respondents (the insiders) must be combined (Geertz, 1973). For this reason, the results of the observation will be supported by the findings of the questionnaires and interviews. Ulhoi and Bollingtoft (2005) argue that there are two mechanisms that facilitate or

⁸ It should be kept in mind that observation was an ongoing technique for this study which continued until the end of the interviews during visits for the questionnaire or for interview sessions in the incubator.

hinder networking in incubators. One is connected to individuals and their relations, and the other is related to the construction of the facility. My observation gave some insights about the latter mechanism, but the interviews were necessary in order to understand the relations between the tenant firms and between the firms and the university. Triangulation between these two methods is critical for the study since they provide different viewpoints.

Step 2: Pilot Interview

In the second step, a pilot interview was conducted with one of the tenant firm owners in order to test which questions of the draft interview instrument work and which do not. Prior to the interview, I first reviewed the literature in order to design the interview. In addition, I tried to identify questions that had not been asked before that might contribute to my research. Finally, I came up with an interview guide of 40 questions, starting with grand tour questions about the firm (past experience of the firm, the industry the firm is operating in, the interviewee's position in the firm) and questions on the demographics of the firms. I continued with questions about the incubator services and also some planned probes on comparing the life of the incubator firm in the beginning and in the present. Here I tried not to mention any categories (force any concepts) to the interviewees in order not to affect their answers. Next I planned to focus the conversation on the mechanisms that facilitate and hinder networking, the links with the university, and lastly the problems and solutions that the interviewee seem in the incubator (Appendices 2 and 3).

I met the interviewee (a tenant firm owner) during my observations in the main entrance hall and arranged a pilot interview. The interview took exactly 58 minutes. We did the interview in the entrance hall, as per the interviewee's suggestion. As there were other employees in the office, it would be more comfortable in the entrance. The interviewee was the owner of a company which had been incubated for about a year. I recorded the interview with two recorders, one digital, and one tape recorder in order to have a backup. I started with the grand tour questions as planned. He gave detailed answers to each of my questions, and then I moved to questions about the services. While talking, he came forth with the importance of the

university, so I directed the topic of conversation to links of the firm and employees with the university. I did not enforce to following of the guideline I had prepared beforehand. Then I moved back to the networking questions. During the whole conversation, he mentioned the problems regarding each topic and sometimes offered solutions.

After the pilot interview I checked the questions and added or removed some of the questions of the actual interview guide. I eliminated the questions about financial support, because the interviewee explained them to me in detail. Furthermore, there were some contradictions about the relations with the management. Although he insisted that there is no hierarchy, he also said that there is no physical flow of people between the administration wing of the building and the firms. For this reason, some projective questions about the relations between the tenant firm managers and specialists were added to the interviews to be conducted to the rest of the firms. Where the etic and emic views did not match, I added projective questions to get the answers to questions to which the informants cannot easily respond as they have not thought on those issues before. According to Zaltman and Coulter (1995), 80% of the communication is non-verbal, and some techniques which can codify and organize this non-verbal data are necessary. The specialty of projectives is the data it provides. Projective questions serve to discover deep structures of hidden thoughts. In this way, the researcher can put some distance with the informants and the situation and consequently understand the unsaid, unrealized thoughts.

There were some mismatches with the emic and etic views generated so far. During the observations I had felt that open doors represented some kind of openness to interaction with other firms; the interviewee disagreed with this. In order to analyze this issue deeper, I decided to ask questions about the perceptions of the other interviewees on their neighbors' openness to communication. I also learned from the pilot interview that there used to be some occasions, such as barbeque parties, that brought the firms together in the past. Thus, I added questions about the tenant firms' participation in such events and the events' benefits.

The respondent strongly underlined the importance of being a University M graduate in considering to be a tenant firm in this incubator. In the upcoming interviews, I decided to delve further into the issue of “being the graduates of the host university” in order to understand whether the historical roots play a critical role in social capital enhancement. The respondent also indicated that the firms are like neighbors and they are close to some of them but do not get along with others. I questioned with which firms they get closer to identify the antecedents of social capital. Therefore I added the question “With which firms do you get along with better and how did you get closer?” to the interview guide. Lastly, the respondent mentioned the recruiting/career planning service of the university as a relationship with the university which I had not thought of before, so I added it as a question in the questionnaire. The pilot interview was very useful in shaping the questionnaires and interviews.

Step 3: Questionnaire

The third step was conducting a questionnaire. All tenant firms were asked to complete this questionnaire and 26 firms out of 40 firms responded, resulting in a response rate of 65%. The questionnaire was composed of three sections. The first section was made up of general questions about the firms and the informant, the industrial sector of the firm, duration in the incubator, the educational background, and age of the owner. In the second section, five-point Likert scales were used to investigate how much importance was given to various issues about relations with other firms and the host university. The questions asked if the managers preferred to collaborate with firms in the incubator over firms outside the incubator. In addition, one goal was to measure if tenants of Incubator X preferred to work with University M professors or hire University M graduates over others. While the second section was about the thoughts and preferences of the informant, the third section measured how often these situations actually took place. This time the scale was composed of six frequency measures (never, once a year, once in three months, monthly, weekly, and daily) (Appendices 4 and 5). The respondents were expected to state how often they got together with other tenant firms or science park firms for organized or spontaneous social activities, how often they collaborated for business purposes, how

often they did a project with or took advice from University M academic personnel, and how often they used various services of the incubator or University M.

In order to investigate any observable patterns, factor analysis was conducted to the data collected by the questionnaires. According to the total scores on these factors, general cases and deviant cases were found. Firms with average, highest, and lowest factor scores were selected to participate in the interviews.

Step 4: Interviews

Silverman (2001) states that the aim of quantitative research is generalizing through statistical sampling procedures. The procedures make the quantitative researcher comfortable about the representativeness of the sample. The aim of qualitative research is not generalization, therefore having a large sample is not as vital as it is for quantitative research. There are no significance levels to be reached, no normality assumptions, or no outliers. The qualitative approach is central to naturalistic research. According to this naturalistic point of view, it is not appropriate to make generalizations by looking at different situations, which brings transferability. The interpretations made must be time- and condition-specific, which means information rich cases that can be analyzed in depth are required in qualitative research (Erlandson et al., 1993). To achieve transferability and credibility in qualitative research, purposive or theoretical sampling⁹ is used. Mason (1996) defines theoretical sampling as selecting groups or categories on the basis of their relevance with the research question and theoretical position. Creswell (1998) states that theoretical sampling helps examine individuals who can contribute to the evolving theory, because theoretical sampling enables researchers to use their judgments while selecting the respondents and serves the objectives of the study (Anderson and Jack, 2002).

In the present incubator context, interviews were conducted on three groups of respondents: founders of tenant firms, incubator specialists, and host university professors who have been in a relationship with the incubator firms. The reason for

⁹ If the purpose is theoretically defined, then the sampling is called “theoretical sampling”.

this selection is to examine different views and to triangulate the data in order to have credible, dependable, transferable, and confirmable results (Wallendorf, 1989). The respondent of the pilot interview was chosen by chance, which can be criticized as being convenience sampling instead of theoretical sampling. However, since I was new to the environment, I did not have any information about the firms and had to start from somewhere. While I was making observations in the entrance hall, I met with a firm owner and talked to him for a couple of minutes, and arranged a day for an interview, and the second stage of the data collection process started this way.

Nine firms were chosen according to their factor scores and demographic characteristics so as to enhance diversity in this step. The interviews were semi-structured and done with the host firm managers, incubator specialists, and university professors as in the research design formed by Vedovello (1997). The interviews lasted from 45 minutes to two and a half hours and were all recorded by two devices: one digital recorder and one tape recorder in order to have a backup. The interviews took place wherever the interviewees felt comfortable. Some preferred their own offices, others preferred the common spaces of the incubator building. The first group of interviews was conducted to nine firms from various sectors, each of which have been incubated for different time periods and are in different stages of their lifecycles. All the managers that were interviewed were male and except the manager of Firm G, they were all engineers. The demographics of the selected firm's managers can be seen in appendix L. The selection criteria and the characteristics of each case can be seen in Section 4.2. A wide variety of cases, including deviant cases, were chosen.

The interviews were used to understand the relationships among firms, the links to the host university, and the perceived advantages of such linkages. An interview guideline was prepared based on extant literature and the results of the initial observations and pilot interview (Appendices E and F). Following the study by Chan and Lau (2005), the interviews started with general information about the firm, followed by the position of the interviewee in the firm, the industrial sector of the firm, the duration the firm had been incubated, the events that brought the founders together, and the decision to operate in the incubator. Incubator services were

analyzed using similar concepts with Ulhoi and Bollingtoft's (2005) study. Questions about the perceived benefits provided by the incubator were next. In the third section, two social capital development mechanisms (mechanisms about individuals and their relations, and mechanisms related to the incubator building) that hinder or facilitate networking (Bollingtoft et al., 2005) were investigated. In the fourth section, links between the university and firms were studied. Possible types of relations were determined by Vedovello (1997) and Wiggins and Gibson (2003). In the last section of the interview, the problems the firms faced were investigated (Darr and Rotschild, 2005). The saturation point was reached where no further new information was gathered after all nine interviews were completed.

The second group of interviewees consisted of the specialists in the incubator management team. Two out of six incubator specialists who were mentioned most often by the firm managers were selected for the second group of interviews. One has been working as a specialist for ten (Specialist 1) and the other has been working for four years (Specialist 2). Due to their tenures they might have different views and perceptions, but they also have enough experience to grasp what is going on in the incubator. Conducting interviews to both the firm employees and specialists in management provides more accurate information about their relations since views of both sides can be evaluated (Appendices G and H) (Silverman, 2001). As outsiders to the relations among tenant firms and relations between the firms and host university, they bring an outsider's view on social capital development in the incubator.

The last group of respondents consists of two University M professors (See Appendices I and J). The first University M academician selected during the theoretical sampling process owns one of the firms selected after the factor analysis (Firm K). However, in order to have a wider view and reach the saturation point, one more academician of the host university who does not own a firm in the incubator, but only works as a consultant to some tenant firms was interviewed (Academician 1). He was selected since some of the tenant firm managers who had participated in the interviews mentioned him when asked to give a name of an academician they had

worked with. Academician 1 has been a professor in the Department of Electrical and Electronics Engineering since 1999 and is a University M graduate.

The first aim at this stage is to understand the university-incubator relations from a different point of view. The second purpose is to find out how academicians meet the entrepreneurs in the incubator and how the linkages are initially formed. This will help explain what facilitates social capital development among the incubator firms and the university. The durations and location of all interviews can be seen in Appendix K.

Before and during the interviews, observations of the environment continued. Although non-participant observation is an unobtrusive method and serves to analyze the contribution of the spatial factors of the building to social capital development, it lacks transferability. Moreover, the observer has his/her own perceptions (Bollingtoft et al., 2005). For this reason a triangulation with the interview technique was conducted. Observation was supported by interviews in the qualitative side of the research (Anderson and Jack, 2002). The two techniques together allow the examination of social capital development and the construction of a model of the social capital development process.

Due to time constraints it was not possible to conduct deep case study research. Probably because of competition issues, the firms did not allow their business meetings or daily activities to be observed.

CHAPTER 5

RESULTS

5.1. Observation

Incubator X is made up of two buildings: 1) the main building, a U-shaped two-storey building with an inner garden, and 2) a small prefabricated additional building, where in addition to 10 incubator firms, two science park firms are also located. Before the questionnaires and interviews, I made a day-long observation in both of the buildings and took field notes, following an observation guideline. Later, I analyzed these notes and prepared for the following stages of the data collection procedure. Observations continued during each of my subsequent visits to the incubator.

The first thing I observed in the incubator environment was its location on the University M campus. The incubator is between the university and the science park, right across the road of the Faculty of Economic and Administrative Sciences B-Building (Figure 7). This can be interpreted as the incubator being a link between the university and science park. 90% of the entrepreneurs in the incubator are graduates of University M, and after graduating from the incubator, they will try to move on to the science park. The location of these buildings shows the intention of the incubator, and gives some signals about the university's influence on the incubator which is facilitating university-industry collaboration.

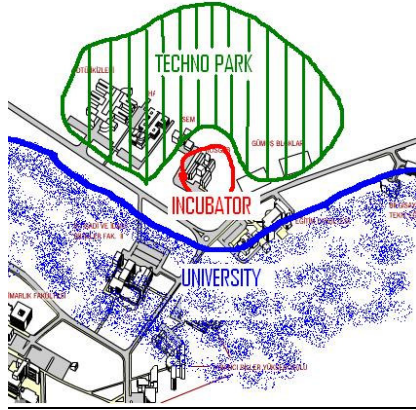


Figure 7 Incubator X's location on University M campus

Later, the interior of the buildings was observed. The main building is composed of three uses: the firms, the administration, and the common spaces (Figure 8).

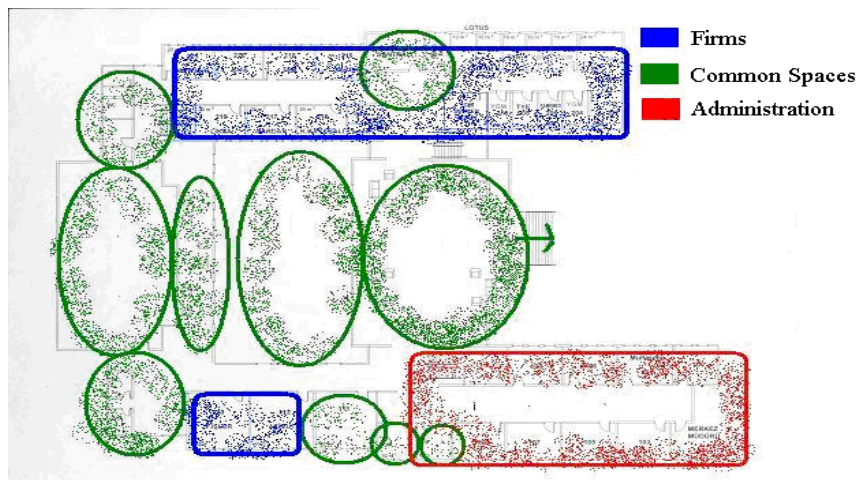


Figure 8 Plan of Incubator X (Main Building, Ground Floor)

The photographs of the building can be seen in Appendix B. In the main building's ground floor, there is a large entrance hall, where four groups of armchairs are located (Photos 1 and 2). Although the space is large, there are only four groups of chairs. This is the largest common space in the building, with a tea machine in the middle of the room, right across the main entrance door. In the entrance hall, English

rock music is playing constantly (probably the University M's radio station of University M). I thought this was done in order to provide an intimate atmosphere, which contrasts with the large distance between the sitting groups. The building is U-shaped, the corridor on the left side of the main entrance contains the administration offices, and the rooms for facilities served all the tenant firms, like the photocopy room (Photo 4), the meeting room (Photo 5), the information desk. In front of the photocopy room, there are two chairs and the post boxes of the firms (Photo 6). In addition, on this side there is the wall panel, with news about incubators, KOSGEB, or success stories of the graduate firms (Photo 7). There is also a bookcase with books about marketing, finance, SMEs, books published by KOSGEB, and magazines about University M. On the other corridor, there are the firms' offices and some other common facilities such as the kitchen (Photo 8) and two vending machines (Photo 9). Lastly, in the middle, there is a smaller common space, which is used for some small celebrations (Photo 10), the inner garden (Photo 11), conference hall (Photo 12), and the toilets. During my subsequent visits to the incubator for interviews, I realized that two table tennis tables were put in the smaller common space. The additional building is a small square-shaped building with two floors. There is a small common space in the entrance, with two chairs and the water fountain (Photo 3), but on the second floor there is no common space (Photo 15).

The gathering spaces are dispersed on the ground floor. In the entrance hall where important gatherings and celebrations take place, there is a wide distance between the sitting groups. The large space between these groups may hinder communication (Fayard et al., 2007). Moreover, although this hall is centrally located, it does not have a functional centrality (Fayard et al., 2007). There should be some social activities in this hall in order to enhance its usage by the workers and promote communication among them. In the smaller common space (Photo 10) the chairs are arranged side by side, which does not allow face to face communication, and I did not see anyone playing table tennis there during any of the visits. Only the chairs in front of the photocopy room seems to be useful, because they might be used while waiting for queues, and employees of different firms might chat here, or meet when they are checking their mail. Furthermore, the bulletin board is an important

gathering space, where news and different types of support and announcements of interest to all firms are exhibited. This is an example of communication between management and the firms, because the posted news is chosen by the administration specialists. During my observation, I did not see anyone using the kitchen or vending machines. In addition, the inner garden is not used at all. This means it is not used for public gatherings.

The firms in the main building both on the ground and second floor had minimum communication. I believe this is an effect of building layout (Photos 13 and 14). The firms are located side by side, and I did not see any movement between firms. The same can be observed in the additional building where there are ten incubator firms, and two science park firms. In this building, the office rooms are placed around a square shaped common space, but all the doors were closed (Photo 15). On the ground floor, there are firms located side by side, and a branch of İşbank (a national bank of Turkey) at the very end of the corridor. During one of my visits, I observed two neighboring firm employees greeting each other, but still the communication is far less than the communication in the main building. Moreover, the buildings in the secondary building are more isolated from the ones in the main building, since physical distance separating people decreases the amount of spontaneous, informal contact among them (Fayard et al., 2007).

On the first day of my data collection through observation, I sat in the entrance hall and watched people entering and leaving the building in order to observe interactions among firms. I sat there between 11.00 to 11.30 and 12.00 to 12.30. During the first observation, I observed two men from different firms chat standing up for about five minutes and then go in different directions. The chats on the armchair groups took at most 10 minutes. There were 2-3 people groups talking to each other, sitting closely. I found out by asking that all were from the same company. This supports my idea that this space cannot easily bring employees of different companies together. I made the second observation between 12.00-12.30 in order to watch groups leaving the building for lunch, but unfortunately very few people left the building from the main entrance door during that time.

In the building, some of the doors were open, some were tightly closed, one had iron bars (Photo 16), one firm had tightly closed iron doors (Photo 17), and one had a different type of door (steel with a peep hole) (Photo 18). This made me feel that there are different levels of communication, trust and, collaboration between firms. While some were more inviting with open doors, some were very much closed to outside relationships.

The administration is separated from the firms, but it would not be fair to say that there is a complete segregation and lack of communication. While I was walking on the administration side, I observed that employees of the tenant firms and even the graduated firms easily entered this side and communicated freely. One of the employees asked for the projector for his presentation from one of the specialists, and it was provided without difficulty. Furthermore, I met a woman, an employee of a graduated incubator firm, who came to the incubator in order to ask for advice from one of the specialists, and she was happily welcomed by them. Lastly, during the interview with one of the firms in the entrance hall of the building, I had the chance to observe a conversation between the firm owner, the incubator manager, and one of the specialists. They talked in a friendly manner, the specialists invited the manager to lunch, but he joked about having an interview for my thesis and they laughed. The managers and specialists have friendly relations with both the tenant and graduate firms and no dominant hierarchy is felt among their conversations.

Another interpretation is about the colors in the building. All of the walls are in plain white, and there are only a few paintings on the large walls. This makes the place look more like a hospital, which I believe might hurt the socialization feeling among firms.

As a conclusion, it can be said that the general layout of the firm offices does not allow intense communication between firms. Although being in the same location is expected to be advantageous for social capital creation, the layout of the building does not encourage social capital enhancement. I believe different firms in an open

office system will create more interaction (Fayard, 2007). The common spaces are dispersed throughout the building in order to make them equally accessible to all the firms. People come together and meet in different parts of the building. The music system in the entrance hall creates a warm atmosphere, but the large space between the chair groups neutralizes it. Also, the hospital-like corridors and the white walls make some parts of the building look very cold. I observed that the relationship between the firms and the administration is close. Furthermore, the location of the university department buildings, the incubator building, and the science park buildings shows that a link can be formed between all three.

5.2. Pilot Interview

Before starting the analysis, the pilot interview was transcribed verbatim and read. Later I conducted open, axial, and selective coding procedures (Strauss and Corbin, 1990) in order to analyze this interview. This analysis helped me reconsider the interview questions and prepare a better interview guideline to be used in the further interviews. Analysis results for each topic can be seen below.

Services and Advantages of the Incubator

The interviewee said his firm used many financial advantages of the incubator, but did not mention services like photocopying or fax machines. Later I found out that most of the firms have those facilities in-house because they find it difficult to share. After being probed, he strongly agreed that the name of “KOSGEB” brings them credibility. He also added that being in the incubator helped them to overcome the difficulties of being new to the market, and protected them:

We needed something protective over us. Therefore, I can say that this place was very helpful. I mean I can say it prevented us from bankruptcy in our bad times. (Pilot interview)

(Koruyucu birşeye ihtiyacımız vardı üstümüzde. Dolayısıyla o bakımdan burası çok faydalı oldu diyebilirim. Yani başta bizim kötü günlerimizde iflas etmememizi sağladı diyebilirim.)

However, he did not talk much about conferences or education programs, despite my probing to get more detail, which might show that the incubator is not successful in promoting such services.

Individuals and their Relations

The respondent said that they are like a *family*, which is a very important point for my research. This means the tenants trust each other. The respondent added that, just like individuals, there are firms that they get along with well and some that they do not. However, they all know and greet each other. The ones who do not greet the others are the ones who are isolated from the group. The respondent stated that they can go and ask questions to other firms with whom they are close and they are open to working with other firms. He admitted to not meeting with the employees of the tenant firms in their social environments although they are friends since he thinks such meetings would be “boring”. He thinks so because he does not want to spend his free time with the people he sees all week. These show me that there is a strong interaction and social network among individuals and firms in Incubator X, but this does not continue out of the incubator’s walls.

Construction of the Incubator

The respondent only mentioned the entrance hall, the bank, and the corridors as common spaces. During my observation, I found out that the common spaces were distributed all around the building, but it seems like they are not used effectively. In addition to this, my interpretation about the doors in my observation study seems to be exaggerated. The interviewee told me that their firm also has iron bars in the doors, but it is not because they want to separate their firm from other firms, but for theft protection. The iron bars were made by the prior tenants.

Incubator Management

The respondent insisted that there is no hierarchy between the firm and the incubator management; they chat with the specialists during the day when they meet in a common space. He added that they can easily go to the management side of the building, but the managers and specialists never go downstairs to where firms are.

However, he thinks the management is not close to the tenant firms in the areas but should be. He complained that the specialists were not working professionally and they lacked knowledge in many issues.

Links to the Host University

First of all, the interviewee said that one of the perceived reasons of being selected to the incubator is being a University M graduate. Secondly, even if there were no financial advantages, he would choose to be in this incubator since it is on University M's campus. He believes that the atmosphere has a great contribution to his performance and motivation. He is presently doing his Ph.D., one of the employees is an undergraduate student, and his partner and the other employee are also graduates of University M. So they know the academic staff of University M well, they can use facilities like the library, and can get advice from University M academicians if necessary. In addition, he has a friend who is an instructor at University M and he plans to do a project with him. Since the firm employees are still students, easy access to the campus is critical for them. Lastly, when they think of recruiting new employees, they use the career planning service of the university. His comments showed me that closeness to the host university is vital for the performance of the incubator.

As explained above, the pilot interview was very useful in shaping the questionnaires and interviews with the theoretical sample that was chosen.

5.3. Questionnaire

A questionnaire survey was conducted in order to have some general information about the incubator environment and to get prepared for the final stage of interviews. For this reason, descriptive statistics about the firms were collected via a questionnaire applied to all 40 tenants, 26 of the firms responded to the interview (response rate: 65%). While I was waiting for them to complete the questionnaire, I let them ask me questions about the questionnaire if they had any. Later a factor analysis was conducted to select the firms according to various criteria for the

interview process and to create the theoretical sample¹⁰. When an item has close loadings on more than one factor, I chose the larger loading one as its factor, since the analysis is used only to explore the characteristics of the firm. In order to enhance diversity, the theoretical sample was composed of cases with average factor scores and deviant cases with extremely high or extremely low factor scores. The demographics of the firms also played an important role during the selection process.

The first section of the questionnaire (Appendices C and D) yielded three factors (Table 2) which measure the *desirability* of:

Factor 1: Building relationships with the host university and the science park of the university.

Factor 2: Building relationships with academicians, and

Factor 3: Interacting with other firms.

Table 2 Rotated Component Matrix of Section 1

	Component		
	1	2	3
Question 15: Interns students from University M are more than interns from other universities.	.913		
Question 14: Employees graduated from University M are more than employees graduated from other universities.	.905		
Question 13: Preferring interns to be from University M	.762	.267	.453
Question 12: Preferring employees to be from University M	.756	.288	.416
Question 7: Thinking that being from University M Science Park is a critical criterion in choosing a partner firm	.591	.337	.576
Question 11: Asking for advice from other University academicians		.924	
Question 9: : Doing projects with other university academicians		.921	
Question 8: Doing projects with University M academicians	.408	.751	
Question 10: Asking for advice from University M academicians	.302	.704	.426
Question 5: Sharing ideas with an Incubator X tenant firm		.631	.616
Question 3: Asking for advice from an Incubator X tenant firm	.337	.485	.441
Question 2: Trusting more to an off-incubator firm	.219		.859
Question 1: Working together with an Incubator X firm	.526		.636
Question 6: Thinking that being from Incubator X is a critical criteria in choosing a partner firm	.592	.228	.609
Question 4: Considering asking a tenant firm to join to their project		.500	.553

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

Rotation converged in 6 iterations.

¹⁰ There is near universal agreement that factor analysis is inappropriate when sample size is below 50 (<http://www2.chass.ncsu.edu/garson/pa765/factor.htm>, April 2007). In this study, although the sample size (n=26) is too small to conduct a proper factor analysis, it was done in an exploratory fashion in order to give a general idea about the population and find support for our observations on the descriptive statistics.

The second section of the questionnaire yielded four factors (Table 3), which measures the frequency of relationships which are *actually* taking place:

Factor 4: Frequency of usage of services provided by the host university and its science park,

Factor 5: Frequency of communicating with academicians,

Factor 6: Frequency of being involved in unplanned social activities with other firms, and

Factor 7: Frequency of communicating with other firms for professional purposes, such as co-operating in a project or asking for advice on a project.

Table 3 shows that questions 6, 8, 10, 11, 12, 13, 15, 16, and 17 load on Factor 4, questions 1 and 2 load on Factor 5, questions 5 and 7 load on Factor 6, and questions 3 and 4 load Factor 7. Although questions 9 and 14 seem to be items of Factor 3, they were found irrelevant to Factor 7, and were thus excluded from the factor score calculations (Appendices Z and V).

Later, for each question of the factors, a factor score was assigned. Total factor scores were calculated by adding the item scores of each question of a factor (Table 4). The theoretical sampling was done according to the factor scores of each firm.

Table 3 Rotated Component Matrix of Section 2

	Factor			
	1	2	3	4
Question 8: Frequency of participating in previously programmed social activities with the University M Science Park firms	.913			
Question 15: Frequency of participating in training programs of the incubator or KOSGEB	.840		.216	
Question 16: Frequency of participating in conferences-meeting prepared by the incubator or KOSGEB	.829		.202	.266
Question10: Frequency of hiring employees through the Career Planning Service (KPM) of University M	.794			-.247
Question 17: Frequency of using the conference and meeting rooms of the incubator	.793			
Question 11: Frequency of using the social facilities of University M	.703	.241		
Question 13: Frequency of asking for advice from Incubator X specialists	.614		-.386	
Question 12: Frequency of using the facilities and equipment of University M	.565	.344	.549	
Question 6: Frequency of participating in previously programmed social activities with the Incubator X tenant firms	.518	.369		.230
Question 2: Frequency of doing projects with University M academicians		.950		
Question 1: Frequency of asking for advice from University M academicians		.905		
Question14: Frequency of using financial supports of KOSGEB			.765	
Question 9: Frequency of using the Continuous Education Center (SEM) of University M			.666	
Question 5: Frequency of participating in unplanned social activities with the Incubator X tenant firms			.563	
Question 7: Frequency of participating in unplanned social activities with the University M Science Park firms	.447	.358	-.510	.205
Question 4: Frequency of asking for advice-sharing ideas with Incubator X tenant firms			.209	.783
Question 3: Frequency of working together with Incubator X tenant firms	.393			.696
Question 11: Frequency of using the social services (restaurants, the shopping center, sports centers, concerts, exhibitions) of University M	.296			-.569

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations.

Table 4 Factor Scores of the Firms (Firms in bold are selected for final interviews).

	FACTOR SCORES								
	Section 1				Section 2				
Firm No:	Factor 1	Factor 2	Factor 3	Total Score	Factor 4	Factor 5	Factor 6	Factor 7	Total Score
Firm A	24	18	24	66	25	4	6	10	45
Firm B	24	5	22	51	24	3	8	13	48
Firm C	28	15	23	66	11	1	3	9	24
Firm D	22	13	19	54	9	10	3	8	30
Firm E	18	7	19	44	19	1	6	5	31
Firm F	18	14	14	46	14	4	9	6	33
Firm G	23	17	17	57	3	10	9	5	27
Firm H	15	10	15	40	9	3	5	7	24
Firm I	23	13	17	53	8	1	7	7	23
Firm J	14	12	12	38	9	2	8	6	25
Firm K	21	20	25	66	41	3	7	7	58
Firm L	26	15	25	66	22	4	8	11	45
Firm M	24	20	20	64	18	10	7	4	39
Firm N	10	6	6	22	6	1	2	6	15
Firm O	11	8	6	25	8	1	5	6	20
Firm P	24	20	25	69	30	10	7	8	55
Firm Q	13	11	15	39	14	5	5	7	31
Firm R	23	16	19	58	22	8	8	8	46
Firm S	22	14	13	49	6	4	4	7	21
Firm T	18	12	22	52	23	1	7	8	39
Firm U	30	20	23	73	9	3	5	7	24
Firm V	22	15	7	44	11	1	7	14	33
Firm W	28	15	24	67	23	7	8	11	49
Firm X	28	8	14	50	11	1	8	8	28
Firm Y	26	19	22	67	18	3	6	9	36
Firm Z	20	16	12	48	12	5	3	5	25
Factor Average	21.35	13.81	17.69	52.85	15.58	4.08	6.16	7.77	33.62

Among these firms, Firms A, B, C, G, K, V, W, X, and Y were selected as the theoretical sample to be interviewed. The general criterion for firm selection was to choose the ones that have been incubated for more than 6 months, as it was assumed that younger firms do not yet have enough experience or social capital development. Furthermore, we tried to select firms with different characteristics. Firm A is one of the oldest firms with a great deal of experience in the incubator, with high factor scores on desired and actual relations with both the other tenant firms and the

university. On the other hand, Firm B, which is as old as Firm A, has low scores on desired and actual relations with academicians of the host university while its scores on relations with other firms are high. Firm W, on the other hand, has very similar characteristics to Firm A, but is a young firm (only 6 months old). The reason for this selection is to search for the effect of tenure differences on firms. Firm C, again an old firm, was selected in order to understand why its actual relations with the other tenant firms and the host university are low, although scores on desired relations with them are very high. Firm K is unique because it operates in a completely different industry. By selecting this firm, I aim to understand how being in different sectors affects the relations among firms. These four firms' owners are all University M graduates. The owners of Firms G, V, and X are graduates of other universities. What is unique about Firm G is one of the owners is a University M faculty member. However, Firm G's usage of science park and university services is the lowest. Firm V is owned by other university graduates; they do not communicate with University M academicians, and do not benefit from the host university or science park services. However, they have above average relations with other incubator firms. The reason for this selection is to analyze the situation for a firm owned by graduates of other universities. All the firms mentioned up to now are located in the main building, thus they have a higher chance to meet with each other during the day. Firms X and Y are located in the second building. Selecting these firms will demonstrate the effect of physical segregation on social capital development. They are both old firms; one is owned by a University M graduate and the other by other university graduates.

The selection criteria can be seen in Table 5 below.

Table 5 Case Selection Criteria.

Case	Demographics	Factor Scores
Firm A	<ul style="list-style-type: none"> - 3 years old - Owners: All University M graduates - 3 owners - Location: Main building 	<ul style="list-style-type: none"> - Actual and desired conditions for all factors (Factors 1-7) are above average.
Firm B	<ul style="list-style-type: none"> - 2 years old - Owners: All University M graduates - 2 owners - Location: Main building 	<ul style="list-style-type: none"> - Desired and actual relations with other firms are among the highest (Factors 1, 6, 7). - Desired and actual relations with the academicians of the host university are below average (Factors 2, 5).
Firm C	<ul style="list-style-type: none"> - 3 years old - Owner: University M graduate - 1 owner - Location: Main building 	<ul style="list-style-type: none"> - High desired relations with both other firms and University M academicians (Factors 1, 2, 3), but very few actual relations taking place (Factors 5, 6, 7).
Firm G	<ul style="list-style-type: none"> - 6 months old - Owners: Other university graduates - Owners: All academicians (only one of them is a University M academician) - 3 owners - Location: Main building 	<ul style="list-style-type: none"> - Frequency of usage of science park and university services is lowest (Factor 4).
Firm K	<ul style="list-style-type: none"> - 2 years old - Owner: University M graduate - 1 owner - The only firm from a different industrial sector - Location: Main building 	<ul style="list-style-type: none"> - Desired relations with other firms are high (Factor 1), frequency of actual relations taking place average (Factors 6, 7). - Desired relations with the academicians of host university are high (Factors 2, 3), but frequency of actual relations taking place is very low (Factor 2). - Frequency of usage of services provided by the host university and its science park (Factor 4) is the highest.
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"> - Desired relations with academicians of the host university are average (Factor 2), but actual relations taking place is the lowest (Factor 5). - Desired usage of University M and science park facilities is the lowest (Factor 3), actual usage very low (Factor 4). - Desired relations and frequency of formal relations with other firms is high (Factors 1, 7).
Firm W	<ul style="list-style-type: none"> - 6 months old - Owners: All University M graduates - 2 owners - Location: Main building 	<ul style="list-style-type: none"> - Actual and desired conditions for all factors all above average (Factors 1-7).
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"> - Desired relations with the host university and science park and host university academicians are low (Factors 2, 3), desired relations with other firms are high (Factor 1). - Frequency of using the services of the science park and host university and frequency of relations with University M academicians are low (Factors 4, 5).
Firm Y	<ul style="list-style-type: none"> - 2 years old - Owners: All University M graduates - 2 owners - Location: Additional building 	<ul style="list-style-type: none"> - Desired relations are above average (Factors 1, 2, 3), but actual relations taking place are slightly above or below the average (Factors 4, 5, 6, 7).

5.4. Interview

The data collected through various methods were analyzed through a grounded theory approach, following open, axial, and selective coding processes in order to link the developed propositions to the existing literature (Strauss and Corbin, 1990). The results will be represented in two sections: In the first section, social capital development among tenant firms will be evaluated, in the second section social capital development between tenant firms and the host university will be analyzed.

5.4.1. Social Capital Development Among Tenant Firms

The data were analyzed in order to find out the antecedents and benefits of social capital among tenant firms. All the three dimensions of social capital are found out to be taking place in the incubator context. Table 6 gives an example each for the structural, relational, and cognitive dimensions of social capital, as mentioned by the managers during the interviews with the firms.

Table 6 Examples of Social Capital Dimensions.

Structural Dimension	KOSGEB prepares barbeque parties from time to time. In these parties we get together and talk to each other about recent events. (Firm C) (KOSGEB zaman zaman burada bir mangal partisi yapar. Bu partilerde bir araya geliriz, işte son olayları birbirimize aktarıyoruz.)
Relational Dimension	There is a very happy environment here. I mean, I come here everyday happily. If the firm was out (<i>outside of the incubator</i>) I don't know if I would be this peaceful. There are times we leave our keys with other firms if we will not be here. We trust them. (Firm A) (Çok mutlu bir ortam var burada. Yani buraya her gün mutlu bir şekilde geliyorum. Dışarıda olsaydım bilmem bu kadar huzurlu olur muydum. Buraya gelmeyeceksek anahtarımızı başka firmalara bıraktığımız oluyor. Güveniyoruz onlara.)
Cognitive Dimension	Since we are all similar people, we have a thing that comes from our past. We have a common language. (Firm F) (Sonuçta hepimiz benzer insanlar olduğumuz için, geçmişten gelen birşeyimiz var. Ortak bir dilimiz var.)

5.4.1.1. The Conceptual Model

The study was conducted with the aim of determining the antecedents and benefits of social capital and the effect of the three dimensions of social capital in the incubator context. The proposed conceptual model can be seen in Figure 9.

Here the relations among the seven antecedents and five benefits of social capital are represented. As can be seen, for the formation of the benefits, the structural dimension of social capital is necessary. Furthermore, some antecedents create benefits following a process between the social capital dimensions.

5.4.1.2. Antecedents of Social Capital

Informal ties:

The first antecedent of social capital mentioned by all respondents is the formation of informal ties. Informal ties lead to structural social capital development. Physical proximity, the building layout, conferences and other social activities organized by the incubator management, and the previous ties among tenant firm managers prior to being incubated are the factors that affect the creation of informal ties.

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 the way that they can do the job is by getting support from one of our capabilities.. (Firm B)

(Koridorda oturup sohbet ederken tanışıyoruz. Konuşuyoruz zaman içinde sonra karşılıklı yeteneklerini öğreniyoruz, sonra bir iş geliyor, ama onlar da o işi yapmasının yolu bizdeki bir yetenekten destek alması oluyor.)

Since we are close to each other, and are in the same place, plus I know their capabilities in doing research and development, their projects and details very well, I always prefer TEKMER (*Incubator X*). (Firm B)

(Birbirimize yerimizin yakın olması, aynı ortamda bulunmamız, artı AR-GE yapabilme becerilerini çok iyi bildiğim için, projelerini, detaylarını iyi bildiğim için her zaman Tekmer'i tercih ederim.)

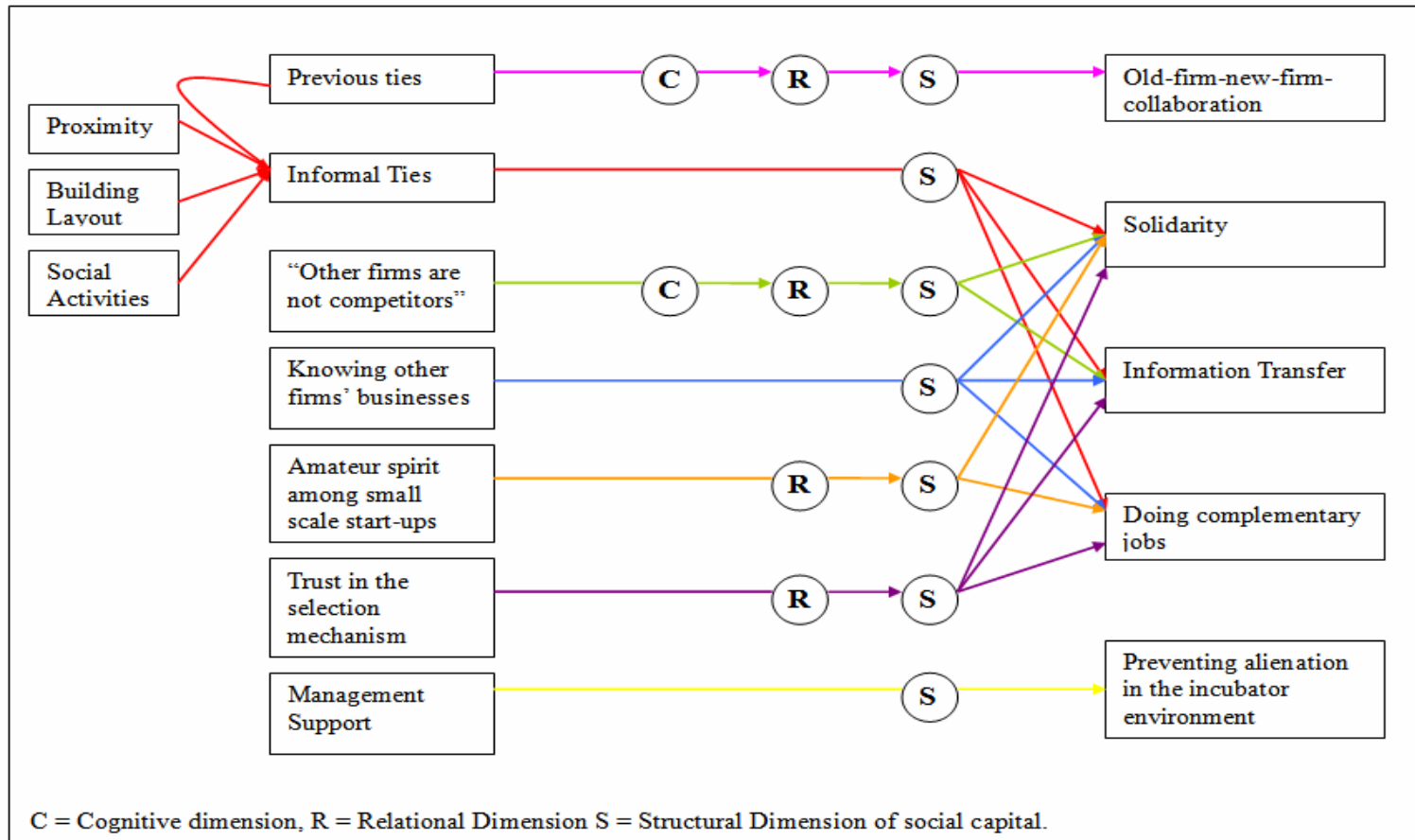


Figure 9 Proposed Conceptual Model

Since the firms on the lower floor have the chance to go out into the garden, there are tables and sitting groups there. On this side, there are offices and maybe one-third of them are full. The rest are empty. For this reason it is hard to meet with them and chat. There is a lower probability of working together.

(Firm V)

(Alttakiler direkt bahçeye çıkma olanağı olduğu için, orada mesela oturma yerleri, masalar filan var. Bu tarafta da ofisler var, bu taraftaki ofislerin de belki üçte biri doludur. Diğerleri boştur.... Ondan dolayı hem karşılaşma zor oluyor hem muhabbet zor oluyor. İş yapabilme olasılığı çok daha düşük oluyor.)

The proximity of the firms to each other and to the common spaces increases their chances of meeting with each other. By establishing informal ties; the firms develop structural social capital. In this way, they get to know each other and learn each others' projects. The manager of Firm V stated that firms on the ground floor are closer to the garden (one of the gathering places) which helps them to establish more ties with the other firms. For this reason, he thinks proximity to common spaces is critical. The higher the chance they meet with each other, the more informal ties they develop by chatting. They talk about each other's capabilities, projects, etc., which forms the basis for further formal ties to do joint projects.

They (tenants) definitely, definitely prefer to work with an incubator firm rather than an outside firm. They are in the same place after all. If you are going to do business, would you go to the shop on the ground floor of your house, or would you go two streets away? I mean, you are face to face with this person, you know him. (Specialist 2)

(Kesinlikle kesinlikle çalışmak için buradaki firmayı tercih ederler dışarıdakine göre. Sonuçta aynı yerdeler. Mesela bir iş yapacak olsan evinin altındaki dükkana mı gidersin iki sokak ötedekine mi? Yani bu adamla yüz yüzesin, tanıyorsun onu.)

The specialists agree that proximity is an antecedent of structural social capital formation. Specialist 2 states that having continuous face to face communication

promotes the firms' preferences to choose each other for collaboration, instead of working with off-incubator firms.

The second factor that affects informal tie formation is the physical layout of the building.

Think of some tiny little shops in the market. Since we have one hall. People see each other. In time they start to greet each other. Somehow, a kind of a relationship starts to be formed. Next, people start to ask each other questions. (Firm A)

(Çarşıdaki küçük küçük dükkanları düşünün. Küçük küçük olduğu için bir tane salonumuz var. İnsanlar birbirlerini görüyor. Zamanla merhabalaşıyor. Bir şekilde ilişki kurulmaya başlanıyor. Ondan sonra insanlar birbirlerine sorular sormaya başlıyorlar.)

The “neighborhood” metaphor comes to mind here. Neighbors are regarded as close friends in Turkey, whom you can easily turn to for help anytime you need. Here the manager of Firm A uses this metaphor in order to express his feelings about being very close to the tenant firms both physically and psychologically. These neighborhood-like relations bring them closer and create informal ties.

An important characteristic of the building layout is that it divides the incubator into separate buildings.

We moved to the additional building in order to distance ourselves from the others. (Firm Y)
(Kendimizi soyutlamak için ek binaya geçtik.)

As the manager of Firm Y claims, the firms in the additional building feel themselves distanced. Being in a different building reduces the chance of meeting in the common spaces and corridors. Therefore, creating social capital through informal ties gets more difficult.

The third factor is getting to know each other during conferences and other social activities organized by the incubator management. All the firm managers who had

participated in these activities mentioned the help of these activities in creating relationships.

KOSGEB organizes barbeque parties here from time to time. In these parties we get together and talk to each other about recent events. (Firm C)
(KOSGEB zaman zaman burada bir mangal partisi yapar. Bu partilerde bir araya geliriz, işte son olayları birbirimize aktarıyoruz.)

Managers of Firms A, V, and F state that during the meetings set by the incubator management, the firms introduce themselves to the others, thus they get to know each others' businesses and capabilities. Later when they need help from a firm, they know who to ask.

The existence of previous ties is the last identified critical factor for informal tie formation. The manager of Firm C states that:

There were firm owners who graduated together with, or rather, before us. We have a natural acquaintance with them and we trust them. (Firm C)
(Şimdi birlikte mezun, birlikte mezun olduğumuz değil de benden daha önce mezun olmuş birlikte olduğumuz firma sahipleri vardı. Onlarla zaten doğal tanışıklığımız var ve güvenimiz var.)

The manager of Firm A explains this relationship with a famous Turkish saying “I know how this one brave eats his yogurt”¹¹. This expression shows that firm owners who know each other beforehand can form informal relations, but this time the structural dimension of social capital does not emerge directly. First a common language among firms (which constitutes the cognitive dimension of social capital) creates trust among actors (which constitutes the relational dimension). Later, trust among actors enhances the creation of actual networks, which is the structural dimension of social capital.

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

¹¹ Bu yiğidin nasıl yoğurt yediğini bilirim.

(Sonuçta hepimiz benzer insanlar olduğumuz için, geçmişten gelen birşeyimiz var. Ortak bir dilimiz var.)

Most of the firm managers are University M graduates and their previous ties create a common language between the firms. Thus, being a host university graduate is one of the antecedents of the cognitive dimension of social capital. If they are not host university graduates, they work with firms outside the incubator whose managers are graduates of their own universities:

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

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

(Soru: Peki... firmayla yakınlaşmanız nasıl oldu? Nasıl onlarla iş yaptınız?

Cevap: O firmayla yakınlaşmamız bizim yine Üniversite B'den bir arkadaşımız vardı. Mali Müşavirlik denetim şirketi sahibiydi. O bize bir projemizde yardım etti, sonra birlikte işler yapmaya başladık.)

Other tenants are not competitors

Managers of firms A, C, Y, and the manager of the firm who joined the pilot interview state that they do not regard the other incubator firms as their competitors.

In reality 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 abroad. (Firm C)

(Biz kendi aramızda rekabet etmiyoruz aslında...Bizim esas rekabet edeceğimiz kişiler işte yurtdışından gelip de buranın artı değerini alıp yurtdışına götüren firmalar.)

There is no competition, in that sense, there is not much competition, because everyone has a field to work on, the sector is wide. I mean if I do a job for this one and he does a good job for that one, it is enough. For this reason, there is no serious apparent competition, at least not first degree competition. (Pilot interview)

(Ya yok rekabet yani o anlamda çok rekabet yok. Çünkü herkesin kendi çalıştığı alanı var, sektör geniş. Yani ben oraya iş yapsam, o öbür tarafa iş yapsa zaten yeter. Onun için ciddi anlamda bir rekabet görünürde en azından birinci derecede yok.)

The managers say that the firms have their own businesses and add that the incubator management guarantees the selection of firms with different concentration areas. Moreover, there is an unwritten pact among firms about not entering to each others' domain unless they are asked for help. This is an example of the cognitive dimension of social capital, which is an unwritten norm set in the incubator environment. This dimension leads to the creation of the relational dimension by increasing inter-firm trust. The managers believe that other firms will never attempt to do the same project as theirs. Eventually, the formation of relations among the tenant firms is enhanced, which constitutes the structural dimension of social capital.

Amateur spirit among small-scale start-ups

The manager of Firm C claims that as all the firms are start-ups, they still have an amateur spirit, which makes them more open to believing in each other, enhancing inter-firm trust among firms, which constitutes the relational dimension of social capital.

Question: So do you trust (the others)? If you were to work together, would you trust the 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 the result would be but trust, I would trust them from the beginning. (Firm C)

(Soru: Peki güven duyuyor musunuz? İş yapacak olsanız dışarıya göre buradakine daha güven duyuyor musunuz?)

Cevap: Tabii kesinlikle, kesinlikle. Çünkü buradaki insanların içinde bir amatör ruh var. Sonuç ne olur bilmiyorum ama güven, önceden bir güven duyarım.)

Moreover, being small brings them together in order to be stronger when competing with bigger and stronger firms:

We are all small firms. These firms are not qualified enough to finish high level projects by themselves. But when three or four firms come together, by creating a potential of 8-10 people, quite good projects can be done. This would make us stronger, and this is the fundamental reason why I chose to be in this incubator. (Firm A)

(Hepimiz ufak firmalarız. Bu firmalar kendi başlarına çok yüksek düzeyde projeleri bitirebilecek düzeyde değiller. Ama üç, dört firma bir araya gelip sekiz, on kişilik bir iş potansiyeli yaratarak oldukça güzel projeler yapabilir. Bu bizi daha güçlü yapar ve TEKMER'i tercih etmemin en temel nedeni bu.)

Trust in the selection mechanism

As it can be understood from the quotes above, firms that trust the selection mechanism trust each other as well. They prefer incubator firms more than the off-incubator firms. This creates the relational dimension of social capital. Due to this trust, they come together more easily to form relationships for further projects, which forms the structural dimension of social capital.

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

(KOSGEB firması mı, AR-GE anlamında yetkin insanlar diye bakıyor; çünkü buraya girmek için uzun bir süreçten geçmek gerekiyor. Yedi, sekiz ay süren, üniversite hocalarının kurullarda seni ciddi anlamda yorduğu, hem mesleki anlamda bu işi yapabileceğini algıladıkları hem de ticari anlamda de işte başarıyı yakalayıp yakalayamayacağını bir şekilde test ettikleri bir yöntem var. Buradan geçip geliyorsun.)

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

(Dışarıdaki bir firmanın işi ne kadar iyi yaptığını ancak referanslarından bilebilirsiniz. Zaten işte buradaki şeyi biliyorum, eleme sisteminin iyi olmasından kaynaklanıyor yani. O iyi olduğu için buraya alınan firmalar da sıradan firmalar, yani sıradan kişiler değil sonuçta. Belli bir birikim, belli bir vizyonu olan kişiler.)

Knowing other firms' businesses

Knowing what other tenant firms work on is another antecedent of social capital that directly creates the structural dimension.

I can't know everything. And I definitely have to use many things in a project. Libraries are important, but finding someone who has done the same thing in practice is a better opportunity, learning from someone who has experienced similar difficulties. Here, while we chat with each other, we learn what others do. This is one of the best things about the incubator. (Firm A).

(Her şeyi bilme şansım yok. İlla ki bir proje içerisinde çok fazla şey kullanman lazım. Sorma ihtiyacı duyuyorsun. Kütüphaneler önemli bir imkan. Ama öte yandan pratik anlamda bunu yapmış birini bulmak çok daha önemli bir imkan, daha önce bu tarz sorunları yaşamış birinden öğrenmek. Sohbet ortamlarında ne iş yaptıklarını öğreniyoruz. Bu TEKMER'in en iyi özelliklerinden biri.)

While they are talking with other firm employees, the firms get the chance of learning which firms have complementary skills to complement their own deficiencies.

Not all firms who know each others' businesses come closer. The fit between the employees of different firms is also important in shaping the relations among them.

While doing a project with other firms, I give priority to the ones that I have better relationships with: friendlier relationships. (Firm A)

(Öncelikli olarak, örneğin bir ortak proje yaparken şeye bakarsın; yani ben oraya bakarım, öncelikle ilişkimin daha iyi olduğu, biraz daha arkadaşlık, dostluk ilişkisi aradığım şeylere bakarım.)

Management support

Management support is the last factor that creates the structural dimension of social capital. It is particularly critical for the firms that do not have previous relationships with the other firms, because they need management support in order to develop their initial contacts with the other tenant firms.

I just learned that there are catering services in the İkizler Building. All the firms go to 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)

(Yeni öğrendim, İkizler binasında yemek yeniyormuş. Bütün firmalar farklı yerlere gidiyor. Hani burada bir günlük bir danışmanlık içinde nerede yemek yenilebilir, ulaşım imkanları nasıl olabilir falan açıklanabilir.)

The first group of firms that emphasize the necessity of management support is the firms whose managers are not graduates of University M. They need the support of the incubator management more than the other firms. More interestingly, they call the specialists “advisors”, which implies their need for advisory support to get used to the new environment they have entered.

The second group of firms who indicate that management support might be useful is the firm managers who are new to the incubator. Again, they need support in order to get used to the environment. 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: The firms are trying to make money, they do not have time; but it's the management's job to help us. (Firm W)

(Soru: Peki bir sorun olduğunda şirketinizde, çok rahatlıkla danışabilir misiniz?)

Cevap: Çok onu gerektirecek bir durum olmadı açıkçası. Belki olabilir bilmiyorum. Yani danışabileceğimiz insanlar olduğunu hissediyorum açıkçası. Ama burada mesela ben daha çok yönetime danışmayı tercih ederim, firmalar dışında. Çünkü, bunun sebebi de şu: Firmalar, kendileri para kazanmaya çalışıyorlar; çünkü vakitleri yok ama yönetimin zaten işi bize yardımcı olmak.)

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

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

(Arada bir şey yapıyoruz, mangal partisi, yılbaşı partisi. Burada amacımız firmaların birbiriyle kaynaşması. Çok giren çıkan firma var ve bunların birbirine kaynaşması biz olmadığımız sürece olmuyor. Yani birbirini tanıyanlar kaynaşıyor, ama tanımayanları bu şekilde kaynaştırmaya çalışıyoruz.)

On the other hand, older firms with managers who are graduates University M do not mention that they needed incubator management support. They argue that the manager and the specialists do not interfere with what they do and that there is no hierarchy between them. They add that the management's friendly attitude is satisfactory for them:

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)

(Ben ve arkadaşlarım yönetimle gayet içten ve samimiyiz. Gider muhabbet eder, çaylarını kahvelerini içeriz.)

Our relations with the management are really sincere. We do not have anything to say about the incubator management. They really approach us sincerely and they are aware of some of the existing problems. (Firm B)

(Yönetimle ilişkilerimiz gerçekten içten. TEKMER yönetimiyle ilgili söyleyecek birşeyimiz yok. Gerçekten içten yaklaşıyorlar bize ve varolan sorunların bir kısmının farkındalar.)

5.4.1.3. Benefits of Social Capital

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

...last year we had an intern friend here and then we helped him establish a firm here. We give him our reference and did our best. (Firm A)

(Geçen yıl bir stajyer arkadaşımız vardı burada ve sonra burada bir firma açmasına yardım ettik. Referansımızı verdik, elimizden geleni yaptık.)

The first observed benefit is *collaboration among old and new firms*. Previous ties among firms bring new 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 entering the incubator, just like they had been helped when they entered.

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

Answer: Oh, yes, definitely, definitely! Someone comes and asks us, “Brother, how did you do this?”, next time we go and ask. This is a very efficient 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)

(Soru: Rahatlıkla gidip diğer firmalardan yardım isteyebiliyor musunuz?)

Cevap: Ah evet kesinlikle, kesinlikle! Biri gelir bize sorar: “Abi siz şunu nasıl yapmıştınız?”, diye, sonraki sefer biz gider sorarız. Bu çok verimli birşey. Örneğin bizim işimizle alakasız ya da daha önce benzerini yapmadığımız bir proje aldık. O işi alırız sonra da buradaki diğer firmaların da yardımıyla yaparız o işi.)

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 turn to their neighbors for help and in turn try to do their best if their neighbors ask for help. The specialists also observe this approach in the incubator. Specialist 1 notes that there is a synergy in the environment and an electronic firm who needs software in a project can easily go and as a neighbor in the software sector to help them.

As managers of Firms C and Y imply, *information transfer* is the third benefit of social capital. Once the structural ties among firms are established, the firms pass their information on various topics such as market information, incubator supports, or bank credits 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. I mean here you earn money anyway. The important thing here is transferring our knowledge to each other and being stronger. (Firm C)

(Yani bilgi durduğu yerde kalmamalı. Yani demek istediğim para zaten kazanıyoruz bir şekilde. Asıl önemli olan bilgimizi birbirimize aktarıp daha güçlü olmak.)

I, for example, told some of the firms, I mean the firms with whom we have some communication, about the support of the Scientific and Technological Research Council of Turkey and this way they applied for funding. It was good for them. (Firm Y)

(Ben mesela, etrafımızdaki bazı firmaları, yani diyalogumuz olan bazı firmalara TÜBİTAK desteğinden bahsettim ve böylece başvuru yaptılar. İyi oldu onlar için.)

When the firms get to know each other, they understand which firms can complement their deficiencies in larger projects. Another benefit of social capital is *the motivation of the firms to do complementary jobs*. By combining their power, they become stronger start-ups in the competitive market and are able to do larger projects. As it was indicated above by Firm A, the smaller firms get together in order to participate in large projects and be able to compete with larger and stronger firms.

The last benefit is critical for the firms whose owners are not University M graduates and do not know about the environment at all. 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, which prevents the alienation of the firm managers coming from other universities.

5.4.1.4. Time as a Moderator between the Antecedents and Benefits

It is found out that time acts not as an antecedent, but as a moderator during the formation of the benefits of social capital. The structural dimension of social capital is essential to create the mentioned benefits; however in certain cases, a process, beginning from the cognitive dimension and moving to the relational dimension and then to the structural dimension, which is moderated by time, takes place. Firm managers who graduated from the same university have a common language, which is the cognitive dimension of social capital. Another example of the cognitive dimension is an unwritten rule among tenant firms, about not doing each others' businesses. These antecedents facilitate trust generation between the managers leading to the relational dimension of social capital. This must then lead to formation of ties which is the structural dimension of social capital

The amateur spirit of the managers and trusting the selection mechanism are the factors that directly create trust (relational dimension). This relational dimension helps the firms to develop the structural dimension of social capital by forming actual ties among each other. These changes between the dimensions take place over time since it takes time for firms to build trust. Then this trust in others' goodwill turns to competence trust and develops informal or informal relations.

5.4.1.5. Propositions

Following the grounded theory approach, three propositions are developed in light of the results.

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

Proposition 2: There is a process of social capital creation among three dimensions of social capital and time moderates this process.

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 in the selection mechanism*) first create relational social capital, which in turn develop the structural dimension of social capital.

5.4.2. Social Capital Development Between Tenant Firms and the Host University

Being on the university campus is one of the most critical factors for the tenant firm managers (especially for the ones graduated from the host university) in their decision to establish their firms in the incubator. Before mentioning the financial incentives provided, they directly explained how it was to continue working in the University M campus:

Question: Would you choose to be in this incubator if there were no financial advantages?

Answer: Maybe, maybe. But this situation is related to us being in University M for a long time. I mean from the same school, same culture.

For this reason I cannot be objective about this. (Firm B)

(Soru: Ekonomik avantajı olmasa da burada yer almak ister miydiniz?)

Cevap: Olabilir, olabilir. Ama bu çok uzun yıllardır M Üniversitesinde olmamızla ilgili bir durum. Yani hani okuldan, ortak kültürden. O konuda o yüzden çok objektif olamayacağım.)

There are many benefits, tangible or intangible. This is a good thing. For us, only being in University M is enough. (Firm K)

(Yani birçok faydası var, gözle görülen görünmeyen. Bu iyi bir şey. Bizim için M Üniversitesinde olması yeterli.)

I do not know what it means to be off-campus. (Firm W)

(Kampüs dışında olmak ne demek bilmiyorum.)

On the contrary, firm managers who are graduates of other universities emphasize financial opportunities in their site selection:

It is not related to University M, it is completely financial. It could have been University M or University B. I mean if the rent is \$10 per square meter and the other is \$15 per square meter, then the other one is meaningless. (Firm V)

(M Üniversitesi ile alakası yok, tamamen finansal. M Üniversitesi de olurdu, B Üniversitesi de. Yani şey, burası metrekaşe başına 10 dolar diğeri 15 dolarsa, diğerrinin hiçbir anlamı yok.)

Specialist 1 summarizes this difference as follows:

Question: Why are most of the firm managers University M graduates?

Answer: Because University M graduates prefer being here. You know there is a form for incubator applications. You can take the form to the University H incubator, or University G incubator. The form is the same for all of them. But if you are a University M graduate, you prefer University M's incubator. If you are a University H graduate, you prefer its incubator. You know the environment, you know the faculty. Besides you know the campus. They choose the place they know.

(Soru: Neden yöneticilerin çoğu M Üniversitesi mezunu?

Cevap: Çünkü M Üniversitesi mezunları burayı tercih ediyor. Biliyorsunuz TEKMER başvuruları için bir form var. Bunu H Üniversitesi Tekmerine de götürebilirsin, G Üniversitesi TEKMER'ine de. Form aynı hepsi için. Ama M Üniversitesi mezunuysan M Üniversitesini tercih edersin. H Üniversitesi mezunuysan onun TEKMER'ini seçersin. Çevreyi tanıyorsun, hocaları tanıyorsun. Bunun yanında kampüsü biliyorsun. Bildikleri yeri seçiyorlar.)

These quotations show that being in the host university has different impacts on firms with owners graduated from the host university or other universities. For this reason, social capital development has also varying importance for each type of tenant firm. In this section, the second level of social capital which takes place between the tenant firms and the host university will be analyzed. Once again, the antecedents and benefits of social capital development will be evaluated.

5.4.2.1. Antecedents of Social Capital

The first antecedent of social capital is the *previous ties* among firm owners and the host university academicians. Firm managers who are host university graduates prefer to work with the academicians they used to know from their school. For example, the owners of Firm W are doctoral students in the host university and their thesis advisor is the firms's consultant. The managers feel more comfortable while working with the academicians of the host university with whom they have prior contacts:

When I was in Aselsan (*his former firm*) we were together with many of my professors from University M. The atmosphere and the trust this creates is a very special thing. I mean feeling that the instructor is supporting you, your being checked and approved is a very special thing. (Firm C)

(Yani ben Aselsan'dayken bir sürü M Üniversitesinden hocamızla birlikteydik biz. Onun verdiği hava, kendine güven çok bambaşka bir şey. Yani onu arkada hissetmek, yaptığın şeyin kontrol edilip de onlar tarafından onaylanması bambaşka bir şey.)

The academician who joined this study also supported this view and added:

Question: How did the firms whom you consult find you?

Answer: Now, people who establish firms in such places happen to be our friends. Or they find us through their acquaintances in University M. Physical proximity is a secondary factor here. The environment and acquaintances are dominant. (Academician 1)

Soru: Danışmanlığınızı yaptığınız firmalar nasıl buluyor sizi?

Cevap: Şimdi böyle yerlerde firma kuran insanlar arkadaşlarımız oluyor bizim. Ya da M Üniversitesindeki tanıdıkları aracılığıyla buluyorlar bizi. Fiziksel yakınlık daha ikinci planda. Çevre ve tanıdıklar ön planda.

On the contrary, managers who are graduates of other universities do not choose to work with the host university academicians in spite of their proximity to them. They continue to work with the academicians of their universities, which emphasizes the importance of previous ties compared to physical proximity. Managers who are graduates of other universities complain that they do not have the chance to know the host university academicians:

Question: Whose help do you ask for in your projects? University M academicians?

Answer: I am not a University M graduate. I do not know any faculty member here. (Firm X)

(Soru: Peki kimden yardım istiyorsunuz? Üniversite M hocaları falan mı?

Cevap: Ben buradan mezun değilim. Ben buradan hiç hoca tanımıyorum.)

The second antecedent of social capital is the *general attitude of the university towards the incubator firms*. Managers from other universities feel themselves alienated due to the university policy towards non-members. Their access to the university campus, usage of libraries, laboratories and other social facilities are highly restricted.¹² Therefore, they cannot communicate with the university staff and collaborate with the university as easily as the managers graduated from the host university.

It is impossible for us to use the facilities provided by the university! (Firm V)

(Üniversitenin verdiği hizmetlerden yararlanmamız imkansız zaten!)

This shows that such firms expect a positive attitude from the university in order to form collaborations.

¹² The managers of firms who are other university graduates can enter to the science park area of the university from a different entry if they own a sticker. They can not use the campus site entrances. If they want to enter to the campus, they need to take permissions.

Another antecedent which especially fosters social capital development of firms with managers of non-host university graduates is the *management support*. Just like their social capital with the other tenant firms, the support of the incubator management and specialists is critical for other university graduates since they do not know the university academicians and do not have any previous ties with them:

We do not have any information about University M academicians. I mean what can be done? If an idea like “We can get help from this professor” developed, maybe it can be more...but we, for example, we have a problem, but a problem like, a technical problem that we should get consultancy from someone, referring to University M academicians would not occur to us.

(Firm V)

(M Üniversitesi hocalarından haberimiz yok. Yani hani ne yapılabilir?....Bu hocadan danışmanlık alabiliriz tarzında bir şey gelişse bizde belki daha şey olur ama bizim mesela birşey, sorunumuz oluyor; ama şey bir sorun yani teknik bir sorun, birisinden danışmanlık almamız gereken, M Üniversitesi hocaları aklımıza gelmez.)

Lastly, it should be kept in mind that believing in the importance of academic support is a critical factor in creating university-industry collaboration. The firms who have closer relations with the academic staff are the ones who believe that the theoretical knowledge developed in the university is necessary for their further development. Manager of Firm B explained their attitude as:

I mean I go to the professors from my term, visit them, ask them about things which I have difficulty with. They are at a theoretical level which I can never reach. The man is a professor, he has put in a lot of work. Yes, they have problems relating to the practical side, but what we do is not always practical. I mean, if you are going to do the R&D of a task on a theoretical basis, you have to foresee what might take place. For example, material selection is a very important matter. I mean if you are going to make an appliance, you prepare your material list, you order a large quantity, and for example, you chose an inappropriate material. Here, in order to plan things the right way, I believe the professors are very important. (Firm B)

(Yani kendi dönemimdeki hocalarıma gidiyorum, ziyaret ediyorum, takıldığım yerleri soruyorum. Teorik anlamda hiçbir zaman benim

erişemeyeceğim bir nokta. Adam profesör olmuş, ciddi anlamda çok uğraşmış. Pratik anlamda evet sıkıntıları oluyor ama bizim yaptığımız iş her zaman pratik bir iş değil. Yani teorik anlamda yeni bir işin AR-GE'sini yapacaksın mutlaka başına ileride neler gelebileceğini iyi planlamak zorundasın. Örneğin malzeme seçimi çok önemli birşey. Yani bir cihaz yapacaksın, malzeme listeni hazırlıyorsun, çok sayıda getirtiyorsun, siparişini veriyorsun ve uygunsuz malzeme seçtin örneğin. İşte bunları iyi planlamak için bana göre hocalar çok önemli.)

5.4.2.2. Benefits of Social Capital

The first benefit of social capital enhancement between the tenant firms and the host university is its effect on the creation of relational dimension of social capital among tenant firms. It is observed that firm managers who have already developed chauvinism towards the host university serve the development of social capital among tenant firms. This cognitive dimension of social capital, which roots from the university-firm linkages and their previous ties with the other firm managers from the university environment, reflects on the relations among firms as goodwill trust since they believe they have a common language and common understanding:

Now there are firm owners that with whom we did not graduate together, but had graduated before us, and stayed in the same dorms as us for a long time, together with us in the Electronics Department. We have a natural acquaintance and trust with them. We have known each other for a very long time, I mean since '79. (Firm C)

(Şimdi birlikte mezun, birlikte mezun olduğumuz değil de benden daha önce mezun olmuş ama çoktan beri aynı yurtta kalmış, işte Elektrik Bölümünde birlikte olduğumuz firma sahipleri vardı. Onlarla zaten doğal tanışıklığımız var ve güvenimiz var. Birbirimizi tanıyoruz uzun yıllardır, ta 79'dan beri tanıyoruz işte.)

The second benefit of social capital is *information transfer* among tenant firms and the university. The academicians might work as formal consultants for the projects, or firm managers can go and ask for their advice on their projects. In both cases, tenant firm managers prefer academicians they know from school, which means previous ties are key factors here. On the other hand, firm managers sometimes give

lectures and conferences to the students in order to demonstrate how the concepts they learn theoretically in university courses are applied in practice:

We established “The Association of JAVA Technologies” in order to disseminate what we know. It is centered in Istanbul. In Ankara we organized our first event. In the Electrical-Electronics Engineering Department, we gave lectures to University M students after five thirty in the afternoon. There we gave the lectures in one of our previous professors’ auditorium. We taught them what happens in the sector. (Firm C)

(Biz “Java Teknolojileri Derneği”ni kurduk bu bildiklerimizi aktarmak için. İstanbul merkezli. Ankara’da da ilk etkinliğimizi düzenledik. Elektrik-Elektronik Bölümünde M Üniversitesi öğrencilerine ders verdik öğleden sonraları beş buçuktan sonra. Dersleri eski bir hocamızın amfisinde verdik. Sektörde neler olduğunu öğrettik.)

The cognitive dimension of social capital causes firm managers prefer to employees who are University M graduates or students because they believe that the university infuses the students with a common understanding and vision. For this reason, the physical proximity to the university is seen as a benefit since the firms can hire *University M students or recent graduates* easily:

Now if possible we prefer University M graduates: A common culture, a common language. You took the same courses from the same professors. (Firm B)

(Şimdi mümkünse M Üniversiteli tercih ediyoruz. Ortak kültür, ortak konuşma, aynı hocalar, aynı dersi aldın.)

Furthermore, the owners of some firms, such as Firm W, are pursuing doctoral studies and are working in their firm at the same time. These managers indicate that the physical proximity is advantageous for firms with managers who are graduates of University M. On the other hand, other university graduates do not think that physical proximity has such a benefit. They even think that it is hard for their employees to come to the campus as it is not easily accessible. Although Firm X has part-time employees who are students of University M, Firm V has never hired interns or employees from University M. They do not consider being a University M

graduate or student as a selection criterion. Once again, we can interpret that proximity might not always work as a benefit; it is the previous ties and the cognitive dimension of social capital that brings the university and industry together.

In addition to the social capital created, being in the university provides many other opportunities to the firms like utilizing the *social facilities* of the campus, *gaining prestige*, and *working in a pleasant environment*. The social facilities of the campus are used by the managers graduated from University M:

We use the social environment. For example, I often go to the Social Building (*a cafeteria for university faculty and staff*) and eat there. And then I use the shopping center. I bring my son to summer school. I mean not just me, but the members of my family also use the facilities. For this reason, we like being on University M. (Firm C)

(Sosyal çevreyi kullanıyoruz, mesela sık sık Sosyal Binaya gidiyorum, orada yemek yiyorum. Ondan sonra işte alışveriş merkezini kullanıyoruz, oğlumu yaz okuluna getiriyorum. Yani sadece ben değil aile fertleri de şey yapıyor. O yüzden M Üniversitesinde olmak hoşumuza gidiyor.)

However, graduates of other universities complain about the university policy that does not allow them to use any of these services. Their entrance to the campus site is restricted. They find being on campus meaningless:

It is impossible for me to use the university facilities. We can never do it. I mean it is meaningless that the Science Park is in University M.

(M Üniversitesinin verdiği hizmetlerden faydalanmamız imkansız. Hiç yapamıyoruz. Yani Teknokentin M Üniversitesinde olmasının hiçbir anlamı yok.)

University M is one of the most prestigious universities in Turkey. Thus, all managers think that being located in this university puts them into a more prestigious position in the eye of their suppliers, customers, and firms outside the incubator:

We serve medical firms. Speaking of Ankara, maybe being in Tunalı Hilmi (*a central street in Ankara*) would have improved our business by 50 percent up to now. Why? Because most of the doctors (*offices*) are there. I mean, it is a problem for a doctor to come us, our going there is another

problem, parking places and such. But what happens? When I send someone an e-mail, when I complete a job, if “University M Science Park” is written on it, it brings about something automatically, it provides an advantage. I mean everybody knows that not every firm can come here! (Firm K)

(Biz medikal şirketlerine hizmet veriyoruz. Ankara için konuşuyorum, atıyorum Tunali Hilmi’de olmamız belki bizim işleri şimdiye kadar yüzde elli arttırmış olabilir. Niye? Çünkü bütün doktorlar orada. Yani bizim bir tane doktorun buraya gelmesi dert, bizim oraya gitmemiz dert, park yeridir...Ama ne oluyor, ben bir mail attığım zaman, bir iş yaptığım zaman M Üniversitesi Teknokent yazıyor olması yani zaten kafadan birşey sağlıyor, bir avantaj sağlıyor. Yani sonuçta herkes biliyor, buraya her şirket giremiyor.)

Of course there is an increase in respect towards us, I mean we people think all the Japanese as perfect engineers, there is such a bias in our head. When you say “University M Science Park”, such a thing appears in peoples’ minds. (Firm C)

(Tabii ki bize olan saygınlık artıyor. Yani insanlar bütün Japonlara mükemmel mühendis gözüyle bakıyor, öyle bir kalıp var kafamızda. “M Üniversitesi Teknoparkı” deyince de böyle birşey oluşuyor insanların kafasında.)

The manager of Firm C uses “the Japanese” metaphor in order to express how the public perceives firms in the University M Science Park. Just like the Japanese, firms in the science park are assumed to have outstanding skills in research and development compared to the off-park firms, which he believes increases the respect and confidence felt towards them.

Thirdly, since the firms are co-located with firms with similar characteristics, managers with the same education levels, and all dealing with research, development and innovation, they feel that the atmosphere is a decent atmosphere compared to the city center:

Our neighbors were lathe shops and glaziers when we were in Kızılay (*a region in the city center*). We did not have the chance to learn about supports and credits through the grapevine. Being in University M, in the same building and the same atmosphere has such benefits.

(Kızılay'dayken komşularımız tornacılar, camcılardı. Oradayken destekler, krediler hakkında kulaktan kulağa bilgi almamız mümkün olmuyordu. Aynı M Üniversitesi'nde olmanın, aynı binada, aynı atmosferde olmanın böyle avantajları var.)

Lastly, being in the same environment after graduation has *psychological benefits* for the managers. They feel more comfortable and confident in this atmosphere. The manager of Firm K, a graduate of University M, states that:

The greatest advantage is psychological. In the end... I mean... I am not out of the campus, University M. I eat at places I know and meet with a couple of friends there. I mean, we ride our bikes, we go for a walk, I mean we meet after work in the afternoon. Besides, there is a synergistic atmosphere here. There is a smell in the air, a smell of doing business. (Firm K)

(En büyük avantaj psikolojik. Sonuçta, hani yani...çıkmamış oluyorum kampüsten, M Üniversitesinden. Yemek yemeye filan da bildiğim yerlere gidip orada birkaç arkadaşım ile görüşüyorum. Ne bileyim, bisiklete biniyoruz, yürüyüş yapıyoruz, akşam iş çıkışında buluşuyoruz. Bunun yanında bir sinerji ortamı var. Havada bir şey kokusu var, bir iş yapma kokusu var.)

5.4.2.3. Propositions

Following the grounded theory approach, four propositions can be developed in light of the results of the second set of interviews regarding social capital development between the tenant firms and the host university

Proposition 1: The primary factor that develops social capital between the host university and tenant firms is not the proximity among them. Rather, previous ties facilitate this development.

Proposition 2: The formation of cognitive social capital between the host university and tenant firms triggers the enhancement of relational social capital among tenant firms and the university.

Proposition 3: The antecedents and benefits of social capital development vary between firms with managers who are host university graduates and firms with managers graduated from other universities.

Proposition 4: If the manager of the firm is not a host university graduate, incubator management support and the general attitude of the university towards the firms play a critical role in social capital generation.

CHAPTER 6

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 points to the same results. Informal networks are developed 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 showingg the importance of previous ties in social capital generation among tenant firms. This research is also in line with Bollingtoft et al. (2005) that claims that being in the same building, i.e., geographical proximity, enhances social capital development.

Another point to note about our findings is the effect of management. 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 claims that management support is not equally important for all firms. It is more critical for firms who are new to the environment: 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 their amateur spirit, and trusting the selection mechanism of the incubator are other important antecedents.

If the benefits are analyzed, 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 other benefits identified in this study.

Extant literature does not describe the university-industry linkages as social capital but only considers these linkages as university-industry collaboration (Phan et al., 2005, Rothaermal et al., 2005, Markman et al., 2005, Link et al., 2005, Vedovello, 1997). This study perceives the relations between the firm managers and host university faculty as a second layer of social capital and addresses an important debate on the antecedents of social capital literature. According to Scott (2004), science parks located closer to universities grew significantly faster. On the other hand, Vedovello (1997) claims that proximity facilitates only informal and human resources ties among the parties, but it is primarily the existence of related research fields that enhance the creation of formal links. This research shows that the formal, informal and human resources linkages depend on previous ties among actors, not on geographical proximity. Firm managers who are not graduates of the host university continue to work with their own university professors regardless of geographical distance. This shows that social capital development among the firms and academicians is not based on proximity, but on previous ties between these actors. As also shown by Adler and Kwon (2002), previous ties are critical antecedents for the development of social capital in this context.

There is an emphasis on psychological benefits on the firm managers who are the graduates of the host university. They feel more motivated due to working in a home-like environment which they are used to since their student years.

This study underlines a process of social capital development as an addition to the existing literature. Nahapiet and Ghoshal (1998) defined three dimensions of social capital and accepted them as independent dimensions. According to our findings,

there is a process among these dimensions which generates benefits from the antecedents of social capital. The structural dimension, which is the most instrumental dimension in generating benefits, may be developed through the relational dimension and the cognitive dimension may result 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 the linkage between the two layers of social capital.

CHAPTER 7

CONCLUSION

This research has several contributions to the existing literature. When the first layer of social capital development (social capital among tenant firms) is considered, the study extends the studies of Nahapiet and Ghoshal (1998) and Tsai and Ghoshal (1998) to demonstrate that the three dimensions of social capital might be involved in an evolving process. Extant literature does not identify an evolving process between the dimensions. However, this research shows that these dimensions give birth to one another. The cognitive dimension among actors transforms into the relational dimension, and finally into the structural dimension, which is necessary for the perception of benefits. Here, time does not act as an antecedent (Lyons, 2002) but as a moderator in the transformation of various dimensions of social capital.

7.1. 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. For further research, the necessity of the development of the relational dimension of social capital to initiate the development of the structural dimension of social capital should be analyzed. In order to gain some of the benefits from social capital, developing trust (the relational dimension of social capital) is critical. However, some antecedents identified directly engender the structural dimension to constitute a benefit. As an extension to this line of thinking, the temporal sequence of the dimensions of social capital should be investigated, as time acts as a moderator between various dimensions of social capital.

Thirdly, the basic assumption of this study, is that benefits of social capital generate success, was not tested. The long-term success of the graduated firms can also be evaluated in order to test this assumption and understand the relationship between the benefits of social capital and the success of the firms. Fourthly, 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. Furthermore, as social capital is perceived as a public good in this research, the characteristics of the owner 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 also affect social capital enhancement. Moreover, the effects of social capital development on the university side should be elaborated. Lastly, the effect of proximity compared to the effect of previous ties on social capital development between the tenant firms and the host university should also be analyzed further.

7.2. Managerial Implications

In different stages of their lifecycles, firms have different needs and expectations. They might need support to develop the cognitive, relational, or structural dimensions of social capital in order to better utilize 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 conferences and informal social activities like barbeque parties are very important for social capital development. Firms get the chance to know each other and each other's capabilities. This enhances information transfer, solidarity, and cooperation in large projects. Management should bring the firms together with such activities. These activities can also bring the university staff and the firm owners together to share ideas.

The firms participated in this study on a voluntary basis. The inactive tenant firms were not physically present 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 can not be regarded as a limitation of the study. These 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.

Lastly, the support of the management team to incoming firms or firms whose owners are not host university graduates is critical. Such firms need incubator management support in order to get used to the environment and benefit from social capital.

7.3. Limitations

There were several limitations in the study due to the methodology used. Firstly, only nine firms participated in the interviews. I tried to reach three extreme cases in order to have a diverse set of cases, but one firm with no relations with the other firms and the university refused to do the interview. However, I 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 incubator conferences, barbeque parties, or meetings of the firms could have been useful to observe the relations of the firms more closely. Furthermore, only a small number of academic staff participated in the study because I could not reach the academicians who work only as consultants but do not own an incubator firm. There should be more interviews with the university staff in order to have higher quality data.

REFERENCES

- Adler P. S., Kwon S. W. (2002), Social capital: Prospects for a new concept, *Academy of Management Review*, Vol. 27, pp. 17-40.
- Anderson, A. R., and Jack, S. L. (2002), The articulation of social capital in entrepreneurial networks: A glue or a lubricant?, *Entrepreneurship and Regional Development*, Vol. 14, pp. 193-210.
- Baker, W. (1999), Market networks and corporate behavior, *American Journal of Sociology*, Vol. 96, pp. 589-625.
- Batjargal, B. (2003), Social capital and entrepreneurial performance in Russia: A longitudinal study, *Organization Studies*, Vol. 24, pp. 535-556.
- Bollingtoft, A., Ulhøi, J. P. (2005), The networked business incubator: Leveraging entrepreneurial agency? *Journal of Business Venturing*, Vol. 20, pp. 265-290.
- Bourdieu, P. (1985). *The forms of capital: Handbook of theory and research for the sociology of education*, New York: Greenwood.
- Burt, R. S. (1997), A note on social capital and network content, *Social Networks*, Vol. 19, pp. 355-373.
- Burt, R. S. (1997), The contingent value of social capital, *Administrative Science Quarterly*, Vol. 42, pp. 339-365.
- Burt, R. S. (2000), *The Network Structure of Social Capital*, JAI Press, Greenwich, CT.
- Çakmakçı, U. M. (2003), *The Context of Innovation and the Role of the State* in Trott, P. (*Innovation Management and New Product Development*, Prentice Hall, Essex, England.
- Camilleri, P., Humphries, P. (2005), Creating synergy: Developing new forms of partnership between university and industry, *Australian Social Work*, Vol. 58, pp. 26-35.
- Cantner, U., Grad, H. (2005), The network of innovators in Jena: An application of social network analysis, unpublished conference paper presented at the EMAEE Conference in Utrecht, The Netherlands.
- Chan, K. F., Lau, T. (2005) Assessing technology incubator programs in the science park: The good, the bad and the ugly, *Technovation*, Vol. 25, pp. 1215-1228.

- Cohen, W. M., Levinthal, D. A (1990), Absorptive capacity: A new perspective on learning and innovation, *Administrative Science Quarterly*, Vol. 35, pp. 128-152.
- Coleman J. S. (1988), Social capital in the creation of human capital, *The American Journal of Sociology*, Vol. 94, pp. 95-120.
- Colombo, M. G., Delmastro M. (2001), How effective are technology incubators? Evidence from Italy, *Research Policy*, Vol. 31, pp. 1103-1122.
- Cooke, P., Willis, D. (1999), Small firms, social capital and the enhancement of business performance through innovation programmes, *Small Business Economics*, Vol. 13, pp. 219-234.
- Cooke, P., Clifton, N., Oleaga, M. (2005), Social capital, firm embeddedness and regional development, *Regional Studies*, Vol. 39, pp. 1065–1077.
- Creswell, J. W. (1998), *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*, Sage, Thousand Oaks, London.
- Darr, A. Rothschild, L. (2005), Technological incubators and the social construction of innovation networks: An Israeli case study, *Technovation*, Vol. 25, pp. 59-67.
- Erlandson, D. Harris, E., Skipper, B., Allen S. (1993), *Doing Naturalistic Inquiry: A Guide to Methods*, Sage Publications, Thousand Oaks, London.
- European Commission (2006,) *Annual Innovation Policy Trends and Appraisal Report*, Greece.
- Fayard, A. L., Weeks, J. (2007), Photocopiers and water-coolers: The Affordances of informal interaction, *Organization Studies*, Vol. 28, pp. 605-634.
- Florida, R., Cushing, R., Gates, G. (2002), When social capital stifles innovation, *Harvard Business Review*, Vol. 80, Issue 8, p.20.
- Fukuyama, F. (1995), *Trust: The social virtues and the creation of prosperity*. New York: Free Press.
- Geertz, C. (1973), *Interpretation of Cultures*, Basic Books, New York.
- Glaser, B., Strauss, A. (1967), *The Discovery of Grounded Theory*, Aldline, Chicago.
- Granovetter, M. (1985), Economic action and social structure: The problem of embeddedness, *American Journal of Sociology*, Vol. 91, pp. 481-510.

- Hansen, M. T., Chesbrough, H. W., Nohria, N., Sull, D. N. (2000), Networked incubators: Hothouses of the new economy, *Harvard Business Review*, September-October 2000, pp. 74-84.
- Inkpen, A. C., Tsang, E. W. K. (2005), Social capital, networks, and knowledge transfer, *Academy of Management Review*, Vol. 30, pp. 146–165.
- Lalkaka, R. (2002), Technology business incubators to help build an innovation-based economy, *Journal of Change Management*, Vol.3, pp. 167-176.
- Leana, C. R., Pil, F. K. (2006), Social capital and organizational performance: Evidence from urban public schools, *Organization Science*, Vol. 17, pp. 353-366.
- Lechner, C., Dowling, M., Welp, I. (2006), Firm networks and firm development: The Role of the relational mix, *Journal of Business Venturing*, Vol. 21, pp. 514-540.
- Liao, J., Welsch, H. (2005), Roles of social capital in venture creation: Key dimensions and research implications, *Journal of Small Business Management*, Vol. 43, pp. 345–362.
- Link, A., N., Siegel, D. S. (2005), University-based technology initiatives: Quantitative and qualitative evidence, *Research Policy*, Vol. 34, pp. 253-257.
- Löfsten, H., Lindelöf, P. (2002), Science parks and the growth of new technology-based firms: Academic-industry links, innovation and markets, *Research Policy*, Vol. 31, pp. 859-876.
- Löfsten, H., Lindelöf, P. (2005), R&D networks and product innovation patterns—Academic and non-academic new technology-based firms on science parks, *Technovation*, Vol. 25, pp. 1025-1037.
- Lyons T. S. (2002), Building social capital for rural enterprise development: Three case studies in the United States, *Journal of Developmental Entrepreneurship*, Vol. 7, pp. 193-216.
- Markman, G. D., Phan, P. H., Balkin, D. B., Gianiodis P. T. (2005), Entrepreneurship and university-based technology transfer, *Journal of Business Venturing*, Vol. 20, pp. 241-263.
- Mason, J. (1996), *Qualitative Researching*, Sage, Thousand Oaks, London.
- Maxwell, J. A. (1996), *Qualitative Research Design*, Sage, Thousand Oaks, London.
- McAdam, M., Galbraith, B., McAdam, R., Humphreys, P. (2006), Business processes and networks in university incubators: A review and research agendas, *Technology Analysis & Strategic Management*, Vol. 18, pp. 451-472.

- Mian, S. A. (1996), The university business incubator: A strategy for developing new research and technology-based firms, *Journal of High Technology Management Research*, Vol. 7, pp. 191-208.
- Miles, M. B., Huberman, A. M. (1994) *Qualitative Data Analysis*, Sage, Thousand Oaks, CA.
- Nahapiet J., Ghoshal S. (1998), Social capital, intellectual capital and organizational advantage, *Academy of Management Review*, Vol. 23, pp. 242-266.
- Neergaard H., Madsen H. (2004), Knowledge intensive entrepreneurship in a social capital perspective, *Journal of Enterprising Culture*, Vol. 12, pp. 105-125.
- OECD (2005) Science, Technology and Industry Scoreboard, http://www.oecd.org/document/43/0,3343,en_2649_33703_35455595_1_1_1_1,00.html, May 2007.
- Phan, P. H., Siegel, D. S., Wright, M. (2005), Science parks and incubators: Observations, synthesis and future research, *Journal of Business Venturing*, Vol. 20, pp. 165-182.
- Portes, A. (1998), Social capital: Its origins and applications in modern sociology, *Annual Review of Sociology*, Vol. 24, pp. 1-24.
- Putnam, R. D. (1995), Bowling alone: America's declining social capital, *Journal of Democracy*, Vol. 6, pp. 65-78.
- Rothaermel, F. T., Thursby, M. (2005), University-incubator firm knowledge flows: Assessing their impact on incubator firm performance, *Research Policy*, Vol. 34, pp. 305-320.
- Schumpeter, J. (1943), *Capitalism, Socialism and Democracy*, Allen and Unwin, London.
- Silverman, D. (2001), *Interpreting Qualitative Data*, Sage, Thousand Oaks, London.
- Spence, L. J., Schmidpeter R., Habisch A. (2003), Assessing social capital: Small and medium sized enterprises in Germany and the U.K, *Journal of Business Ethics*, Vol. 47, pp. 17-29.
- Strauss, A., Corbin, J. (1990) *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*, Sage, Newbury Park, CA.
- Tötterman H., Sten, J. (2005), Start-ups: Business incubation and social capital, *International Small Business Journal*, Vol. 23, pp. 487-511.

- Tsai W., Ghosal S. (1998), Social capital and value creation: The role of intra-firm networks, *Academy of Management Journal*, Vol. 41, pp. 464-476.
- Uzun, A. (2001), Technological innovation activities in Turkey: The case of manufacturing industry, 1995–1997, *Technovation*, Vol. 21, pp. 189-196.
- Uzzi, B. (1996), The sources and consequences of embeddedness for economic performance of organizations: The network effect, *American Sociological Review*, Vol. 61, pp. 674-698.
- Uzzi, B. (1997), Social structure and competition in interfirm networks: The paradox of embeddedness, *Administrative Science Quarterly*, Vol. 61, pp. 674-698.
- Valentinov, V. (2004), Social capital and organizational performance: A theoretical perspective, *Journal of Institutional Innovation, Development and Transition*, Vol. 8, pp. 23-31.
- Vedovello, C. (1997), Science parks and university-industry interactions: Geographical proximity between the agents as a driving force, *Technovation*, Vol. 17, pp. 491-502.
- Walker, G., Kogut, B., Wijian, S. (1997), Social capital, structural holes and the formation of an industry network, *Organization Science*, Vol. 8 Issue 2, pp. 109-125.
- Wallendorf, M., and Belk, R. W. (1989), Assessing trustworthiness, in Hirschman, E. C. (Ed.), *Interpretive Consumer Research*, Provo, UT: Association for Consumer Research, pp. 97-114.
- Wiggins J., Gibson D. (2003), Overview of US incubators and the case of the Austin Technology Incubator, *International Journal of Entrepreneurship and Innovation Management*, Vol. 3, pp. 56-66.
- Woolcock, M. (1998), Social capital and economic development: Toward a theoretical synthesis and policy framework, *Theory and Society*, Vol. 27, pp. 151-208.
- Woolcock, M., Narayan, D. (2000), Social capital: Implications for development theory, research and policy, *World Bank Research Objectives*, World Bank, New York.
- Yu. L. (2002), How location clusters affect innovation?, *MIT Sloan Management Review*, p. 16.
- Zaltman R., and Coulter, G. (1995), Seeing the voice of the customer, *Journal of Advertising Research*, Vol. 35, pp. 35-51.
- www.kobitek.com/makale.php?id=38 - 28k , March, 2007

www.nbia.com, April 2007

<http://www.tekmer.gov.tr>/September, 2006

<http://www.open.ac.uk/hsc/researchsocinteracturban.htm>, April 2007

APPENDICES

APPENDIX A. OBSERVATION GUIDE

- Where is the incubator on the campus?
- Analyze the interior design of the building:
 - Colocation of common spaces (meeting halls, entrance hall, kitchen, restrooms, corridors, gardens, etc.)
 - Allocation of the tenant firms to offices
 - Location of the management units
 - Gatherings and movement in the building
 - Where do the employees gather together?
 - Flow of the employees between firms / between firms and the management units
 - Usage of common spaces
- Atmosphere
 - Are doors closed / open?
 - Do people greet / smile at each other?
 - Do employees of different firms chat / talk when they meet?
 - Do employees of the tenant firms and specialists chat / talk when they meet?
 - How long do the chats / talks last?
 - Do the employees go to lunch alone / in small groups / in large groups?

APPENDIX B. PHOTOGRAPHS OF THE BUILDING



Photo 1 Entrance Hall



Photo 2: Entrance Hall



Photo 3: Common Space of Additional Building



Photo 4: Photocopy Room



Photo 5: Meeting Room



Photo 6: Post Boxes



Photo 7: Wall Panel with News and Books



Photo 8: Kitchen



Photo 9: Vending Machines



Photo 10: Small Common Space



Photo 11: Inner Garden



Photo 12: Conference Room



Photo 13: Firms in the main building



Photo 14: Firms in the main building



Photo 15: Firms in the additional building



Photo 16: Doors



Photo 17: Doors



Photo: 18: Doors

APPENDIX C. QUESTIONNAIRE FOR TENANT FIRMS (ENGLISH)

Your position in the firm: _____
 Number of employees in the firm: _____
 The industrial sector the firm operates in: _____
 Time spent in the incubator (in months): _____
 Age(s) and education level of the firm owner(s): (The university and the department they have graduated from)
 1. _____
 2. _____
 3. _____

Please read the questions below and choose the box that is most appropriate for you:

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	If I want to do joint work with another firm, I prefer an SME in the University M incubator.					
2	I would trust an SME in the University M incubator more than a firm outside the incubator.					
3	If I face a problem in my work, I would consider asking for help from another tenant firm.					
4	If I face a problem in my work, I would consider asking for help from the employees of another tenant firm to join the project.					
5	I would exchange ideas with a University M incubator tenant firm.					
6	When choosing a partner for my project, being a tenant firm in the University M incubator would be an important criterion for me.					
7	When choosing a partner for my project, being a firm in the University M Science Park would be an important criterion for me.					
8	I would consider doing projects with University M academicians.					
9	I would consider doing projects with other university academicians.					
10	I would not hesitate in asking for help from University M academicians when I face a problem.					
11	I would not hesitate in asking for help from other university academicians when I face a problem.					
12	I prefer recruiting new employees from University M.					
13	I prefer recruiting interns from University M.					

14	Up to now, the number of employees who are students / graduates of University M has exceeded the number of employees who are students / graduates of other universities.					
15	Up to now, the number of interns who are from University M has exceeded the number of other university interns.					

Please mark how often you do the activities below:

		Never	Once a year	Once every three months	Monthly	Weekly	Daily
1	Asking for advice from a University M academician.						
2	Doing a joint project together with a University M academician.						
3	Doing a joint project with a University M incubator firm.						
4	Asking for advice from and sharing ideas with a University M incubator firm.						
5	Participating in unplanned social activities with University M incubator firms' employees (having tea, chatting in the corridors, chatting in the common spaces, going out for lunch, etc.)						
6	Participating in planned social activities with University M incubator firms (attending social activities organized by incubator management, organizing dinners or trips, etc).						
7	Joining unplanned social activities with University M Science Park firms (having tea, chatting in the corridors, chatting in the common spaces, going out for lunch, etc.).						
8	Joining planned social activities with University M Science Park firms (attending social activities organized by incubator management, organizing dinners or trips, etc).						
9	Using the Continuous Education Center (SEM) for your training.						
10	Hiring employees through the University M Career Planning Center.						
11	Using the social facilities on the University M campus (restaurants, shopping center, sports facilities, concerts, exhibitions, etc.).						
12	Using the resources belonging to University M (laboratories, library, equipment related to your job, etc.)						
13	Asking for advice from the University M incubator specialists.						
14	Using support such as Software support, Advertising and Presentation support, Training support, Qualified Employee support provided by the Small and Medium Industry Development Organization of Turkey (KOSGEB)						
15	Participating in the training programs organized by KOSGEB or the University M Incubator management.						
16	Participating in the meetings organized by KOSGEB or the University M Incubator management.						
17	Using areas in the incubator building, such as the conference room, meeting room, etc. for your own projects.						

Thank you for participating in our questionnaire.

APPENDIX D. QUESTIONNAIRE FOR TENANT FIRMS (TURKISH)

Firmadaki göreviniz: _____
Firmadaki toplam çalışan sayısı: _____
Firmanın yer aldığı sektör: _____
Firmanın TEKMER’de geçirdiği süre (ay olarak): _____
Firma sahibi/sahiplerinin yaş(lar)ı ve eğitim durumu(ları): (mezun olduğu okul ve bölüm)
1. _____
2. _____
3. _____

Lütfen aşağıdaki önermeleri okuyup size en uygun gelen kutucuğu işaretleyiniz:

		Kesinlikle katılmıyorum	Katılmıyorum	ne de katılmıyorum	Katılıyorum	Kesinlikle katılıyorum
1	Başka bir firma ile ortak iş/proje yapmak istesem M Üniversitesi TEKMER’de yer alan bir KOBİ’yi tercih ederim					
2	M Üniversitesi TEKMER’de yer alan bir KOBİ’yle dışarıdaki bir KOBİ’ye göre daha fazla güvenirim.					
3	İşimde bir sorunla karşılaşırsam TEKMER içerisindeki başka bir firmanın çalışanlarına danışmayı düşünürüm.					
4	İşimde bir sorunla karşılaşırsam M Üniversitesi TEKMER’deki başka bir firmanın çalışanlarından projeye katılmaları yönünde yardım istemeyi düşünürüm.					
5	M Üniversitesi TEKMER’de yer alan bir firma ile fikir alışverişinde bulunurum.					
6	Projem için ortak firma seçmem gerekirse, firmanın M Üniversitesi TEKMER’de yer alması benim için önemli bir kriter olur.					
7	Projem için ortak firma seçmem gerekirse, firmanın M Üniversitesi Teknopark’ta yer alması benim için önemli bir kriter olur.					
8	M Üniversitesi öğretim elemanları ile ortak proje yapmayı düşünürüm.					
9	Başka bir üniversitenin öğretim elemanları ile ortak proje yapmayı düşünürüm.					
10	Bir sorunla karşılaştığım zaman M Üniversitesi öğretim elemanlarına danışmaktan çekinmem.					
11	Bir sorunla karşılaştığım zaman başka bir üniversitenin öğretim elemanlarına danışmaktan çekinmem.					
12	Yeni bir eleman alınacağı zaman onun M Üniversiteli olmasını tercih ederim.					
13	Stajyer alınacağı zaman onun M Üniversiteli olmasını tercih ederim.					
14	Şimdiye kadar firmadaki M Üniversitesi öğrencisi/mezunu çalışan sayısı, diğer üniversite öğrencisi/mezunu çalışan sayısından daha fazla olmuştur.					
15	Şimdiye kadar firmada çalışan M Üniversiteli stajyer sayısı, diğer üniversite öğrencisi stajyer sayısından daha fazla olmuştur.					

Lütfen aşağıdaki eylemleri ne sıklıkla yaptığınızı işaretleyiniz.

		Hiç	Yılda Bir	Üç Ayda Bir	Ayda Bir	Haftada Bir	Her Gün
1	M Üniversitesi öğretim elemanlarına fikir danışmak						
2	M Üniversitesi öğretim elemanlarıyla ortak iş/proje yapmak						
3	Bir M Üniversitesi TEKMER firmasıyla ortak iş/proje yapmak						
4	Bir M Üniversitesi TEKMER firmasına danışmak/fikir alışverişinde bulunmak						
5	Bir M Üniversitesi TEKMER firmasının çalışanlarıyla planlanmamış sosyal aktiviteler gerçekleştirmek (çay içmek, koridorlarda konuşmak, ortak mekanlarda sohbet etmek, yemeğe çıkmak, vb.)						
6	Bir M Üniversitesi TEKMER firmasının çalışanlarıyla programlanmış sosyal aktivitelere katılmak (yemek düzenlemek, gezi düzenlemek, vb.)						
7	Bir M Üniversitesi Teknopark firmasının çalışanlarıyla planlanmamış sosyal aktiviteler gerçekleştirmek (çay içmek, koridorlarda konuşmak, ortak mekanlarda sohbet etmek, vb.)						
8	Bir M Üniversitesi Teknopark firmasının çalışanlarıyla programlanmış sosyal aktivitelere katılmak (Teknopark yönetiminin düzenlediği sosyal aktivitelere katılmak, yemek düzenlemek, gezi düzenlemek, vb.)						
9	Sürekli Eğitim Merkezinden (SEM) eğitimleriniz için faydalanmak						
10	M Üniversitesi Kariyer Planlama Merkezi (KPM) aracılığı ile eleman almak						
11	M Üniversitesi'ndeki sosyal imkanları (restoranlar, Çarşı, spor tesisleri, konser, sergi, vb.) kullanmak						
12	M Üniversitesi'ne ait kaynak ve teçhizatı (laboratuvar, kütüphane, işinizle ilgili cihazlar vb.) kullanmak						
13	M Üniversitesi TEKMER'deki uzmanlara çeşitli konularda danışmak						
14	KOSGEB tarafından sağlanan Yazılım Desteği, Reklam ve Tanıtım Desteği, Eğitim Desteği, Nitelikli Eleman Çalıştırma Desteği gibi hizmetleri kullanmak						
15	KOSGEB/M Üniversitesi TEKMER yönetimi tarafından düzenlenen eğitimlere katılmak						
16	KOSGEB/M Üniversitesi TEKMER yönetimi tarafından düzenlenen toplantılara katılmak						
17	TEKMER'de yer alan konferans salonu, toplantı salonu gibi mekanları kendi işiniz/projeniz için kullanmak.						

Anketimize katıldığınız için teşekkür ederiz.

APPENDIX E. GUIDELINE OF THE INTERVIEW WITH THE TENANT FIRM OWNERS / MANAGERS (ENGLISH)

A. Information about the firm (Chan and Lau, 2005)

1. General information about the firm: Your position in the company, the work domain of the company, the sector it operates in, number of employees, etc.
2. Could you please give some information about the history of the company?
3. How did the founders of the company come together? (Historical roots: Adler and Kwon, 2002)

B. Services of the incubator and the benefits of being located here (Ulhoi and Bollingtoft, 2005)

4. How did you decide to take place in the incubator? Why did not you prefer a place outside the incubator?
5. What do you think about the firm selection mechanism of the incubator?
6. Which facilities of the incubator do you utilize? What kind of benefits are there?
7. When the firms outside of the incubator hear that you are an incubator firm, do their attitudes towards you change? Does your respectability increase?
8. If there were no economic incentives, would you still prefer to take place in the incubator?
9. What are the deficiencies when the facilities of the incubator are considered? (Darr and Rotschild, 2005)
10. How are your entrances to the management side of the incubator? Does management come to your side of the building? (Frequency, ease, reasons, etc.) (Ulhoi and Bollingtoft, 2005)
11. How are your relations with the incubator management? (Is there any hierarchy, if necessary projective: If the incubator specialists were teachers, what kind of teachers would they be?) Do they meet your expectations?

12. How would you assess the incubator management? (Are they successful? What are the problems? In the future what should be changed?)

C. Mechanisms that hinder or facilitate networking (Ulhoi and Bollingtoft, 2005)

C. 1. Individuals and their relations (internal SC)

13. Are there any tenant firms that you work with collaboratively?

14. If there are, how did you get closer? (Formal-Informal-Homophily) (Is there an understanding of: I do a favor to the one who did me a favor?)

15. When you are choosing a collaborator, would you prefer an incubator firm to an off-incubator firm of the same size? If you make such a choice, what are the reasons behind it?

16. Do you get together with the tenant firms in social activities? How did you get closer with the ones that you meet?

17. Which common spaces do you use? In which parts of the building do you have the opportunity to meet with / greet the employees of other firms? (To the ones in the secondary building: Is it a problem to be in a separate building?) (Ulhoi and Bollingtoft, 2005)

18. Do you trust the tenant firms? If you do, how did this trust develop? Which of the firms do you trust more? (Probe: Do you get closer to the off-incubator firms more carefully?)

19. Do you join the activities that bring the tenant firms together? Did you benefit from these activities? (If necessary, question forming new relationships.)

20. Do you think that for all the firms there are common values that developed because of being together in the incubator? (Ask for success stories, common fears, common goals, common language, etc.)

21. Did you see any concrete benefits of being together with the other tenant firms? (Question entrepreneurship.) (If there are no firms that they are in contact with, ask if they faced any difficulties due to this situation. Did they prefer not to have relationships or was the environment unsuitable? If they had relationships, what would be their benefits?)

22. Do you think that the social relations are enough? (Darr and Rotschild, 2005)
23. What should be done in order to enhance the relationships among firms? What kind of services should be given in order to enhance your relations with other firms? (Darr and Rotschild, 2005)
24. Projective: Assume that your firm is a human being. Do you feel that you have grown since you have been here? In what sense? (Did the number of ties you develop increase?)

C.2. External SC (Adler and Kwon)

C.2.1. Links with University (Wiggins and Gibson, 2003, Vedovello, 1997)

25. Which facilities of University M did you use since you were established?
26. What are the advantages of being located on the University M campus?
27. Compare the situations of the incubator being inside and outside the campus.
28. Have you ever done projects with university academicians or departments?
29. Are there any academicians who work with you as consultants? (Frequency, are they from University M?)
30. How did you develop relations with the academic personnel? (If the academicians are not from University M but from another university, ask the reason for preferring University M. If there are no relations, ask why there are not. What kind of a system would they prefer?)
31. Have you ever hired University M graduates / students as employees or interns? Did you especially prefer the ones from University M?
32. What are the advantages of being located in the University M campus?
33. What are the advantages of working with university academicians? (If they have ever worked with university academicians: If you had worked with university academicians, what kind of advantages would there have been?)
34. Do you see any deficiencies in providing university-industry collaboration? If you do, what can be the solutions?

C.2.2. Links with Outside Firms

- 35. Have you ever done projects with off-incubator firms?
- 36. Do you have commercial relations with off-incubator firms? (Market relations)
- 37. Do you come together with the employees of the firms you work with socially? (Social relations)
- 38. Do you work as a subcontractor for large off-incubator firms? (Hierarchical relations)
- 39. If the answer is yes for any of the above four questions: What are the reasons for choosing the off-incubator firms to work with? How did you get closer?

APPENDIX F. GUIDELINE FOR THE INTERVIEW WITH THE TENANT FIRM OWNERS / MANAGERS (TURKISH)

A. Şirket Bilgileri (Chan ve Lau, 2005)

- 1.Şirketle ilgili genel bilgi: Şirketteki konumunuz, şirketin iş tanımı ve yer aldığı sektör nedir, çalışan sayısı, vb.
- 2.Şirketin tarihinden kısaca bahseder misiniz?
- 3.Şirket kurucuları nasıl bir araya geldiler? (Adler ve Kwon, 2002)

B. TEKMER hizmetleri ve burada yer almanın katkıları (Ulhoi ve Bolingtoft, 2005)

- 4.TEKMER’de yer almaya nasıl karar verdiniz? Dışarıda neden yer seçmediniz?
- 5.TEKMER’in firma seçim sistemiyle ilgili ne düşünüyorsunuz?
- 6.TEKMER’in hangi imkanlarından yararlanıyorsunuz? Size ne gibi faydaları dokundu?
- 7.Dışarıdaki firmalar TEKMER firması olduğunuzu duyduğunda, size karşı yaklaşım değişiyor mu? Saygınlığınız artıyor mu? Örnek.
- 8.Ekonomik avantajlar olmasa yine de TEKMER’de yer almayı tercih eder miydiniz?
- 9.TEKMER hizmetleri gözönüne alındığında gördüğünüz eksiklikler neler? (Darr ve Rotschild, 2005)
10. Yönetim bölümüne giriş çıkışınız nasıl? Onlar sizin bölümünüze geliyor mu? (sıklık, rahatlık, sebepler, vs.) (Ulhoi ve Bollingtoft, 2005)
11. TEKMER yönetimiyle ilişkileri nasıl değerlendirirsiniz? (Hiyerarşi var mı? Projective: TEKMER uzmanları öğretmen olsalar, nasıl birer öğretmen olurlardı?) Beklentilerinizi sağlıyorlar mı?
12. Yönetimi nasıl değerlendiriyorsunuz? (Başarılı mı? Sorunlar neler? TEKMER’in geleceği açısından neler değişmeli?)

C. Ağsal İlişkileri tetikleyen ya da Engelleyen Mekanizmalar (Ulhoi ve Bollingtoft, 2005)

C.1. Bireylere ve ilişkilerine bağlı olanlar (Internal SC)

13. TEKMER içinde ortak iş yaptığınız firmalar var mı?
14. Var ise, bu firmalarla yakınlaşmanız nasıl oldu? (Resmi-resmi olmayan-homofil: “bana iyilik yapana ben de iyilik yaparım” mantığı var mı?)
15. Kendinize ortak seçerken, bir TEKMER firmasını aynı büyüklükteki dışarıdaki bir firmaya tercih eder misiniz ? Böyle bir tercih yaparsanız, arkasındaki etkenler neler olur?
16. TEKMER firmalarıyla sosyal ortamlarda bir araya geliyor musunuz? Geldiklerinizle yakınlaşmanız nasıl oldu?
17. Hangi ortak alanları kullanıyorsunuz? Diğer firma çalışanlarıyla sohbet-karşılaşma imkanı binanın hangi bölümlerinde oluyor? (Ek binadakilere: Ayrı binada olmak bu anlamda sorun mu?) (Ulhoi-Bollingtoft, 2005)
18. TEKMER’de yer alan firmalara güven duyuyor musunuz? Duyuyorsanız bu güven nasıl sağlandı? Hangi firmalara daha çok güven duyuyorsunuz? (Dışarıdaki firmalara daha dikkatli mi yaklaşıyorsunuz?)
19. TEKMER şirketlerinin toplu halde bir araya geldiği aktivitelere katılıyor musunuz? Bu aktivitelerin faydasını gördünüz mü? (Yeni ilişki kurmayı sorgula.)
20. Tüm firmalar için ortak olan ve burada hep beraber bulunmaktan kaynaklanan ortak değerler olduğunu düşünüyor musunuz? (Başarı hikayeleri, ortak korkular, ortak hedefler, ortak dil, vs. sorulabilir.)
21. Diğer firmalarla bir araya gelmenin ne gibi somut faydalarını gördünüz? (girişimcilik) (İletişimde olduğu TEKMER firması yoksa, olmamasının zorluklarıyla karşılaşmış mı? Onlar mı oluşmasını istemedi, ortam mı elverişli değil? Ters olsaydı ne faydası olurdu? vs.)
22. Sosyal ilişkilerin yeterli olduğunu düşünüyor musunuz? (Darr ve Rotschild, 2005)

23. Firmalar arası iletişimin artırılması için neler yapılmalı? (yapısal boyut). İlişkilerinizin güçlenmesi için ne gibi hizmetler verilmeli? (Darr ve Rotschild, 2005: Problemler)

24. Projective: Firmanızın bir insan olduğunu düşünün. Kendinizi buraya geldiğinizden beri büyümüş hissediyor musunuz? Ne anlamda? (İlişkileriniz arttı mı?)

C.2. Dışarıdaki aktörlerle olanlar (Dışsal sosyal sermaye) (Adler and Kwonö 2002)

C.2.1. Üniversite ile ilişkiler (Wiggins ve Gibson,2003, Vedovello, 1997)

25. Kurulduğunuzdan beri M Üniversitesi'nin hangi hizmetlerini kullandınız?

26. M Üniversitesi kampüsü içinde olmanın ne gibi avantajları var?

27. TEKMER'in kampüsü içinde olma ve olmama durumunu karşılaştırın.

28. Hiç üniversite hocalarıyla ya da bölümlerle ortak proje yaptınız mı? (M Üniversitesi ya da diğer)

29. Danışman olarak görüştüğünüz akademik personel var mı? (sıklık-Üniversite M'li mi?)

30. Akademik personelle ilişkileriniz nasıl gelişti? (M Üniversitesinden başka üniversiteyse, onu tercih etme sebepleri? İlişki yoksa: Oluşmama sebebi nedir? Nasıl bir sistem tercih ederdiniz? vs.)

31. M Üniversitesi mezunu/öğrencisi çalışmanız/stajyerleriniz oldu mu? M Üniversitelileri özellikle tercih ettiniz mi?

32. M Üniversitesi içinde yer almanın size ne gibi faydaları oluyor?

33. Üniversite hocalarıyla çalışmanın size ne gibi katkıları var? (Çalışmadıysa: Çalışmış olsaydınız avantajları olur muydu?)

34. Üniversite-sanayi ilişkisinin sağlanması konusunda eksiklikler görüyor musunuz? Görüyorsanız ne gibi çözüm yolları önerebilirsiniz?

C.2.2. Dışarıdaki firmalarla ilişkiler:

35. TEKMER dışındaki firmalarla ortak projeler yaptınız mı?

36. TEKMER dışındaki firmalarla ticari ilişkileriniz var mı?
37. Birlikte iş yaptığınız firma çalışanlarıyla sosyal olarak birlikte oluyor musunuz?
38. TEKMER dışındaki büyük bir firmanın taşeronu-alt birimi olarak çalışıyor musunuz?
39. (Bu dördünden birine evet dediyse): Onları tercih etme sebepleriniz nelerdir? Nasıl yakınlaştınız?

APPENDIX G. GUIDELINE OF THE INTERVIEW WITH THE INCUBATOR SPECIALISTS (ENGLISH)

A. General information about the incubator

1. What are your responsibilities as a specialist?
2. How do you regard the activities of the University M Incubator? What are the characteristics that make you a better incubator than the others? (What are the reasons firms prefer this incubator?)
3. What do you think the contributions of the incubator are to the tenant firms? Is its contribution to the development of the firms adequate? If not, what are the deficiencies in the incubator services?
4. Why do the firms prefer to take place in the incubator? Do you think that their expectations are met?

B. Relations between the management and the firms

5. How would you define your relations with the firms? How are the firms' attitudes towards you?
6. When do you interfere with the firms and warn them?
7. How often do you go to the corridors on the firms' side or to their offices? What is the typical reason for visiting them?
8. How often do you meet with the tenant firm employees?
9. Do you ever come together with the employees for reasons other than work? For social activities?
10. Where do you and the employees come together? Do you use the common spaces?

C. Relations among tenant firms

11. What kind of attempts do you have in order to enhance interaction among the tenant firms?
12. How is the participation of the firms to your attempts? What kind of benefits do firms face with when they contribute?
13. Have you ever observed the tenant firms working collaboratively or helping one another?
14. Which firms do you think get into closer relationships? What kinds of commonalities bring them together? (Question the University M affiliation). How do the firms that do collaborative work choose each other? Which are the firms who do not have any relations with other tenant firms?
15. What kind of advantages do you think the firms have by being colocated?
16. Do you think that the firms who work together come together for social activities? If they do, how did they get closer?
17. Do you think that the incubator atmosphere and the facilities are enough in creating interaction among firms? What can be some problems? What else can be done in order to increase this interaction?
18. Do you think that there is trust among the incubator firms? Did you observe that incubator firms trust each other more than they trust outside firms?
19. Do you think that the firms have a common language in the incubator?

D. Relations with the university

20. What kind of advantages do you think the tenant firms and incubators have by being located on the university? Compare the situation of being located on-campus and off-campus.
21. Do firms work collaboratively with any academicians? How do they get in touch with the academicians they work with? Does the incubator have any service on this issue?
22. Can incubator firms ask for the academicians' advice about the problems they face? With which academicians do they have closer relations?

- 23. Which of the host university facilities do tenant firm employees utilize?
- 24. How many of the firm managers are University M graduates and how many of them are other university graduates? Is being a graduate of University M a critical criterion for being chosen as a tenant firm in the incubator? Do you think the firms whose owners are not University M graduates isolated?
- 25. Do you think that the university-industry collaboration is supported enough by the present system? If you do not think so, what are the deficiencies? How can these be fixed? What can the university do on this issue?

E. Links with outside firms

- 26. Are there any firms that work with off-incubator firms? If there are, how do they choose whom to work with? Do you have any activities to introduce incubator firms to off-incubator firms?

APPENDIX H. GUIDELINE OF THE INTERVIEW WITH THE INCUBATOR SPECIALISTS (TURKISH)

A. TEKMER’le ilgili genel bilgiler

1. Uzman olarak görevleriniz nelerdir?
2. M Üniversitesi TEKMER’inin çalışmalarını nasıl değerlendiriyorsunuz? Sizi diğer TEKMER’lerden üstün kılan özellikler nelerdir? (Firmaların bu TEKMER’i tercih etme sebebi, vs.)
3. Sizce TEKMER’in firmalara katkıları nelerdir? Firmaların gelişimine katkısı yeterli midir? Değilse TEKMER hizmetlerinde ne gibi eksiklikler görüyorsunuz?
4. Firmalar TEKMER’de yer almayı neden seçiyor? Beklentilerini karşıladığınızı düşünüyor musunuz?

B. Yönetim ve firmalar arası ilişkiler

5. Firmalarla ilişkilerinizi nasıl tanımlarsınız? Firmaların size yaklaşımı nasıl?
6. Ne gibi durumlarda firmalara müdahale ediyorsunuz, onları uyarıyorsunuz?
7. Firmaların yer aldığı koridorlara ya da ofislerine ne sıklıkta gidiyorsunuz? Gitme amacınız ne oluyor?
8. Firma çalışanlarıyla ne sıklıkta görüşüyorsunuz?
9. İş haricinde başka konularda görüştüğünüz, sosyal anlamda bir araya geldiğiniz oluyor mu?
10. Firmalarla bir araya geldiğiniz görüşmeler hangi mekanlarda oluyor? Ortak mekanları kullanıyor musunuz?

C. Firmalar arası ilişkiler

11. Firmalar arası etkileşimi sağlamak için TEKMER olarak ne gibi girişimleriniz oluyor?

12. Bu girişimlere firmaların katılımı nasıl? Katılan firmalar ne gibi faydalarla karşılaşılıyor?
13. Firmalar arası ortak iş yapma/dayanışma olduğunu gözlemlediniz mi?
14. Sizce hangi firmalar birbiriyle daha yakın ilişkilere giriyor? Ne gibi ortak noktaları olan firmalar yakınlaşıyor? (M Üniversiteliliği sorgula) Ortak iş yapanlar birbirlerini nasıl seçiyor? Hiçbir firmayla ilişkiye girmeyen firmalar hangileri?
15. Aynı mekanda bulunmalarının ne gibi katkıları olduğunu düşünüyorsunuz? Ek binada bulunmak bir olumsuzluk mu?
16. Sizce farklı firma çalışanları birlikte sosyal faaliyetler de yapıyorlar mı? Yapıyorlarsa onların yakınlaşması nasıl oldu?
17. TEKMER ortamının ve verilen hizmetlerin firmalar arası etkileşimi sağlamada yeterli olduğunu düşünüyor musunuz? Sorunlar neler olabilir? Bu etkileşimi artırmak için neler yapılabilir?
18. TEKMER firmaları arasında güven ortamı olduğunu düşünüyor musunuz? Dışarıdaki bir firmadansa bir TEKMER firmasına daha çok güven duyduklarını gözlemlediniz mi?
19. TEKMER içerisinde bir ortak dil/amaç oluşumu olduğunu düşünüyor musunuz?

D. Üniversite ile ilişkiler

20. Üniversite içinde yer almanın bir TEKMER ve içindeki firmalar için ne gibi katkıları olacağını düşünüyorsunuz? Kampus içinde olma ve olmama durumunu karşılaştırınız.
21. Firmalar öğretim elemanlarıyla ortak çalışmalar yapıyor mu? Birlikte çalıştıkları hocalarla nasıl bir araya geliyorlar? Bu konuda TEKMER'in bir hizmeti var mı?
22. TEKMER firmaları üniversite hocalarına karşılaştıkları sorunlar konusunda danışabiliyor mu? Hangi hocalarla daha yakın ilişkiler sağlanıyor?
23. Firma çalışanları üniversitenin hangi hizmetlerinden yararlanıyor?
24. Sahibi M Üniversitesi mezunu olan ya da M Üniversitesi'nde öğretim elemanı olan firmalar kaç tane? M Üniversiteli olmak M Üniversitesi TEKMER'ine seçilmek açısından önemli bir etmen mi? Size sahibi Üniversite M'li olmayan firmalar ortamdan soyutlanıyor mu?

25. Üniversite sanayi ilişkisinin mevcut sistemde yeterli miktarda desteklendiğini düşünüyor musunuz? Düşünmüyorsanız eksiklikler neler? Nasıl düzeltilebilir? Bu konuda üniversite ne yapabilir?

E. Dışarıdaki firmalarla ilişkiler

26. Firmalar içerisinde TEKMER dışında firmalarla iş yapan firmalar oluyor mu? Oluyorsa beraber çalışacakları firmayı nasıl seçiyorlar? TEKMER firmalarını dışarıdaki firmalara tanıtacak ne gibi faaliyetleriniz var?

APPENDIX I. GUIDELINE OF THE INTERVIEW WITH THE HOST
UNIVERSITY ACADEMICIANS (ENGLISH)

1. What kind of a relationship do you have with the tenant firms? (Formal consultancy, informal helping, giving advice, etc.)
2. With which of the tenant firms do you have relations with? (Their own students? Did they meet in conferences, meetings, etc.? What is the source of the relationships?)
3. Have there been any firms that found you and asked for your help although they had not known you prior to this contact?
4. Do you believe that there are enough activities that bring the academic personnel and the firms together?
5. Are there any firms that you consult outside the University M incubator and science park? How did you get in contact with them?
6. What kind of advantages do the tenant firms get by being located on the university campus? (I am trying to understand the importance of proximity in creating university-industry collaboration.)
7. What kind of advantages do the students and academicians get due to the location of the incubator in the university campus?
8. What kind of advantages do the tenant firms get by being located in the incubator?
9. How do you regard the relationships between the tenant firms? (ties, common language, solidarity, etc.)
10. Would you trust the incubator firms more than the off-incubator firms?
11. Do you think that incubator firms trust each other more than they trust off-incubator firms?
12. What do you think about the firm selection mechanism of the incubator?
13. How do you consider the host university's general approach to the incubator firms? What can be the inadequacies if there are any?

APPENDIX J. GUIDELINE OF THE INTERVIEW WITH THE HOST UNIVERSITY ACADEMICIANS (TURKISH)

1. TEKMER firmaları ile ilişkileriniz nasıl? (Resmi olarak danışmanlık, yardım etme şeklinde danışmanlık, vs.)
2. Hangi firmalarla iletişiminiz var? (kendi öğrencileri mi, toplantı vs. gibi yerlerde mi tanıştı, ilişkinin kaynağı nedir?)
3. Daha önceden bir tanışıklığınız olmadığı halde sizi bulan, sizden yardım isteyen firmalar oldu mu?
4. Akademik personel ile firmaları bir araya getirecek yeterli aktivite olduğunu düşünüyor musunuz?
5. M Üniversitesi TEKMER ve Teknopark'ı dışında danışmanlık verdiğiniz firmalar var mı? Onlarla nasıl iletişim kurdunuz?
6. TEKMER'in üniversite içinde olmasının firmalara ne gibi faydaları oluyor? (üniversite-sanayi ilişkisinin sağlanması açısından yakınlığın önemini anlamaya çalışıyorum).
7. TEKMER'in üniversite içinde olmasının üniversiteye (hocalar, öğrenciler) ne gibi faydaları oluyor?
8. Firmaların TEKMER içerisinde yer almasının onlara ne katkısı oluyor?
9. Firmalar arası ilişkiyi nasıl değerlendirebilirsiniz? (ilişkiler, ortak iş, ortak dil, yardımlaşma, vs.)
10. TEKMER firmalarına daha çok güven duyar mısınız?
11. TEKMER firmalarının birbirlerine dışardaki firmalara göre daha çok güven duyacağını düşünüyor musunuz?
12. TEKMER'in firma seçim sistemi ile ilgili ne düşünüyorsunuz?
13. Genel olarak üniversitenin TEKMER firmalarına yaklaşımını nasıl buluyorsunuz? Varsa yetersizlikler neler olabilir?

APPENDIX K. DURATION OF INTERVIEWS

<u>INTERVIEWEE</u>	<u>INTERVIEW DURATION</u>	<u>LOCATION</u>
Pilot Interview _____	52 minutes _____	Entrance Hall
Firm A _____	99 minutes _____	Manager's office
Firm B _____	122 minutes _____	Manager's office
Firm C _____	63 minutes _____	Manager's office
Firm G / Host University Academician _____	53 minutes _____	Manager's office at University M
Firm K _____	61 minutes _____	Manager's office
Firm V _____	38 minutes _____	Manager's office
Firm W _____	34 minutes _____	Manager's office
Firm X _____	55 minutes _____	Entrance Hall
Firm Y _____	65 minutes _____	Manager's office
Specialist 1 _____	60 minutes _____	Specialist's office
Specialist 2 _____	34 minutes _____	Specialist's office
University M Academician _____	15 minutes _____	Academician's office at University M

APPENDIX L. DEMOGRAPHICS OF INTERVIEWED FIRM MANAGERS

Manager of	Gender	Age	Education Level	Graduated University	Major Area in Undergraduate Education
Firm A	Male	29	B.Sc.	Host University	Electrical and Electronics Engineering
Firm B	Male	30	M.Sc.	Host University	Electrical and Electronics Engineering
Firm C	Male	44	M.Sc.	Host University	Electrical and Electronics Engineering
Firm G	Male	43	Assoc. Prof.	Other University	Education Sciences
Firm K	Male	24	B.Sc.	Host University	Industrial Design
Firm V	Male	27	B.Sc.	Other University	Computer Engineering
Firm W	Male	26	PhD	Host University	Electrical and Electronics Engineering
Firm X	Male	32	M.Sc.	Other University	Mechanical Engineering
Firm Y	Male	41	PhD	Host University	Mechanical Engineering
Pilot Interviewee	Male	26	PhD	Host University	Electrical and Electronics Engineering