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Social capital and innovation in industrial clusters: an evidence from case of family and non-family firms in Turkey

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Abstract

The academic discourse in economic geography and regional development has been focused on aspect of socio-cultural of industrial clusters accepted as an engine of economic and regional growth until two decades. Aspects of socio-cultural of economic activities have been highlighted by new terms such as relational economic geography, relational turn and cultural turn in economic geography and regional development. The role of socio-cultural for economic geography and regional development has been discussed with "social capital" hypothesis in literature. Social capital effect on positive social and economic development refers to norms, trust, networks, and proximity occurred between economic factors. Social capital is a key notion providing reciprocity learning and absorption of knowledge and information in industrial cluster and firms.

In this context, the purpose of this paper is to determine how the innovation performance of family firms according to social capital potential differs from that of non-family firms. In this study it was analysed with descriptive methods in the context of data obtained from surveys and in-depth interviews from Turkey how innovation performance of family firms differs in terms of different social capital potential from that one of non- family firms. The main hypothesis about the source of the social capital is that the *actors formed across diverse social group and/or non-family are more innovative than actors formed across homogeneous social group and/or family.* As the result of this study regarding to analysis and in-depth interviews, social capital formed across homogeneous actors provided significant advantages for family firms in the establishment process of a new firm. Cultural and social characteristics of actors were determinant factors on their social capital potential. Thus, components of social capital were decisive on innovation activities for both of family and non-family firms.

Keywords: social capital, trust, innovation, family firms, non-family firm, Turkey

Introduction

Social capital is one of the main components which facilitates learning and knowledge absorption of industrial clusters in general and which facilitates learning and knowledge absorption process of firms in special. Knowledge and innovations obtained in context of factors such as informal relationships, social habits and behaviours are more valuable than information which obtained by mutual agreements while this process of learning and knowledge absorption partially occurs by mutual agreements. Thus networks as a result of social habits, renewed social relationships, behaviours have supported process of learning and knowledge absorption. Routine relations, habit and social networks are more important than the discovery of new opportunities in newly established clusters (Staber, 2007). Social capital contributes to determine the required facilities and opportunities for the survival of firms. Social capital also plays a role on both

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knowledge absorption and development of innovative activities in the clusters. In this context, there are many studies claimed positive effects of social capital on the cluster performance[1].

Effects of social capital on knowledge absorption and innovative activities between firms are located substantially within new economic geography literature such as relational economic geography, relational turn, and cultural turn in the case of industrial clusters. While Keynesian economic regime focused on demand-based management approach is dominated by the view that a prerequisite for economic development in the period of unrecognized the importance of innovation in empirical and institutional research until 1980's, because of depending on the crisis in the 1970s and the decline in economic. Development management approach has been dominated for necessities instead of demand-based management approach since the late 1970s. Firms and nation-states have realized that innovation is an important factor for the formation of the competitive conditions of global economy during this period. The change in economic systems has led to the differentiation of perspectives on innovation and learning processes. The term of innovation used to be defined as the new information to manufacture completely new product until 1970s. In addition to this definition, currently the term of innovation has been referring a complex structure to adapt new competetive market conditions; such as (1) development of manufacturing and marketing models, (2) determination of labor divisions, (3) specialization and new organization models (Ruuskanen, 2004). However, firms in transition to new technologies and the process of adaptation continue to be an important factor in innovation and economic development. According to the OECD's research and evaluation, one of the biggest indicators of economic growth has been technological change since the beginning of the 1990s.

From this perspective, the study investigated potential of social capital in the success of the firm in Konya region, which was developed under the leadership of the family firms in especially 1950's and which is one of the major manufacturing industries since three decades. The conceptual framework of concepts such as firm, innovation and social capital in industrial clusters was firstly presented. Secondly, the purpose and scope of the study, hypothesis and methodological approaches which were designated for testing hypotheses and covering methods of analysis were determined. Thirdly, findings which were obtained in analysis and method techniques were presented. In the final stage, discussion of the findings from analyses and conclusions were presented.

The conceptual background: Social capital, innovation and family firms

Economic geography, regional development and industrial districts have consensus on such activities as learning regions and innovations embedded in a social milieu. According to the basic argument of economic geography, regional development and industrial regions, social networks are embedded in the social milieu (Granovetter, 1985: Grabher, 1995). Embeddedness basically focuses on (1) economic activities affected by institutions, (2) relations and attitudes of actors, (3) structure of the network as a result of relationships between actors and, (4) social relations affected by cultural environment (Ruuskanen, 2004). Social capital can improve cooperation and coordination of actions within and among economic factors according to this perspective (Ruuskanen, 2004). So, social capital represents sources of externalities which provide significant outputs in the economic milieu because social capital is a component of joint action which enforces economic activities. Thus, actors contribute to strengten the weakness of each other.

In addition, social capital plays an impulsion role in the spread of human capital and intellectual capital. Knowledge and innovation should be transfered from the academic milleu to industrial environment or policy environment for effective and successful implementation of human capital accumulation. Formation and maintenance of different social networks and social capital which are based on the general behaviour and cooperation is nature of pre-condition in transfer and spread of knowledge and innovation. Thus it can be said that social capital is one of the key concepts and theories in economic development. In other words, social capital is an underlying factor in the background in the process of realization of economic development. Especially competitiveness within the new economic structure was linked with innovations

[1] See Cooke et al. (2005), Boschma (2005), Woolcock (1998), Beugelsdijk and Schaik (2003), Putnam et al, (1993), Rutten and Boekema (2007) for effects of social networks and social capital on the cluster performance.

and knowledge offered to the market of the firm. In other words, competitiveness of firms in the new economic structure depends on the infrastructure of information which were developed both the manufacturing process and new product development process. Infrastructure of information which was enriched as a result of the networks and cooperation has been at the center of the theories of economic development especially industrial clusters literature last three decades.

Innovativeness is considered as internalization of external knowledge and determination of capabilities of the actors. There are discussions about social dimension of economic/regional development. Important component of economic growth have referred to innovation on industrial clusters since last three decades. Innovativeness used to be evaluated as processes based on knowledge and R&D work in firm level. As a result of industrial clusters, the innovation concept was changed significantly. Therefore, innovation covers development of an existing product or process, reciprocally learning process between actors, improvements in social habits and the organization as well as it covers producing a new product for sector and a new process for firms (Morgan, 1994; Koroglu, 2005; Freeman, & Soete, 2003). In this literature, many factors such as primarily customers providing a significant contribution to innovation activities with their ideas and demands, competitiveness firms, universities, research institutions, technology centers raise the interaction of innovative processes (T dtling, & Kaufmann, 2001). This interaction facilitates obtaining information and learning in firm level. It is spread through social relations and networks while learning and knowledge process is generally managed by mutual agreement, informal relations and habits.

Innovation has become a strategic issue for the success of firms after the 1980's. In literature of industrial clusters, potentials of social capital emerging between actors were seen as a way of learning process about access to new knowledge and innovation while innovation activities are evaluated depending on several variables such as skilled work force, R&D expenditures, quality certificates, increasing in manufacturing activity and number of patents. According to this, the structure and dimension of social capital which occurred between actors were evaluated in many studies which have different levels of impact on innovative activities of firms (Woolcock, 1998; Woolcock, 2002; Putnam, 2001; Patton, & Kenney, 2003; Rutten, & Boekema, 2007). It is necessary to recognize the multidimensional structures of its sources for understanding of the concept of social capital on innovation performances. Concept of social capital was classified in two dimensional as bonding and bridging by Putnam and was added third dimensional named linking social capital by Woolcock (Karakayaci, 2011). Bonding social capital refers to relations among family members, close to friends and a neighbour, while bridging social capital refers to relations among more different associates and actors who have some different demographic groups regardless of how well they know and another. Linking social capital also refers to alliances with sympathetic individuals in positions of power (Isham *et al.*, 2002). This distinction of bonding and bridging social capital is important in the context of local development. However, both imply horizontal social ties or relationships between equals, and such a view obviously misses out on the important aspect of the exercise of power. The idea of 'linking' social capital has been developed to address these concerns. Linking social capital is a more complex issue but relates closely to bridging social capital. It refers to relations between individuals and groups in different social milieu in a hierarchy where power, social status and wealth are accessed by different groups (Evans, & Syrett, 1998). On the other hand, Adler and Kwon developed the definiton of internal and external social capital. While the internal social capital is defined as social networks, norms and trust that facilitate coordination and cooperation for common benefit, external social capital is defined as set of opportunities arising from the social relations of actors and providing several advantages (Lichtenberg, & Siegel, 1991). Structural social capital focuses on the whether actors are related to each other or not, and cognitive social capital focuses on the shared values among actors, common judgements and stories while relational social capital developed by Nahapiet and Ghoshal is defined as the relationships between actors through interaction (Fukuyama, 1995).

In this context, potentials of different social capital led to different impacts for the success of the firms. According to this, it is emphasized that bridging and linking social capital occurred among different actors in different levels is more effective than potentials of bonding social capital for the success of the firm. However, role of social capital which is occurred among different actors was also

discussed substantially for surviving in crisis, start-up and growth of firms. From this perspective, it is identified that the social capital is effective for the formation of industrial clusters which is dominated by family firm but it is emphasized that it has a negative effect on the process of development competitive structures in industrial clusters. Because family firms are a social organizations established for the producing goods and services by individuals with family ties (Alayoglu, 2003).

According to the Bute (2010), "family firms are social organizations which were established for feeding the family and preventing dispersion of heritage. Two or more persons have power to control the financial structure of the enterprise. Family members are located in the important parts of the management levels and at least two generations of family are employed. Family firms are social organizations which were established for the producing goods and services by individuals with family ties".

Distinctive features of family firms can be listed like the following (Tuncel, 2011):

- Firm's members tend to always check all the activities within the firm.
- Works are carried out according to the self-assessment of the firm boss.
- Corporate actors believe that they know best of everything and they don't like receive any support from outside.
- Corporate actors internal reporting and obtaining information.
- Administrative and operational authority/responsibilities in the firm are not certain.
- Conflict and administrative problems among actors in the firm and family members directly affect the firm's daily operations.
- Norms and beliefs of the family are forced within the firm.
- Entrepreneur family members know the job very well because they know practitioners of job. They are successful at production.

In this context, a strong correlation has been determined between firm characteristics and potential of social capital on innovative activities of firm in literature. Effects of potential occurred on achievements of the firm were investigated in the context of innovation capacity of firms and structure of competitiveness. It is assumed that knowledge channels and learning capacities, resulting from especially relations among actors, increase innovation activities of firms. Innovation activities were investigated different dimensional such as product innovation and process innovation in terms of content and context (Gunadi, 2011; Geenhuizen, & Indarti, 2005). Product innovation is defined as process of adapting and develops new technologies on using or for developing of new product in the production process. New product or production technology must be newly developed within the firm in product innovation. If new product which is developed newly is new for firm and not new for market, it can be said that innovation has a low degree (Tödtling, & Kaufmann, 2001; Karlsson, 1997). Process innovation is considered completely independent of production innovation. Process innovation is defined adaptation to new technologies which is regulated of process and provided flexible conditions instead of total renewal of the production process. While production innovation is evaluated a process for restructuring and increasing the level of competition of firm in long term, process innovation is evaluated a process for solving the short-term and reducing the risk instead of benefits long-term opportunities (Sverrison, 1994).

Methodology

Aim, Scopes and Hypothesis

This study was aimed to determinate effects of potentials of social capital on innovation activities of family firms and non-family firms. In this study was basically investigated the following question: does the potential of social capital in family and non-family firms support or restrain development of firm? In this context, the purpose of this paper is to determine the difference between innovation performance of family and non-family firm according to different social capital potential. In this study it was analysed with descriptive methods in the context of data obtained from surveys and in-depth interviews from Turkey how innovation performance of family and non-family firms differ in terms of different social capital potential of family and non-family firms. The main hypothesis about the source of the social capital is that the actors formed across diverse social group and/or non-family are more innovative than actors formed across homogeneous social group and/or family.

In this study, the method of qualitative and quantitative research was used. Qualitative research is a method adopting interpretive approach to the problem of multi-methodical research to focus on a particular point. According to this meaning, it is dealing with phenomena which are the subject of

research in their atmosphere. Qualitative research searches an answer to questions such as why, how, and what manner. Qualitative research deals with subjective data such as convictions, experiences, perceptions and emotions of persons. Qualitative research tries to understand a situation in the relationship links. It reveals the variables that affect an event (Grbich, 2013). Quantitative research method is consisting of statistical techniques.

In this study, qualitative research method aim to be used due to reveal underlying causes of finding in quantitative analysis. As a result of the research, in-depth and multi-dimensional qualitative information was obtained through face-to-face interviews.

Data

In order to test the hyphotesis, variables for the potential of social capital and innovative performances were used in the study. The variables of social capital in the context of part of the conceptual and theorical debates in the study were evaluated in the context of 22 criterias and each criterion was questioned according to the 5 point likert scale. Accordingly, variables for social capital were listed as follows:

1. How important are friends and acquaintances? (Friend)
2. How important is a colleague? (Colleague)
3. How important is membership in various club and voluntary organization? (Memorg)
4. How important is membership in various groups? (Memgro)
5. How important are the same ethnic and religious groups with you? (Memeth)
6. How important are universities and research institutions? (Unird)
7. How important are governmental and non-governmental institutions? (Institution)
8. How important is human potential of actors/firms (for example: skills and qualifications of employees or managers)? (Humanpot)
9. How important is potential of physical (machinery and equipment, opportunities)? (Physicalpot)
10. How important is the potential of learning and knowledge? (Cognitionpot)
11. How much do you trust friends and acquaintances? (Trustfri)
12. How much do you trust colleagues? (Trustcol)
13. How much do you trust voluntary organization and administrators with collaborative actors/firms? (Trustorg)
14. How much do you trust governmental and non-governmental institutions? (Trustinst)
15. How much do you trust the same ethnic and religious groups with you? (Trusteth)
16. How important is quality certified actors/firms? (Certificate)
17. How important is the reputation of the actor while seeking collaborations? (Reputation)
18. How much do you trust arm's-length firms? or How important is proximity with collaborating? (Trustprox)
19. What is the level of importance of time spent with colleagues and others? (Coltime)
20. How important are long-time relationships? (Longrel)
21. How important is frequency of relationships with actors/firms? (Frerel)
22. How important is it to contract? (Contract)

Innovative activities of firms were questioned in second set of variables in the study. On the other hand, innovative activites of firms were evaluated in two stages as "product innovation" and "process innovation". Product innovation is defined as developing new production in the production process or new technologies for use in the production process and the process of adapting. New product or production technology developed in product innovation must be newly developed within the firms (Feser, 2001). On the other hand, process innovation is considered to be completely independent of product innovation. Process innovation is defined as the process of adaptation to new technologies which was regulated process, provided more flexible conditions instead of the total renewal of the production process. While product innovation is considered as a process for the restructuring of the firm and increasing the level of competition in the long run, process innovation is considered as a process to solve short run problems and reduce the risk instead of rely on long term advantages (Akcomak, & Weel, 2009). Accordingly, innovation activities were obtained from the sum of firms' activities in the product and process innovation in the last 3 years. Product innovaton capacity was defined as the sum of the firm's new product development activities, received packet and utility model, innovations in production technologies in the last 3 years. Process innovation capacity was defined as the sum of the firm's regulations of production technologies and production process in the last 3 years.

Statistical analysis

Statistical methods such as factor analysis, correlations analysis, and regression analysis were determined for testing the hypothesis within the obtained data.

Factor analysis determines the cause of interdependence between the varibles. The main assumptions of the factor analysis show that the data matrix's criteria and estimation variables before the analysis can not be allocated its sub-matrices and the relationship between the variables is linear (Greene, 2003).

Regression analysis has analyzed the relationship between dependent variable and independent variables. There are statistical values for the validity of the model in regression analysis. For example, Durbin-Watson should be between 1,5 and 2,5 and F value should be more than 4. R2 shows what level variables explain the independent variables. It is accepted that R2 square is generally more than 0.40 in social sciences. Tolerance and VIF variable shows that there are multi-links between variables between models or not. It is wanted that tolerance value is higher and VIF value is lower to avoid multiple connection. Less than 0,20 of tolerance value, and more than 10.00 of VIF values show that there are multilinks among variables.In this situation, pattern can not be considered to be statistically. Correlations analysis measures the degree to which the relationship between the two variables. Correlations analysis is carried out for understand to the degree of direction and try of the relationship between the two variables (Greene, 2003).

The Case Study: Konya Machinery Engineering Industrial Cluster

Konya was one of the most important centers of commercial and manufacturing from the establisment of Ottoman State to the collapse of Ottoman State (1299-1923). Small-sized production increased with railroad construction in Konya at the end of the 19th century. Therefore the presence of 2078 small entrepreneurs is mentioned in 1890s. Gunpowder mill established in 17th century was the first firm in Konya. Konya supported small entrepreneurs by central government with the process of industrialization and the establishment of republic, and 25% of Turkish small entrepreneurs selected a location in Konya in 1920s. Additionally, the potential of Konya in agricultural production significantly developed agriculture-based food industry[2]. Manifacturing of agricultural machinery was accelerated in paralel with accelaration of agricultural machanization and the establishment of the first organized industry zone in Konya with the help of Marshall applied in Turkey in 1960s. In addition to gainning dynamism from 1960 through 1980, Konya has maintained its traditional agricultural characteristics and the migration from the city to tha major metropolis continued. There had been a boom in the region and the number of the subordinate firms increased in 1965. In accordance with the national plans there was a tendency to build industrial districts. 34 small industrial sites and two organized industrial districts were founded between 1975 and 1990. Between 1960 and 1980 the maximum increase in the number of the firms was in the metalic goods, machine and transportation vehicle production sectors (Sarı, 1995).

In this study, Konya machinery engineering industry cluster was chosen. This cluster is formed of mostly family firms. Konya industrial cluster of specialized machinery and food manufacturing has an important development since 1950. Konya industrial cluster has different characteristics for field-study such as spin-off firms, establishment or emergence of new firms through the cooperation between employees and emergence of as a result of the disputes among generation in this process.

In this study, according to the firm's size through using layered sampling method were determined to be interviewed numbers of family and non-family firm in machinery industry sector. According to this, 40 family-firms and 33 non-family firms were interviewed. The distribution is given in table 1 according to the firms' size.

Table 1. Number of face to face survey according to firm size in Konya machinery industrial cluster.

Firm Size		1-9	10-49	50-249	250-+	Toplam
Total Firm		231	272	27	2	532
Family Firm	Number	16	18	5	1	40
	%	6.9	6.6	18.5	50.0	7.5
Non-Family Firm	Number	14	14	4	1	33
	%	6.0	5.1	14.8	50.0	6.3

[2] It is one of the important centers of Turkey in terms of agricultural potential because agricultural area is smooth and efficient. Konya supplies to 48% of sugar beet production, 16% of wheat production, 67% of carrot production and also provides approximately 15% of animal production in Turkey. So Konya region is defined as 'granary' of Turkey.

Besides, studies, conducted in the context of firm size, appear as another point that is required to be questioned in terms of method at the analysis of re lationships between success of industry clusters and social capital. For instance, a medium-sized firm can play an important role in attaining external information and disseminating. In other words, this firm can undertake a role as the bridge to transmit and disseminate external information to other firms in cluster.

In this study was used the primary data sources and secondary data sources according to the method of qualitative and quantitative research methods. The primary data sources are consist of observation and interview. The second data sources are consist of various documents and statistics. Semi-structured interview were created in order to collect data and the questions in the interview format were directed to the experts through face to face interviews. Before starting interview, each participant is given brief information about research. Interviews were occurred within the 1-1.5 hour time period. Participants' responses were recorded through taking note.

Results

The concept of social capital is vital in understanding firm characteristics and succession in family and non-family firms, since social capital creates value by fostering connections among firms. Social capital has been determined in different dimensional in terms of content and context. Social capital is defined as the network of relationships possessed by an individual or social unit/enviromental and actual and potential resources embedded within, available through, and derived from such network (Nahapiet and Ghoshal, 1998). In this article, the effects of potential of social capital in family and non-family firms and potential of social capital on innovation activities of firms were aimed with comparative determination.

In this context, 22 different variables were determined for determining the potentials of social capital in this study. Measurement of the variables was made on the 5-point likert scale in the field study. Factor analysis was made according to the obtained values. As a result of the factor analysis were reduced to 6 factors. Because, eigenvalue statistic is greater than 1 for the first 6 factors accroding to the obtained factor analysis for each two case[3]. In other words, 22 different variables obtained for determining potentials of firms' social capital are reduced to 6 factors. In this way, the potential of firms' social capital were evaluated in the case of 6 factors. Thus, the potentials of each two sample sets' social capital became comparable position according to the obtained 6 factors. The models showed valid results because the Bartlett test of sphericity showed high significance in factor analysis for family and non-family firms. Kaiser–Mayer–Olkin criterion also resulted higher than 0.500. On the other hand, it is seen that the variance percentage of 6 factors, which were included the evaluation in each two sampled sets, are very high (table 2-3). Accordingly, the variance percantage of 6 factors taken into consideration is 67.337% of 22 variables in factor analyis for family firms, the variance percantafe of 6 factors taken into consideration is 71.711% of 22 variables in factor analysis for non-family firms. According to these results, variables obtained from factor analysis method are approximately 70% explanatory for each two case study. In this context, It was determined that components of social capital like the relations between homogeneous groups and relational trust are dominant in the case formed by family firms, and components of social capital defining the relationships among different social groups are dominant in the case formed by non-family firms. According to the results of analysis, the rate of 67,337 eigenvalues variance for family firms was obtained in Konya machinery industry cluster. The rate of 19.041 of this rate is relationship with friends and the rate of 15.816% of this rate is the components of social capital like relational trust. It can be observed that 22,252 percantage of the rate of 71.711 eigenvalues variance is competence trust, 14,256 percantage of this is coginition potential and 12,038 percantage of

[3] Factor analysis aims to obtain the few factors for represent a high degree of the relationships among variables. There are various criteria to determine the number of factors. First criterion is eigenvalue statistic. If eigenvalue statistic is greater than 1, it is considered. Second criterion is Scree Test. Scree test gives the total variance associated with each factor. Graph values obtained up to the point where the horizontal shape factors as a result of analysis are considered to be the maximum number of factors. Third criterion is the percentage of the total variance. Fourth criterion is Joliffe. According to the criterion, the factors are removed from the model in the event of less than 0,7 of the value. Last criterion is decided to the number of factors by the researcher (Kalayci, 2005).

this is the components of social capital like institutional linkages. In the other words, 48,544 percantage of the rate of 71,711 eigenvalues variance is the components of social capital like network relationships between different social groups and actors' cognitive potentials in non-family firms. On the other hand, 23,165 eigenvalues variance is explained in the context of the network relations between homogenous groups and trust factors in non-family firms.

Table 2. Matrix of factor analysis for family firms.

Component	Rotated Component Matrix for Family Firms							
	Factor1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Friend	-,688	-,143	-,233	,130	-,117	-,078	,033	,058
Colleague	,780	,121	,035	-,036	,115	,183	,082	,242
Coltime	,714	,005	-,158	,070	,230	-,250	,192	-,154
Trustfri	,297	,718	-,126	,084	,272	,063	-,320	,077
Trusteth	,362	,595	-,072	,214	-,179	,392	,110	,221
Trustcol	,025	,798	,071	-,231	-,226	-,055	,201	-,166
Memorg	-,063	-,162	,814	,094	,087	-,069	-,267	-,034
Memeth	,088	-,119	,783	,120	-,359	,016	,080	-,214
Memgro	,443	,238	,640	,193	,086	-,135	,066	,024
Trustprox	-,273	,086	,356	,716	,105	-,032	,112	-,267
Trustinst	,081	-,001	,004	,814	,030	,024	-,241	,059
Trustorg	,002	-,354	,127	,655	-,127	,143	,312	-,061
Humanpot	,238	-,100	,004	,055	,855	,059	,144	-,045
Cognitionpot	,167	,007	-,029	-,019	,783	,226	-,325	,034
Longrel	,422	,240	-,143	-,347	,317	,529	,073	-,058
Contract	-,017	,090	,461	-,183	,125	,607	,233	,320
Institution	-,016	-,033	-,167	,204	,176	,801	-,053	-,129
Frerel	-,413	,406	-,192	-,322	,038	-,515	-,223	,249
Unird	-,190	,034	,062	-,024	,096	-,014	-,820	,029
Physicalpot	,015	,468	-,137	-,224	,433	,314	,563	,052
Certificate	-,025	-,444	,411	,229	,034	,172	,088	-,532
Reputation	,004	-,053	-,059	-,019	-,001	-,004	-,009	,927
Eigenvalues	4,189	3,479	2,112	1,832	1,567	1,524	,955	,919
% Variance	19,041	15,816	9,601	8,427	7,325	7,127	4,605	4,203

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity			% Total Variance of 6 factors	% Total Variance
	App. Chi-Squ	df.	Sig.		
,529	338,831	231	,000	67,337	76,145

Table 3. Matrix of factor analysis for non-family firms.

Component	Rotated Component Matrix for Non-Family Firms							
	Factor1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Reputation	,912	-,033	,036	,108	-,080	-,070	,031	,118
Trustinst	,884	-,109	,095	-,230	,001	-,037	-,123	,074
Trustprox	,821	-,188	-,076	,137	,069	,144	-,098	,110

Trustorg	,573	-,348	-,103	-,126	-,065	,257	,120	-,279
Unird	-,064	,854	,245	-,135	-,162	-,079	-,132	-,007
Physicalpot	-,264	,793	,222	,201	,002	,032	,191	-,091
Cognitionpot	-,300	,763	-,018	,273	-,166	-,018	-,071	,337
Institution	-,115	,250	,855	-,044	,010	,172	,013	-,077
Contract	,099	,200	,734	-,116	-,030	-,111	,136	,394
Longrel	,075	-,014	,725	,226	-,096	,009	-,421	-,052
Frerel	-,023	,221	,560	,468	-,040	-,024	,211	,386
Memorg	,184	-,199	,251	-,782	,107	-,103	-,104	,107
Memeth	,215	-,044	,299	,752	,082	,170	-,197	-,118
Colleague	,010	-,066	-,007	,066	,831	-,110	-,044	,004
Friend	-,136	-,374	-,216	-,302	,647	,328	,099	-,035
Coltime	,128	-,470	-,175	-,124	,551	,319	,129	,188
Memgro	-,126	,138	,308	,529	,549	-,009	,052	-,222
Trusteth	,017	-,309	,040	-,021	,153	,825	,212	,116
Trustcol	,117	,220	,096	,316	-,123	,789	-,042	-,196
Certificate	-,070	-,037	-,019	,175	,013	,103	,888	-,010
Humanpot	-,021	-,027	-,009	-,480	,022	,064	,663	,113
Trustfri	-,168	-,012	-,098	,203	,000	,016	-,044	-,814
Eigenvalues	4,895	3,136	2,648	2,174	1,665	1,258	,920	,860
% Variance	22,252	14,256	12,038	9,880	7,568	5,717	4,183	3,907

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	**Bartlett's Test of Sphericity**			**% Total Variance of 6 factors**	**% Total Variance**
	App. Chi-Squ	**df.**	**Sig.**		
,516	501,336	231	,000	71,711	79,801

Variables and components of social capital according to the factor loadings were given in table 4. When the table 4 is examined, it can be seen that component of social capital is differentiated according to the factor loadings of family and non-family firms. As a result of the factor analysis, factor 1 is represented with variables that have stronger relations with friends and relatives in family firms; factor 5 is represented with variables that have stronger relations with friends and relatives in non-family firms. Variables that have stronger relations with friends and relatives are defined as friendship ties. Factor 2 in family firms and factor 6 in non-family firms are represented with set of variables defining relational trust between friends, relatives, colleagues, same ethnic and religious groups. Relational trust, which was defined as type of trust between friends, relatives, colleagues, same ethnic and religious groups was evaluated as a different dimension of social capital in this article. Membership of voluntary organizations, and the membership of social groups and communities defining the relationship between different or similar social groups and organizations, which is one of the most important variable in social capital were classified as components of social capital in the form of voluntary organizations as a result of the factor analysis. As a result of the factor analysis, factor 3 for family firms and factor 4 for non-family firms were defined as voluntary organizational activity. Especially in the literature of industrial clusters, competence trust, adequacy-based on trust in innovation and learning process, is considered to be the most critical component of social capital. Factor 4 which are as a result of the analysis in family firms and factor 1 which is as a result of the analysis in non-family firms were classified as competence trust. Physical and human components shaping the relationships among actors in industrial clusters were defined as cognition potential. Cognition potential, which was defined frame variables as knowledge and skills of employees and managers, the firm's machinery and equipment facilities, was classified in factor 5 for family firms and in factor 2 for non-family firms. Institutional linkages such as

governmental and non-governmental organizations, and institutional linkages evaluated in the context of duration and frequency among the institutional were classified as another component of social capital. In this context, factor 6 which is as a result of the analysis for family firms and factor 3 which is as a result of the analysis for non-family firms were defined as institutional linkages (table 4).

Table 4. Definition of social capital related factors for family and non-family firms.

Family Firms			Non-Family Firms		
Factorial Analysis	**Questions**	**Defin. of Social Capital**	**Factorial Analysis**	**Questions**	**Defin. of Social Capital**
Factor 1	How important are friends and acquaintances? (Friend)	Friendship Ties	Factor 1	How important is the reputation of the actors with collaborative actors/firms? (Reputation)	Competence Trust
	How important is a colleague? (Colleague)			How much do you trust voluntary organization and administrators with collaborative actors/firms? (Trustorg)	
	What is the level of importance of time spent with colleagues and others? (Coltime)			How much do you trust arm's-length firms? or How important is proximity with collaborating? (Trustprox)	
Factor 2	How much do you trust friends and acquaintances? (Trustfri)	Relational Trust		How much do you trust governmental and non-governmental institutions? (Trustinst)	
	How much do you trust colleagues? (Trustcol)		Factor 2	How important is potential of physical (for example: machinery and equipment, opportunities)? (Phsicalpot)	Cognition Potential
	How much you trust the same ethnic and religious groups with you? (Trusteth)			How important is potential of learning and knowledge? (Cognitionpot)	
Factor 3	How important is membership in various club and voluntary organization? (Memorg)	Voluntary Organization Activity (VOC)		How important are universities and research institutions? (Unird)	
	How important is the same ethnic and religious groups with you? (Memeth)			How important is governmental and non-governmental institutions? (Institution)	
	How important is membership in various groups? (Memgro)		Factor 3	How important is to contract? (Contract)	Institutional Linkages
Factor 4	How much do you trust arm's-length firms? or How important is proximity with collaborating? (Trustprox)	Competence Trust		How important are long-time relationships? (Longrel)	
	How much do you trust governmental and non-governmental institutions? (Trustinst)			How important is frequently of relationships with actors/firms? (Frerel)	
	How much do you trust voluntary organization and administrators with collaborative actors/firms? (Trustorg)		Factor 4	How important is membership in various club and voluntary organization? (Memorg)	Voluntary Organization Activity (VOC)
Factor 5	How important is human potential of actors/firms (for example: skills and qualifications of employees or managers)? (Humanpot)	Cognition Potential		How important is the same ethnic and religious groups with you? (Memeth)	
	How important is potential of learning and knowledge? (Cognitionpot)			How important are friends and acquaintances? (Friend)	
	How important is long-time relationships? (Longrel)			How important is membership in various groups? (Memgro)	
	How important is to contract? (Contract)		Factor 5	What is the level of importance of time spent with colleagues and others? (Coltime)	Friendship Ties
Factor 6	How important are governmental and non-governmental institutions? (Institution)	Institutions Linkages		How important is a colleague? (Colleague)	
	How important is frequently of relationships with actors/firms? (Frerel)		Factor 6	How much do you trust the same ethnic and religious groups with you? (Trusteth)	Relational Trust
				How much do you trust colleagues? (Trustcol)	

Variance values obtained for each factor shows the potential of social capital as a result of the factor analysis. The results show that the social capital potentials of family firms and non-family firms differ significantly. As an interpretation of factor anaysis results, the establishment of the cooperations in the family firms of Konya machinery industry cluster are based on relationships such as friendships, family relations, relational trust and voluntary organizations. Despite that the cooperations with different social groups in non-family firms are more predominant in production process.

On the other hand, the relationships between social capital and innovative activities of firms for family and non family were tested with correlation and regression analysis method. Accordingly, correlation matrix was given in table 5, and the results of regressin analysis were given in table 6.

Table 5. Correlations matrix between social capital and innovation for family and non-family firms in Turkey-Konya.

Factors of Social Capital	Correlations for Family Firms		Correlations for Non-Family Firms	
	Process	Product	Process	Product
Friendship Ties	,347	,118	,358	-,202
	,024	,256	,012	,106
Relational Trust	,246	,528	,470	-,349
	,084	,001	,001	,014
Voluntary Organization Activity	,453	,370	-,152	-,082
	,004	,017	,174	,308
Competence Trust	-,294	,276	-,203	,232
	,048	,060	,0,99	,075
Cognition Potential	,076	,116	-,154	,394
	,336	,259	,172	,006
Institutional Linkages	-,130	,056	-,254	,234
	,236	,379	,057	,073

significant at the %1 level, %5 level, %10 level in bold values

When the correlation relationship between the components of social capital and the innovation activities are determined, there are relationships between process innovative activities of family and non-family firms and the components of social capital such as friendship ties, relational trust, and VOC. The components of social capital such as competence trust and institutional linkages and process innovation activities have negative correlation while the components of social capital such as friedship ties, relational trust, and VOC and process innovation activities have a positive correlation. On the other hand, the relation between production innovation and the variables such as relational trust, competence trust, and cognition potential and institutional linkages in non-family firms was determined, the relation between production innovation and variables such as relational trust, VOC, and competence trust in family firms was determined. However, the relation between product innovation and relational trust in non-family firms has a negatif correlation (table 5).

The effects of the components of social capital on the innovation activities were identified with regression analysis method. As a result of the regression analysis made for determining the effects of social capital potentials of family and non-family firms on the innovative activities. It was meaningful that r2 value was more than 0.40, and Durbin-Watson value was between 1.5 and 2.5 in all analysis. Additionally, tolerance and variance inflation factor (VIF) values show that there is no multi-link between the variables (table 6).

The effects of the components of social capital on the innovation activities were tested with regression analysis method in table 6. According to the resuts of the analysis was determined that the effects of social capital potentials of on innovation activities in family and non family firms differentiated. For example, while the components of social capital such as friendship ties, relational trust, and VOC has a positive effect on process innovation, competence tust has a negative effect on process innovation activities in

family firms. In the result for family firms, there is no relationsip among cognition potential, institutional linkages, and process innovation activities. Additionally, the variables of social capital such as relational trust, VOC and competence trust have a positive effect on production innovation activities of family firms. The similar results were identified as a result of the regression analysis made in the case of non-family firms for effecting social capital potentials on innovation activies. Therefore, the effects of the components of social capital occuring between homogenous groups such as friendship ties and relational trust in process innovation activities of non-family firms was identifed like occuring in family firms. On the ther hand, institutional linkages have a negative effect on process innovation activities of non-family firms. The components of social capital such as competence trust, cognition potential and istitutional linkages have an important effect on process innovation activities of non-family firms. Institutional linkages and knowledge-learning process significanltly also affect process innovation activities of non-family firms, whereas relational trust negatively affects on product innovation activities.

Table 6. Regression results for relationship between social capital and innovation for family and non-family firms in Turkey-Konya.

	Regression for Family Firms					
	Unstandardized Coefficients	**t**	**Sig.**	**Unstandardized Coefficients**	**t**	**Sig.**
	B			B		
(Constant)	2,424	11,034	,000	2,515	13,095	,000
Friendship_Ties	,556	2,491	,019	,170	,873	,391
Relational_Trust	,394	1,764	,089	,759	3,894	,001
Voluntary_Org._Act.	,726	3,252	,003	,532	2,726	,011
Competence_Trust	-,471	-2,110	,045	,397	2,038	,052
Cognition_Pot.	,122	,548	,588	,168	,859	,398
Institutional_Link.	-,208	-,931	,361	,080	,410	,685
Models	R Square: ,495	Adj. R Square: ,379		R Square: ,522	Adj. R Square: ,412	
	Durbin-Watson: 2,037			Durbin-Watson: 1,757		
	F: 4,352	Sig.: ,004		F: 4,735	Sig.: ,002	
	VIF: 1,000	Tolerance: 1,000		VIF: 1,000	Tolerance: 1,000	
Dependent Variables	**PROCESS**			**PRODUCT**		
	Regression for Non-Family Firms					
	Unstandardized Coefficients	**t**	**Sig.**	**Unstandardized Coefficients**	**t**	**Sig.**
	B			B		
(Constant)	1,925	10,317	,000	3,225	16,691	,000
Friendship_Ties	,399	2,887	,007	-,221	-1,542	,133
Relational_Trust	,525	3,798	,001	-,381	-2,664	,012
Voluntary_Org._Act.	-,170	-1,231	,227	-,089	-,623	,538
Competence_Trust	-,204	-1,475	,150	,253	1,772	,086
Cognition_Pot.	-,171	-1,240	,224	,430	3,008	,005
Institutional_Link.	-,283	-2,050	,048	,255	1,786	,083
Models	R Square: ,494	Adj. R Square: ,402		R Square: ,433	Adj. R Square: ,378	
	Durbin-Watson: 2,113			Durbin-Watson: 1,835		
	F: 5,365	Sig.: ,001		F: 4,207	Sig.: ,003	
	VIF: 1,000	Tolerance: 1,000		VIF: 1,000	Tolerance: 1,000	
Dependent Variables	**PROCESS**			**PRODUCT**		

Discussion and conclusions

The concept of social capital is vital in understanding firm behaviour and succession in family firms and non-family firms, since social capital creates value by fostering connections between firms. Social capital has been determined in different dimensional in terms of content and context. Social capital is defined as the network of relationships possessed by an individual or social entity. The sum of actual and potential resources embedded within networks, available through, and derived from such network (Nahapiet, & Ghoshal, 1998).

In this article, social capital was evaluated in the context of 6 different variables such as friendship ties, relational trust, voluntary organization activity, competence trust, cognition potential, and institutional linkages based on networks among actors and trust relationships. This article has been determined effects of the six different factors of social capital on innovation of family and non-family firms. There are many study evidenced possitive effect of social capital on firms' innovation activities. Social capital has been seen to contribute to a firm's ability to make value in innovation through the facilitation of integration and exchange of resources in a firm (Kogut and Zander, 1993; Schumpeter, 1934). Social capital is also emerging as a key component supporting the development of intellectual capital which is defined as social components' knowledge and learning capacity such as organizations, firms, social sectors and various actors (Nahapiet and Ghoshal, 1998). According to Steier (2001), it led to developing new notions and product while firm survival and success depend on quality of ability established on networks and trust. However according to the actors' or firms' social and structural features; the effects of social capital components on firms' innovation activities differs from another. In other words, it is not possible to talk about the typology of social capital for organizations or actors identified as social asset. Therefore, analysis were made for testing the hypothesis which are ' the social capital potentials of family and non-family firms show differences' and 'social capital is decisive on the innovation activities of family and non-family firms' determined in the case of family and non-family firms. The process for testing hypothesis occured basically two stage. In first stage, it was analysed that how social capital potential differentiated among family firms and non-family firms. In the second stage, social capital potential of family and non-family were analysed the effects on process and production innovation activities.

In the first stage, factor analysis was conducted on the set of 22 questions which was used for determining firms' social capital potentials. As a result of the factor analyis, 6 different variables such as friendship ties, relational trust, voluntary organization activity, competence trust, cognition potential and institutions linkages identified were obtained as social capital components. As a result of this analysis, it was seen that social capital can be evaluated with different dimensions. Complex structure of social capital presents assessed in different sizes and context (Hauser *et al.*, 2007). As a result of the analysis, it was identified that the most important component of social capital for family firms is friendship ties and relational trust. In other words, it can be said that family firms realize production organizations with close network relations such as friends or acquaintances. Also, relational trust occuring among certain factors within the process appears to be another factor shaping the organization of production in family firms. It was determined that social capital factors such as friendship ties and relational trust are important for especially the continuity of the production process of newly established firms and survival of newly established firms in Konya machinery industry cluster. The participation of the factors is an increasing in economic life because network relations occuring among homogenuous groups and trust reduce social worry and opportunism (Zak, & Knack, 2001). On the other hand, as Granovetter's thinking, stronger ties occuring among homogenuos groups cause due to the combination of the amount of time, emotional intensity, intimacy and reciprocal trust. Social events such as spin-off, employees in other firms of entrepreneurs, and marriage between entrepreneurs and employees caused the establishment of strong ties among entrepreneurs and firms. Therefore, there were important opportunuties to survive for both family and non-family firms in such processes as fragmentatiton of production stages, share of machinery and human resources, and the establishment of links to local market. Ozcan (1995) focused on three factors of firm survival. First, the survival of firms is an event of entrepreneurial motivation and skill. Second, there is a strong involvement of family and firends throughout business management. And last, there are linked to local market opportunities and national trends. Therefore, it can be said that strong ties such as friendship ties, relation-

al trust are important factors in terms of the survival of family and non-family firms. Cultural and social characteristics of actors were determinant factor on their social capital potential. Also investing factors in enriching the social capital in family firms will in turn "improve the family firm's ability to access, create, and recombine strategically relevant resources and competencies" (Salvato, & Melin, 2008).

Hence, the components of social capital such as competence trust, cognition potential, institutional linkages are more dominant in non-family firms. In other words, in addition to network relationships based on skills and knowledge, institutional links play an important role on production organization in non-family firms. In conclusion, family, and non-family firms tend to make greater use of a particular dimensional of social capital. Therefore, social capital is an important component in the production organization, the success, decisions and growth of the firms for both family and non-family firms in Konya machinery industrial cluster.

Social capital such as competence trust, institutional linkages, and cognition potential are factors enhancing the competitiveness of firms due to embeddedness relationships in wider social structures, relationships conducted with formal and informal institutions while social capital components occuring among homogenuous groups such as friendship ties and relational trust support process of firms' survival and growth. For example, Chen (2002) identified that relations of friendship and familiarity are important factors to the survival of firms in Taiwan bicycle industry cluster. It was specified by interviewed firms that certain stages of the production sharing of the components of social capital such as friendship ties and relational trust are important factors in process innovation activities such as labor mobility, machinery-equipment sharing and support, and information transfer in innovation and marketing process.

Therefore, when the importance of the components of social capital such as friendship ties and relational trust is considered to survive firms or the success of firms, intensity and nature of the relationships occuring in homogenous groups for family firms come to the fore. Hovewer, the relationships and trust occuring among different level firms, institutions and actors are needed in the process of becoming more competitive and innovative that have completed the period of growth.

In this context, the role of social capital components is discussed in innovation activities which trigger the competitive strenghts of firms in this study. In other words, hyphotesis which is 'social capital is decisive on innovation activities of family and non-family firms' was tested in the context of the study. Because of the idea that social capital components have a decisive role in innovation activities of firms, differing levels of trust and networks help to explain how social capital can influence the creation of innovation for family and non-family firms. Because it produces family relationships continue, increasing interdependence and interactions principles of reciprocity (obligations) and exchange among family members (Arregle *et al*., 2007).

Innovation activities have been strategic decision for firms in industrial clusters. In the literature it has been discussed that innovation activities accepted an essential subject to success of firms are affected by non- economic factors such as social capital, trust and networks (Hadjimichalis, 2006; Rutten, & Boekema, 2007). The article researched in the case of Konya was detected that social capital components have determined on innovation activities of family and non-family firms. In this article, social capital components such as friendship ties and relational trust occurring among homogeneous groups were determined on process innovation of family and non-family firms. Friendship ties and relational trust encouraging with spatial proximity and face to face relations have revealing cooperation among the certain firms. Therefore, it can play an active role in the sustainable of firm's activities. In other words, it appears that family and non-family firms are embedded in terms of spatially and local networks to process innovation. On the other hand, relationship between relational trust and product innovation in family firms has been considered as an important factor in order to reduce the risks in the process of new knowledge acquisition. Because, firms that have not new knowledge resources can have many risks. Therefore, relational trust is needed for reduction of the risk for sharing of knowledge and learning (Sengun, 2009). The article was also determined that relational trust has a negative impact on product innovation in non-family firms that are associated with different social milleu. Relational trust emerging the certain social milleu can a negative impact on product innovation required to knowledge resources in different level. However, competence trust occurring to technical and organizational performance and in clusters to concentration on related firms is a factor determining to product innovation in Konya

industrial clusters. Firms have been removed from the certain social and economic milleu by competence trust emerging among institutional and organizations (Schmitz, 1999; Sako, & Helper, 1996). Competence trust especially assists with the learning process and knowledge in outside the clusters. Competence trust leads to reduce the production of imitation and to support new product process among family firms in Konya. Thus, competence trust leads to increase the product innovation activities and to reduce process innovation activities.

The article was also detected that cognition potential and institutional ties determined on innovation activities in non-family firms. Ability to collaborate with innovationness firms and institutional of non-famiy firms which is high cognitional capacity is considered as a factor increasing product innovation activities of firms due to being restricted in terms of institutional structuring and perspectives on innovation activities of family firms. It statistically caused to be not determined on innovation activities of family firms in the case study. This situation demonstrates that family firms have a potential weak according to cognition and institutional networks. Because of density of family firms not completed institutional structure in Konya, firms caused to embrace short-term strategies than long-term. This perception and behavior has lead to develop of production process based on imitation with local embedded relationships rather than cognition and institutional social networks given innovative perspective. In contrast, non-family firms indicating the more developing according to institutional structure especially have had a strong relationship with cognition and institutional networks in process innovation. However, there are an inverse relationship between institutional networks and process innovation in non-family firms.

In literature of industrial clusters has been accepted that membership of voluntary organization being the most important component of social capital determined on innovation and economic performance (Hauser et al., 2007). Voluntary organizations have especially taken over an important role in the establishment of cooperations with actors at different levels and locations. Thus, voluntary organizations lead to establish new knowledge networks and have determined on innovation (Sabatini, 2005). In research to Konya machinery industrial cluster, voluntary organizations were not discovered on innovation activities of non-family firms while voluntary organizations were detected to be an important actor in innovation activities of family firms. This situation can be explained within the framework of the effectiveness of social and political structure of the Islamic organizations clustered as social and political structure of Konya. The organizations have followed strategies for cooperations in organizations than cooperations with actors at different levels and locations in terms of political conditions and structural problems. Cooperations in organization lead to emerge informal relations such as family, friendship, kinship ties. Because of this, voluntary organizations have been a factor enhancing cooperation among homogenuous groups. Thus, voluntary organizations are regarded as institutions staying away from meeting the expectations of non-family firms not completed the institutional structure. However, voluntary organizations have taken on an important role for the structural development and survive in economic recession in Konya. In parallel to this situation, the article has significantly identified that voluntary organizations are decisive on process and product innovation activities of family firms.

As a conclusion of this study, social capital components were determiner on innovation activities of both family and non-family firms. However, the article identifed that family firm was rich in terms of social capital components such as friendship ties and relational trust emerging among homogenuous groups while non-family firms were the richer in terms of social capital components such as Institutions Linkages, cognition ties and competence trust emerging among factors at different levels. Therefore, I can say that social capital components are important factors of innovation activities in Konya machinery industrial cluster.

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