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inside an Italian Cluster
- Empirical Investigation**

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Social Capital and Entrepreneurship inside an Italian Cluster:

An Empirical Investigation

Abstract:

This paper aims to explain the role of local context in the development of start-ups' social networks, according to a sociological perspective of entrepreneurship, which considers social capital as a main factor of success for the growth of young firms. This research problem is dealt with in connection with the more consolidated theoretical studies of clustering phenomena, which have attributed to social networks a central role in explaining the concentration of the entrepreneurial process in restricted geographical areas. The research model adopted to measure social capital is based on a personal elaboration of the framework developed by Nahapiet and Ghoshal, which considers social capital as a heterogeneous resource, constituted by a structural, relational and cognitive component. The strong turn of external relationships by the start-ups can justify our choice to consider these as a unit of analysis. In particular, we analysed social capital in the dyads of networks between start-ups located in an industrial Italian cluster and their customers. The results of our analysis are quite contrasting with the most accredited hypotheses in the studies, showing that a strong incidence of the local factor can only partially help start-ups. A strong impact of local context, in fact, has a positive influence on the relational and cognitive dimension of social capital bringing the immediate advantage to reduce the costs of control and to develop trust in the business relations. However, it has a negative impact on the structural dimension of the social capital, hindering knowledge transfer, value information and new ideas.

Key words: social capital, industrial clusters, start-ups, inter-organisational networks, regression analysis

Introduction

This paper aims to explain the role and the influence of local context in the development of start-ups' social networks, according to a sociological perspective of entrepreneurship, which considers social capital as a main factor of success for the growth of young firms (Aldrich, 1999). This research problem is dealt with in connection with the more consolidated theoretical studies of clustering phenomena, which have attributed to social networks a central role in explaining the concentration of the entrepreneurial process in restricted geographical areas.

It is known that in recent years researchers studying the entrepreneurship process have increasingly employed the social capital construct. The use of social skills in this field of research arose from the recognition that traditional approaches to the study of entrepreneurs failed to include a social context (Thornton, 1999). Indeed, in the strategic management field it is frequently acknowledged that entrepreneurs give great importance to meeting and face to face ties, leading to the belief that "business know who" is at least important as "business know how". Many researchers thus began to analyse the networks in which small firms are embedded and such interest in entrepreneurial social relationships has increased during the last few years (Jarillo, 1989).

No doubt, the importance of social capital in the start-up process is strengthened by the diffusion of a very large number of studies based on industrial clusters which have strongly denied the image of start-ups as atomistic actors (Yli-Renko et al., 2001), showing how these economic units are more and more embedded in large social and professional networks with other organizational actors (Gorden, McCann, 2000). The geography of the social structure of personal ties, which are strongly embedded in a specific context, explains the creation of new firms and the diffusion of the entrepreneurial process within a restricted area. Indeed, a strong tie with a specific local context provides individuals with more opportunities to acquire knowledge of the business, form critical networks and build confidence in their ability to open new ventures.

Moreover, every stable social system embedded in this local context increases the likelihood that individuals will leave their current employer and become entrepreneurs and it explains why new entrepreneurs usually decide to begin a new venture in the same place where they have lived (Aldrich, Zimmer, 1986; Aldrich, 1999). This sociological entrepreneurial perspective is in accordance with the better known studies of clusters which affirm that the specific characteristic of a cluster is the strong tie between social and economic elements, so that the firms located there would not represent the whole of the production unit and that social networks are the most important factors in the development of new co-located economic activities (Porter, 1998).

Even if importance of the social capital during the start-up process has strongly been appreciated, studies have not yet dwelt on the way the local context is able to influence its growth directly. In this analysis, we have measured the “local context impact” according to two different dimensions: proximity between the actors involved in economic transactions and sense of affiliation of the entrepreneur to the cluster (origin and number of years lived in the cluster). The results of our analysis are quite opposite with the most accredited hypotheses in the studies, showing that a strong incidence of the local factor can only partially help start-ups. A strong impact of local context, in fact, has a positive influence on the relational and cognitive dimension of social capital behaving the immediate advantage to reduce the costs of control and coordination and to develop trust and a sense of reciprocity between start-ups and their customers. However, it has a negative impact on the structural dimension of the social capital, hindering knowledge transfer, value information and new ideas.

Theoretical background

The social capital: an overview

In the last fifteen years the concept of social capital has been growing more and more popular in a vast range of social disciplines (Bourdieu, 1983; Coleman, 1990). An increasing number of different researchers, such as for instance economists and sociologists, have used this concept to

answer a wide range of questions related to their own specific fields of research, in accordance with the idea that social phenomena can influence economic activities (Burt, 1992; Moran & Ghoshal, 1996).

Really this term was originally used to describe the relational resources, embedded in cross-cutting personal ties, that are useful for the development of individuals in community social organization (Jacobs, 1965). Recent research has applied social capital theory to analyse the set of relations that a single actor (individual or firm) has instituted with other people, and to identify the ways with which these relations are exploited to reach personal goals.

Social capital can take different forms, primarily trust, norms, and networks (Lesser, 2000). Both the trust and norms are developed over time through repeated series of interactions and exchange of resources (Knack, Keefer, 1997). Like for the case of trust, norms act as constraints on narrow self-interest, leading individuals to contribute productively to exchange instead of behaving opportunistically. Finally, networks develop as actors develop reliable and effective communication channels across organizational boundaries.

Normally, the studies distinguish three types of networks useful to social capital: business, information and research networks (Lin et al., 2001). The business networks include clients, suppliers, competitors, suppliers and etc. The information networks included trade fairs and exhibitions, meeting and publications, patent documents, and so on. Then, the research networks included government research laboratories, technology transfer organizations, universities and so on.

Moving to key elements of social capital one of these is “embeddedness” (Granovetter, 1985), which is determined by specific types of social structure and that for firms is the personal ties and networks of relations between and among firms that differentiates them, explains performance and economic development processes more generally. In this paper, we follow this definition of social capital, which seems to be neutral to the external vs. internal characteristic distinction, according to Lin (2001): “*resources embedded in a social structure which are*

accessed and/or mobilized in purposive actions”. It is a multidimensional definition, which considers three different elements of social capital: resources embedded in a social structure, accessibility to such social resources by individuals, and use or mobilization of such social resources by individuals in a purposive actions. According to this definition, the social capital can be seen as a factor that is able to influence in a positive way the action of a single actor, of a collective group and of a global organization. It permits firms to simplify the creation of tacit knowledge (Nonaka, 1991), the spread of relevant information and the creation of trust relationships.

The social capital approach to the field of entrepreneurship

A thorough analysis of entrepreneurship literature permits us to remark that there have been two main approaches to the study of this topic (Gartner, 1988). Even if these two approaches have been very useful in providing valuable information on different factors of entrepreneurship, in recent years some authors have underlined a lot of weaknesses in these two traditional prospective (Aldrich, 1999). Among these critical points, the main one is that these theoretical frameworks include the idea that resources that are useful for attaining business success can be obtained only by people with the right sociocultural or psychological backgrounds. Therefore, during the 1980s in particular, a social network perspective was suggested (Aldrich, Zimmer, 1985) to explain why some people are more successful in starting and developing businesses and in general the entrepreneurship process.

This approach suggests that a start-up’s growth process is contingent on the nature and structure of his social relationships, which also provides the resources and support required for entrepreneurship. Probably the social network construct has been increasingly employed by researchers studying this topic, because of the recognition that entrepreneurship research acknowledge the environmental context in which the entrepreneur exists (Granovetter, 1985; Birley, 1985). Indeed, a lot of varied empirical evidence regarding this topic has strongly denied

the image of start-ups as atomistic actors, showing how these economic units are more and more embedded in large social and professional networks with other organizational actors (Yli Renko, Autio, & Sapienza, 2001). These remarks allow us to reinforce the hypothesis that the entrepreneurial process, understood as another form of economic action, can become explicit within a web of social relationships that are able to facilitate or also to bind it (Granovetter, 1985).

The start-up's social networks have been called the most significant resource of the firm (Yli_renko et al., 2001) and especially social encounters between the single entrepreneur, with whom the firm at this stage of growth is normally identified, and his or her network contacts are often the main strategic elements that are able to improve new venture development. In deed, the larger network structure in which entrepreneurs are embedded constitutes a significant portion of their opportunity structure (Aldrich, Wiedemnayer, 1993).

In this context social capital is defined as start-ups' relations and contact with other different units; such contacts to the extent that they provide the means for identifying opportunities or obtaining resources or to the extent that they facilitate the utilization of other resources, are potential sources of competitive advantage. It is normal to think that the importance of social capital in the entrepreneurship field has been attributed to the fact that they provide resources, access to resources or emotional support (Lin, 2001; Birley, 1985). In fact, liabilities of newness and smallness are characteristics of start-ups and therefore there is evidence that small firms are using external cooperative relations (Ring, Van de Ven, 1994) and that the use of cooperative relations is increasing. Therefore, focusing on social networks turns attention to relationships between the start-up and others that deliver resources, which are important in establishing and in developing a business (Larson, 1992). The social capital presence is been especially highlighted in reference to vertical networks and in particular dyadic start-up-customer relationships (Hakansson, 1982). In fact, various empirical evidence shows not only that start-ups are not isolated units, but also that they can grow from social links to their

customers, because these social relations in particular are useful in supporting the development of business (Aldrich, Zimmer, 1986).

The social capital approach to the industrial cluster phenomenon

As globalisation has accelerated, interest in localised groups of firms in related industries has grown. This has been due to successful examples of such clusters found in growing or prosperous regions, in disappointment with economic development models based on large firms. According to Porter (1998), clusters can be defined as a geographic concentration of interconnected firms and institutions inside a particular field. They can include suppliers of specialized inputs such as components and services and providers of specialized infrastructure, but also universities, agencies and trade associations able to provide specialized information or technical support.

In the literature regarding clusters, great attention has been especially attributed to the entrepreneurship issue according to a social perspective. In fact, the importance of the social capital construct during the start-up process would seem to reflect the publication of numerous studies based both on industrial districts and on clusters (Porter, 1998, 2000), which have shown that social networks are the most important factors in the creation of a local system of firms and that social capital plays a leading role in the development of co-located economic activities (Saxenian, 1994). According to social capital theory, we consider that industrial clusters are different from these traditional explanations in that there is a belief that such clusters reflect not simply economic responses to the pattern of profitable opportunities and complementarities, but also a peculiar level of embeddedness and social integration (Gordon, McCann, 2000).

In this perspective, the specific characteristic of a cluster is the strong link between social and economic elements, so that the firms located there would not represent the whole of the production unit. Sociological analyses focus on how cultural similarities, community cohesiveness, interdependence among local firms, repeated interaction, and familiarity allow

firms to trust that their counterparts will not act opportunistically. This trust can facilitate the smooth functioning of fragmented clusters made up of many participants.

In this sense, the industrial cluster is always seen as a privileged place for the creation of social networks interfirmly because of the presence of trust and informality in the economic transactions of co-located actors that are facilitated by their proximity. In fact all economic relations are socially embedded in a specific local context, in the sense that these depend upon norms, institutions and set of assumptions shared by actors belonging to same social place.

Social capital, entrepreneurship and industrial clusters: an original interpretative model

While several different studies have already verified that size and interconnectivity in a start-up's social networks affect its performance, what has not yet been studied in depth is the analysis of the possible causes that allow these social networks to develop. This is a great limitation because social networks are not fixed, but they depend on social context of business and they can be activated according to different needs (Granovetter, 1985; Burt, 1992). In fact, the structure of social ties figures in access to social capital according to different ways, which depend precisely on the specific social context where they are developing.

Based on the previous theoretical review, this paper aims to verify if the location within an industrial cluster can impact strongly on the development of the social capital of a start-up. In other words we are interested in studying the way in which the embeddedness of a new venture inside an industrial cluster can be improved and facilitate the development of social capital in the transaction relationships managed by these local start-ups.

This interest arises from the fact that if we contemporaneously consider the entrepreneurial process within an industrial cluster according to the social capital literature, we can remark that the industrial cluster, seen as a special type of inter-organisational network based on a natural overlap between the economic and social dimension, can improve the growth of social capital in the transaction relations implemented by local start-ups, in comparison with the

other start-ups located in peripheral areas and further away from concentrate agglomerations of economic activities. This idea has found a good framework of application inside geographically limited places, where the existence of stable social relations among local actors is favoured by a phenomenon of local proximity. In other words, the geography of a social structure of personal ties, which are strongly embedded in a specific context, can explain the creation of new firms and the spread of the entrepreneurial process inside a restricted area

In this context, we might remark that different empirical studies show that entrepreneurship development is inherently a local phenomenon according to a social perspective of analysis. This affirmation justifies also why in the studies the social networks of a start-up overlap with the personal relations of the entrepreneur, which has a very important role in industrial clusters. (Birley et al., 1990). Personal networks lead to economic networks and the networking of entrepreneurs leads to the overall network of relations (Dubini, Aldrich, 1993).

Individuals start companies based on their prior experience and interests, typically filling some niche that a larger corporation may judge too small, exploiting a new opportunity that may have a risk profile unsuited to a larger corporation or using a unique set of skills and knowledge to develop applications from licensed patents. In developing their company, entrepreneurs rely on their local context, connections and knowledge of the business environment. According to empirical literature on entrepreneurship, many individuals have location inertia due to reasons such as family mobility constraints, locational preferences, familiarity of the environment, the relatively higher costs associated with changing residence or the high cost of establishing a new company in a thickly populated environment where office and housing costs tend to be higher (Cooper, Slovin, 1990).

In fact, a strong connection with a specific local context provides individuals with more opportunities to acquire knowledge of the business, form critical networks and build confidence in their ability to develop a start-up. We think that the geography of social structure justifies the idea that the cluster effect, that is the importance and strength of local factor, can simplify the

development of social capital in the economic relations implemented by start-ups. In fact, in the development of a new firm we can remark that individuals belonging to this organization, entrepreneurs in primis tend to develop geographically localized networks of friends, acquaintances and contacts. Thus they become embedded in a local social structure. In this way, we can affirm that entrepreneurs who come from a specific and restricted local context probably have simpler access to developing social capital, whereas those external to this local context, before creating the start-up, must rely much more on their personal social networks.

Hypotheses

As emphasised above, this paper aims to verify the possible influence exerted by the local force of development of social capital within transaction relationships managed by start-ups located inside an industrial cluster. Several studies have examined how start-ups have a multiplicity of external relationships, encompassing suppliers, investors, universities and other organizations (Birley, 1985), underlining that these relationships have a significant and long-lasting impact on the survival and success of new firm (Larons, 1992). We preferred to contextualize the social capital asset inside the transaction relationships between start-ups located in an industrial cluster and their customers. In fact, various empirical evidence has indicated that the relationships between firms and customers have been deeply modified over time (Von Hippel, 1978), becoming more and more complex and articulated in form and content, in order to acquire the frequent, personalized contacts based on mutual trust (Dyer, 1996; Deeds, De Carolis, & Coombs, 1999). Moreover, several studies have already verified that customer relationships are central to the core, value-adding activity of start-ups. Consequently, successful customer relationships are often critical to the survival and growth of such firms (Eisenhardt, Schoonhoven, 1996). In order to verify the impact of local force factor on the development of social capital embedded in transaction relationships between start-ups located inside a cluster and their customers, we have formulated three following propositions of research.

Normally, studies identify the peculiarity of a cluster as the result of the high concentration of actors linked by strong cultural homogeneity and familiarity in a given local area, where strong closed social networks can to create the trust necessary to encourage profitable social-economic forms of collaboration. In fact, start-ups located in this area are characterized by a dense network of social and personal relationships, which influence the course of economic transactions and the creation of social capital (Coleman, 1990). This is seen as a strategic resource which can strengthen cooperation between economic actors and so the formation of stable and long term relationships.

If the cluster is considered a favorable environment for the development of relationships of trust among the actors embedded in this context, we can conclude that local actors prefer to conclude the greatest possible number of exchanges with each other. Moreover, they probably consider the actors who are external to the cluster as threats to the economic equilibrium of the system or even a deviation from the ideal type (Lin, Cook, Burt, 2001). In fact, the literature on clusters suggests that informal, unplanned, face to face, oral communication normally characterizes the management of economic relationships between co-located actors. It is precisely in this type of communication that geographic concentration provides a distinct advantage and differentiates inside and outside relations (Maskell, Malmberg, 1999). A local culture with specific norms, values, and institutions makes it possible to transfer tacit forms of knowledge from one actor to another within a cluster and not from actors belonging to external context.

In this way, we suppose that proximity between actors may continue to represent an important factor in the creation of social capital, formulating the following hypothesis of research:

Hypothesis 1: The level of social capital embedded in relationships between start-ups and customers can be positively associated with the customers' location inside the cluster and negatively with the customers' location outside it.

According to the theoretical literature discussed above, we can affirm that the start-up process is not autonomous and isolated in comparison with the production geographical context in which the new enterprise had been, but it is inserted in a dense network of existing social relationships (Gulati, 1999). Since in the start-up phase, the personal and social networks of the entrepreneur coincide with the social networks of the firm, we can suppose that the level of social capital of the start-up is directly referable to one or more critical factors associated with the entrepreneur. This means that the strong ties already established by the “nascent entrepreneur” (Aldrich, 1999), if conceived in instrumental terms, can represent a valid starting point as the network’s start-up structure, but they can also represent an important asset for a start-up and they can represent a solid base of credibility and trust for the new entrepreneur. As regards, studies generally emphasise that the entrepreneur from the cluster or at any rate from extremely bordering areas could already have established before the new entrepreneurial activity a lot of profitable personal connections and relationships with important local actors, such as customers or suppliers to the new firm. These arguments are strengthened by high large number of studies (Shane & Venkataraman, 2000), that emphasise the inertia of entrepreneurs in the choice of location of a new business, confirming how people undertake new entrepreneurial activities in the area of origin or in which they have already worked, really because of the geography of the social structure (Thornton, 1999). For this, we can formulate these two following hypothesis of research:

Hypothesis 2: The level of social capital embedded in the relationship between start-ups and customers can be positively associated with the number of years the entrepreneur has lived inside the cluster before undertaking this activity.

Hypothesis 3: The level of social capital embedded in the relationship between start-ups and customers can be positively associated with the origin of entrepreneur inside the cluster.

Methods

Sample and Data

The principles underpinning our identification of industrial clusters, coherently with the formulated research hypothesis, are: 1) presence of positive rates of creation of new firms 2) opening of the cluster toward the outside 3) search for a sector where the problem of knowledge transfer is considered complex and linked to tacit systematic know-how and therefore of difficult transferability; this situation brings different actors to set up strong and long lasting business relations based on high levels of mutual knowledge

After a detailed investigation of the local area in Italy, we chose to analyze this research problem within the metropolitan high-tech cluster in Rome, called the Tiburtina Valley. This territory is characterized by a large concentration of firms, with significant technological capabilities and a high-performing competitive presence both on national and foreign markets. As in Silicon Valley, the high-tech Roman firms in this restricted urban context gave rise to a homogenous-type agglomeration. It represents the most typical example of metropolitan cluster in Italy, being characterized by productivity ratios greater than those at a national level. The high-tech cluster is localized along the Via Tiburtina route, about 14 kilometers from the center of Rome and has a total area of 70 ha.

About 1200 small and medium-sized firms in the ICT sectors, which employ around 20,000 workers, belong to this cluster. According to data collected during the year 2000 by the Chamber of Commerce of Rome, the Tiburtina Valley in reality contains three different clusters 1) electronic's sector (397 firms); 2) media sector (220 firms) 3) new economy sectors (583 firms). Among these three different clusters, we preferred to devote our attention in particular to the electronic's one, which, according to the definition by ANIE (National Federation Electronics Firms), is constituted by the computer industry, electronics in narrow sense and of telecommunications. Using SITC classification codes, the electronic's sector is constituted by firms specialized in the production of components and electronic tools, of precision and

automation instruments; the computer industry by the manufacturing firms of software and data processing programs, but also consulting firms; the telecommunication's sector by firms manufacturing cables, electric conductors and different types of telecommunication's equipment.

We preferred to analyze these three sectors, which form the basis of electronic cluster for several different reasons. The Roman firms linked to the three sectors are of considerable importance in the Italian economy, as is shown by the fact that since the end of the eighties the Tiburtina Valley has been recognized as the third most important Italian industrial conglomeration in the field of electronic's. Moreover, we remarked that the electronic's cluster was the one with the highest rates of entrepreneurial development in recent years, in comparison to the average for the whole high-tech cluster located there (Unione Industriali di Roma, 2001).

Using the data bank of the Chamber of Commerce of Rome, we saw that from 1985 to 2000 120 firms in the high-tech electronic's sector strated up of which fewer than sixty have survived. We focused on young firms because such firms have been thought to benefit or suffer most from key external relationships (Eisenhardt, Schoonhoven, 1996). So, we excluded the firms with more than 10 years of life, according to previous research on entrepreneurial firms (Covin, Slevin, 1990); in this way, we identified a total of 54 start-ups. Before starting the empirical research, we did a preliminary detailed exploratory study through free interviews with selected actors of the cluster, so that we could reconstruct at least from a qualitative prospective the map of the relationships among the principal actors working there.

In the choice of the tool with which to do our empirical data collecting, we were conditioned by aims of standardization and uniformity, which underpin our research. We used a set questionnaire in the closed question-answer form, which we previously tested randomly on 3 sample firms and then we drew up face- to- face interview sheets for entrepreneurs. The form has 20 questions and is divided into three different sections: the first aims to analyze the structure of firm and the profile of entrepreneur; the second is focused on the relationships between firms and

their customers, both at a qualitative and quantitative level; the third aims to ascertain the level of social capital in these economic networks. To identify the subject to be interviewed, we were helped by the limited size of the sample firms and also by the previous review of the cluster phenomenon. We collected data from the entrepreneur's answers, which can be considered representative of the whole start-up, according to entrepreneurship literature which conjectures that during the first step in the life cycle of a firm the personal and social networks of the entrepreneur normally coincide with the total network of the start-up (Bird, 1989).

Table 1 presents descriptive statistics for our sample. On average, firms in the sample were about five years old, realized about 400 billion of Euro in annual revenue, have 6 employees and spent about 14% of their revenue on R&D. The total entrepreneurs of these firms origin from cluster for 55% and they are on average about 45 years old. The customers of these start-ups are localized inside the cluster only for 48%.

Table 1: Descriptive statistics of the sample

	Age in years of firms (mean)	Sales (billion of Euro), mean	Employees (mean)	R&D expenditure as % of sales (mean)	Age in years of entrepreneurs (mean)	Localization of customers	Origin of entrepreneurs
N= 48; 211	5	400	6	14%	45	48% inside cluster 52% outside cluster	55% inside cluster 45% outside cluster

Measures

Independent variables. In this analysis, we have measured the local factor force according to two different dimensions: proximity/distance among the actors involved in the economic transactions

– start-up and customers- and sense of affiliation of the entrepreneur to the cluster. Basing ourselves on previous analytical review, we suppose that variable “number of years lived inside cluster” (HP 2) and “origin of entrepreneur” (HP3) may be the optimal proxy of affiliation of the entrepreneur to the cluster where firms are developing; while the variable “localization of customers with respect to start-ups inside the cluster”, can be seen as a positive measure of proximity/distance of relations (HP1).

We have calculated the variable “localization of customers with respect to start-ups inside the cluster”, basing on the physical distance between start-ups and customers, expressed in the kilometric values, which we have computed as the logarithmic transformation. Therefore to higher values it corresponds a higher distance among protagonists

Also for the variable “number of years lived inside cluster” we have preferred to use the values obtained by the logarithmic transformation, moreover in order to measure the effect of variable “origin of entrepreneur” we computed a dummy-coded variable, where “1” means inside cluster, and “0” outside cluster.

Social capital construct. To measure the social capital we have based ourselves on a personal elaboration of the framework developed by Nahapiet and Ghoshal (1998), integrated by a recent study of Yli-Renko, Autio, Sapienza (2001), in which this concept is analyzed according to the three following dimensions: 1) structural, constituted by the social ties between different actors and by the location of a single actor in the complex social structure (Burt, 1992) 2) relational, which describes the type of personal relationships that the single actors develop with other external actors through continuous interactions over time, giving particular attention to feelings of respect and trust (Krackhardt, 1996; Nooteboom, Berger, & Noorderhaven, 1997) 3) cognitive, which has built on the resources got through the sharing of codes, paradigms and languages, that permit one to facilitate the understanding of common goals among partners and to drive the way of acting in the social system (Brass, 1994).

We have proceeded in the following way to make the social capital concept measurable in empirical terms. First of all, we divided this concept into different possible dimensions of analysis, which we analyzed through the following two indicators: a) network ties between start-ups and customers, concerning the structural dimension of social capital; b) relationship quality, concerning both cognitive and relational dimension, according to the literature about social capital and trust (Uzzi, 1997; Tsai & Ghoshal, 1998), which supposes that the sharing of common aims among partners in a relationship can be facilitated by the development of trust, which in turn is simplified by the frequent social interactions.

Second, we measured these two different indicators through a series of adequately selected variables. For measuring network ties, we used two following variables: 1) number of new economic ties useful for the development of start-ups 2) level of relevant information embedded in every relation. In this logic, we consider networks with customers to be a possible source of social capital if they can create meaningful links between the firm and the broad market (Lane & Lubatkin, 1998), but also if they reinforce the image and reputation of firms as young enterprises (Eisednhardt & Schoonhoven, 1996). Moreover, customers can be considered as a source of social capital if they allow the firm to obtain important new useful information in the life of a start-up, corroborating the hypothesis based on different studies which considers that inter-personal ties can have a fundamental role in the process of spreading of important information, which therefore is a valuable but scarce resource.

We have measured relationship quality through two following variables: 1) Level of personal knowledge between firms and customers (Tsai & Ghoshal, 1998; Yli Renko et al., 2001); 2) Level of trust within a network, which is measured in the following four ways: a) sharing of common expectations and aims; b) lack of opportunistic behavior; c) creation of common investments (commitment); d) development of informal relationships. In this perspective, the relationship quality between firms and customers seems to depend on the way and the intensity with which participants develop common aims or create mutual expectations.

The social capital, as a resource, pushes the different actors in an economic relationship to expect some positive results from these transactions. It permits people to minimize opportunistic behavior and consequently to reduce the costs caused by the activities of control and monitoring. In fact, according to Larson (1992), it is possible to remark that relationships based on trust permit firms to reduce time by giving up monitoring and bargaining over agreements, so to encourage strong investments in the absorption and use of knowledge (Barney & Hansen, 1994; Lane & Lubatkin, 1998). Other studies have found that relationship quality allows the actors involved in an economic transaction to act in an informal way, without explicit and detailed contracts but through social norms based upon mutual expectations (Nooteboom et al., 1997).

The last step is represented by the selection of a series of items to measure the chosen variables, according to a personal elaboration of a study by Yli Renko et al. (2001). In fact, we measured the variables 1) number of new economic ties useful for the development of start-ups and 2) the level of important information embedded in every relation through 9 total items, while for the variables 1) level of personal knowledge between firms and customers 2) level of trust within a network, we used a total of 22 items. All items were measured on a seven-point Likert-type scale. Figure 1 summarizes the different steps used in this paper to measure the social capital as a strategic and organizational asset.

Figure 1: The social capital as a strategic and organizational asset

Control variables. Research on social capital has shown that the development of durable social ties of a focal actor such as a start-up can be strongly influenced by total number of economic partners and by duration of each relation.

In fact, several traditional studies assume that, with the increase of the period duration when two partners are tied to each other also the intensity and the strength of the tie increases , generating a growth of social capital. Due to the ambiguity in empirically established relationships between duration of relation and development of social capital, we included it as a control by computing the logarithmic transformation of this relation's duration at the end of 2002.

Furthermore, in the studies it is assumed that the lower is the number of protagonists involved in interaction the stronger are the ties which can be set up and, as a consequence, the social capital embedded in these networks gets a higher growth.

Therefore, the relation duration and the overall number of involved ties may influence the social capital development, independently of the effect and power due to the local force. At last, another important factor could be the dimension of partners involved in a relation. While this causes minimum variance levels for the sample start-up (Tab.1), it could negatively affect the validity of the achieved results related to the customers. In fact, higher dimensions customers could more easily create profitable relations to the higher amount of material and not material resources they could invest, but at the same time could make use of more formal relations. We used the customer dimension as a control variable, measured through the revenues (in average) and the number of total employees.

Reliability, validity and data analysis

We collected data entirely through face-to-face interviews with 48 out of 54 firms from an identified statistical population, for a response rate of 88%. This process of data collection lasted about 10 months. The total number of customers for whom we established the relational maps of the start-ups in the sample was 211, which is the sum of all the customers spontaneously listed by the 48 entrepreneurs. Rather than imposing a numerical limit, we preferred to leave the entrepreneurs free to quote their more important customers, imposing only a maximum number of 10.

We took several steps to ensure valid responses and to check that our measures were reliable. The reliability of the measures of social capital is demonstrated in the fact that Cronbach alphas are all 0.72 or higher, indicating strong internal consistency. Multiple item measures also enhance the content coverage for constructs.

A confirmatory factor analysis (CFA) was estimated on the 22 items measuring different dimensions of social capital. This model constrained each item or variables to load only on the factor for which it was a proposed indicator and permitted no correlations in the error structure. We employed the eigen value >1 rule to establish that only one factor is represented in each set of

items. Also, any items with an item-total correlation of below 0.30 were excluded, as were items loading on different factors. Overall, results of this analysis indicated that the five-factor structure was a good fit to the data ($\chi^2=531.45$, $\chi/df=2.37$, goodness-of-fit index (GFI)=.92, confirmed fit index (CFI)=.94, and root-mean-square residual (RSMR)=.04. We acknowledge that decision to use subjective measures to study social capital raises a concern that the relationships between the dependent and independent variables could be attributable to common method variance. Really, the results of the CFA suggest that common method variance was not overly influencing the results. Moreover, we assess its potential impact with another additional analyses. The first was a factor analysis of the independent and dependent variables. We extracted the first factor, which should contain the best approximation of common method variance. We then reanalyzed the relationships between the independent and dependent variables after “partialing out” the variance accounted for in the first factor. After conducting this procedure we found that both the nature and significance of the results remained unchanged. Taken together, this second analysis, combined with the CFA results, suggest that common method variance was not operating at a level that would invalidate the findings.

We employed hierarchical regression analysis in order to test our hypotheses. This approach assesses the direct and interactive effects of the predictor variables.

Results

Measurement model

Table 2 summarizes the results of confirmatory factor analysis on the measurement model. The measurement items (social capital) for each factor are presented with the standardized factor loadings and their associated Z-statistics. The composite reliabilities and the variance extracted are also reported. As the factor loading indicate, the measurement model performed very well, because all of the constructs demonstrate good internal consistence and, hence, reliability. In fact, the standardized factor are all above the recommended minimum of 0.40 (Ford et al., 1986).

The composite reliabilities are all above the recommended minimum of 0.70. The average variance extracted range from 0.51 to 0.75.

Table 2: Measurement model

Factor name	Measurement item	Standardized loading	Z-statistics	Composite reliability	Average variance extracted
Relational and cognitive dimension of social capital	We maintain close social relationships with this customer	0.73***			
	We know this customer's people on a personal level	0.71***	3.43		
	In this relationship both sides avoid making demands that can seriously damage the interests of the other	0.52			
	In this relationship neither side takes advantage of the other even if the opportunity arises	0.82***	5.80		
	This customer always keeps its promises to us	0.68***	6.23		
	We've never been afraid of losing contacts with a certain customer	0.51	2.34		
	The transaction with this customer is based on usual procedures without very formal agreement	0.81***	5.90		
	We take into consideration the order of this customer even if we haven't still received his formal request	0.62***			
	We send our products to this customer before receiving the entire payment	0.51			
	We never have financial problems with this customer	0.73***	9.81		
	We frequently have relationships with this customer	0.56			
	This customer is a relative of the entrepreneur or of someone who works in the firm	0.53			
	We met this customer already before the start of our firm	0.88***	9.32		
	We met this customer already during our previous work experiences	0.71***	9.40		
	This customer often come in our head office even if there isn't an economic or work reason	0.69***			
	We meet this customer more frequently during extra-working situations rather than professional situations	0.53			
				0.72	0.55

Structural dimension of social capital	We have got new customer contacts through this customers	0.80	7.12		
	This customer has opened the doors of other customers for us	0.92***	7.74		
	We have got new contacts (suppliers, employees) through this customer	0.77***	9.67		
	We have got useful information from this customer for the development of new products	0.58			
	We have got the support of this customer during the achievement of new patents	0.61***	8.55		
	This customer has been very useful during the launch of a new product	0.56			
				0.84	0.74

Table 3 presents descriptive statistics and the zero-order correlation for all variables. The relational-cognitive dimension of social capital is highly positive related to origin of entrepreneur inside cluster ($p<.001$) and to number of years lived inside cluster before start the new firm ($p<.001$). Moreover, this variable is highly positively related to proximity between partners of relationships ($p<.001$): it begins to degree as the distance increases between customers and start-ups. The structural dimension of social capital is highly negatively positive related to proximity between partners ($p<.001$) but it is highly negative related both to origin of entrepreneur inside cluster and to number of years lived inside cluster ($p<.001$). Moreover, from this table we can see that two chosen variables to measure the local force impact to respect to “sense of affiliation” are highly and significant correlated ($r=0.52$; $p<.001$), while the other measure of local force, that is the variable “proximity between actors” is positively related to these two variables but in a lesser extent ($p<.01$). Than, as we can attend, two different dimensions of social capital are highly and positively correlated ($r=0.88$; $p<.001$),

Table 3: Means, standard deviations, and correlations[^]

Variables	Mean	s.d.	1	2	3	4	5	6	7
1.N°of total customers	4.55	3,22							
2Duration of relation	5,12	2,90	.01						
3 Size of customers: Total employers Total revenues (average)	35 500,00 (E)	28,12 323,45 (E)	.03 .05	.08 .01					
4Origin of entrepreneur			-.08	.16	.11 .14				
5 N°years lived inside cluster	4,80	3,87	-.13	.15	.13 .04	.52***			
6 Proximity	4,45	2,32	-.06	.17	.04 .05	.32**	.30**		
7 Relational-cognitive dimension of social capital	3,23	3,12	-.08	.28**	.12 .02	.88***	.74***	.53***	
8 Structural dimension of social capital	3,55	3,21	-.011	.26**	.25** .29**	-.30**	-.53***	-.55***	.88***

[^] N=48

* $p < .05$

** $p < .01$

*** $p < .001$

These results are strongly confirmed by hierarchical regression analysis. We have realized two different regression analyses. In the first (Table 4), only the cognitive-relational dimension of social capital was our dependent variable. The blocks of control and independent variables were then entered into the regression equations one a time. The three control variables – duration of relation, number of total customers, dimension of customers – were entered first to control for any extraneous effect. In step 2 we added the two variables that measured the independent dimensions of our model in relation to “sense of affiliation” (origin of entrepreneur, number of

years lived inside cluster). In step 3 we added the independent variable “proximity”. Since there was no theoretical rationale for determining the order of entry of the independent variables, there was no need to use any preordered sequence.

Table 4: Regression Analysis for relational-cognitive dimension of social capital^{^^}

VARIABLES ENTERED	STEP 1 Control	STEP 2 Sense of affiliation (two variables)	STEP 3 Distance between actors (one variable)
1.N°of total customers	.11 (.19)	.03 (.09)	.01 (.09)
2.Duration of relation	.25** (.15)	.28** (.12)	.31** (.10)
3. Size of customers	.08 (.11) .07 (.08)	.05 (.10) .04 (.07)	.03 (.08) .05 (.04)
4 Origin of entrepreneur		.90*** (.09)	.65*** (.08)
5 N°years lived inside cluster		.75*** (.05)	.51*** (.05)
6 Proximity			-.65*** (.07)
R ²	0.23	.723	.804
VarR ²		.776	.850
F	0.41	40.21***	45.72***

^{^^} Standardized regression coefficients are shown. Standard errors are in parentheses.

The results presented in Table 4 in relation to only relational-cognitive dimension of social capital are consistent with the prediction of Hypotheses 1. Our first hypothesis predicted that a strong proximity between actors would be positively related to social capital. Table 4 adds further support to the positive and significant correlation between the two variables presented in Table 3. The beta coefficient of distance in the full model is in the predicted direction, and is statistically significant ($p < .001$). The results presented in Table 4 are consistent with the prediction both of Hypotheses 2 and of 3, in relation to relational-cognitive dimension of social capital. In fact results of the regression analysis add a great support to the positive and significant

correlation between these two independent variables and the relational and cognitive dimension of social capital, as we can verify through the related beta coefficient.

This model is significant at the $p < .001$, $F = 45.72$, $R^2 = .80$) and the addition of variable measuring the proximity between actors yield a great improvement, explaining an additional and significant percentage of variance over that explained by the control variables and the “sense of affiliation” variable. Also the change in the F-statistic is significant. An interesting result is the role played by the duration of relation in every step of the model. When added as a control variable in the model, duration of relation is positively related with social capital for the relational-cognitive dimension ($p < .01$), especially in step 3 when “proximity” variable is entered. On the contrary, number of total customer of a single firm, a variable that is salient in many studies of strategic management, is not significant in our research. It does not affect the studied dimension of social capital. Same conclusions apply for the customer dimension variable

In the second regression analysis (Table 5), the structural dimension of social capital is our dependent variable. Once again, we initially regressed our control variables against structural dimension of social capital (step 1). In step 2 we added the block of variables from the “sense of affiliation” perspective. We then entered the “proximity” variable in step 3.

Table 5: Regression Analysis for structural dimension of social capital^{^^}

VARIABLES ENTERED	STEP 1 Control	STEP 2 Sense of affiliation (two variables)	STEP 3 Distance between actors (one variable)
1.N°of total customers	.11 (.16)	.08 (.06)	.07 (.05)
2.Duration of relation	.18* (.13)	.17* (.11)	.21* (.13)
3. Dimension of customers	.22* (.11) .20* (.08)	.29** (.15) .21* (.11)	.27** (.12) .29** (.18)
4.Origin of entrepreneur		-.88*** (.19)	-.55*** (.09)
5. N°years lived inside cluster		-.72*** (.07)	-.58*** (.06)
6. Proximity			.85*** (.07)
R ²	0.23	.723	.804
VarR ²		.776	.850
F	0.41	40.21***	45.72***

^{^^} Standardized regression coefficients are shown. Standard errors are in parentheses.

The results presented in Table 5 in relation to only structural dimension of social capital does not provide support for our hypothesis and in this way they add further support to the different correlations shown in Table 3.

Our first hypothesis predicted that a strong proximity between actors would be positively related to social capital. The negative and statistically significant association reported in Table 3 between proximity and structural dimension of social capital is confirmed by the regression analysis in Table 5, and therefore this first hypothesis, in relation to only structural dimension, should be rejected: as the distance increases between customers and start-ups this dimension begins to grow. The beta coefficient of distance in the full model is in the opposite predicted direction, and is statistically significant ($p < .001$). Moreover, the results presented in Table 5 are opposite with the prediction both of Hypotheses 2 and of 3, in relation to structural dimension of social capital. In fact results of the regression analysis shows a negative and significant

correlation between these two independent variables and the structural dimension of social capital, as we can verify through the related beta coefficient.

This model is significant at the $p < .001$, $F = 55.72$, $R^2 = .80$) and also in this way the addition of variable measuring the proximity between actors yield a great improvement, explaining an additional and significant percentage of variance over that explained by the control variables and the “sense of affiliation” variable. Also the change in the F-statistic is significant. Also in this way, an interesting result is the role played by the duration of relation in every step of the model. The effects of this control variable is reduced in comparison to the effects played on the relational-cognitive dimension of social capital, as above seen, but it does not lose its significance ($p < .05$). Also for the structural dimension, the variable “number of total customer of a single firm” is not significant in our research and it does not affect this dimension of social capital. On the contrary an interesting result is the influence of the dimensions of customers, which seems to play a strong role on the structural dimension of social capital.

Discussion

The data provide mixed support for our hypotheses. In fact, on the base of these data, we can formulate some conclusions, partially verifying the research hypotheses.

Hypothesis 1: Location of customers and social capital (proximity/distance)

As the distance increases between customers and start-ups, we can see that the structural dimension of social capital begins to grow and that relational and cognitive dimensions begin to decrease.

Hypothesis 2: Origin of entrepreneur and social capital

Data confirm that the origins of the entrepreneur from the cluster is positively linked to very important levels of social capital in the relational and cognitive dimensions and it is negatively linked to levels of the structural dimension of social capital. On the contrary, the origins of the

entrepreneur from outside the cluster is associated with negative levels of social capital in the relational and cognitive dimensions and is linked to positive levels of the structural dimension.

Hypothesis 3: Number of years lived inside industrial cluster and social capital

As the number of years lived by the entrepreneur in the cluster before beginning the start-ups increases, the relational and cognitive dimensions of social capital grow but the structural dimension begins to decrease. On the contrary, a small number of years lived by the entrepreneur in the cluster before developing the new enterprise, is associated positively with the structural dimension and negatively with the relational and cognitive one.

If we consider these three variables contemporaneous, measuring the local force impact as discussed, we can affirm that:

1) Considerable local factor impact is associated with positive levels of relational and cognitive dimensions of social capital. Indeed, firms of our sample generally create very informal networks with their business partners, characterized by mutual trust and very close levels of personal knowledge. As soon as a such factor decreases in importance, also this dimension of the social capital decreases: the partners begin to formalize their relationships and they do not superimpose their personal and working spheres with so much frequency. Perhaps, these results can be explained by the strong influence exercised by the dimension of customers (control variable) on the structural dimension of social capital, which normally growth when the size of customers begins to growth. In fact, studies hypotize that dimension usually involves a great formalization and depersonalization of relationships (Williamson, 1985)

2) a considerable local factor impact is negatively associated with the structural dimension of social capital. Indeed, as soon as this element decreases in importance, exchange of important information begins to grow, becoming much more detailed: the relationships of these firms are

based on continuous detailed exchange of knowledge and normally they are not limited only to the purely commercial sphere.

On the basis of the results obtained, we can formulate the same remarks. The collected data show how the process of diffusion and circulation of value information seems hindered by a strong incidence of local factor, while it seems to benefit by the opening of firms towards the outside, in contrast with most traditional literature on the clusters and on social capital. The results obtained, rather, confirm what is upheld in the most recent studies on location and innovation (Malmberg & Maskell, 2002), which underline the existence of information redundancy inside so much closed local contexts and consequently of inertia mechanisms in processes aiming for radical strategic and organizational change. In this sense, we can explain the links between the structural dimension of social capital and high local factor impact, according to Uzzi (1997), who has pointed out the possible existence of overembeddedness in strong and closed networks. This author, on the basis of various empirical evidence that have shown that excessively closed relationships can isolate small firms from external sources of knowledge and information (Dyer & Sing, 1998), has concluded that high levels of social capital are not always able to foster knowledge exchange (Nahapiet & Ghoshal, 1998). Redundancy of information is the direct consequence of the creation of coexistent and structurally equivalent connections. Indeed, people linked by strong networks have the same sources of information, although they bring the immediate advantage of development of trust and the decrease of transaction costs related to the management of business relations.

Conclusions

These results certainly allow us to deny the hypothesis that a strong connection with the local context is always able to impact positively on the development of social capital in transaction relations between start-ups in a cluster and their customers. Due to the different results achieved

depending on the consideration of the two dimensions of social capital, it is more effective to keep these two dimensions as independent factors and not to consider social capital as a single entity.. In this sense, entering into the still open debate of studies on the possible dualism between strong (Coleman, 1990) and weak networks (Granovetter, 1973; Burt, 1992), our research shows that both these network typologies are of value and can be considered sources of social capital, but with different aims and purposes. Indeed, if we consider the relational and cognitive dimensions of social capital, we can see that strong social networks are particularly useful in favoring the carrying out of profitable economic transactions among similar actors and belonging to the same economic context of origin. Normally, these strong networks allow a firm to obtain the important advantage of reducing control and coordination costs and of developing trust and confidence in partners. (Larson, 1992).

On the contrary, if we divert our attention on the structural dimension of social capital, we can remark that weak social networks simplify the management of economic transactions between actors belonging to different social and economic contexts. Indeed, these networks permit a firm to access new sources of information and to give preference to intensified knowledge transfer processes. In our opinion, it seems more opportune not to consider social capital as an abstract generic concept, but as a multidimensional factor, which needs to be broken down to its different constitutive dimensions, considering that different results obtained according to which dimension is analyzed. This conclusion is very important because it supports at an empirical level several hypotheses formulated in recent research into this subject, which emphasise that social assets can impact on the performance and management of relationships between partners in different ways and not always in a positive way (Uzzi, 1997).

Moreover, if we concur with the idea, which has merged from the present paper that the development of two different dimensions of social capital depends on the different level of intensity of local force, we must consider that management of this asset within a cluster is characterized by a trade-off between costs and benefits. Indeed, start-ups inside clusters in their

networks with customers would be found in a situation of trade-off between reliability of the relationship (trust, absence of opportunistic behavior, limited need for control processes (Baker & Obstfeld, 1999) – and effectiveness of the relationship (widening of networks, greater transfer of knowledge and important information (Granovetter, 1973; Lin, 2001).

In the case of very positive levels of the structural dimension of social capital – connected with a scarce incidence of local factor- these actors would probably find themselves managing effective but not reliable networks. On the contrary, in the case of significant relational and cognitive levels of social capital – connected with strong impact of local factor- the actors would be in the opposite situation, that is, they would have to manage effective but very reliable networks. Thus, if start-ups located in a cluster aim to obtain control, maintenance and stability in their business relations they could focus their efforts towards widespread penetration of the local market. But if they are interested in widening their business economic relations and in exploiting short-term opportunities, the start-ups could looking for some autonomous or alternative ways of development to those typically employed inside their local context of origin (industrial cluster).

Implications, limitations and future directions

Our findings can offer some interesting reflections in the field of research into the social capital and clusters. Firstly, whereas past research has focused on social capital as a macro-level concept in industrial networks (Burt, 1992) or as a micro-level concept within organizations (Moran & Ghoshal, 1996; Tsai & Ghoshal, 1998), ours proofues that the concept of social capital is applicable also to inter-organizational strategy according to a recent study (Yli Renko et al., 2001). Secondly, as pointed out above, while previous research has often analyzed only a single dimension of social capital, our results indicate that it is better to divide this concept into two different dimensions, since we reached opposite conclusions according to whether we considered the structural or the relational and cognitive dimension Furthermore, we showed that the

management of business relations between start-ups and customers located inside industrial clusters can be facilitated through possession and exploitation of such an intangible asset as social capital, which can become a profitable source of competitive advantage, but only if carefully managed by individuals.

Various limitations characterize our research. We have collected data from inside a high-tech cluster located in central Italy and the choice of this sector and of this specific geographic location may limit the applicability and the generalization of our results also in other contexts. Indeed, as the studies point out, learning is a process embedded in a specific social, cultural and physical setting (Hakansson, 1982; Von Hippel, 1978). So, Italy being a relatively small country it makes proximity to the key customer more likely and so it may enhance the potential for social relational effects (Dyer & Sing, 1998). Indeed, since our sample presents high technological innovation rates and considerable levels of R&D investments without industry- and country-specific variables of control, it's difficult to generalize our results to a broader sample. Moreover, the relatively young age of these firms and the lack of suitable resources are probably two factors which foster the creation of external relations and the growth of start-ups.

Last, two other very important areas deserve further attention. In our opinion, it could be useful to extend the analysis through the construction of a model which links the impact of local factor force with the growth and the development of start-up, considering social capital as an intermediary explanatory variable. In this sense, on one hand it might be interesting to verify if it is the presence of social capital between two actors that favors greater involvement in purely business networks or if rather it is the creation of certain types of business agreements between the partners that determines the creation of social capital. This means answering two following research questions: "I trust this customer and therefore do I have the tendency to stipulate some R&D agreements with him?" or "I have shared some R&D activities with this customer and therefore do I trust him?". Further analysis is finally needed to investigate the possibility of using the social network analysis to verify the possible influence between the structure of networks and

the formation of social capital. However, this implies not focusing on the social capital as a relational asset, as we have done in this paper but rather hypothesizing the location of an actor in a network as the key of the social capital (Burt, 1992). It involves using several different statistical measures such as the density, the centrality and the closing of relations.

References

- Aldrich, H. 1999. *Organizations Evolving*. London: Sage Publications.
- Aldrich, H., & Zimmer, C. 1986. Entrepreneurship through social networks. In D.L. Sexton & R.W. Smilor (Eds), *The art and science of entrepreneurship*: 3-23. Cambridge: MA. Ballinger.
- Baker W., & Obstfeld, D. 1999. Social capital by design: structures, strategies and institutional context. In R.Th.A.J.Leenders & S.M. Gabbay (Ed.), *Corporate social capital and liability*: 88-105. Boston: Kluwer.
- Barney, J.B., & Hansen, M.H. 1994. Trustworthiness as a Source of Competitive Advantage. *Strategic Management Journal*, 15: 175-190.
- Bird, B.J. 1989. *Entrepreneurial behavior*. USA: Scott, Foresman and Company,
- Birley, S. 1985. The role of networks in the entrepreneurial process. *Journal of Business Venturing*, 1: 107-117.
- Bourdieu, P. 1983. The Form of Capital. In J.G. Richardson (Ed.), *Handbook of theory and research for the sociology of education*: 241-258. New York: Greenwood.
- Brass, D. 1994. A social network perspective on human resources management. In G.R. Ferris (Ed.), *Research in personnel and human resources management*: 39-79.
- Burt, RS. 1992. *Structural holes: the social structure of competition*. Harvard University Press. Cambridge, MA.
- Coleman, J.S. 1990. *Foundations of social theory*. Harvard University Press.
- Covin, J.G., & Slevin, DP. 1990. New venture strategic posture, structure, and performance: an industry life cycle analysis. *Journal of Business Venturing*, 5: 123-135.
- manufacturing industries. *Regional Studies* 36: 333-344.
- Deeds, D.L., De Carolis D., & Coombs, J. 1999. Dynamic capabilities and new product development in high technology ventures: an empirical analysis of new biotechnology firms. *Journal of Business venturing* ,15: 211-219.

- Dubini P., & Aldrich H. 1991. Personal and extended networks are central to the entrepreneurial process. *Journal of Business Venturing*,6: 305-313.
- Dyer, J. H. 1996. Specialized supplier network as a source of competitive advantage: evidence from the auto industry. *Strategic management Journal*,17: 271-292.
- Dyer, J.H., & Singh, H. 1998. The relational view: cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*,23: 660-679.
- Dyer, J.H., & Nobeoka, K. 2000. Creating and managing a high performance knowledge-sharing network: the Toyota Case. *Strategic Management Journal*, 21: 345-367.
- Edvison, L., & Malone, M.S. 1997. *Intellectual Capital. Realizing your company's true value by findings its hidden brainpower*. New York: Haperbusiness.
- Eisenhardt, K.M., & Schoohoven, C. 1996. Resource-based view of strategic alliance formation: strategic and social effects in entrepreneurial firms. *Organization Science*,7: 136-150.
- Friedman, R., & Krackardt, D. 1997. Social capital and career mobility. *The Journal of Applied Behavioral Science*,33: 316-334.
- Fukuyama, F. 1995. *Trust: social virtues and the creation of prosperity*. London: Hamish Hamilton.
- Gartner, WB. 1985. A conceptual framework for describing the phenomenon of new venture creation. *Academy of Mangement Review*,19 (4): 696-706.
- Ford, JC, McCallum, R.C., & Tait, M. 1986. The application of exploratory factor analysis in applied psychology : a critical review and analysis. *Personnel Psycology*,39: 291-314.
- Gordon, I.R., & McCann, P. 2000. Industrial clusters: complexes, agglomeration and or social networks? *Urban Studies*,37: 513-532.
- Grabher, G. 1993. The weakness of strong ties. The lock-in of regional development in the Ruhr area. In G. Grabher (Ed.), *The embedded firm. On the socioeconomic of industrial networks*: 255-277. London: Routledge.

- Granovetter, M.S. 1973. The strength of weak ties. *American Journal of Sociology*, 78: 1360-1380.
- Granovetter, M.S. 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology*, 91: 81-150.
- Gulati, R. 1999. Network location and learning: the influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal*, 20: 397-420.
- Hansen, M.T. 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 42: 82-111.
- Hakansson, H. 1982. *International Marketing and Purchasing of Industrial Goods: An Interaction Approach*. IMP Project Group. John Wiley and Sons
- Jacobs, J. 1965. *The death and life of great American cities*. New York: Penguin Books.
- Jarillo, J.C. 1989. On Strategic networks. *Strategic Management Journal*, 9: 31-41.
- Karagozoglu, N., & Lindell, M. 1998. Internationalization of small and medium sized technology based firms: an exploratory study. *Journal of Small Business Management*, 36: 44-59.
- Knoke, D. 1999. Organizational networks and corporate social capital. In R.Th.A.J Leenders, & Gabbay S.M. (Eds.), *Applied network analysis*: 195-222. Newbury Park. CA, Sage.
- Kogut, B., & Zander U. 1992. Knowledge of the firm. Combinative capabilities and the replication of technology. *Organization Science*, 3: 383-397.
- Krackhardt, D. 1996. The strength of strong ties: the importance of philos in organizations. In N. Nohria & R.G. Eccles (Eds.), *Networks and organizations: Structure, form, and action*: 261-289. Harvard Business School Press.
- Krugman, P. 1991. *Geography and Trade*. MIT Press, Cambridge.
- Lane, P.J., & Lubatkin, M. 1998. Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19 (5): 461-477.

- Larson, A. 1992. Network dyads in entrepreneurial settings: a study of the governance of exchange relationships. *Administrative Science Quarterly*, 37: 76-104.
- Lawson, C., & Lorenz, E. 1999. Collective learning, tacit knowledge and regional innovative capacity. *Regional Studies*, 33: 305-317.
- Leana, C.R., & Van Buren, H.J. 1999. Organizational social capital and employment practices. *Academy of Management Review*, 24: 538-555.
- Lin, N. 2001. Building a network theory of social capital. In N. Lin, Cook, K., & R.S. Burt. (Eds.), *Social Capital. Theory and research*. New York: Aldine De Gruyter.
- Lin, N., Cook, K., & Burt, R. 2001. *Social capital*. New York: Walter de Gruyter.
- Malmberg, A., & Maskell, P. 2002. The elusive concept of localization economies: towards knowledge based theory of spatial clustering. *Environment and Planning*, 34: 429-449.
- Marshall, A. 1920. *Principles of Economics*. London: MacMillan,.
- McDougall, P., Shane, S., & Oviatt, B. 1994. Explaining the formation of international new ventures: the limits of International Business Research. *Journal of Business Venturing*, 9: 469-487.
- Moran, P., & Ghoshal, S. 1996. Value creation by firms. *Academy of Management*. Best Paper Proceedings: 41-45.
- Nahapiet, J., & Ghoshal, S. 1998. Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, 23: 242-266.
- Nonaka, I. 1991. The knowledge creating company. *Harvard Business Review*, 69 (6): 96-104.
- Nooteboom, B. 2000. Learning by interaction: absorptive capacity, cognitive distance and governance. *Journal of Management and Governance*, 4 (1-2): 69-92.
- Nooteboom B., Berger, H., & Noorderhaven, N. 1997. Effects of trust and governance on relational risk. *Academy of Management Journal*, 40: 308-338.
- Porter, M.E. 2000. Location, competition and economic development: local clusters in a global economy. *Economic Development Quarterly*, 14 (1): 15-34.

- Porter, M.E.1998. Clusters and the new economics of competition. *Harvard Business Review*,76 (6): 77-90.
- Ring, P.S., & Van de Ven, A.H. 1994. Development processes of cooperative interorganizational relationships. *Academy of Management Review* 19: 90-118.
- Saxenian, A. 1994. *Regional Advantage. Culture and competition in Silicon Valley and Route 128*. Cambridge:Harvard University Press.
- Scott, A. 1998. *Regions and the world economy. The coming shape of global production, competition and political order*. Oxford: University of Oxford Press.
- Shane, S., & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25: 217.226.
- Thornton, P.H. 1999. The sociology of entrepreneurship. *Annual Review of Sociology* 25: 219-246.
- Tsai W., & Ghoshal S. 1998. Social capital and value creation: the role of intra-firm networks. *Academy of Management Journal*,41: 464-476.
- Uzzi, B. 1997. Social structure and competition in interfirm networks: the paradox of embeddedness. *Administrative Science Quarterly*, 42: 35-67.
- Venkataraman, S. 1997. The distinctive domain of entrepreneurship research: an editor's perspective. In Katz J. (Ed.), *Advances in Entrepreneurship firm emergence and growth* 3: 119-138. Jai Press, Greenwich, CT.
- Von Hippel, E. 1978. A Customer-Active Paradigm for Industrial Product Idea Generation. *Research Policy*, 7 (3):240-66.
- Williamson, O.E. 1975. *Markets and Hierarchies*. New York: The Free Press.
- Yli-Renko, H., Autio E., & Sapienza, H.J. 2001. Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic Management Journal*, 22: 587-613.