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**Trapped by over-embeddedness: the effects of regional
social capital on internationalization**

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Trapped by over-embeddedness: the effects of regional social capital on internationalization

1. Introduction

The reduction of national trade barriers and the use of efficient systems of communication and transportation have removed many of the obstacles that impeded the flow of goods in previous decades (Fernández and Nieto 2006). At the same time, the rise of information technology and the global telecommunication networks have enhanced the firms' possibilities to organize the trade of technical knowledge on a global basis (Kogut and Zander 1993). As a result, the internationalization opportunities are greatly increased and firms can not only participate in foreign markets setting up their products, but they can also exploit their technological advantages trading the proprietary knowledge to foreign organizations through international markets for technology (Chen 2005).

However, the conception of globalization raises questions about the continuing relevance of local contexts in affecting firms' behavior. Numerous contributions state that paradoxically globalization accentuates, rather than minimizes, the significance of the local context for firms' strategic decisions (Acs and Preston 1997). The characteristics of the home-region continue to exert a strong influence over international firms (Patel and Vega 1999). In particular, successful internationalizations require that firms leverage resources and knowledge of other organizations (Hara and Kanai 1994; Oviatt and McDougall 1994; Bell 1995). The characteristics of the social structure affects the flow of knowledge and defines the firms' possibilities to access to external resources that are locally embedded (Bonaccorsi

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1992; Welch and Luostarinen 1993). With regard to this, social ties play an important role in facilitating firms' internationalization (Coviello and Munro 1997; Ellis and Pecotich 2001; Lu and Beamish 2001; Harris and Wheeler 2005).

In this paper, we aim to contribute to the understanding of the home-region determinants of firms' participation in foreign markets. A central argument in this paper is that social capital is a geographically bound phenomenon (Putnam, Leonardi et al. 1993). Knowledge spillovers dissipate over distance as "walking to a meeting place becomes difficult or as random encounters become rare" (Rosenthal and Strange 2003: 387) and partners in innovation have to be able to travel back and forth quickly to solve any problem that can emerge in the process of collaboration (DeBresson 1996). This implies that the geographic extent of knowledge spillovers is bounded, but does not provide an explanation of the reasons for which some geographic locations have greater amounts of knowledge than others do. Almeida and Kogut (1999) underlined that the geographical differences in knowledge stocks can result from heterogeneity in sources for knowledge to spill over. Mobility of individuals is an important mechanism through which knowledge spreads (Pavitt 1984; Saxenian 1994; Almeida and Kogut 1999). However, even if there is not a direct mobility of individuals, information might spread through interpersonal networks (Kogut and Zander 1996; Zucker, Darby et al. 1998; Shane and Cable 2002; Stuart and Sorenson 2003; Uzzi and Lancaster 2003). Information and knowledge spillovers require frequent contact between people and one of the sources for knowledge spillover is the links among actors (Almeida and Kogut (1999; Rosenthal and Strange 2003). This statement emphasizes the basic role of social interaction and relational resources.

We follow Woolcock and Narayan (2000: 226) in defining social capital as being "the norms and networks that enable people to act collectively". In particular, we analyze the role of regional social capital in defining the internationalization possibilities by distinguishing between internationalization of goods, measured as firms' export performance, and internationalization of knowledge, measured as firms' participation in international markets for technology. To the best of our knowledge this paper is the first study that examines these relationships. We hypothesize that a degree of home-region social capital will increase both the internationalization of goods as well as the internationalization of knowledge, but that beyond a certain level of social capital, firms will become over-embedded in the region and the degree of internationalization will decrease from that point. Furthermore, we conjecture that firms' investment in R&D — in various ways — moderates

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the relationship between home-region social capital and the degree of internationalization for goods and knowledge.

Empirically, we use data collected by the Italian Institute of Statistics (ISTAT) on 1999 to explore the differences in the level of social capital within Italian regions. We select eleven variables that identify individual strong ties (e.g. friendships ties) social participation (e.g. participation in voluntary associations) and political participation (e.g. participation in political parties). Merging data on social capital with a large dataset of Italian manufacturing firms, we find that social interaction component of social capital is curvilinearly (taking an inverted U-shape) related to firms' internationalization of goods and firms' internationalization of knowledge. Our results suggest that social capital produces a positive return on firms' internationalization only up a threshold point. When the point is crossed, the return of social capital starts to decline indicating that, in their internationalization process, firms suffer the problem of over-embeddedness. In addition, we find that more firms suffer for the problem of over-embeddedness in case of internationalization of knowledge than in the case of internationalization of goods. Besides, our findings show that while for internationalization of goods, firms that invest more in R&D activities do not seem to suffer negative consequences of embeddedness, for internationalization of knowledge the negative effects of over-embeddedness tend to persist.

The paper is set out as follows. In the next section, we present the theoretical and conceptual foundations for examining the role of regional social capital in explaining the firms' participation in international market for goods and internationalization markets for technology. This leads to the hypotheses guiding our research and to a presentation of the methodology and results. A discussion of the research findings follows, and the paper concludes with the contributions and limitations of the study and suggestions for future researches.

2. Theoretical framework

Firms have incentives to expand their market range and capture new market opportunities. Therefore, internationalization is significantly important for their prosperity. The commercialization of products, and hence the participation in the international market for goods, generally represents the first opportunity to define the firm's position in new

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markets (Gans 2003 ; Fernández and Nieto 2006). However, technology can be exploited in foreign markets even when it is disembodied from the product via the transfer of licenses and know-how. Increasing evidences showed that firms aim to make profit not only by trading their own output, but also by exchanging their technological knowledge to others (Arora, Fosfuri et al. 2001; Chen 2005). The development and application of “technologies of globalization” in a wide range of communication and transport applications has facilitated the exchange of knowledge in a global economy (Archibugi and Michie 1997:4) and the firms’ participation in international markets for technology (Narula 2002). Contractual arrangements — e.g., licenses or patents— tend to be an efficient option for exploiting know-how in foreign markets (Telesio 1979; Davidson and McFetridge 1985) and a technology invented in one country can be put in use in another countries (Guellec and van Pottelsberghe 2001).

Linkages and embeddedness within the home-region may play an important role in defining the firms’ participation in international markets (Hansen 1992). Several authors noticed that the social context affects internationalization promoting communication (Bonaccorsi 1992) and co-operation (Kaufmann 1995) among local actors.

A context characterized by a rich set of relationships and social ties encourages the exchange of knowledge and information. Recently, many researches conducted to identify the mechanisms through which knowledge flow (Saxenian 1994; Zander and Kogut 1995; Almeida and Kogut 1999; Shane and Cable 2002; Rosenkopf and Almeida 2003; Stuart and Sorenson 2003; Uzzi and Lancaster 2003) concluded *that exchange of information and knowledge might be facilitated by social interactions among different actors*. The concept of social capital has been introduced to capture the *social dimensions that shape the economic performances of specific geographical contexts* (Woolcock and Narayan 2000). In particular, Putnam’s (1993) analysis on the effects of social capital among the Italian regions inspired an extensive literature on social interaction and community participation that coalesce around a general framework held together by the idea of social capital.

The previous literature on internationalization has manly applied the concept of social capital referring to the firms’ network structure. Contributions have been provided by Yli-Renko et al. (2002) that demonstrated that firms’ ties favor international growth through the generation of greater technological knowledge and by Presutti et al. (2007) that explored the effects of the entrepreneur’s social network on export profitability in hi-tech start up

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firms. A step forward in the conceptualization of the role of social capital in influencing firms' internationalization has been made by Zhou et al. (2007) demonstrating the importance of social network in the explanation of the relationship between internationalization and performances for born global small and medium enterprises. They found that home-based social networks play a mediating role in explaining the relationship between inward and outward internationalization and performance.

Although those studies, showing the importance of social variables in the internationalization process, can be considered valuable contributions, no evidences have been provided on the relationship between the level of regional social capital and internationalization. *Thus, we explore the implications of regional social capital as a critical context resource in reinforcing the processes acquisition of knowledge and information useful for firms' internationalization.*

3. Hypothesis development

3.1 Social capital and internationalization

Theoretical arguments and empirical evidence suggests that firms are more likely to export if they belong to an export intensive region (Clerides, Lach et al. 1998) and hence the co-location of other exporting firms in the same region significantly increases the probability of international markets entry (Greenaway and Kneller 2007). Foreign market knowledge is often acquired by firms through repeated interactions with others who have this knowledge (Chetty and Blankenburg Holm 2000). By mean of repeated interactions firms gain access to various sources of information and have more opportunities to exploit external sources of knowledge (Grabher 1993). In this case, social capital acts as an institutional reparation mechanism of the market failure supporting not only the actors' wiliness to cooperate, but also their propensity to undertake riskier choices.

The sociological literature has asserted that social capital represent a valuable source of information encouraging relationships among agents that are stable and productive over time (Granovetter 1973; Coleman 1988). Social relationships, often established to pursuit other goals, reduce the time and the investment required to obtain information. Burt (1992) claimed that the information benefits derived from social capital consist on access, the

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opportunity to obtain important information; on timing, the opportunity to obtain information earlier; and on referrals, to be mentioned at the right time in the right place.

Zhou (2007) synthesized the information benefits generated by social capital that can help internationalization in (i) knowledge of foreign market opportunities; (ii) advise and experiential learning; (iii) referral, trust and solidarity by a third party. Those information benefits provided by regional social capital may favor internationalization helping the diffusion of a stimulate consciousness of foreign market opportunities (Reid 1984), facilitating the identification of foreign exchange partners (Ellis 2000) and providing tacit and valuable knowledge about international business practices (Eriksson, Johanson et al. 1997; Sharma and Blomstermo 2003). Additionally, social capital helps firms in overcoming the resource limitations that often constrain international expansion (Lu and Beamish 2001) establishing legitimacy and credibility, and facilitating the development of new capabilities for international expansion at lower risks (Zaheer and Mosakowski 1997). Furthermore, social capital influences export initiation (Ellis and Pecotich 2001) and favors a more international vision and managerial openness (Yeoh 2004).

However, although we have argued in favor of a positive effect of social capital on firms' participation in international markets for goods, we claim that when the level of social capital becomes too high, it could trap firms in their local area preventing the search process outside the firms' own region. This could have negative consequences for firms' participation in international markets for goods. There are different reasons that explain this behavior. First, as claimed by Levinthal and March (1993), firms have "the tendency to ignore the larger picture" as they are inclined to operate in the proximity of existing knowledge and to privilege the near neighbors. This may in part explain why many firms tend to enter foreign markets later in their development (Johanson and Vahlne 1977). High levels of social capital in the firms' context may accentuate firms' resistances to focus on foreign markets since they increase reciprocal loyalties and obligations with local partners. Switching costs can be severe after partner selection. Consequently, in region with high level of social capital, firms are likely to treat local partners as the first priority (Autio, Sapienza et al. 2000).

Second, as the attention-based theory of the firms (Simon 1947; Ocasio 1997) suggested, firms operate in a variety of institutional and cultural settings and entrepreneurial

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and managerial attention is the most precious resource inside the firms. The decision-makers “concentrate their energy, effort and mindfulness on a limited number of issues” (Ocasio 1997: 201). In every new location, a firm needs to invest time and attention to establish its presence. Since a high level of social capital in the firms’ area tends to favor entrepreneurial and managerial attention on local issues, it may increase firms’ resistances to move attention and efforts in foreign markets (the so call “attention allocation problem”). This resistance becomes more and more difficult for firms to overcome because organizations are generally characterized by a structural inertia that forces them to continue in old patterns (Autio, Sapienza et al. 2000) and reduce the possibility to have major changes (Hannan and Freeman 1977).

The third reason lies in the nature of social capital itself. The common distinction is between “bonding” and “bridging” social capital. It draws on Granovetter’s (1973) work on “strong” and “weak” ties. Putnam and Goss (2002: 8) underlined that “although the phrase “social capital” has a felicitous ring to it, we must take care to consider the potential vices of social capital, or even just the possibility that virtuous forms can have unintended consequences that are not socially desirable”. Putnam (2000 :22) argued that there are “many different forms of social capital” including bridging (between group) and bonding (within group). In reality, most forms of social capital are a blend between bonding and bridging ties (Putnam 2000). Portes (1998) claimed that strong bonding ties may be unfavorable for a community’s ability to form bridges with the outside. This may produce less desirable consequences by imposing conformist behavior (Westlund and Bolton 2003) and by leading to “groupthink” (Janis 1982). In sum, we hypothesize that social capital produces a positive return on firms’ international growth only up a threshold point. When the point is crossed, the return of social capital starts to decline.

H1a: Structural social capital is curvilinearly (taking an inverted U-shape) related to firms’ internationalization process in terms of participating in international markets for goods.

To obtain economic advantages, firms attempts to exploit their own technological competences in foreign markets. Although probably somewhat lagging behind the external trade of goods, the internationalization of technologies is a key component of firms’ internationalization. The internationalization of technology means that the ownership of

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inventions cross national borders (Patel and Vega 1999) and technologies invented in one country can be exploited in other countries. However, as Granstrand et al. (2003) have demonstrated, the technological activities continue to be mostly embedded in and influenced by the conditions of home regions and firms tend to search for knowledge near to their location. In explaining that firms' attitude, Narula (2002) suggested that often firms are technologically locked in by relationships of trust, iterations and interactions existing among local firms. When a firm disrupts a relationship has to consider the consequences in term of switching costs, inactivity, and the impact on other interconnected relationships (Johanson and Vahlne 1977).

Furthermore, it has been noticed that the firms' home region remains the principal site for firms' R&D. In their search for knowledge, firms are limited by technological and geographic context (Rosenthal and Strange 2003). According to the evolutionary economics literature, the firms' tendency to concentrate their search in the proximity of the existing knowledge is caused by the path dependence (Dosi 1982; Nelson and Winter 1982) since the past searches for knowledge is the natural starting points for new searches. High levels of regional social capital may favor the firms' tendency to look in the home market of technologies since closer relationships reduce external information from other sources (Uzzi 1997) . This shows that firms in contextual settings with high social capital may fails to recognize the opportunity to participate in international markets for technology and too close regional ties from "ties that bind" may become "ties that blind" (Grabher 1993: 24). Therefore, in a similar vein to the internationalization of goods, the internationalization of technologies may not benefit from regional social capital when the firm is located in a region where the level of social capital is too high.

H1b: Structural social capital is curvilinearly (taking an inverted U-shape) related to firms' internationalization process in terms of participating in international markets for technology.

Given the nature of the commodity considered, the market for technology is characterized by a series of imperfections. The intrinsic characteristics of this market generate several difficulties in terms of recognition, disclosure, and team organization (Teece 1981). Firms might, nevertheless, create and accumulate knowledge that can find applications in foreign markets. However, a series of bargaining and transactions costs

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hamper the knowledge flow from the knowledge producers to other firms abroad that could apply this knowledge with profit. Not only the cost of obtaining information is particularly high, but there are also impediments associated with using the kind of market that affect the transfer. In order to use this market, firms require information about potential partners, and they need to conduct a negotiation and to accept the terms of the trade.

When technological knowledge is transferred potential “erosion in the value” of firm's knowledge occurs due to not only to opportunistic behaviors but also to higher capabilities of the firm to take value from their knowledge with respect to other organizations (Kogut and Zander 1993; Madhok 1997: 46). As claimed by Madhok (1997), any technology is the result of an embedded and a nonembedded component. The nonembedded component is generic can be easily transfer through patent or licences. However, the firm-embedded component of technological knowledge is difficult to transfer to other firms without serious loss in value. Those difficulties raise with the increases of geographical and cultural distances (Teece 1986).

According to that perspective that lines with the behavioral theory (Cyert and March, 1963) and evolutionary theory of the firm (Nelson and Winter, 1982), knowledge is mainly a firm-specific idiosyncratic know-how, the product of the firm's own investments. Therefore, technological knowledge has more value to the firm than to any potential licensee. The licensees may find difficulties in efficiently and effectively acquiring, and hence integrating, new technological knowledge since they have to sustain the costs generated by an imperfect replication and adaptation (Cantwell, 1991). Without the property of embeddedness the value of technological knowledge is reduced. The technological knowledge vendor retains part of the knowledge even when this knowledge has been sold to other organizations. Furthermore, technologies are not static, but evolve constantly (Teece 1981). Therefore, to have full benefit from the trade technology, the partners have to establish a continual and recurrent cooperation. The need of a continuous transfer of knowledge facilitates the firms' tendency to relate to local partners.

Since buying and selling knowledge is a complicated process it will require that the participating firm from the home-region is to be able to scan the international players in the market for technology to make judgments concerning potential partners in the market in the presence of potential opportunistic behavior. To be sure, being able to participate in

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international markets for technology requires very often the ability to collaborate directly with sellers or buyers at the international level — in addition to the direct economic exchange of the technology (Contractor 1981). However, as argued above, having too many local, regional linkages may seriously limit the possibilities for developing (collaborative) linkages in the international market. This may be somewhat in contrast to markets for goods; where markets are more “perfect” — and where direct collaboration with international partners is required less. In sum, this leads us to posit:

H2: A larger proportion of firms will suffer from the negative effects caused by too much regional embeddedness in the case of the internationalization in markets for technology than in the case of markets for goods.

3.2 The moderating role of research and development activities

To succeed in foreign markets, firms have to intensify their search for competitive advantages (Hitt, Hoskisson et al. 1997). Many studies linked knowledge and international expansion (e.g. Johanson and Vahlne 1977; Eriksson, Johanson et al. 1997; Yli-Renko, Autio et al. 2002). According to the resource-based theory (Penrose 1959; Barney 1991), firms' knowledge may be exploited in terms of better performances in new environments (Kogut and Zander 1992; Presutti, Boari et al. 2007). In general, firms that invest in knowledge creation are more likely to develop learning skills that are useful to realize a successful growth in foreign markets (Autio, Sapienza et al. 2000). Numerous empirical works on firm's export behavior showed the importance of firms' investment in the creation of new knowledge as one of the main factors that enhances the firms' success into international markets (Gruber, Mehta et al. 1967; Keesing 1967; Bloodgood, Sapienza et al. 1996; Basile 2001; Roper and Love 2002; Dhanaraj and Beamish 2003).

At the same time, Cohen and Levinthal (1990) have argued that not only will R&D investments make firms able to introduce new products (that can be exported) based on the derived knowledge — R&D investments also provide firms with absorptive capacity, i.e. the ability to identify, assimilate, and exploit knowledge from the external environment. For this

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reason we argue that firms with a higher degree of R&D spending will be better able to take advantage of the local regional knowledge provided through the social capital with which the region is endowed. Accordingly, we conjecture:

H3a: Firms that invest more in R&D will be better able to better exploit embeddedness regarding goods internationalization

The effect of R&D may be different if we analyze the firms' participation in the international markets for technology. For knowledge to transfer, the possessor of knowledge has to recognize the opportunity to exchange his knowledge. The knowledge recipient, on the other hand, has to be able to discover and absorb the value of this knowledge. Firms have the tendency to believe that their main innovations are the product of the new knowledge produced by their in-house research. However, in any firm, a fraction of the new knowledge acquired by the research staff is knowledge created by that firm, but part of the knowledge is created by researches conducted elsewhere. With regard to this, previous studies have demonstrated that many firms find difficulties in understanding that part of the produced knowledge has not been realized inside of their boundaries (Simon 1947). This phenomenon, known as "the not invented here syndrome" (Katz and Allen 1982) produces at least two sets of consequences. First, firms will be reluctant in accepting new knowledge with the consequence that, since information sharing does not automatically lead the utilization of the acquired information (Goldhar, Bragaw et al. 1976), the not-invented here syndrome may be very dysfunctional for firms.

Second, firms will not share the knowledge produced by their R&D activities. In particular, it is often the case that R&D activities create spillovers that cannot be internally commercialized. The knowledge produced is rarely licensed to others, but, in most of the cases, knowledge waits for internal developments (Chesbrough 2003).

We conclude that a high amount of investments in R&D could facilitate both the not invented here and the firms' tendency to search for new knowledge in their near environment. Accordingly, we expect that those two aspects may affect the firms' capability to exploit over-embeddendness in term of participation in international markets for technology. In particular, we claim that firms that are investing more in R&D are more inclined to participate in local market for technologies and local partners may easily became their priority.

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H3b: Firms that invest more in R&D will be more prone to suffer from the negative effects caused by too much embeddedness regarding markets for technology internationalization.

4. Empirical analysis

4.1 Data description

In this research, we use variables referring to two different levels of analysis, firm and region, therefore data come from different sources. Regarding the firm level, data on internationalization in Italian manufacturing firms has been collected by Capitalia (an Italian Bank Group) for a stratified random sample of more than 4,400 manufacturing firms with more than 10 employees (Capitalia 2006). The survey refers to the three-year period 2001-2003. The survey response rate was 28.5 percent. The actual number of observations, without missing values, includes 1984 firms as regard the internationalization of goods and 1974 firms as regard the internationalization of knowledge.

At the regional level, the data we used to analyze structural social capital have been collected by the Italian National Institute of Statistics (ISTAT) through Multi-scope Analyses carried out in 1999. The survey response rate was 82.5 per cent. The individual responses have been aggregated by ISTAT according to the 21 regions' level (NUTS2). To our purposes, we believe that the level of the 21 Italian regions is the most relevant level of aggregation for our purposes, since variation in social capital levels is likely to be predominantly between, rather than within, regions. This is indicated by the fact that other variables such as GDP per capita and participation rates in political elections tend to be dissimilar across the 21 regions, but rather similar within regions (across provinces within each region). To measure regional expenditure in R&D as the percentage of regional GDP, regional human capital and the size of the population, we use data obtained from EUROSTAT.

4.2 Research strategy

We decided to focus on Italy. The reason for that choice lies in the stark differences in term of social capital that characterizes Italian regions. Those differences attracted the first

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social capital researchers: Banfield (1958), after one year spent in a small town in Southern Italy trying to explain why this town was so underdeveloped, concluded that Southern Italy's economic backwardness was due to the lack of civic engagement; Putnam (1993) found that the performance of social and political institutions was powerfully influenced by citizen engagement in community affairs. Moreover, Italian regions are characterized by the large presence of industrial districts in which both a community of people and a population of firms cooperate in one naturally and historically bounded area (Becattini 1990: 38). In industrial districts, people and firms tend to merge (Ottati 1984) The community characteristics of the social environment widely influence economic relations and trust and reciprocal co-operation are distinctive elements of this kind of socioeconomic organization (Brusco 1982).

Our empirical strategy for the analyses of the effect of social capital on internationalization follows two steps. First, in an effort to measure a multidimensional concept focusing on its sources, we synthesize the concept of social capital in two main factors using a principal component analysis. Second, in order to understand the effect of social capital on internationalization, we conduct a tobit and a coordination logit analysis. Since our hypotheses concern moderating effects, we use complex interactions to test them.

4.3 Measures

Dependent variables

As indicators for firms' *internationalization of goods*, we focus on exporting activity, because export represents the most common strategy adopted by Italian firms to internationalize. Therefore, we use export intensity as dependent variable to assess the degree of involvement of Italian manufactory firms in the markets for goods. Export intensity is the ratio of foreign sales on total sales. This indicator is widely considered as an appropriate measure for firms' export performance (Bonaccorsi 1992; Fernández and Nieto 2006). In exploring the firms' participation in international markets for technology, we refer to the firms' transmission of codified knowledge. The flow of codified knowledge does not necessarily require face-to-face contact and can often be realized by impersonal means, such as patents or licenses. We measure firms' participation in the international markets for

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technology (*internationalization of technology*) with a dummy variable that takes value 1 if the firm has bought or sold a patent in a foreign country, 0 otherwise.

Independent variables

To measure structural social capital of the Italian Regions, we selected a total of 11 regional social capital variables. Table 1 displays details of the meaning of the social capital variables. We consider variables representing strong ties (*Meeting friends regularly; Social meetings; Satisfaction as to relationships with friends*), participation in social associations (*Participation in cultural associations; Participation in voluntary associations, Participation in non-voluntary organizations, Number of voluntary associations per region*) and political participation (*Unpaid work for political parties; Money given to parties; Participation in political meetings*)

[Insert Table 1 about here]

Granovetter (1973) describes the strength of weak ties as being the access to new resources. Weak ties create bridges, linking individuals through social circles generating a greater amount of information in a very broad network of actors. Putnam views memberships of horizontal associations fundamental for cooperation and communication among their members and also sees them as a source of generalized trust and social ties, conducive to economic performance and governmental efficiency. Scaff (1975) underlines that two distinct concepts define political participation; participation as interaction or participation as an instrumental action. The former is closely associated to the idea of cooperation and reciprocity to promote communication and the achievement of common interests; the latter refers to participation as an instrument to obtain personal advantages, in turn generating competition for resources (Scaff 1975).

We run a non parametric principal component analysis (PCA) on the social capital variables. The non- parametric principal component analysis differs from the standard PCA since it deduces eigenvalues from a co-graduation matrix (Spearman's rho or rank order correlation coefficients). The aim of this procedure consists on minimizing the effect of outliers. Table 2 reports the eigenvalues and the percentage of variance explained by the two components. Table 3 displays the two principal components that we extract from the analysis. The two components explain more than 80% of the total variance. This can be considered a

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very satisfactory result for studies dealing with social variables. The first component appears to capture the idea of “social interaction” and the second factor appears to capture the concept of “political participation”.

[Insert Table 2 about here]

[Insert Table 3 about here]

Control variables

Firm’s internationalization depends on firm and regional characteristics. Therefore, control variable are at firm and regional level. As regard to the firm level, researchers generally agree that innovation is an important factor to explain export performance (Ito and Pucik 1993; Molero 1998; Wakelin 1998; Basile 2001) on consequence we control for firm’s innovation through a dummy variable (*innovation*) assuming value 1 if the firm has introduced at least one innovation on the triennium 2001-2003, 0 otherwise. Firm’s *size* is expected to have a positive effect on internationalization as international trade might be considered as a way of extending the markets and allowing exploitation of scale economies (Krugman 1979; Basile 2001). Therefore, we control for firm’s size, using the number of employees in 2001.

Oviatt and McDougall (1997) argue that firm’s *age* affects accessibility to foreign markets since older firms might have experience advantages favoring their international growth, for that reason we control for firm’ age measured as the number of years.

Internationalization is strictly dependent on *firm’s sector*, accordingly we include the mean export intensity by industry (Fernández and Nieto 2006), and *pavitt* dummy variables to obtain sector characteristics.

Internationalization is affected by firm’s investment strategies (Basile 2001). To capture firm’s investment strategy, we control for the firm’s investments in industrial data processing over the total sales (*investment in technologies*) and firm’s investments in *human capital* measured as the number of employees that in 2001 have been involved in at least one training course over the total number of employees. Furthermore, we control for firm’s *commercial agreement* using a dummy variable taking value 1 if the firm stipulated commercial agreements with other firms in foreign courtiers, 0 otherwise.

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The regional characteristics influencing internationalization include the regional expenditure of private firms in R&D as the percentage of regional GDP (*GDP Innovation*), as well as the percentage of the workforce with a science and technology degree to measure the human capital of the region (*regional human capital*). The population variable is captured by the logarithm of number of residents in a given region (*population*). Moreover, we control for the people propensity to respect the rules even when there is not a substantial punishment (*tax paid*) using the number of RAI-TV (Italian public service broadcaster) subscriptions every 1.000 inhabitants. Table 4 provides descriptive statistics and correlations among our variables. From the table, it can be seen that, on average, firms' *export intensity* is 30.29. The correlations are in the general low, apart from the correlation ($r = 0.70$) between regional tax paid and social capital I – social interaction. However, since the results are robust dropping any of the two variables, we do not appear to have multicollinearity problems.

[Insert Table 4 about here]

5. Results

In order to measure firms' internationalization of goods, we use export intensity as dependent variable. Export intensity (export/sales) is a doubly truncated variable assuming values varying between 0 and 100 by definition. Besides, this variable often takes the value of zero. To deal with the problem of censored samples a generally used approach is the tobit model (Kumar and Siddharthan 1994; Wooldridge 2002). This model uses all the available information from the explanatory variables, including those for which the dependent variable is zero. Model I in Table 5 reports the results of the tobit estimations.

[Insert Table 5 about here]

With respect to Hypothesis 1 (“*Social capital is curvilinearly -taking an inverted U-shape- related to firms' internationalization process.*”), we find support for the hypothesis. First, the parameter for social interaction component of social capital is significant and positive in explaining export intensity showing that social interaction component of capital is an important factor in explaining internationalization of goods. Second, the parameter for

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social interaction component of social capital squared is negative and significant as well, showing that when firms are located in region characterized by too high level of social capital there are decreasing returns¹.

Figure 1 displays the empirical model's prediction of the relationship between social capital and export intensity. From the figure, it can be seen that the point where social capital has negative consequences for export intensity — what could be called the “tipping point” — is at the score of 2.0 on the social capital scale (the maximum score is 2.896), so that when a firm is located in a region in which the social interaction component of social capital is greater than 2.0, negative consequences arise. The number of regions to the right of the tipping point is 6. In those regions are localized 994 firms.

[Insert Figure 1 about here]

Moreover, the political participation component of social capital does not seem to favor firms' internationalization of goods. This may be because two distinct concepts define the political participation; participation as interaction or participation as an instrumental action (Scaff 1975). When the later prevails, the political participation becomes a tool for the achievement personal advantages and it generates competition and hampers communication.

Firms' internationalization of knowledge is measured using a dummy variable that assumes value 1 if the firm has experience in international markets for technology in term of selling or buying patents and licenses. However, the firm participation in international markets for technology represents a rare event that interests only the 0.03 % of the firms in our sample. To deal with this problem we use a complementary logit model. Complementary log-log models are generally used when the probability of an event is very small. Unlike the logit and probit models, the complementary log-log function is asymmetrical. The log-likelihood function for complementary log-log is: $\ln L = \sum w_j \ln F(x_j b) + \sum w_j \ln (1 - F(x_j b))$ where $F(z) = 1 - \exp(-\exp(z))$ and w_j denotes optional weights.

¹ It is possible that the relation between social capital and export intensity is not quadratic, but a saturation curve, or even a logarithmic one. To clarify the nature of the curve, we introduced in the models a saturation term, the logarithm of social capital, and we found that social capital² is still significant. This test offers some evidences on the quadratic specification. However, introducing the logarithmic of social capital, while we are retaining social capital and social capital², causes enormous amounts of multicollinearity.

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Model III and IV in table 5 show the results of the complementary logit estimation. We find support for the hypothesis H1b (“*Structural social capital is curvilinearly (taking an inverted U-shape) related to firms’ internationalization process in terms of participating in international markets for technology*”) since the parameter for the social interaction component of social capital is significant and positive in explaining the firm’s participation in international markets for technology and the parameter for social interaction component of social capital squared is negative and significant as well, showing the presence of decreasing returns.

The graph of the relationship between social capital and internationalization of knowledge (Figure 2) shows that the tipping point is at the score of 1.9 on the social capital scale. Eight regions are above the tipping point.

[Insert Figure 2 about here]

We find support for the Hypothesis 2 (“*A larger proportion of firms will suffer from the negative effects caused by too much embeddedness in the case of the internationalization in markets for technology than in the case of markets for goods*”) since, in the case of internationalization of knowledge, the tipping point occurs at 1.9 of the social capital scale and consequently more firms appear to suffer for the over- embeddedness (see Figure 2).

To test Hypothesis 3a (“*Firms that invest more in R&D will be better able to better exploit embeddedness regarding goods internationalization*”), we introduce a quadratic interaction term ($R\&D * Social\ Interaction$ and $R\&D * Social\ Interaction\ squared$). According to Jaccard, Turrisi and Wan (1990: 59) the quadratic interaction term reflects the curvature of the U-shaped relationship at different levels of the moderator variables. Model II in Table 5 shows that $R\&D * Social\ Interaction$ is positive and statistically significant. This term suggests that the shape of the quadratic relationship changes at different levels of firms’ investment in R&D.

To understand the moderating effects of R&D on the quadratic relationship between social capital and export intensity, the tobit equation in Model 2 is reduced by substituting representative values for firm R&D (25th and 75th percentile means) and replacing all other predictors with their respective variable means (Cohen and Cohen 1983; Jaccard, Wan et al. 1990; Schick and Ponemon 1993).

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Figure 3 shows the graph of these relationships. As can be seen in Figure 3, the intersection of these graphs suggests that firms characterized by low investment in R&D activities appear to suffer the problem of over-embeddedness. Conversely, under conditions of high investment in R&D, firms seem not suffer the problem of over- embeddedness. Thus, the curvature of the relationship is more pronounced for firms with low investment in R&D. This result leave as to the conclusion that firms' investing more in R&D are more capable to take advantage from the benefits generated by social capital.

[Insert Figure 3 about here]

Regarding hypothesis 3b ("*Firms that invest more in R&D will be more prone to suffer from the negative effects caused by too much embeddedness regarding markets for technology internationalization*") we found that the firms investing in R&D seems to suffer more from the problem of over-embeddendess. Therefore, with regard to the firms' participation in international markets for technology, social capital is more important for firms with a low level of investment in social capital. Figure 4 shows that social capital helps firms with little investment in R&D to participate in international markets for technology.

[Insert Figure 4 about here]

6. Conclusions

We set out in this study to explore the role of regional social capital in affecting internationalization. To structure our analysis, we drew on social capital theory, which has assumed that informal ties vary in the degree to which firms are embedded in social networks. Further, we build on the previous works on knowledge transfer and spillovers (Audretsch and Feldman 1996; Cassiman and Veugelers 2002; Alcácer and Chung 2007). To classify types of internationalization, we developed the distinction between firms' participation in international markets for goods and international markets for technology.

As expected, our findings suggest that regional social capital favors firms' internationalization — both in the case of goods as well as in the case of knowledge-. However, the positive effects of social capital on firms' internationalization start to reduce when the level of social capital becomes too high. We showed that this statement is true both for the internationalization of good that for the internationalization of knowledge. We think

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that this finding represents an important contribution to the understanding of the role of firm home-region in defining firms' international growth.

Furthermore, we explored whether firms that are investing more in R&D are able to overcome the problem of over- embeddedness. In this case, we build on internationalization theory, while also using the not invent here hypothesis. We found that, regarding the international market for goods, firms that invest more in R&D could better utilize regional social capital to internationalize. In case of firms' participation in international markets for technology, we found that social capital is more important for firms with low investments in R&D. This result provides a contribution regarding the role of R&D in cases of over-embeddedness.

The findings of the study also have managerial implications. Managers should consider regional social capital has a valuable contextual resource for firms to internationalize; however, they have to be aware that when they are located in a region with a very high level of social capital, their embeddedness may lead to negative consequences for their participation in international markets. Our results show that the investment in R&D may help firms to overcome the problem of over-embeddedness. Therefore, managers may wish to invest more in R&D if they are located in regions with high level of social capital to avoid the negative return on internationalization. However, the investments in R&D do not help the firms to overcome embeddedness in the case of the market for technology. In this market, the not invented here syndrome seems to have the more severe consequences, and the investments in R&D do not appear to help firms in exploiting regional social capital. Consequently, managers should be aware that, in regions with high level of social capital, the participation in international markets for technology might be reduced, and in order to avoid the trap of over- embeddedness, they have promote and favor that the employees of the firm create their own social networks that cross regional and national borders. Regarding the political participation component of social capital, we find that while it does not affect the firms' participation for international markets for goods, it has a positive effect on the firms' participation in international markets for technology.

This study has limitations. In particular, as we used cross-sectional data, future researches should be conducted to examine whether the current results are consistent with a set of results emerging from a panel of repeated cross sections. In particular, cross- sectional data does not permit to control for the effects of firms' past abilities while a past

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characterized by a high degree of involvement in international markets affects significantly the firms' participation in international markets.

The findings of our research also open up new paths for further researches. For instance, further researches could examine the role of innovation in mediating the role of social capital on internationalization. Using the lens of regional social capital may help to reveal how the balance between exploration and exploitation can be achieved and how this balance shapes business performance.

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Table 1. Description of the variables included in the PCA

Variable	Description
<i>Participation in cultural associations</i>	People aged 14 and more who have joined meetings in cultural circles and similar ones at least once a year in the 12 months before the interview for every 100 people of the same area
<i>Participation in voluntary associations</i>	People aged 14 and more who have joined meetings in voluntary associations and similar ones at least once a year in the 12 months before the interview for every 100 people of the same area
<i>Participation in non-voluntary organizations</i>	People aged 14 and more who have joined meetings in non voluntary organization at least once a year in the 12 months before the interview for every 100 people of the same area
<i>Number of voluntary associations per region</i>	Number of voluntary organizations for every 10.000 people
<i>Money given to associations</i>	People aged 14 and more who have given money to an association at least once a year in the 12 months before the interview for every 100 people of the same area
<i>Meeting friends regularly</i>	People aged 6 and more meeting friends at least once a week for every 100 people of the same area
<i>Social meetings</i>	People aged 6 and more attending bars, pubs, and circles at least once a week in the 12 months before the interview for every 100 people of the same area.
<i>Satisfaction as to relationships with friends</i>	People aged 14 and more who are satisfied with their relationships with friends
<i>Unpaid work for political parties</i>	People aged 14 and more who have carried out unpaid work for a political party in the 12 months before the interview, for every 100 people of the same area
<i>Money given to parties</i>	People aged 14 and more who have given money to a political party at least once a year for every 100 people of the same area
<i>Participation in political meetings</i>	People aged 14 and more who have joined a political meeting in the 12 months before the interview, for every 100 people of the same area.

Table 2. Results of Principal Component Analysis

Component	Eigenvalue	Percentage of variance Explained	Cumulative percent
1	6.56	59.61	59.61
2	2.44	22.18	81.79

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Table 3. Matrix of factor loadings.

	Component1: Social interaction	Component2: Political Participation
<i>Participation in cultural associations</i>	0.882	0.246
<i>Participation in voluntary associations</i>	0.893	0.149
<i>Participation in non-voluntary organizations</i>	0.940	0.196
<i>Number of voluntary associations per region</i>	0.775	0.333
<i>Money given to associations</i>	0.877	0.295
<i>Meeting friends regularly</i>	0.814	-0.167
<i>Social meetings</i>	0.908	-0.010
<i>Satisfaction as to relationships with friends</i>	0.873	-0.083
<i>Unpaid work for political parties</i>	-0.586	0.729
<i>Money given to parties</i>	-0.115	0.897
<i>Participation in political meetings</i>	-0.349	0.866

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Table 4. Descriptive Statistics and Correlation matrix

	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>Internationalization of goods</i>	33.269	30.502																	
<i>Internationalization of technology</i>	0.030	1.166																	
<i>Social capital--Social Interaction²</i>	4.306	2.051																	
<i>Social capital--Social Interaction</i>	1.961	0.680	0.963																
<i>Social capital—Political Participation</i>	-0.034	0.842	0.012	0.088															
<i>R&D</i>	0.041	0.072	0.042	0.060	-0.027														
<i>Innovation</i>	0.742	0.438	0.010	0.023	-0.003	0.232													
<i>Firm's Sector</i>	30.971	13.749	0.085	0.109	0.005	0.126	0.121												
<i>Size</i>	132.410	385.508	0.024	0.027	-0.053	-0.010	0.079	0.055											
<i>Commercial agreements</i>	0.175	0.380	-0.013	-0.027	-0.024	0.122	0.132	0.099	0.074										
<i>Investments in technologies</i>	0.017	0.179	-0.008	-0.003	0.015	0.022	0.017	0.023	0.004	0.001									
<i>Supplier dominated</i>	0.517	0.500	-0.031	-0.049	-0.026	-0.122	-0.094	-0.173	-0.042	-0.041	-0.037								
<i>Scale intensive</i>	0.172	0.378	-0.068	-0.073	-0.008	-0.081	-0.028	-0.348	0.028	-0.049	-0.009	-0.446							
<i>Science based</i>	0.043	0.202	-0.068	-0.057	-0.032	0.202	0.056	-0.013	0.017	0.016	0.009	-0.227	-0.099						
<i>Specialized suppliers</i>	0.268	0.443	0.122	0.142	0.050	0.106	0.101	0.483	0.016	0.078	0.044	-0.636	-0.278	-0.141					
<i>GDP Innovation</i>	0.543	0.363	0.355	0.368	0.067	0.040	0.021	0.028	0.003	0.003	0.018	-0.138	0.005	0.029	0.135				
<i>Regional Human Capital</i>	6.281	1.763	0.186	0.339	0.253	0.079	-0.011	0.090	-0.001	-0.065	0.001	-0.112	-0.024	0.044	0.123	0.170			
<i>Population</i>	15.212	0.710	-0.072	-0.001	0.122	0.031	-0.025	0.042	-0.002	-0.041	0.029	-0.115	0.040	0.012	0.089	0.217	0.477		
<i>Airports</i>	133.249	108.847	-0.179	-0.080	0.146	0.020	0.012	-0.004	-0.010	-0.018	0.037	-0.114	0.053	0.072	0.049	0.183	0.279	0.729	
<i>Taxes paid</i>	75.400	6.188	0.567	0.702	0.375	0.040	0.029	0.119	0.004	-0.033	-0.002	-0.018	-0.080	-0.018	0.094	0.144	0.407	-0.172	-0.070

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Table 5. Results of the regression models

	Model I		Model II		Model III		Model IV	
Social capital--Social Interaction ²	-6.745 ***	1.987	-8.171 ***	2.149	-0.595 †	0.354	-0.980 **	0.417
Social capital--Social Interaction	26.850 ***	6.957	30.722 ***	7.378	2.228 †	1.220	3.587 **	1.446
Social capital—Political Participation	-1.305	1.004	-1.276	1.004	0.370 *	0.171	0.400 *	0.175
R&D	34.980 ***	10.779	75.501 †	50.734	2.949 **	1.123	14.144 †	5.135
R&D* Social interaction ²			37.241	22.024			4.803 †	2.702
R&D* Social interaction			100.156	68.460			15.788 *	7.933
Innovation	5.600 ***	1.736	5.506 **	1.735	0.761 †	0.440	0.746 †	0.441
Size	0.008 ***	0.002	0.008 ***	0.002	0.001 ***	0.000	0.001 ***	0.000
Commercial agreements	10.511 ***	1.808	10.492 ***	1.806	1.321 ***	0.251	1.346	0.252
Investments in technologies	3.185	3.872	3.264	3.867	-0.028	0.704	-0.019	0.684
Firm's Sector	1.269 ***	0.065	1.269 ***	0.065	0.017	0.012	0.016	0.012
Supplier dominated	4.211 †	2.204	4.232 †	2.202	-0.210	0.420	-0.209	0.420
Scale intensive	1.744	3.962	1.858	3.971	0.639	0.535	0.508	0.551
Science based	1.265	2.643	1.199	2.642	-0.191	0.483	-0.207	0.483
Specialized suppliers								
GDP Innovation	0.329	2.240	0.216	2.239	0.495	0.356	0.432	0.357
Regional Human Capital	-1.919 **	0.661	-1.901 **	0.661	-0.231 †	0.133	-0.245 †	0.140
Population	2.407	1.982	2.321	1.986	0.349	0.382	0.422	0.408
Airports	-0.008	0.011	-0.008	0.011	-0.002	0.002	-0.002	0.003
Taxes paid	-0.217	0.296	-0.245	0.296	-0.052	0.046	-0.059	0.046
Constant	-52.694	39.791	-50.789	39.863	-7.023	6.471	-8.402	6.809
Number of Observations	1994		1994			1982		1982
R2	0.041		0.041					
Chi2	682.494 ***		685.888 ***		85.243 ***		89.599 ***	

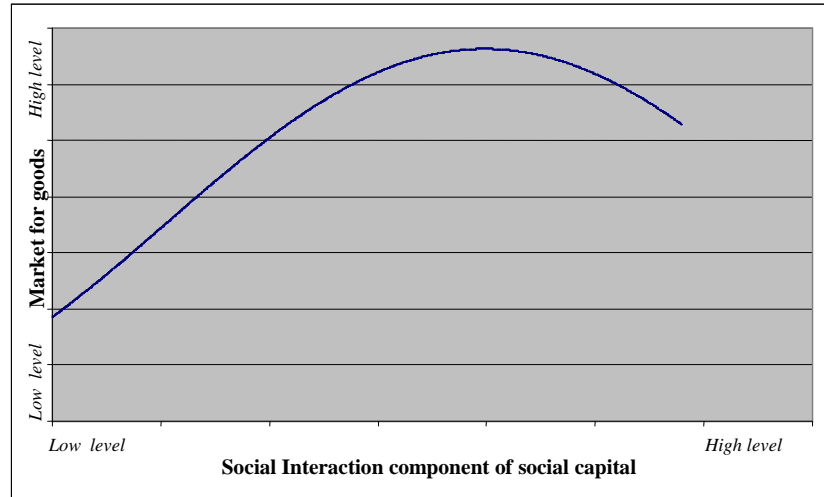


Figure 1: Predicted relationship between firms' export intensity and structural social capital

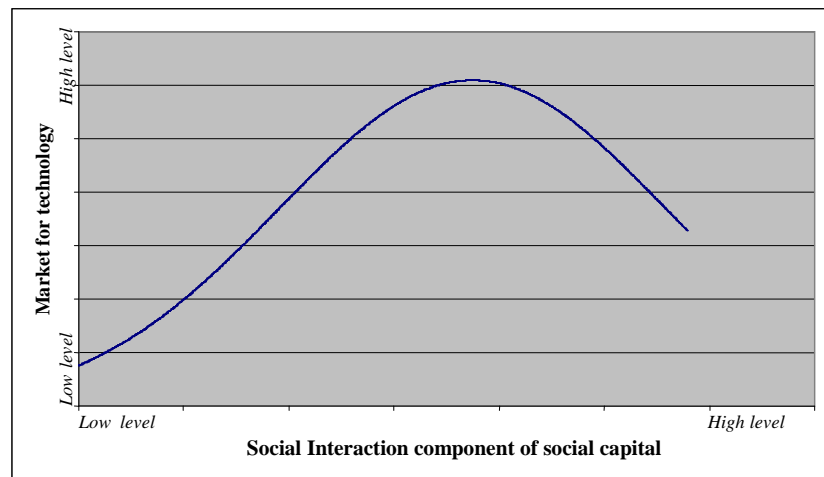


Figure 2: Predicted relationship between firms' internationalization of knowledge and structural social capital

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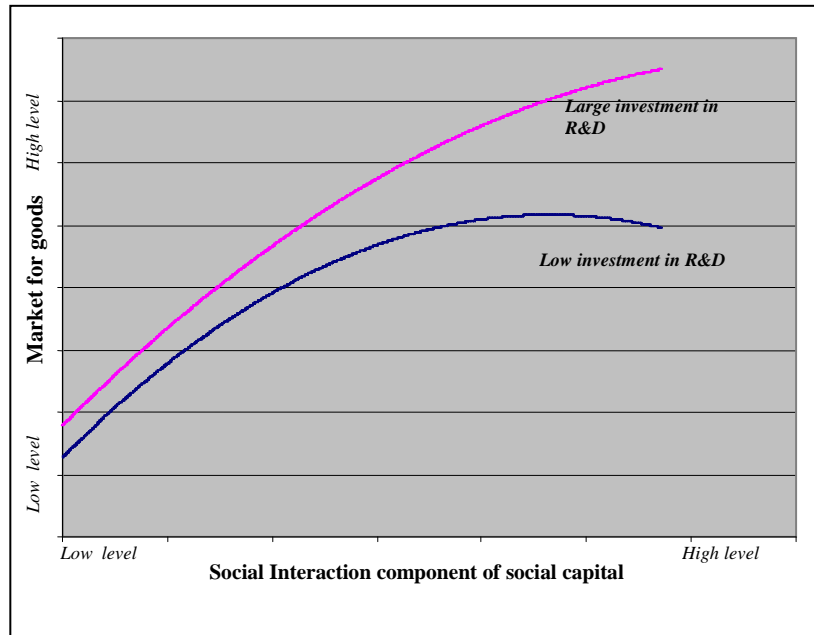


Figure 3: Predicted relationship between firms' export intensity and structural social capital moderated by R&D

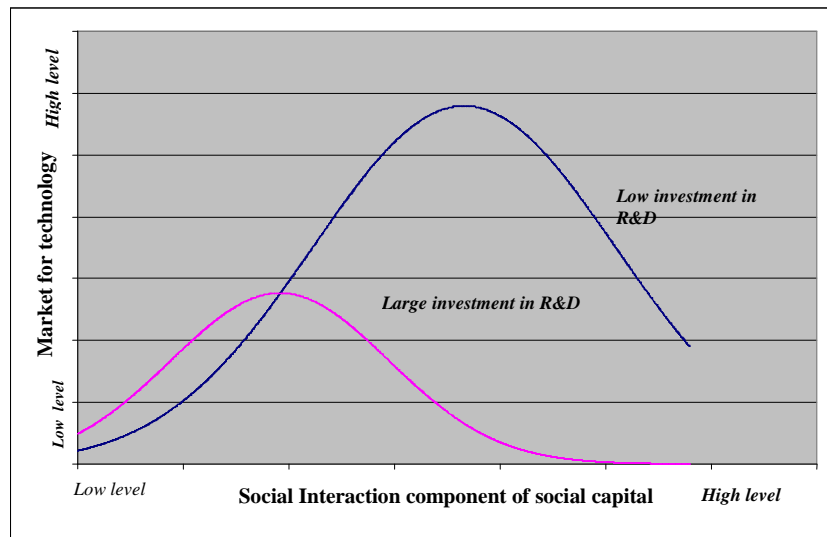


Figure 4: Predicted relationship between firms' internationalization of knowledge and structural social capital moderated by R&D

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