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# Trapped by Over-Embeddedness: The Effects of Regional Social Capital on Internationalization

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**Abstract:**
Drawing on social capital theory and international business literature, we argue that firms' home region social capital increases the degree of firms' internationalization for both goods and knowledge. Beyond a certain level of social capital, however, firms become over-embedded in their home region social relationships so that the degree of internationalization decreases. We also conjecture that firms' investment in research and development moderates the relationship between home region social capital and the degree of internationalization for goods and knowledge in a positive fashion. Combining data on social capital at the level of 21 regions with a large-scale data set on internationalization activities by a representative sample of around 2000 Italian manufacturing firms, we find—after controlling for a large set of firm and regional characteristics—overall support for our theoretical arguments.

**Keywords:** Regional social capital; Internationalization; Research and development; over-embeddedness

**Jel codes:**

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## INTRODUCTION

The reduction of national trade barriers and the efficient use of transportation systems have removed many obstacles that had hitherto hindered the flow of goods (Fernández and Nieto 2006). In addition, the diffusion of information and communication technology has increased firms' opportunities to trade technological knowledge on a global basis (Kogut and Zander 1993). Not only can firms participate in foreign markets to sell their products, but they can also exploit their technological advantages trading their proprietary knowledge through international markets for technology (Chen 2005).

The increasingly complex of new technologies imply technological interdependencies between firms that can benefit from broaden their technological activity through an international strategy. Cantwell (1995) named this phenomenon technological globalization. Technological globalization imposes the creation of "new international structures for technology creation": while in the past, the foreign technological activities conducted by the firms were aimed to exploit domestic strength, today, the trade of technological knowledge becomes crucial for the firms to access external sources of knowledge and expertise (Cantwell 1995 :171).

The globalization of products and knowledge raises questions about the relevance of local contexts in affecting firms' behavior. Numerous contributions have stated that paradoxically globalization accentuates, rather than minimizes, the relevance of local contexts for firms' strategic decisions, as the characteristics of home regions continue to exert a strong influence over firms' internationalization processes (Patel and Vega 1999). Since successful internationalization requires firms leverage resources and knowledge of other organizations (Hara and Kanai 1994; Oviatt and McDougall 1994; Bell 1995), the characteristics of local social structure—by affecting the circulation of knowledge—inform and define firms' possibilities to access locally embedded resources (Bonaccorsi 1992; Welch and Luostarinen 1993). Hence, social ties play an important role in facilitating firms' internationalization (Coviello and Munro 1997; Ellis and Pecotich 2001; Harris and Wheeler 2005).

Despite the fact that these studies underlining the importance of social variables for firms' internationalization process have greatly enhanced our understanding of the phenomenon, no theoretical or empirical research regarding the relationship between the level of localized, regional social capital and internationalization exists at this point in time. Accordingly, to help bridge this research gap, in this paper, we aim to

explore the implications of regional social capital as a critical context resource in reinforcing the processes of acquisition of knowledge and information, useful for firms' internationalization processes. The starting point is that social capital is a geographically bound phenomenon (Putnam 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). Empirical research has underlined that knowledge spills over through a variety of mechanisms. Intra- and inter-region mobility of individuals is an important mechanism whereby knowledge may spread (Pavitt 1984; Saxenian 1994; Almeida and Kogut 1999). In addition, as information and knowledge spillovers require frequent contacts amongst people, social ties are important channels for knowledge exchange and flows (Kogut and Zander 1996; Zucker et al. 1998; Almeida and Kogut 1999; Shane and Cable 2002; Rosenthal and Strange 2003; Stuart and Sorenson 2003; Uzzi and Lancaster 2003).

We define regional social capital as the localized norms and networks that enable people to act collectively within a region. This conceptualization follows Woolcock and Narayan's (2000b: 226) general definition of social capital and using that definition we focus on the density of the network ties individuals living in a given region might have. Specifically, we examine a key dimension of social capital, namely social interaction at regional level. We test the relationships between regional social capital and firms' internationalization. Specifically, we distinguish between internationalization of goods—as measured by firms' export performance—and internationalization of knowledge—as measured by firms' participation in international markets for technology. To our knowledge, this paper is the first study that examines these relationships. In particular, exploring the relationship between firms' participation in international markets for technology and social capital, this study attempts to make a contribution the emerging literature on internationalization of the intangible resources (Knight and Kim 2009).

Empirically, we use data collected by the Italian Institute of Statistics (ISTAT) in 1999 to explore the differences in the level of social capital across Italian regions. We selected 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). We find that regional social capital in the form of social interaction is curvilinearly (taking an inverted U-shape) related to

firms' internationalization of goods and knowledge. In other words, social capital produces a positive return on firms' internationalization only up to a threshold. When this is crossed, the return of social capital declines indicating that, in their internationalization process, firms suffer from over-embeddedness (Uzzi 1997). In addition, we find that firms suffer from over-embeddedness more in the case of internationalization of knowledge than in the case of internationalization of goods. Our findings show that whereas for the internationalization of goods, firms that invest more in research and development (R&D) do not seem to suffer negative consequences of embeddedness, for the internationalization of knowledge, the negative effects of over-embeddedness tend to persist.

The paper is organized as follows. Next section presents the theoretical and conceptual foundations of the role of regional social capital for firms' internationalization. This leads to the hypotheses guiding our research and to a presentation of the methodology and results. A discussion of the research findings follows. We conclude with contributions and limitations of the study and suggestions for future research.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Internationalization is a strategic option for firms' competitiveness as it enables firm to expand their scope through capturing new market opportunities. Although firms' traditional approach to internationalization is their participation in the international market for goods, increasingly firms profit by exchanging their technological knowledge with others organizations located in foreign countries (Gans and Stern 2003; Fernández and Nieto 2006). This was partly enabled and facilitated through the development and application of "technologies of globalization" (Archibugi and Michie 1997:4; Narula 2002). Contractual arrangements—e.g., licenses or patents—are options for exploiting know-how in foreign markets (Telesio 1979; Davidson and McFetridge 1985) as a technology invented in one country can be put in use in other countries (Guellec and van Pottelsberghe 2001).

The concept of social capital has been introduced to capture the social dimensions that may shape economic performances of geographical contexts (Woolcock and Narayan 2000a). Specifically, Putnam's (1993) analysis of Italian regions inspired an extensive literature on social interaction and community participation that coalesced around a general framework held together by the idea of social capital. Empirical research has identified mechanisms whereby knowledge flows and concluded that a

context characterized by a rich set of relationships and social ties encourages the exchange of knowledge and information (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). Accordingly, linkages and embeddedness within the home region may play an important role in defining firms' participation in international markets (Hansen 1992). For instance, Yli-Renko et al. (2002) showed that firms' ties favor international growth through the generation of greater technological knowledge. Zhou and Luo (2007) made a step forward in the conceptualization of the role of social capital in influencing firms' internationalization and demonstrated the importance of social networks in the explanation of the relationship between internationalization and performance for the so-called "born global" firms.

Nevertheless—and as pointed out in the introduction—although studies showing the importance of social variables for firms' internationalization process are very valuable contributions, no evidence concerning the relationship between the level of localized, regional social capital and internationalization exists. We aim to fill this lacuna in the literature.

**Social capital and internationalization**

Firms develop knowledge on international markets and operations internally. They may also vicariously acquire it from external actors. Research has noted that social contexts may affect internationalization as it promotes communication and co-operation processes relevant for knowledge acquisition among local actors (Kaufmann 1995). As a consequence, socially rich regions may help the acquisition of international knowledge that would encourage firms' internationalization processes. Given that there are export-active firms in the region, social capital may be a transmission mechanism whereby firms get state-of-the-art knowledge and information of how other local firms undertake goods internationalization.

Zhou and Luo (2007) synthesized the information benefits generated by social capital that may help internationalization: (i) knowledge of foreign market opportunities; (ii) advice and experiential learning; (iii) referral, trust and solidarity by a third party. Specifically, Chetty and Blankenburg Holm (2000) found that foreign market knowledge is often acquired by firms through repeated interactions with others who have this knowledge. Through repeated interactions firms gain access to various sources of information and have more opportunities to exploit external

sources of knowledge (Grabher 1993). Social capital may support not only actors' willingness to cooperate, but also their propensity to undertake risky choices. The benefits provided by regional social capital may favor firms' internationalization process as they facilitate the identification of foreign exchange partners (Ellis 2000), and provide tacit and valuable knowledge about international business practices (Eriksson et al. 1997; Sharma and Blomstermo 2003). In addition, social networks may help firms overcome 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). We argue that geographically bounded social capital may have a similar effect on international expansion in the market for goods.

Although research has argued in favor of a positive effect of social capital on firms' participation in international markets for goods, we submit that when the level of social capital becomes too high, it could trap firms in their local area preventing search processes outside their home region. 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 privilege the near neighbors. High levels of social capital in firms' home regions may accentuate their resistances to focus on foreign markets since they increase reciprocal loyalties and obligations with local partners. Switching costs can be severe after partners' selection. Consequently, in region with high level of social capital, firms are likely to treat local partners as their first priority (Autio 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 and managerial attention is the most precious resource inside the firms. 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- called "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 old patterns of behavior (Autio et al. 2000).

The third reason lies in the nature of social capital itself. 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 lead to groupthink (Janis 1982). To sum up, 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: Regional social capital is curvilinearly (taking an inverted U-shape) related to firms' internationalization process in terms of participation in international markets for goods.*

To obtain economic advantages, firms attempt to exploit their own technological knowledge in foreign markets. Although lagging behind the trade of goods, the internationalization of markets for technologies is becoming key for firms' strategy and competitiveness (Arora et al. 2001). As in the case of the internationalization of goods, regional social capital may facilitate participation in international markets for technology. First, knowledge on how to participate in such markets may flow much more easily within regions characterized by high levels of social interaction. Second, social capital may make firms more innovative. The information benefits central in the first stage of the search process for innovative solutions consist of access, the opportunity to obtain a valuable piece of information; on timing, the opportunity to be informed early; and on referrals, to get your name mentioned at the right time in the right place. Social capital eases the process of such external information search through a richer set of communication channels. Innovation is defined as a "new combinations" of existing knowledge (Schumpeter 1912/1934; Kogut and Zander 1992; Fleming and Sorenson 2001). Accordingly, since variety of knowledge is key to the process of the generating of new combinations (Metcalfe 1994), in a second phase, external search helps organizations to plug into external sources of variety (often through collaboration), allowing them to create innovations, based on new

combinations of technologies and knowledge (Laursen and Salter 2006). Accordingly, firms from regions characterized by high levels of social interaction may have a higher supply of knowledge—this knowledge can be sold in international markets for technology.

Narula (2002) suggested that often firms are technologically locked in by relationships of trust, iterations, and interactions existing among local firms**.** In their search for new knowledge, firms are limited by technological and geographical contexts (Rosenthal and Strange 2003). According to evolutionary economics, firms tend to concentrate their search in the proximity of existing knowledge due to path-dependency (Dosi 1982; Nelson and Winter 1982): past search for knowledge is the natural starting point for new search. High levels of regional social capital may favor firms' tendency to search in the geographical vicinity of the firm since closer relationships reduce external information from other sources (Uzzi 1997). This leads to us argue that firms located in contexts characterized by very levels of high social capital may fail to recognize opportunities to participate in international markets for technologies too close regional "ties that bind" may become "ties that blind" (Grabher 1993: 24). It is worth noting two further issues. First, maintaining too many social relationships carry with it increasing intangible costs. Firms may therefore be attracted by developing new social ties without taking into account their underlying costs and therefore get trapped in an incestuous, spiraling cost increase. Second, the added value of additional social ties may be lower due to information redundancy. Therefore, after a certain threshold, high regional social capital may hinder firms' participation in international markets for technology.

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

Given the nature of the commodity considered, markets for technologies are 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 hamper knowledge flows from producers to other firms abroad that could apply this knowledge with profit. Not only is the cost of obtaining information particularly high, but there are also impediments associated with using the kind of market that

effect the transfer. In order to use this market, firms require information about potential partners, and they need to conduct a negotiation and 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 due to better capabilities of other firms to take value from their knowledge (Kogut and Zander 1993; Madhok 1997: 46).

As claimed by Madhok (1997), any technology is the result of an embedded and a non-embedded component. The non-embedded component is generic and can be relatively easily transferred through patent or licenses. However, the firm-embedded component of technological knowledge is difficult to transfer to other firms without serious loss in value. A licensees may find difficulties in efficiently and effectively acquiring, and hence integrating, new technological knowledge since they have to sustain the costs generated by imperfect replication and adaptation (Cantwell 1991). In addition, technologies are not static, but constantly evolve (Teece 1981). Therefore, to get the full benefit from the traded 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 requires that the participating firm from the home region has to be able to scan the international players in the markets for technology to make judgments concerning potential partners. Being able to participate in 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 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 “less imperfect”, and where a very strong focus on local interaction may be less damaging, given that direct collaboration with international partners is less required than regarding markets for technologies. In sum, this leads us to posit:

*H2: Firms will suffer from the negative effects caused by over-embeddedness more in the case of internationalization in markets for technology than in the case of markets for goods.*

### The moderating role of R&D

Several studies have explored the relationships between knowledge production and international expansion (e.g Johanson and Vahlne 1977; Eriksson et al. 1997; Yli-Renko et al. 2002). According to the resource-based theory (Penrose 1959; Barney 1991), firms may exploit their knowledge bases in terms of better performances in new environments (Kogut and Zander 1992; Presutti et al. 2007). Firms that invest in knowledge creation are more likely be able to develop skills that are useful to successful growth in foreign markets (Autio et al. 2000). Peng (2001) recognized that the resource-based theory enriches the international business literature through the recognition of firm's internal knowledge as a specific and hard-to-imitate resource that contribute to define the firm's success in foreign markets (Knite and Kim, 2009). Research on firms' export behavior has demonstrated the importance of investments in the creation of new knowledge as one of the main factors that enhances firms' success in international markets (Gruber et al. 1967; Keesing 1967; Bloodgood et al. 1996; Basile 2001; Roper and Love 2002; Dhanaraj and Beamish 2003). Knight (2004) suggested that internal knowledge increases the firm's technological competence and facilitates the development of innovative products and the adaptation of those products to foreign markets. In addition, Cohen and Levinthal (1990) argued that R&D investments enable firms to introduce new products—that can be exported—as well as equip firms with absorptive capacity, i.e. the ability to identify, assimilate, and exploit knowledge produced elsewhere. For this reason, we argue that firms with a higher degree of R&D spending will be better able to take advantage of knowledge embedded in local contexts. In other words, we submit that there is a *complementarity effect* between firms' R&D investments and regional social capital in affecting internationalization outcomes, so that for any given level of regional social capital in the form of social interaction, higher R&D intensity should lead to more internationalization:

> *H3: R&D investments positively moderate the relationships between regional social capital and goods and knowledge internationalization*

## EMPIRICAL ANALYSIS

### Data description

In this research, we used variables referring to two different levels of analysis, firms and regions. Data come from different sources. Regarding firm level, we used data on internationalization in Italian manufacturing firms collected by Capitalia (an Italian

Bank Group) for a stratified random sample of more than 10,000 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 1994 firms as regards the internationalization of goods and 1987 firms regarding the internationalization of knowledge.

At the regional level, through Multi-scope Analyses, the Italian National Institute of Statistics (ISTAT) collected data on structural social capital in 1999. The survey response rate was 82.5 per cent. Subsequently, ISTAT aggregated the individual responses according to the 21 regions' level (NUTS2). For our purposes, we believe that the level of the 21 Italian regions is the most relevant level of aggregation, 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 (i.e., 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 used data obtained from EUROSTAT.

**Research strategy**

We decided to focus on Italy due to the stark differences in term of social capital that characterizes Italian regions as illustrated by 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. In addition, Italian regions are characterized by a large presence of industrial districts wherein both a community of people and a population of firms cooperate in a historically bounded area (Becattini 1990: 38) to the extent that people and firms tend to merge (Ottati 1984). 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 complementary logit analyses. Since our hypotheses concern moderating effects, we used a complex interaction to test them.

**Measures**

***Dependent variables.*** We used export intensity as dependent variable to assess the degree of firms' *internationalization of goods*, because export represents the most common strategy adopted by firms to internationalize. 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). Export intensity (export/sales) is a double truncated variable assuming values varying between 0 and 100 by definition. Besides, this variable often takes the value of zero. Regarding *internationalization of technologies* we refer to firms' transmission of codified knowledge. The flow of codified knowledge can often be realized by impersonal means, such as patents or licenses. Therefore, we measure the firm's participation in the international markets for technology with a dummy variable that takes value 1 if the firm has sold a patent or licensed a patent in a foreign country, 0 otherwise.

***Independent variables.*** To measure structural social capital of the Italian regions, we selected 11 regional social capital items. Table 1 displays details of the meaning of the social capital items. We considered items representing strong ties (*Meeting friends regularly; Social meetings; Satisfaction as to relationships with friends*), and participation in social associations (*Participation in cultural associations; Participation in voluntary associations, Money given to an association; Participation in non-voluntary organizations, Number of voluntary associations per region*).

[Insert Table 1 about here]

We ran a non-parametric principal component analysis (PCA) on the social capital items (including those listed above, in addition to a number of items reflecting political participation). 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. We considered this a very satisfactory result for studies dealing with social variables. The first component appears to capture the idea of "social interaction" (*Social capital—social interaction*) and the second factor appears to capture the concept of "political participation" (for details of the latter, see the control variable section below). A key moderating variable is *R&D intensity* measured by the fraction of sales spent on R&D.

[Insert Table 2 about here]

[Insert Table 3 about here]

***Control variables.*** Internationalization is influenced by firm and regional characteristics. Therefore, the control variables included in our models are at firm and regional level. Concerning the firm level, we included firm's *Innovation* measured as a dummy variable assuming value 1 if the firm has introduced at least one innovation over the triennium 2001-2003, 0 otherwise (Ito and Pucik 1993; Molero 1998; Wakelin 1998; Basile 2001); firm's *size* that is measured as the number of employees in 2001 (Bonaccorsi 1992); and firm's principal activities, captured using four dummies (*Supplier dominated, Scale intensive, Science based, Specialized suppliers*) representing the Pavitt (1984) sectors. To measure the *Firm's sector* we also included the mean export intensity by industry (Fernández and Nieto 2006). Internationalization is affected by firm's investment strategies (Basile 2001). Therefore, as additional control variables, we included the firm's investments in industrial data processing over the total sales (*Investments in IC technologies*) and the firm's *International commercial agreements* using a dummy variable taking value 1 if the firm has established commercial agreements with other firms in foreign courtiers in the three year period 2001-2003, 0 otherwise.

Since our key independent variable (the social interaction component of social capital) is a regional variable, we want to make sure that it will not capture further aspects of the firms' regional context. Adding regional control variables in the model helps to solve this problem. In this context, we controlled for political participation (*Unpaid work for political parties; Money given to parties; Participation in political meetings*), as another dimension of social capital (*Social capital—Political participation*). We also controlled for the expenditure of private firms in R&D as the percentage of regional GDP (*Regional private R&D/GDP*), the percentage of the workforce with a science and technology degree to measure the human capital of the

region (*Regional human capital*), and the regions patenting intensity measured as the number of patents registered to the European Patent Office every 1 million of inhabitants. The population variable is captured by the logarithm of number of residents in a given region (*Population*). We added a further control variable to measure regional infrastructures such as *Airport* infrastructure, measured as the number of passengers embarked and disembarked by air every 100 inhabitant. Finally, we controlled for the people propensity to respect the rules even when there is not a substantial punishment (*Tax paid*) using the number of RAI (the 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 30.33. The correlations are 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]

**Results**

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. Table 5 shows the results of the Tobit estimation presenting multiple models: model I uses only the key independent variables; model II uses only the control variables; model III and IV use both the independent and the control variable.

[Insert Table 5 about here]

We found support for Hypothesis 1a ("*Regional social capital is curvilinearly (taking an inverted U-shape) related to firms' internationalization process in terms of participation in international markets for goods*"). The parameter for the social interaction component of social capital is significant and positive in explaining export intensity showing that social interaction contributes in explaining internationalization of goods. In addition, social interaction squared is negative and significant as well, showing that export intensity increases with social interaction, up to a certain point. When we pass this point, and the level of social capital becomes too high, export

intensity diminishes.[1] Figure 1 displays the empirical model's prediction of the relationship between social interaction 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 2.1 on the social capital scale (the maximum score is 2.9). In other words, when a firm is located in a region in which the social interaction component of social capital is greater than 2.1, the negative consequences overtake the positive. There are 883 firms to the right of the tipping point (of a total of 1994).

[Insert Figure 1 about here]

Firms' internationalization of knowledge is measured using a dummy variable that assumes the value of 1 when the firm has experience in international markets for technology in term of selling patents and licenses. Firms' participation in international markets for technology represents a rare event that interests only the 0.01 percent of the firms in our sample. To deal with this problem we used 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: $\ln L = \Sigma w_j \ln F(x_j b) + \Sigma w_j \ln (1-F(x_j b))$ where $F(z) = 1-\exp(-\exp(z))$ and $w_j$ denotes optional weights.

Model V and IV in table 6 show the results of the complementary logit estimation. We also found support for the hypothesis H1b concerning firms' participation in international markets for technology ("*Regional 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 positive and significant, and since the parameter for the social interaction component of social capital squared is negative and significant. The graph of the relationship between social capital and

[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 capital^2 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 capital^2, causes enormous amounts of multicollinearity.

internationalization of knowledge (Figure 2) shows that the tipping point is at the score of 1.61 on the social capital scale. There are 1682 firms to the right of the tipping point.

[Insert Figure 2 about here]

The evidence renders support for Hypothesis 2 (*"Firms will suffer from the negative effects caused by over-embeddedness more in the case of 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 1.61 of the social capital scale, and consequently, more firms appear to suffer from over-embeddedness (1682 against 883 firms). Moreover, the downward-sloping part of the curve is much steeper in the case of international markets for technology (Figure 2) as compared to the market for goods (Figure 1).

To test Hypothesis 3 ("*R&D investments positively moderate the relationships between regional social capital and goods and knowledge internationalization*") we analyzed the internationalization of goods and the internationalization of knowledge separately. Regarding selling goods in international markets, we introduced a quadratic interaction term (*R&D×Social interaction* and *R&D×Social interaction^2*). 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^2* is positive and statistically significant in explaining firm's participation in the international markets for goods. 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 II is reduced by substituting representative values for firm R&D ($25^{th}$ and $75^{th}$ percentile means) and replacing all other predictors with their respective variable means (Cohen and Cohen 1983; Jaccard et al. 1990; Schick and Ponemon 1993). Figure 3 graphs these relationships. As it can be seen from the figure, the intersection of these graphs suggests that firms with low investment in R&D activities appear to face the problem of over-embeddedness. Conversely, under conditions of high investment in R&D, firms seem not suffer from this problem. Thus, the curvature of the relationship is more pronounced for firms with low investment in R&D. Those results lead us to the

conclusion that firms investing in R&D are able to take full advantage from social capital.

[Insert Figure 3 about here]

When it comes to selling of technological knowledge, the quadratic interaction term (R&D×Social Interaction and R&D×Social interaction^2) is still positive and significant in explaining firm's internationalization of technologies. However, once we reduce the complementary logit model by substituting representative values for firm R&D ($25^{th}$ and $75^{th}$ percentile means) and replace all other predictors with their respective variable means, we find that the firms investing in R&D seems to suffer more from the problem of over-embeddedness (see Model 4). 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 R&D. Figure 4 shows that social capital helps firms with little investment in R&D to participate in international markets for technology. In sum, the evidence is in line with Hypothesis 3 regarding international markets for goods, but not regarding markets for technology.

[Insert Figure 4 about here]

In this paper, we considered political participation as a control variable. However, it is worth nothing a brief discussion of the effects of this variable on internationalization. Results show that political participation does not affect firm's internationalization. These findings could be explained considering the complex nature of political participation. Political scientists agree that two very different motivations can explain political participation: participation as instrumental action, when individual are motivated by their personal interests and goals, and participation as interaction, when individuals decide to participate to obtain collective benefits. When the former prevails, there are negative effects on performance. The difficulties in separating those two aspects of political participation consequently cause problems in obtaining clear results.

## DISCUSSION AND CONCLUSIONS

We set out to study the role of regional social capital on firms' internationalization processes. To frame our analysis, we drew on social capital theory—which assumed that firms and individuals behavior varies in the degree to which they are embedded in social networks—knowledge transfer and spillovers literature, and on international business literature. To classify types of internationalization, we adopted the

distinction between firms' participation in international markets for goods and international markets for technology.

The hypotheses presented in this paper posit an inverted U-shaped relationship between social capital and internationalization: as social capital increases, so does internationalization, up to a point which is the top of the curve, but once it passes this optimal point internationalization decreases. We have shown that this statement is true both for the internationalization of goods and for the internationalization of knowledge. The explanation of these findings is based on the notion that social capital could be positive, improving internationalization until it reaches a certain level (the tipping point) at which point negative, deteriorating effect are produced. Researchers agree that high level of social capital invariably results in an increase of firms' attention on domestic issues that consequent phenomena like group thinking and myopic toward non-local opportunities will have a negative effect on internationalization. On the contrary, a solid, yet moderate level of social capital may favor internationalization because social capital simulates people communication and knowledge diffusion. This finding represents an important contribution to understanding the role of firm's home region in defining and influencing international growth.

The inverted U-shaped curves illustrate how internationalization increases, and then decreases with increasing levels of social capital. We have analyzed the market for goods and the markets for technology separately. As mentioned above, in both cases we have identified tipping points. In comparing the two markets, however, we found that a larger number of firms are over-embedded in the case of participation in markets for technology then in the case of markets for goods. This result could be explained looking at the nature of technological knowledge that is dynamic and difficult to be transferred and replicated in other contexts: selling technological knowledge requires frequent and repeated interactions between the vendor and the buyer that favor the firm's tendency to relate to local partners.

Additionally, we explored whether firms that invest more in R&D are able to overcome the problem of over-embeddedness. We found contradictory results. According to our data, firms that highly invest in R&D better exploit regional social capital to participate in the international market for goods. We have argued that a *complementarity effect* is at work between R&D investments and regional social capital in the form of social interaction. R&D investments enlarges firms' research

horizons in terms of research areas that enables firms' search processes for the acquisition of new knowledge and—in turn—avoid the traps of over-embeddedness. On the other hand, 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. Rather than the expected complementarity effect, we found a substitution effect between high R&D investments and regional social capital in the case of markets for technology. In other words, for a given level of regional social capital, high investments in R&D give rise to a lower probability of selling a technology abroad as compared to low investments in R&D. It seems that the combination of R&D and localized social capital is not helpful (for most values in the distribution), when it comes to producing technologies that go beyond the international state-of-the-art (as reflected in obtained patents that are sold later on). In this case, we can speculate that this has to do with the Not Invented Here (NIH) syndrome. This syndrome suggests that greater attention to external knowledge may confront internal resistance from at least some of the company's technical staff. The NIH syndrome can be defined as "…the tendency of a project group of stable composition to believe that it possesses a monopoly of knowledge in its field, which leads it to reject new ideas from outsiders to the detriment of its performance." (Katz and Allen 1982: 7). Accordingly, the NIH syndrome is a behavioral response that can induce a substitution relationship between the uses of external knowledge—in our case transmitted through localized social capital—and internal R&D activities. Related, the arguments and findings provided by Helfat (1994) imply that technological search through R&D investments is path dependent and to a degree myopic. However, when a high degree of novelty is required—as in the case of producing and later selling a technology in the international market—the combination of internal search through R&D and localized social capital may not offer enough opportunities for knowledge recombination (see, Rosenkopf and Almeida 2003). In contrast, in the case of the internationalization of goods where true novelty—compared to the world's knowledge frontier—may be of smaller relative importance, R&D investments positively moderate the effect of localized social capital.

**Implications for theory**

We have contributed to highlight the important intersection between international business, strategic management, and social capital literature. First, we conceptualized the distinction between firms' participation in international markets for

goods and international markets for technology. In doing so, we have bridged the international business literature to the literature on markets for technology. Previous research has dealt with firm's commercialization of knowledge (Arora et al. 2001), but have not explored the contingencies that affect the firm's trade of technologies in international markets. To the best of our knowledge, our study represents the first contribution that demonstrates how external contingencies shape firms' internationalization of their technologies across geographical regions. Our results contribute to the emerging literature on the internationalization of intangible resources (Knight and Kim 2009).

Second, we have contributed to social capital theory by proposing that geographical bound social capital influences firm's internationalization. This result is in line with Ellis (2000) who showed that network ties are vital for firm's internationalization, Park and Luo (2001) and Peng and Luo (2000) who demonstrated the positive effects of local trust and cooperation to promote internationalization, and Zhou et al. (2007) who provided evidence on the moderating effect of social capital on other central variables in affecting firms' international growth. Our study has also cast light on very important negative side effects of a very high level of social capital. As claimed by Portes (1998) and Putmam and Goss (2002), high levels of social capital may carry penalties. This result is consistent with the literature on embeddedness that has supported the idea that knowledge transfer is related to the type of ties (Uzzi and Lancaster 2003) and that the myopia generated by systemic lock-in has a negative effect on firm performance (Grabher 1993). Referring to that prospective, Autio et al. (2000)—without mentioning social capital—observed that the level of firm' commitment to existing relationships, in terms of obligations and loyalties, can influence internationalization.

The findings of our study hold implications for the international business literature and economic geography literature as they illustrate the importance of the interrelation between firms' internationalization strategies and the spatial context. Our results extend previous studies—e.g. Oettl and Agrawal (2008), Almeida and Kogut (1999)—that provided interesting insights on the mechanisms whereby knowledge flows. In this context, we have demonstrated that social capital is a crucial for knowledge and information flows. Finally, our research contributes to explaining the role of firm's R&D investment in relation to internationalization. International business literature has highlighted the importance of internal source of knowledge to

international learning (Brush 1992; Rennie 1993; Oviatt and McDougall 1994; Oviatt and McDougall 1997). Our research enriches the existing contributions supporting the idea that internal knowledge influences the relationship between geographically bound social capital and internationalization. This finding contributes to clarify how the investment in R&D impacts on the international growth strategy of firms.

**Implications for management**

The findings of this study also have managerial implications. Managers should consider regional social capital a valuable contextual resource for international strategies. However, they should be aware that when a firm is located in a region with a very high level of social capital, it may suffer from over-embeddedness that may lead to negative consequences for the participation in international markets. Our results show also that the R&D investments may help firms overcome the problem of over-embeddedness. Therefore, managers may wish to invest more in R&D if the firm is located in a region with high level of social capital to avoid the negative return on internationalization. However, in markets for technology, investments in R&D do not help firms to overcome the problem of over-embeddedness. Consequently, managers should be aware that in regions characterized by high level of social capital, the internationalization of technological knowledge might be reduced, and to avoid the trap of over-embeddedness, they should induce their employees to create their own social networks that cross regional and national borders.

**Limitations and further research**

This study has limitations. As we used cross-sectional data, future research should examine whether this study's results hold using longitudinal data. Specifically, cross-sectional data do not permit to control for the effects of firms' past abilities. If firms have been engaged in international markets in the past, this is likely to affect firms' future international strategies.

The findings of our research also open up new paths for further research. We have argued that R&D-intensive firms do not get trapped by over-embeddedness. This may also be due to the fact that R&D activities are increasingly collaborative and therefore require the development and management of relationships with a variety of institutions—including universities and research centers—that are characterized by different mindsets as well as being located elsewhere. Interaction with different mindsets and different geographical backgrounds may help enlarge firms' perspectives. Hence, it would be interesting to check and control for the nature and

location of R&D partners. In addition, the openness of the research network (Laursen and Salter 2006) may differ across the internationalization process. Hite and Hesterly (2001) have argued that configuration and nature of performing networks should vary across time. During the first phases, networks are mainly identity-based, whereas later on networks get solidified around more formal relationships.

In this study, we could not deeply explore the nature of R&D. The distinction between research and development would provide further information of the moderating role of R&D in defining the relationship between social capital and internationalization. Specifically, research can be said to be part of the so-called "body of knowledge" and has an explorative nature, while development refers to the "body of practice" and is more exploitative (Nelson and Winter 2002). Splitting R&D in its components may possibly better explain how absorptive capacity works in affecting the firm's possibility to refer to external contingencies in their international process. A further limitation of this study is that we do not dispose of data which would permit us to explore whether the product of R&D consists in generic or specific technologies. Literature on markets for technology suggests that more general technologies are more likely to be licensed. General technologies incorporates have a large number of potential applications and uses that rise the possibility to commercialize that knowledge. In addition, the applications of this technology can be very distant from the patent holder who will be more inclined to license, when the technology will be used in other distant markets, and hence the competition with a firm's own technology will be very limited (Gambardella et al. 2007). On the other hand, firms have little interest in commercializing specific technologies, because they can be efficiently used in internal processes and it may also be difficult to find external partners that might be interested in acquiring this knowledge.

Finally, in our study we are not considering the role played by individual social capital in defining the relationship between geographical bound social capital and internationalization. Frequently, entrepreneurs refer to their personal social capital to obtain resources and knowledge functional to international growth. Consequently, the relationship between internationalization and regional social capital could be interpreted as both an immediate (as direct) and mediated (by the individual social capital of the entrepreneur) relationship. By combining data on individual social capital, geographical bound social capital and firm's internationalization, future

research should better be able to explore the characteristics of the above relationship.

## REFERENCES


Almeida, P., B. Kogut. 1999. Localization of Knowledge and the Mobility of Engineers in Regional Networks *Management Science* **45**(7) 905-917.

Archibugi, D., J. Michie. 1997. *Technology, Globalisation and Economic Performance*. Cambridge University Press, Cambridge.

Arora, A., A. Fosfuri, A. Gambardella. 2001. *Markets for Technology: The Economics of Innovation and Corporate Strategy*. The MIT Press, Cambridge, Massachusetts.

Autio, E., H.J. Sapienza, J.G. Almeida. 2000. Effects of age at entry, knowledge intensity, and imitability on international growth *Academy of Management Journal*

**43**(5) 909–1014.

Banfield, E. 1958. *The Moral Basis of a Backward Society*. Free Press, New York.

Barney, J.B. 1991. Firm Resources and Sustained Competitive Advantage *Journal of Management* **17**(1) 99-120.

Basile, R. 2001. Export behaviour of Italian manufacturing firms over the nineties: The role of innovation. *Research Policy* **30**(8) 1185–1201.

Becattini, G. 1990. The Marshallian industrial districts as a socio--economic notion. F. Pyke, ed. *Industrial Districts and Inter-Firm Co-Operation in Italy* International Institute for Labour Studies, Geneva.

Bell, J. 1995. The internationalisation of small computer software firms—a further challenge to “stage” theories. *European Journal of Marketing* **29**(8) 60–75.

Bloodgood, J., H. Sapienza, J. Almeida. 1996. The Internationalization of New High-Potential U.S. Ventures: Antecedents and Outcomes. *Entrepreneurship: Theory & Practice* **20**(4) 61-76.

Bonaccorsi, A. 1992. On the relationship between firm size and export intensity. *Journal of International Business Studies* **4**(4) 605–635.

Brusco, S. 1982. The Emilian model: Productive decentralisation and social integration. *Cambridge Journal of Economics* **6**(2) 167-184.

Brush, C. 1992. Factors motivating small firms to internationalize: The effect of firm age. *Doctoral dissertation, Boston University*.

Cantwell, J. 1991. Historical trends in international patterns of technological innovation. J. Foreman-Peck, ed. *New perspectives on the late Victorian economy*. Cambridge University Press, Cambridge, 37-72.

Cantwell, J. 1995. The globalization of technology: what remains of the product cycle model? *Cambridge Journal of Economics* **19**(1) 155.

Capitalia. 2006. Indagine sulle imprese Italiane: Rapporto sul sistema produttivo e sulla politica industriale. Capitalia, Roma, 127.

Chen, S. 2005. Extending internalization theory: a new perspective on international technology transfer and its generalization. *Journal of International Business Studies* **36**(2) 231-245.

Chetty, S., D. Blankenburg Holm. 2000. Internationalisation of small to medium-sized manufacturing firms: a network approach. *International Business Review* **9**(1) 77-93

Cohen, I., P. Cohen. 1983. *Applied multiple regression! correlation analysis for the behavioral sciences*, 2nd ed. Erlbaum, Hillsdale, NI.

Cohen, W.M., D.A. Levinthal. 1990. Absorptive capacity: A new perspective of learning and innovation. *Administrative Science Quarterly* **35**(1) 128-152.

Contractor, F.J. 1981. *International technology licensing:Compensation, costs and*

*negotiation* Lexington books,D.C. Heath & Co. Lexington Lexington, Massachusetts.

Coviello, N., H. Munro. 1997. Network relationships and the internationalisation process of small software firms. *International Business Review* **6**(4) 361-386.

Davidson, W.H., D.G. McFetridge. 1985. Key characteristics in the choice of international tech- nology transfer mode. *Journal of International Business Studies* **16**(2) 5-21.

Dhanaraj, C., P. Beamish. 2003. A resource-based approach to the study of export performance. *Journal of Small Business Management* **41**(5) 242–261.

Dosi, G. 1982. Technological Paradigms and Technological Trajectories: A Suggested Interpretation of the Determinants and Directions of Technical Change. *Research Policy* **11** 147-162.

Ellis, P. 2000. Social ties and foreign market entry. *Journal of International Business Studies* **31**(3) 443–469.

Ellis, P., A. Pecotich. 2001. Social Factors Influencing Export Initiation in Small and Medium-Sized Enterprises. *Journal of Marketing Research (JMR)* **38**(1) 119-130.

Eriksson, K., J. Johanson, A. Majkgard, D.D. Sharma. 1997. Experiential knowledge and costs in the internationalization process. *Journal of International Business Studies.* **28**(2) 337–360.

Fernández, Z., M.J. Nieto. 2006. Impact of Ownership on the International Involvement of SMEs. *Journal of International Business Studies* **37**(3) 340-351.

Fleming, L., O. Sorenson. 2001. Technology as a complex adaptive system: Evidence from patent data. *Research Policy* **30** 1019-1039.

Gambardella, A., P. Giuri, A. Luzzi. 2007. The market for patents in Europe *Research Policy* **36**(8) 1163-1183

Gans, J.S., S. Stern. 2003. The product market and the market for 'ideas': commercialization strategies for technology entrepreneurs. *Research Policy* **32**(2) 333-350.

Grabher, G. 1993. The weakness of strong ties. The lock-in of regional developmente in the Ruhr area. G. Grabher, ed. *The Embedded Firm*. Routledge, London and New York.

Gruber, W., D. Mehta, R. Vernon. 1967. The R & D Factor in International Trade and International Investment of United States Industries. *The Journal of Political Economy* **75** (1).

Guellec, D., B. van Pottelsberghe. 2001. The internationalisation of technology analysed with patent data *Research Policy* **30**(8) 1253-1266

Hansen, N. 1992. Competition, Trust and Reciprocity in the Development of Innovative Regional Milieux. *Regional Science* **71**(2) 95–105.

Hara, G., T. Kanai. 1994. Entrepreneurial networks across oceans to promote international strategic alliances for small businesses. *Journal of Business Venturing* **9**(6) 489-507.

Harris, S., C. Wheeler. 2005. Entrepreneurs' relationships for internationalization: functions, origins and strategies. *International Business Review* **14**(2) 187-207.

Helfat, C. 1994. Evolutionary Trajectories in Petroleum Firm R&D. *Management Science* **40** 1720-1747.

Hite, J.M., W.S. Hesterly. 2001. The Evolution of Firm Networks: From Emergence to Early Growth of the Firm. *Strategic Management Journal* **22**(3) 275-286

Ito, K., V. Pucik. 1993. R&D spending, domestic competition, and export performance of Japanese manufacturing firms. *Strategic Management Journal* **14**(1) 61-75.

Jaccard, J., C.K. Wan, R. Turrisi. 1990. The Detection and Interpretation of Interaction Effects Between Continuous Variables in Multiple Regression. *Multivariate Behavioral Research* **25**(4) 467-478.

Janis, I.L. 1982. *Groupthink: Psychological Studies of Policy Decisions and Fiascoes*. Houghton Mifflin Company, Boston MA.

Johanson, J., J. Vahlne. 1977. The Internationalization Process of the Firm—A Model of Knowledge Development and Increasing Foreign Market Commitments. *Journal of International Business Studies* **8**(1) 23–32.

Katz, R., T. Allen. 1982. Investigating the Not Invented Here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R&D projects. *R&D Management* **12**(1) 7-19.

Kaufmann, F. 1995. Internationalisation via co-operation - strategies of SME. *International Small Business Journal* **13**(2 ) 27-33.

Keesing, D.B. 1967. The Impact of Research and Development on United States Trade. *The Journal of Political Economy* **75**(1).

Knight, G., S. Cavusgil. 2004. Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies,* **35**(2) 124–141.

Knight, G.A., D. Kim. 2009. International business competence and the contemporary firm. *Journal of International Business Studies* **40** 255-274.

Kogut, B., U. Zander. 1992. Knowledge of the firm. Combinative capabilities and the replication of technology. *Organization Science* **3**(3) 383–397.

Kogut, B., U. Zander. 1993. Knowledge of the Firm and the Evolutionary Theory of the Multinational Corporation. *Journal of International Business Studies* **24**(4) 625-645.

Kogut, B., U. Zander. 1996. What Firms Do? Coordination, Identity, and Learning *Organization Science* **7**(5) 502-518.

Kumar, N., N.S. Siddharthan. 1994. Technology, Firm Size and Export Behaviour in Developing Countries: The Case of Indian Entreprises. *Journal of Development Studies* **31** 289-309.

Laursen, K., A.J. Salter. 2006. Open for Innovation: The role of openness in explaining innovative performance among UK manufacturing firms. *Strategic Management Journal* **27**(2) 131-150.

Levinthal, D.A., J.G. March. 1993. The myopia of learning. *Strategic Management Journal* **14**(Special issue on organizations, decision making and strategy (Winter)) 95-112.

Lu, J.W., P.W. Beamish. 2001. The internationalization and performance of SMEs. *Strategic Management Journal* **2**(6–7) 565–586.

Madhok, A. 1997. Cost, Value and Foreign Market Entry Mode: The Transaction and the Firm. *Strategic Management Journal* **18**(1) 39-61

Metcalfe, J.S. 1994. The economics of evolution and the economics of technology policy. *Economic Journal* **104** 931-944.

Molero, J. 1998. Patterns of internationalization of Spanish innovatory firms. *Research Policy* **27**(5) 541–558.

Narula, R. 2002. Innovation systems and ‘inertia’ in R&D location: Norwegian firms and the role of systemic lock-in. *Research Policy* **31**(5) 795-816.

Nelson, R.R., S. Winter. 1982. *An Evolutionary Theory of Economic Change*. Harvard University Press, Cambridge, Massachusetts.

Nelson, R.R., S.G. Winter. 2002. Evolutionary Theorizing in Economics. *Journal of Economic Perspectives* **16**(2) 23-46.

Ocasio, W. 1997. Towards an attention-based view of the firm. *Strategic Management Journal* **18**(Summer Special Issue) 187-206.

Oettl, A., A. A. 2008. International labor mobility and knowledge fow externalities *Journal of International Business Studies,* **39**(8) 1242-1260.

Ottati, D. 1984. Trust, interlinking transactions and credit in the industrial district. *Cambridge Journal of Economics* **18**(6) 29-546

Oviatt, B., M. McDougall. 1997. Challenges for internationalization process theory: The case of international new ventures. *Management International Review* **37**(2) 85-99.

Oviatt, B.M., P.P. McDougall. 1994. Toward a theory of international new ventures *Journal of International Business Studies* **25**(1) 45–64.

Park, S.H., Y. Luo. 2001. Guanxi and Organizational Dynamics: Organizational Networking in Chinese Firms. *Strategic Management Journal* **22**(5) 455-477.

Patel, P., M. Vega. 1999. Patterns of internationalisation of corporate technology: location vs. home country advantages. *Research Policy* **28**(2-3) 145-155

Pavitt, K. 1984. Sectoral patterns of technical change: Towards a taxonomy and a theory. *Research Policy* **13**(6) 343-373.

Peng, M.W., Y. Luo. 2000. Managerial Ties and Firm Performance in a Transition Economy: The Nature of a Micro-Macro Link. *The Academy of Management Journal* **43**(3) 486-501.

Penrose, E.T. 1959. *The Theory of the Growth of the Firm*. Basil Blackwell, Oxford.

Portes, A. 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology* **24** 1–24.

Presutti, M., C. Boari, L.Fratocchi. 2007. Knowledge acquisition and the foreign development of high-tech start-ups: A social capital approach. *International Business Review* **16** 23–46.

Putnam, R.D. 2000. *Bowling Alone*, New York.

Putnam, R.D., K.A. Goss. 2002. Introduction *Democracies in Flux*. Oxford Scholarship Online Monographs.

Putnam, R.D., R. Leonardi, R.Y. Nanetti. 1993. *Making Democracy Work*. Princeton University Press, Princeton.

Rennie, M.W. 1993. Global competitiveness: born global *The McKinsey Quarterly 4: 45–52.*

Roper, S., J. Love. 2002. Innovation and export performance: Evidence from the UK and German manufacturing plants. *Research Policy* **31** 1087–1102.

Rosenkopf, L., P. Almeida. 2003. Overcoming Local Search through Alliances and Mobility. *Management science* **49**(6) 751-766

Rosenthal, S., C. Strange. 2003. Geography, Industrial Organization, and Agglomeration. *Review of Economics and Statistics* **85**(2) 377-393.

Saxenian, A. 1994. *Regional Advantage: Culture and Competition in Silicon Valley andRoute 128*. Harvard University Press, Cambridge, MA.

Schick, A.G., L.A. Ponemon. 1993. The Influence of Auditors' Perceptions of Organizational Decline on Audit Risk. *Organization Science* **4**(1) 92-107.

Schumpeter, J.A. 1912/1934. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*. Oxford University Press, London.

Shane, S., D. Cable. 2002. Network Ties, Reputation, and the Financing of New Ventures *Management Science* **48**(3) 364-381.

Sharma, D.D., A. Blomstermo. 2003. The internationalization process of born globals: a network view. *International Business Review* **12**(6) 739–753.

Simon, H.A. 1947. *Administrative Behavior: A Study of Decision-Making Process in Administrative Organization*. Macmillan, Chicago.

Stuart, T., O. Sorenson. 2003. The geography of opportunity: spatial heterogeneity in founding rates and the performance of biotechnology firms. *Research Policy* **32**(2) 229-253

Teece, D. 1981. The Market for Know–How and the Efficient International Transfer of Technology. *The ANNALS of the American Academy of Political and Social Science* **458**(1) 81-96.

Telesio, P. 1979. *Technology Licensing and Multinational Enterprises.*, New York.

Uzzi, B. 1997. Social structure and competition in interfirm networks: The paradox of embeddedness *Administrative Science Quarterly* **42** 35-67.

Uzzi, B., R. Lancaster. 2003. Relational Embeddedness and Learning: The Case of Bank Loan Managers and Their Clients. *Management Science* **49**(4) 383-399.

Wakelin, K. 1998. Innovation and export behaviour at the firm level. *Research Policy* **26**(7/8) 829–841.

Welch, L.S., R. Luostarinen. 1993. Inward-outward connections in internationalisation. *Journal of International Marketing* **1**(1) 46–58.

Westlund, H., R. Bolton. 2003. Local Social Capital and Entrepreneurship *Small Business Economics* **21**(2) 77-113.

Woolcock, M., D. Narayan. 2000a. Social Capital: Implications for Development Theory, Research, and Policy *The World Bank Research Observer* **15**(2) 225-249.

Woolcock, M., D. Narayan. 2000b. Social Capital: Implications for Development Theory, Research, and Policy. *The World Bank Research Observer* **15**(2) 225-249.

Wooldridge, J.M. 2002. *Econometric Analysis of Cross Section and Panel Data*. The MIT Press, Cambridge Massachusetts.

Yli-Renko, H., A. Autio, V. Tontti. 2002. Social capital, knowledge, and the international growth of technology-based new firms. *International Business Review (3): 279–304.* **11**(3) 279-304.

Zaheer, S., E. Mosakowski. 1997. The dynamics of the liability of foreignness: a global study of survival in financial services. *Strategic Management Journal* **18**(6) 439–464.

Zander, U., B. Kogut. 1995. Knowledge and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test. *Organization Science* **6**(1) 76-92.

Zhou, L., W. Wu, X. Luo. 2007. Internationalization and the performance of born-global SMEs: the mediating role of social networks. *Journal of International Business Studies* **38** 673–690.

Zucker, L., M. Darby, M. Brewer. 1998. Intellectual Capital and the Birth of the U.S. Biotechnology Enterprises. *American Economic Review* **88** 290-306.

**TABLE 1**
Description of the variables included in the PCA

| Variable | Description |
|---|---|
| *Participation in cultural associations* | 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 |
| *Participation in voluntary associations* | 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 |
| *Participation in non-voluntary organizations* | 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 |
| *Number of voluntary associations per region* | Number of voluntary organizations for every 10.000 people |
| *Money given to associations* | 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 |
| *Meeting friends regularly* | People aged 6 and more meeting friends at least once a week for every 100 people of the same area |
| *Social meetings* | 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. |
| *Satisfaction as to relationships with friends* | People aged 14 and more who are satisfied with their relationships with friends |
| *Unpaid work for political parties* | 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 |
| *Money given to parties* | 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 |
| *Participation in political meetings* | 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 |

**TABLE 3**
Matrix of factor loadings.

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

**TABLE 4**

Descriptive Statistics and Correlation matrix

| | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Participation in international market for goods | 30.330 | 30.297 | | | | | | | | | | | | | | | | | | | | |
| 2 Participation in international markets for technologies | 0.175 | 0.380 | 0.051 | | | | | | | | | | | | | | | | | | | |
| 3 Social capital—social interaction | 1.857 | 0.751 | 0.115 | 0.011 | | | | | | | | | | | | | | | | | | |
| 4 Social capital—social interaction^2 | 4.012 | 2.154 | 0.091 | 0.008 | 0.963 | | | | | | | | | | | | | | | | | |
| 5 R&D intensity | 0.034 | 0.069 | 0.142 | 0.045 | 0.058 | 0.041 | | | | | | | | | | | | | | | | |
| 6 Innovation | 0.642 | 0.479 | 0.141 | 0.029 | 0.019 | 0.006 | 0.231 | | | | | | | | | | | | | | | |
| 7 Size | 32.410 | 85.508 | 0.157 | 0.023 | 0.032 | 0.031 | -0.023 | 0.103 | | | | | | | | | | | | | | |
| 8 Int. commercial agreements | 0.175 | 0.380 | 0.156 | 0.132 | -0.028 | -0.013 | 0.123 | 0.132 | 0.063 | | | | | | | | | | | | | |
| 9 Investments in IC technologies | 0.017 | 0.179 | 0.031 | -0.001 | -0.004 | -0.008 | 0.022 | 0.017 | 0.005 | 0.001 | | | | | | | | | | | | |
| 10 Firm's sector | 30.377 | 13.709 | 0.445 | 0.072 | 0.094 | 0.069 | 0.134 | 0.117 | 0.087 | 0.092 | 0.025 | | | | | | | | | | | |
| 11 Supplier dominated | 0.517 | 0.500 | -0.070 | -0.045 | -0.047 | -0.029 | -0.121 | -0.092 | -0.035 | -0.040 | -0.038 | -0.156 | | | | | | | | | | |
| 12 Scale intensive | 0.172 | 0.378 | -0.185 | -0.019 | -0.076 | -0.071 | -0.082 | -0.029 | -0.014 | -0.053 | -0.009 | -0.325 | -0.447 | | | | | | | | | |
| 13 Science based | 0.043 | 0.202 | 0.000 | 0.024 | -0.061 | -0.071 | 0.210 | 0.058 | 0.035 | 0.019 | 0.009 | 0.069 | -0.224 | -0.098 | | | | | | | | |
| 14 Specialized suppliers | 0.268 | 0.443 | 0.230 | 0.055 | 0.142 | 0.123 | 0.103 | 0.099 | 0.035 | 0.078 | 0.045 | 0.407 | -0.636 | -0.280 | -0.140 | | | | | | | |
| 15 Social capital—political participation | -0.049 | 0.852 | -0.022 | 0.027 | 0.089 | -0.010 | -0.028 | 0.000 | -0.040 | -0.021 | 0.015 | -0.018 | -0.025 | -0.004 | -0.034 | 0.047 | | | | | | |
| 16 Regional private R&D/GDP | 0.543 | 0.363 | 0.040 | 0.035 | 0.367 | 0.354 | 0.038 | 0.018 | 0.025 | 0.004 | 0.018 | 0.030 | -0.136 | 0.007 | 0.032 | 0.130 | 0.065 | | | | | |
| 17 Regional human capital | 6.281 | 1.763 | 0.039 | -0.009 | 0.336 | 0.182 | 0.079 | -0.012 | -0.004 | -0.065 | 0.001 | 0.082 | -0.111 | -0.024 | 0.044 | 0.122 | 0.252 | 0.168 | | | | |
| 18 Population | 15.212 | 0.710 | 0.031 | -0.032 | -0.002 | -0.072 | 0.030 | -0.028 | -0.005 | -0.039 | 0.030 | 0.041 | -0.113 | 0.041 | 0.007 | 0.088 | 0.121 | 0.217 | 0.479 | | | |
| 19 Airports | 33.249 | 08.847 | 0.005 | -0.018 | -0.083 | -0.181 | 0.018 | 0.009 | 0.003 | -0.017 | 0.037 | 0.012 | -0.110 | 0.055 | 0.068 | 0.045 | 0.145 | 0.183 | 0.278 | 0.728 | | |
| 20 Taxes paid | 75.400 | 6.188 | 0.092 | 0.002 | 0.703 | 0.566 | 0.040 | 0.031 | 0.018 | -0.033 | -0.003 | 0.102 | -0.017 | -0.081 | -0.019 | 0.094 | 0.374 | 0.142 | 0.407 | -0.173 | -0.072 | |
| 21 Regional patenting intensity | 94.336 | 47.320 | 0.072 | 0.009 | 0.637 | 0.527 | 0.070 | 0.017 | 0.031 | -0.034 | 0.018 | 0.081 | -0.139 | -0.027 | -0.019 | 0.185 | 0.363 | 0.461 | 0.608 | 0.521 | 0.355 | 0.425 |

**TABLE 5**

Results of the regression models—explaining sales of goods

| | Tobit | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Goods-percent of sales | | | | | | | | | | | |
| | Model I | | | Model II | | | Model III | | | Model IV | | |
| | Coef. | | S.E. | Coef. | | S.E. | Coef. | | S.E. | Coef. | | S.E. |
| Social capital—social interaction | 13.179 | *** | (3.818) | | | | 31.063 | *** | (7.657) | 35.306 | *** | 8.043 |
| Social capital—social interaction^2 | -2.556 | * | (1.347) | | | | -7.322 | *** | (2.061) | -8.819 | *** | 2.220 |
| R&D intensity | 1.1264 | * | (0.514) | | | | 0.360 | *** | (0.109) | 0.877 | * | 0.510 |
| R&D intensity × social interaction | -0.849 | | (0.677) | | | | | | | -1.102 | † | 0.689 |
| R&D intensity × social interaction^2 | 0.326 | † | (0.216) | | | | | | | 0.392 | * | 0.221 |
| Innovation | | | | 7.740 | *** | (1.709) | 6.114 | *** | (1.744) | 6.032 | *** | 1.744 |
| Size | | | | 0.008 | *** | (0.002) | 0.008 | *** | (0.002) | 0.008 | *** | 0.002 |
| Int. commercial agreements | | | | 11.319 | *** | (1.810) | 10.943 | *** | (1.821) | 10.933 | *** | 1.819 |
| Investments in IC technologies | | | | 3.103 | | (3.927) | 2.905 | | (3.904) | 2.989 | | 3.900 |
| Firm's sector | | | | 1.208 | *** | (0.069) | 1.186 | *** | (0.069) | 1.185 | *** | 0.069 |
| Supplier dominated | | | | -2.007 | | (1.844) | -1.626 | | (1.848) | -1.553 | | 1.847 |
| Scale intensive | | | | -7.898 | ** | (2.581) | -7.487 | ** | (2.578) | -7.450 | ** | 2.577 |
| Science based | | | | -8.009 | * | (3.666) | -9.253 | ** | (3.721) | -9.180 | * | 3.744 |
| Specialized suppliers | Benchmark | | | Benchmark | | | Benchmark | | | Benchmark | | |
| Social capital—political participation | | | | -2.142 | * | (0.973) | -0.379 | | (1.118) | -0.333 | | 1.117 |
| Regional private R&D/GDP | | | | 1.084 | | (82.289) | 0.646 | | (2.320) | 0.536 | | 2.319 |
| Regional human capital | | | | -1.340 | ** | (0.625) | -1.611 | ** | (0.685) | -1.597 | * | 0.685 |
| Population | | | | 4.012 | * | (2.073) | 4.237 | * | (2.088) | 4.202 | * | 2.090 |
| Airports | | | | -0.010 | | (0.010) | -0.012 | | (0.011) | -0.012 | | 0.011 |
| Taxes paid | | | | 0.685 | *** | (0.202) | -0.275 | | (0.308) | -0.307 | | 0.308 |
| Regional patenting intensity | | | | 0.019 | | (0.028) | -0.063 | * | (0.036) | -0.063 | * | 0.036 |
| Constant | 7.096 | ** | (2.427) | -130.16 | *** | (38.188) | -79.270 | * | (40.270) | -78.235 | * | 40.325 |
| Number of Observations | 3.281 | | | 2.016 | | | 1994 | | | 1994 | | |
| R2 | 0.005 | | | 0.035 | | | 0.036 | | | 0.037 | | |
| Chi2 | 140.25 | *** | | 592.09 | | | 609.44 | *** | | 612.81 | *** | |

Notes: One-taliled test: †p < .10; * p < .05** p < .01; *** p < .001. Standard deviations in parenthesis.

**TABLE 6**

Results of the regression models—explaining technologies in foreign markets

| | Complementary logit Technologies, dummy | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Model V | | Model VI | | Model VII | | Model VIII | |
| | Coef. | S.E. | Coef. | S.E. | Coef. | S.E. (2.341)rrdddddd | Coef. | S.E. |
| Social capital—social interaction | 3.098 * | (1.664) | | | 3.720 † | | 5.919 * | (2.919) |
| Social capital—social interaction^2 | -0.939 * | (0.518) | | | -1.121 † | (0.690) | -1.841 * | (0.876) |
| R&D intensity | 10.645 * | (8.220) | | | 1.395 | (2.480) | 19.959 * | (10.918) |
| R&D intensity × social interaction | -0.218 † | (0.137) | | | | | -30.369 * | (16.605) |
| R&D intensity × social interaction^2 | 0.069 † | (0.045) | | | | | 9.880 * | (5.474) |
| Innovation | | | 0.247 | (0.643) | 0.153 | (0.656) | 0.058 | (0.658) |
| Size | | | 0.000 | (0.001) | 0.000 | (0.001) | 0.000 | (0.001) |
| Int. commercial agreements | | | 2.106 *** | (0.494) | 2.138 *** | (0.501) | 2.176 *** | (0.505) |
| Investments in IC technologies | | | -0.486 | (4.642) | -0.322 | (3.767) | -0.713 | (6.345) |
| Firm's sector | | | 0.054 ** | (0.023) | 0.052 | (0.023) | 0.052 ** | (0.023) |
| Supplier dominated | | | -0.424 | (0.571) | -0.414 | (0.575) | -0.340 | (0.574) |
| Scale intensive | | | 0.111 | (0.860) | 0.154 | (0.865) | 0.244 | (0.865) |
| Science based | | | 0.244 | (0.808) | 0.233 | (0.831) | 0.101 | (0.860) |
| Specialized suppliers | Benchmark | | Benchmark | | Benchmark | | Benchmark | |
| Social capital—political participation | | | 0.312 | (0.269) | 0.335 | (0.278) | 0.301 | (0.279) |
| Regional private R&D/GDP | | | 0.808 | (0.668) | 0.959 † | (0.685) | 1.003 † | (0.694) |
| Regional human capital | | | 0.070 | (0.186) | 0.003 | (0.202) | 0.028 | (0.203) |
| Population | | | -0.768 | (0.632) | -0.820 | (0.744) | -0.970 | (0.755) |
| Airports | | | 0.001 | (0.004) | -0.001 | (0.004) | -0.001 | (0.004) |
| Taxes paid | | | -0.075 | (0.063) | -0.150 * | (0.085) | -0.149 * | (0.086) |
| Regional patenting intensity | | | 0.004 | (0.010) | 0.004 | (0.012) | 0.005 | (0.013) |
| Constant | -7.032 *** | (-5.320) | 7.912 | (11.400) | 12.534 | (13.114) | 12.993 | (13.257) |
| Number of Observations | 3271 | | 2.009 | | 1987 | | 1987 | |
| Chi2 | 8.630 | | 43.60 *** | | 46.85 *** | | 50.12 *** | |

Notes: One-tailed test †p < .10; * p < .05** p < .01; *** p < .001. Standard deviations in parenthesis.

**FIGURE 1**
Predicted relationship between firms' export intensity and social capital—social interaction

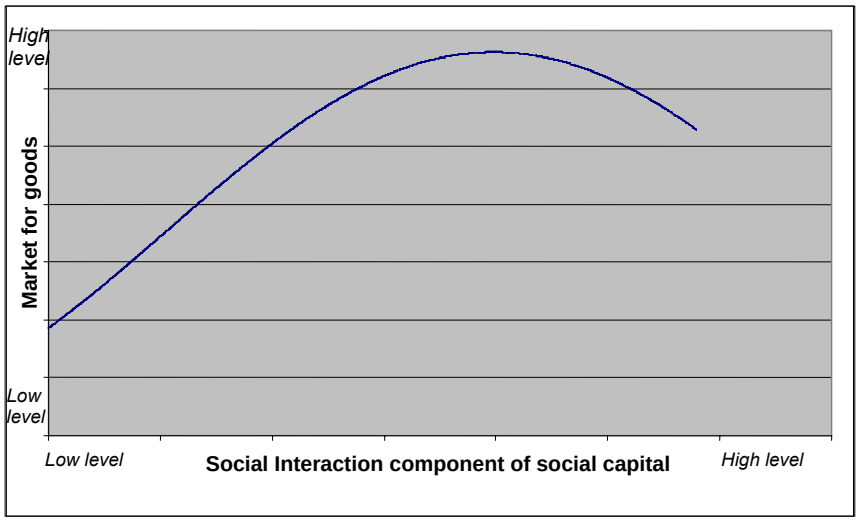


**FIGURE 2**
Predicted relationship between firms' internationalization of knowledge and social capital—social interaction

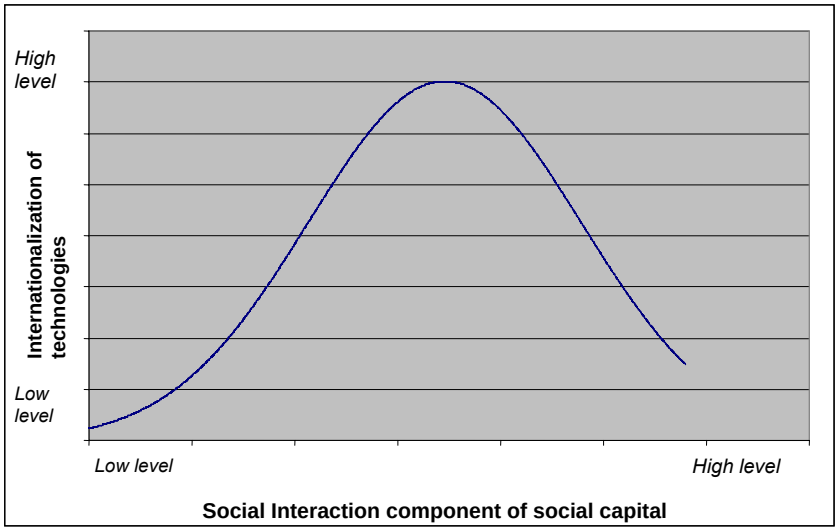

**FIGURE 3**
Predicted relationship between firms' export intensity and social capital—social interaction moderated by R&D

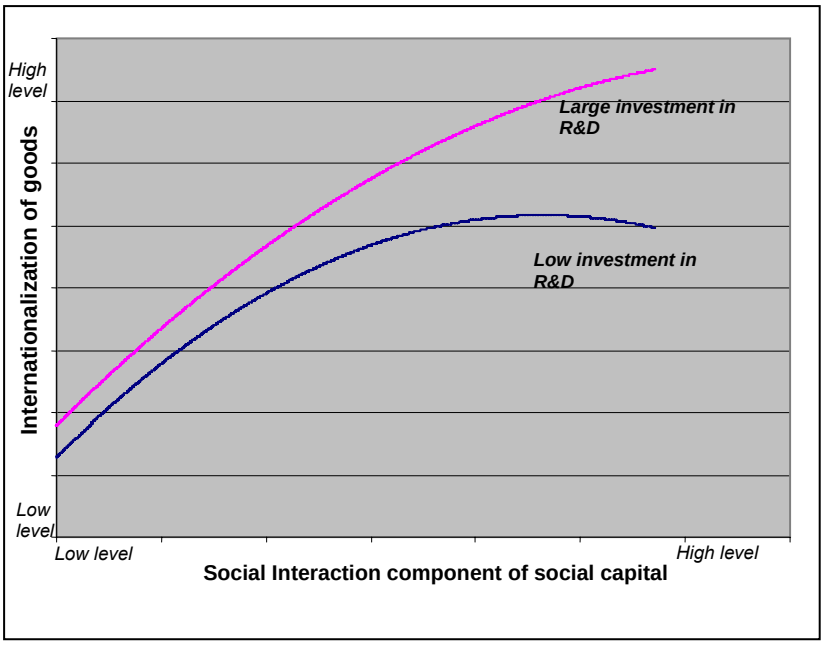


**FIGURE 4**
Predicted relationship between firms' internationalization of knowledge and social capital—social interaction moderated by R&D