

Ruuskanen, Petri; Kankainen, Tomi

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# Dynamic capabilities in small and medium manufacturing firms in rural Finland – role of social capital?

Petri Ruuskanen and Tomi Kankainen

Department of Social Sciences and Philosophy,  
University of Jyväskylä

PO BOX 35  
40014 University of Jyväskylä  
FINLAND  
email: petri.ruuskanen@jyu.fi

## 1. Introduction

In the recent decades the competitive environment of small industrial enterprises has been changing. The changing market and global price pressure presupposes more flexibility, active versatility and adaptability from economic organisations. To be able to gain and maintain a competitive edge, firms have to continuously renew and rethink their products, technology, division of labour, organisation models and production and marketing methods. The development has led to the rising importance of “dynamic capabilities” and “combinative capabilities” of firms. Adapting, integrating, and re-configuring internal and external organizational skills, resources, and functional competences toward changing environment have become a key of competitive advantage of firms. (Teece and Pisano 1994; Kogut and Zander 1992)

In the literature on firm dynamics it has been emphasised that it much depend on the actors’ ability to learn, and absorb external knowledge to their own knowledge base (e.g. Kogut and Zander 1992 and 1996). The developments emphasise the importance of human and intellectual capital when firms seek organisational advantage. Furthermore the locus of development of innovative processes has increasingly shifted from individual firms to interactive networks of learning, which often cross organisational boundaries. (See e.g. Rosenberg 1982; Lundvall 2002) Most firm-level improvements and incremental innovations probably also result from the absorption and localisation of knowledge developed by others (DiMaggio and Powell 1983; Cohen and Levinthal 1990).

There have recently been wide discussions on the geography of knowledge spillovers and economic dynamics in the context of high-tech agglomerations. According to the so called “localized knowledge spillover” argument, firms operating nearby key knowledge institutions and other firms operating related and supporting industries are more dynamic since they are capable to

introduce innovations at a faster rate than firm located elsewhere (see e.g. Feldman 1999; Florida 2002; Audretsch and Feldman 2004). At the same time social scope of cooperative learning and diffusion of new economic knowledge is often bounded. Information and knowledge have a “social life” (Brown and Duguid 2002). Knowledge often spills over organisational boundaries in social networks of peers and innovative processes take place in both informal or institutionalised social networks (see e.g. Schrader 1992; Caniels 2000; Dahl and Pedersen 2004), which emphasise the importance of networking and social capital in seeking competitive advantage. In this article, the determinants of dynamic capabilities of small industrial Finnish firms will be explored. Firms are located in periphery where the economic structures, “creative capital” of diversified population do not breed the economic dynamism (cf. Florida 2002). Specifically we are interested in the role of social capital in creating dynamic capabilities in SMEs. The article is structured as follows: After the introduction, we shortly review the concept of social capital and its importance in the context of firm dynamics. In the third section, we will turn to our quantitative data to analyse the antecedents of dynamic capabilities of SMEs located in Finnish periphery. Furthermore we study the mechanisms related to outcomes; how does social capital produce its positive outcomes. The article will conclude in a brief discussion of the study.

## **2. The concept of social capital**

According to the basic argument of economic sociology, economic activities are embedded in the social environment. In the context of entrepreneurship the argument of embeddedness (see Polanyi 1944; Granovetter 1985 and 1992) basically signifies that economic organisations are not developed in a social vacuum, but business activities of firms are affected by the socially constructed institutions, the actors’ personal relations and the structure of the network of relations.

In the recent years, there has been a lively discussion about the social dimension of economic development. Especially the concept of social capital has become widely used among academics, politicians and policy makers. In the social capital literature (see e.g. Coleman 1988; Putnam 1993; 2000; Woolcock 1998; OECD 2001), it has been stated that social capital enhances the performance of economy and society by facilitating cooperation, reducing transaction costs and improving the flow of information in social networks. It has also been stated that social capital is crucial in the value creation, learning, creation of human and intellectual capital and innovations (e.g. Coleman 1988; Nahapiet and Ghoshal 1998; Tsai and Ghoshal 1998; Lundvall 2002).

The problem of empirical studies, however, has often been that the features social organization which the concept of social capital tries to capture is multifaceted. Thus it has been

very difficult to define social capital unambiguously. There are several theoretical tendencies that emphasise different aspects of social capital. Some scholars, for example, tend to emphasise the individual agents and their position in the overall structure of social networks. Thus they see social capital as an individual's asset which creates personal opportunities (e.g. Burt 1992; Lin 1999). Others place more emphasis on the norms and trust that arise from dense structure of community networks (e.g. Coleman 1988) or from historical institutions and the "civicness" of society (Putnam 1993; 2000). And still others emphasise the bounded solidarity and trust within a particular status group of mutual recognition which makes social capital a group-specific asset (Bourdieu 1986; Portes and Sensenbrenner 1993; Portes 1995).

The attempts to synthesise the different views have mainly drawn on Mark Granovetter's work. In his early work, Granovetter (1973) distinguishes between "strong" and "weak" social ties. By strong ties he means relations characterised by large time commitments, emotional intensity and intimacy. To put it short, they are ties between similar agents. Weak ties, on the other hand, refer to relations between different agents and identity groups. They connect actors who move in different circles, and thus have access to different information sources. The Granovetterian hypothesis of "strength of weak ties" lies precisely in their potential ability to transmit diverse information.

In much the same way, social capital has been distinguished for its "bonding" and "bridging" dimension (e.g. Putnam 2000). Bonding social capital refers to the relations of people who already know each other, feel cultural belonging and share a common identity. Bridging social capital refers to relations that bring people (or groups) together who did not know each other before or knew themselves to be unlike. While bonding social capital facilitates cooperation within a group, bridging social capital lubricates interaction and cooperation among groups. Furthermore Michael Woolcock has pointed out, that the capacity of social groups in their collective interest depends crucially on their capability to link with formal institutions (Woolcock 2000, 23). In addition to the "bonding" and "bridging" dimensions of social capital, he distinguishes a third dimension of social capital: "linking" social capital (e.g. Woolcock 1999). In Woolcock's terminology, linking social capital refers to contacts between actors who are unequal in their access to resources. The concept of linking social capital allows us to analyse e.g. the relationships between small suppliers and their large customers. It also allows us to analyse the kinds of relationships that can form across somewhat artificial dichotomies, such as state vs. market and public vs. private (Szreter 2002, 580–581), which is important when studying e.g. the relations between public knowledge institutions and private enterprises.

## ***2.1. Social Mechanisms of Social Capital***

The social capital literature states that certain features of a social organisation, such as social relationships, social networks, norms and trust, can improve the performance of firms by enhancing the flow of information and learning, facilitating the coordination of between firms, and reducing transaction costs in business networks. (E.g. Coleman 1988; Nahapiet and Ghoshal 1998; Maskell 2000). In the recent years, the social dimension of economy and social capital embedded in business networks have become popular concepts in entrepreneurship and small firm studies (see e.g. Yli-Renko, Autio and Sapienza 2001; Anderson and Jack 2002; Cooke, Clifton and Oleaga 2005; Anderson, Park and Jack 2007; Lee and Jones 2008). The problem of empirical studies, however, has often been the difficulty to clarify the causal links between the alleged sources and consequences of social capital. As a consequence, the concept – despite having become influential in understanding economic development – has at the same time remained somewhat fuzzy (see also Anderson, Park and Jack 2007).

Because of the open nature of social systems it is difficult to find regular causalities in social sciences (Sayer 2000). This holds true also for social capital, and its causes and effects. In empirical studies we can, however, try to find social mechanisms, which mediate the alleged causes and outcomes of social capital. To provide an answer to the question “Why does social capital facilitate firm dynamics?”, or “How do networks enhance learning or performance of economy and society?”, we need to be able to identify social mechanisms that intermediate the causes and effects of social capital (see also Torsvik 2000). By social mechanisms we mean a systematic set of statements that provide a plausible account of how causes and consequences are linked to one another (Hedström and Swedberg 1998; Elster 1998; Sayer 2000). Social mechanisms – mediating the alleged sources of social capital and its positive or negative consequences – have often remained unclear in social capital research. Many scholars distinguish between different forms and consequences of social capital but do not explicitly analyse the mediating mechanisms.

Nahapiet and Ghoshal (1998), for example, in their informative article on social capital, intellectual capital and organisational advantage suggest that it is useful to consider three clusters of social capital: 1) the structural referring to the contacts of people and the structure of networks of those contacts, 2) the relational referring to the kinds of those contacts, and 3) the cognitive referring to “resources providing shared representations, interpretations, and systems of meaning among parties” (ibid., 244). They, however, do not explicitly analyse, how the sources listed produce the alleged outcomes.

The network relations, the quality of those relations or shared cognitive capabilities cannot produce positive (or negative) outcomes, such as creation of dynamic capabilities, without intermediating mechanisms. This kind of causal chain can be found, for example, from Coleman (1988; 1990), even though he doesn't explicitly state his logics. For him certain aspects of social structures are capable to create an environment which encourages cooperation and coordination of action. In his theory dense social networks and appropriable social organisations (sources of social capital) create trust and enhance flow of information among individuals. It is these mechanisms – trust and information flows – which mediate between sources and outcomes, such as dense networks and coordination of action or enhanced learning. The same causal model can be found also from Putnam (1993; 2000) and Burt (1992). Coleman and Putnam, specifically, emphasise the importance of trust. Burt on his behalf sets the issue of trust to one side and emphasises the importance of access and control of information (Burt 1992, 13–16).

Trust can be defined as a social mechanism which reduces the contingency of social complexity and thus facilitates the future orientation (see Luhmann 1979; 1988; Seligman 1997, Miszal 1996; Barbalet 1998). Commitment of resources, for example, to an activity where the future outcome depends on the behaviour or attitude (such as possible opportunistic behaviour, ill will or incompetence) of others requires trust. As a consequence, trust is an essential part of economic life and commercial transactions. As Arrow (1975) put it, “Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time.”

On the other hand the recent debate about so-called dynamic externalities and knowledge spillovers has paid attention to the so called network effects. Actors interacting with each other tend to exchange information for no direct compensation (see e.g. Caniels 2000). These information and knowledge flows can be a by product of networking and interaction notwithstanding the level of trust among participants. Trust and information flows then act as mechanisms which possibly enable the exchange oriented to future, e.g. the birth of a favour bank, spilling over the knowledge of market opportunities and informing new technologies and organisational models among participants of networks. Thus they may also enhance dynamic capabilities of firms.

## ***2.2. Social capital and dynamic capabilities***

There are several studies which suggest that social capital correlates positively with economic performance (see e.g. Knack and Keefer 1997; La Porta et al. 1997; Whiteley 2000). If we suggest that the causality goes from social capital to economic performance, and not vice versa, one

possible route is through increased dynamism of economic organisations. Many authors have, actually, referred to the potential importance of social capital on firm dynamics, innovations and creativity (see e.g. Fountain 1998; Nahapiet and Ghoshal 1998; Tsai and Ghoshal 1998; Maskell 2000; Lundvall 2002; Florida 2002). The empirical evidence on the issue is mixed however.

According to Florida (2002), it is not social capital but weak ties and diverse networks that support creativity and economic dynamism. In his study Florida, however, equals the concept of social capital to strong ties; a phenomenon here called “bonding social capital”. He uses the concept “creative capital” to refer to diverse networks usually known as “bridging social capital” in the social capital literature. In the same vein Lee and Jones (2008) have argued that in creating new business the ability to bridge out of existing networks is very important. Bridging social capital can compensate for a lack of financial and human capital and facilitate the access to additional resources. Cooke, Clifton, and Oleaga (2005) on their behalf studied the effects of social capital on the performance of SMEs. According to them innovative SME firms tend to make greater use of collaboration, information exchange and non local networks. In their data innovative firms are also involved in higher trust relationships.

Landry et al. (2001) studied the importance of social capital for innovations in the Montérégie region of Canada by a questionnaire addressed to manufacturing firms. They measured four types of social capital: network capital, relationship capital, participation capital and trust. Their results suggest that the probability of innovation rises significantly with increased participation in the firms’ meetings, associations and networks. It also rises with increased relationship capital, i.e. the intensity of personal relations with different actors. In this study, trust (measured as trust in the firm’s clients and suppliers and different organisations) was not a statistically significant factor in the firm’s probability of innovating.

In their study Yli-Renko, Autio and Sapienza (2001) studied young technology based firms’ and their customer relationships in the United Kingdom. According to them, social interaction and network ties between suppliers and key customers enhance the knowledge acquisition of suppliers. Knowledge acquisition, on its behalf, was positively related to new product development, technological distinctiveness, and sales cost efficiency. In their data high trust involved in relationship (or bonding social capital) was negatively related to knowledge acquisition.

Isham (2002) on his behalf found that in rural Tanzania agricultural innovations diffuse more rapidly in environments with ethnically based and participatory social affiliations. In other words his results refer to the importance of bonding social capital.

### **3. Analysis**

The aim of the study is to explore the determinants of dynamic capabilities of small industrial Finnish firms located in periphery. Our basic hypothesis are based on the “resource-based perspective” (RBP) on a firm. RBP emphasises the importance of firm specific capabilities and assets as the fundamental determinants of firm performance (see e.g. Teece, Pisano and Shuen 1997). Our basic hypothesis is that dynamic capabilities of firms are related to intangible assets. First, managerial knowhow epitomised in firm’s proactive strategy increases dynamic capabilities. Second, human and intellectual capital embedded in a firm organisation and its employees increase dynamic capabilities. Third, social capital as structural, relational and participation capital enhance dynamic capabilities. Furthermore, on the basis of the social capital theory we assume that trust and knowledge flows are the mediating mechanisms between sources and consequences of social capital. On the one hand, increased level of trust enhances dynamic capabilities of firms. On the other hand, according to the social capital theory, increased knowledge flows related to networks enhance dynamic capabilities.

### ***3.1. The data and descriptive statistics***

To study the determinants of the dynamic capabilities of SMEs in Finnish periphery, we conducted telephone interviews among 253 managers of small and medium sized manufacturing firms. To sample the firms we utilised the database of active business firms in Finland gathered by Helsinki media. In the database there were 12 750 active manufacturing SMEs located in the target regions (see Table 1). Our target respondents were managing directors (MD) of firms. In the study we used the stratified random sampling strategy to ensure variation of firm size and firm location. Moreover, we had sampled a comparable (size, location) backup case to all firms; if a managing director of a firm refused to be interviewed we called to this backup case. The data consists of 253 industrial firms located in the peripheral areas of Finland<sup>1</sup>. The data includes 133 micro (<10 employees), 64 small (10–49), and 55 medium sized enterprises (50–250)<sup>2</sup> (see Table 2)<sup>3</sup>.

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<sup>1</sup> The excluded regions were those of Helsinki, Jyväskylä, Oulu, Tampere and Turku.

<sup>2</sup> Information on firm size is missing in one case.

<sup>3</sup> The interviews were conducted by a subcontractor. The subcontractor did not report the non responses. Thus we cannot report the response rate and analyze the possible sampling bias.



**Table 1. Population of industrial SMEs in the target regions**

Firm size/ employees	Region			Total
	Southern Finland	Central Finland	Nothern Finland	
- 4	1038	7305	955	9298
5 - 9	208	1007	198	1413
10 - 49	197	1347	117	1661
50 -	59	276	43	378
Total	1502	9935	1313	12750

**Table 2. Sample**

Firm size/ employees	Region			Total
	Southern Finland	Central Finland	Nothern Finland	
- 4	24	24	22	70
5 - 9	22	22	22	66
10 - 49	20	23	21	64
50 -	23	19	16	58
Total	89	88	81	258

### 3.2. Measures

#### *Dependent Variable*

We measured the dynamic capabilities of firms by asking if they had in the past three years implemented changes or improvements concerning their 1) Products, 2) Technology, 3) Production system, 4) Organisation, 5) Marketing, and 6) Sources of supply. The items were rated on a 5-point scale (1=No improvements or changes, 5=Radical improvement or change). The variables were chosen on the basis of the Schumpeterian theory of economic development and firm dynamics (Schumpeter 1911). To measure the overall dynamic activities of a firm these six items were combined to form a sum scale, where higher numbers indicate greater dynamic capabilities. Dynamic capabilities (DC) sum variable<sup>4</sup> measures how extensively *and* how radically the firms had changed their business operations in the last three years<sup>5</sup>. The Cronbach's alpha coefficient of the scale was .72. The mean value was 2.51 (SD=.88).

<sup>4</sup> All sum scales are created by calculating the mean of the items.

<sup>5</sup> In this phase, we excluded 21 firms that had set up their business during the last three years, and thus responded as having implemented either "totally new solution" or "no changes" in all six areas.

### *Independent variables*

We measured the *strategy* applied by the firm with a degree of agreement on how the following statements describe their strategy (a 5-point scale: 1=not at all, 5=very well): 1) We take strong initiatives to respond changes. 2) Our firm seeks more adaptability than change (reverse coded). 3) We continuously look for new tracks and ideas for our business. *Proactiveness* sum variable was created by calculating the mean of these items. The Cronbach's alpha coefficient of the scale was .61. The mean value was 3.33 (SD=.77). We also measured firm's own R&D activities by a dummy variable measuring if a firm had budgeted funds for R&D (0=no, 1=yes).

We also included variables measuring *human capital* in a firm. First of all, human and organisational capital was measured by an educational level of a MD. Because education was clearly measured by ordinal scales, it was used as dummy variable (those with no vocational education was made the reference group). Secondly, a MD assessed (5-point scale, 1=very bad, 5=excellent) competence of their employees by 1) their initiative, 2) professional skills, 3) capability to learn, 4) capability to adapt to new technology, and 5) capability to innovate. *Competence of employees* sum variable was created by calculating the mean of these items. The Cronbach's alpha coefficient of the scale was .79. The mean value was 3.74 (SD=.57). Thirdly, a MD assessed the quality of commitment of employees (5-point scale, 1=very bad, 5=excellent).

To be able to analyse the importance of social capital for the dynamic capabilities of firms, we have to measure *social capital* at the firm level. Firstly, we evaluated the *sources* of social capital. Networks were firstly measured structural dimension of social capital by the number of network type of relations of firms. In the interviews we defined network type of relations as business relations which are more stable than pure market relations and aimed to be profitable for all parties of cooperation.

We also measured participation of managers in associational life. According to Putnam (1993; 2000) the associational life is a central forum in creating social capital. Recent studies on civic participation, however, have pointed out the increased activeness is not decisive dimension of participation. Instead, the important thing is if people participate at all. (E.g. Wollebaek & Selle 2002; Diani 2004; Stolle 2003) Thus we measured civic participation by a dummy variable measuring if a MD had participated in meetings of some association in the last 12 months (0=no, 1=yes).

Furthermore we measured relational social capital by asking how much a MD agree or disagree that they know personally a) key personnel of their clients, b) key personnel of their

suppliers, c) people in their main competitors, d) representatives of the Employment and Economic Development Centre of their area, and e) researchers of their branch in universities and other research institutions (5-point scale; 1=totally disagree, 5=totally agree).

We assessed the *mechanisms* of social capital – trust and information flows – to study how social capital is functioning if it shows to be correlated with dynamic capabilities. We measured generalised trust by asking the standard question of World Value Survey: *Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?* (a 3-point scale: 1= most people can be trusted, 2= you can't be too careful in dealing with people, 3= do not know). We also measured the respondents' trust in the firm's business associates by applying different measures introduced by Cummings and Bromiley (1996). We measured business trust with a degree of agreement on how the following statements describe their experiences in their business relationships (a 5-point scale: 1=Never, 5=Always): 1) Your business associates meet their obligations and keep commitments. 2) They share information with you to enable the development of your operations. 3) You can trust that confidential knowledge shared with them is not spread to your competitors. 4) They communicate openly with you about their future plans that impact your firm. 5) They do not take advantage of you when they have the opportunity. We combined these five items to form a sum scale (1–5) "Business Trust" (BT), where higher numbers indicate greater trust. The Cronbach's alpha coefficient of the scale was .78. The mean value was 3.62 (SD=.68).

To evaluate the mechanism of information flow related to networks, we asked about the external information sources that have stimulated the firms' dynamic activities (5-point scale, 1=No importance, 5=Very important). Several types of knowledge sources were involved (customers, competitors, suppliers, dealers, enterprises located in close proximity, enterprises located at distance, universities, research institutions, Employment and Economic Development Centre, Technology Centre and branch associations). We combined these to form a sum scale "Knowledge Sources" (KN), which measures information spillovers between organisations related to the networks. The Cronbach's alpha coefficient of the scale was .91. The mean value was 2.49 (SD=.61)

In addition, we included several independent variables to isolate the effects of strategy, human capital, and social capital from the other factors. We measured *firm size* by number of employees. We used the natural log of employment because firm size is log-normally distributed and because it is likely that adding a single person to a very small business would be more remarkable than adding a single person to a larger business.

We also included *firm age* based on founding year. To control the technology level of firms in different branches we included the variable measuring the technology level in the firm's industry based on the OECD definitions of industries.

Furthermore we controlled the impact of the *business environment* by including several variables on location. We asked firms to assess the availability of public services and private services available in the area (5-point scale, 1=very bad, 5=excellent). The public services sum variable was created by calculating the mean of the answers to the questions about the availability of education, research, financing, consultation and labour services in the area. The Cronbach's alpha coefficient of the scale was .81. The mean value was 3.20 (SD=.76). The private services sum variable was created by calculating the mean of the answers to the questions about the availability of financing, marketing, financial management, production engineering, information technology, management and support (repair, maintenance etc.) services. The Cronbach's alpha coefficient of the scale was .74. The mean value was 3.34 (SD=.74). Furthermore, the impact of the business environment is measured by the number (4-point scale, 1=none, 4=lots of) of enterprises of the same branch and enterprises of related and supporting branches located in the area.

### **3.4. Results**

The continuous renewal and rethinking of products, technology, division of labour, organisation models and production and marketing are basic characteristics of the market and competition. In our data, 95% of the firms had implemented at least some changes in their operations during the last three years. Most commonly, the firms develop their products. 44% of the firms had made radical changes to their products and 83% had made at least minor changes. 36% had radically developed their technology and 76% had made some changes. On the other hand, 50% of the firms had made any changes to their organisation or sources of supply, and only 53% had redesigned their marketing channels. (See Table 3)

**Table 3. Dynamic Activities of Firms: changes implemented during the last three years, %**

	Totally new solution	Radical change of old solution	Development of old solution	Minor change of old solution	No changes
Products	27	18	27	12	16
Technology	18	18	22	18	24
Production system	14	16	21	13	36
Organisation	6	12	13	16	53
Marketing	11	14	14	13	48
Sources of supply	7	10	17	16	50

To explore the relationship between overall dynamic capabilities of firms and their economic performance we calculated correlations between DC and firms' previous growth in terms of turnover and employment change. According to our data, the firms with greater dynamic capabilities had grown slightly more in terms of turnover ( $r=.27^{***6}$ ) in the past five years. Dynamic firms also rate the benefits of the implemented changes more highly than the others. This holds true for the importance of changes for both previous growth ( $r=.41^{***}$ ) and productivity ( $r=.36^{***}$ ).

To analyse the antecedents of dynamic capabilities of SMEs of hierarchical regression analysis<sup>7</sup> was performed between the dependent variable (DC) and background characteristics of a firm, the variables measuring the strategy, human capital and social capital and business environment were as independent variables.

Table 4 displays a hierarchical regression with the standardized regression coefficients  $R^2$ , and adjusted  $R^2$ .

In the first model we included only the variables measuring the background characteristics of a firm. As can be seen in the model 1 (Table 4) firm size is only background variable which correlate with the dynamic capabilities. Firm age or the technology level of firms industry do not correlate with the firm dynamics. Adjusted  $R^2$  of the model is .13, which indicates that only 13 % of the dynamic capabilities is predicted by these background characteristics .

When we enter the variables measuring firm's strategy to the model we recognize that both proactiveness of firm's strategy and investments in research and development have an independent effect to firm dynamics. Firm size still is statistically significant antecedent of

<sup>6</sup> Pearson's correlations. \* $p<.05$ ; \*\* $p<.01$ , \*\*\* $p<.001$

<sup>7</sup> See the diagnostics of the normal distribution, homoscedasticity and non-multicollinearity in Appendix 1.

dynamic capabilities. Adjusted R<sup>2</sup> value of .22 indicates that almost a quarter of the variability in firm dynamics is predicted by firm's strategy and its size.

**Table 4. Hierarchical Regression of the Antecedents of Dynamic Capabilities (N=224)**

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Background characteristics</b>					
Firm size	.32***	.15*	.11	.05	.05
Founding year	-.06	-.10	-.08	-.09	-.08
Technology level of industry	.10	.09	.11	.10	.10
<b>Strategy</b>					
Proactiveness		.24***	.25***	.20**	.20**
Activeness of R&D (dummy: no funds budgeted=0)		.23***	.24***	.21**	.21**
<b>Human capital</b>					
Educational level of manager: no vocational education (reference group)			-	-	-
vocational school			.09	.11	.11
folk high school level			.001	-.06	-.06
tertiary education			.08	.004	.004
Competence of employees			-.12	-.09	-.10
Commitment of employees			.07	.04	.05
<b>Social Capital</b>					
Structural social capital				.17**	.16**
Participation capital: not participate (reference group)				-	-
participate at least once				.22***	.22***
Relational social capital: key personnel of clients				-.10	-.10
key personnel of suppliers				.04	.04
people in the main competitors				.07	.08
representatives of the E&E Centre				.01	.007
researchers of the own branch				.12	.12
<b>Business environment</b>					
Public services					.06
Private services					-.02
Enterprises of the same branch					-.04
Enterprises of the related branch					.05
R <sup>2</sup>	.14	.25	.26	.38	.38
Adjusted R <sup>2</sup>	.12	.23	.23	.33	.32

- standardized coefficients (BETA)
- \*\*\*p<0.001 \*\*p<0.01 \*p<0.05

Entering the human capital variables to the model does not change the picture. According to the model 3 human capital variables do not correlate with dynamic capabilities. Anyhow, firm size now loses its significance. Adjusted R<sup>2</sup> value remains the same.

When we enter the social capital variables to the model 4 we find that both structural social capital (as a number of network types of relations) and participation capital correlate with the dynamic capabilities. Instead the relational capital as close personal relations is not an antecedent of dynamic capabilities. Adjusted R<sup>2</sup> value of .33 indicates that a third of the variability in firm dynamics is predicted by firm's strategy and its social capital.

In the field of economic geography there have recently been wide discussions on the geography of knowledge spillovers and economic dynamics. According to the so called "localized knowledge spillover" argument, externalities related to knowledge spillovers are bounded to space. Firms operating nearby key knowledge institutions and other firms operating in related and supporting industries are more dynamic since they are capable to introduce innovations at a faster rate than firm located elsewhere (see e.g. Feldman 1999). The discussion usually deals with the externalities related to industrial districts and high-tech agglomerations. It is, however, possible that dynamic capabilities are not related to social capital but rather to advantageous location also in the context of the periphery. Thus we controlled the impact of the *business environment* on dynamics of firms by entering several variables on location to the model. According to the results the availability of public services or private services does not correlate with the dynamic capabilities. The same holds true with the location of firms of the same branch or firms of related and supporting branches in the area.

According to the analysis, there are two factors related to overall dynamic capabilities of SMEs located in periphery: business strategy and social capital. Instead firm size or age, technology level of industry, or human and organisational capital variables do not correlate with dynamic capabilities. The same is true with the geography of economic activities. Availability of different services in the area or location of other enterprises in the area does not correlate with dynamic capabilities.

### *Mechanisms of Social Capital*

Thus far, we have found support for the social capital theory. The analysis shows that social capital has an independent positive correlation with the dynamics of firms. Firstly, structural social capital as increased network type of business relations is positively related to dynamic capabilities of firms. The same holds true with the participation capital. Participation of a MD in

associational life increases the probability of dynamic activities. However, relational capital or personal knowledge of different business contacts is not a statistically significant factor in the dynamic capabilities of firms.

It is impossible to establish any strong claims of causality by a cross sectional data. On the bases of the social capital theory, however, we can try to identify social mechanisms, which mediate the causes and outcomes. We can ask, “What is the causal mechanism whereby the dynamic capabilities emerge from participation and network activities?” What is the causal pattern which connects networking and firm dynamics and answers to the question, “Why are networkers more dynamic than others?” (See Elster 1998, 47–52)

As discussed, in social capital theory there are, basically, two mechanisms which potentially explain the causality between the sources and consequences of social capital. The first is trust. It is often stated that knowledge is shared in networks of trust. According to the argument trust makes the diffusion of knowledge in networks efficient, since it encourages the disclosure of information in networks. If trust, on the contrary, is absent in social networks, the actors tend to hedge themselves and withhold knowledge. Without trust that the business partner will act reciprocally in the future, the actors will withhold relevant knowledge and avoid stating ideas that they believe will increase their exposure to others. (See Zand 1972; Maskell 2000) Thus it is possible that increased participation in business networks and associations increases the trust between actors, which then facilitates the share of knowledge, cooperation and collective efforts oriented at innovations and other dynamic activities.

It is, however, also possible that networking increase interaction between firms and their employees, which as a by-product of network communication enhances the flow of information and increase the “knowledge spillovers” between firms which increase the dynamic capabilities.

First we explore the importance of trust. In the data 66 % of the respondents said that most people can be trusted. When we compare the level of generalised trust among respondents with Finnish population we recognise that the level of among the MDs is quite low. According to Statistics Finland 81 % of the population in Finland responds that most people can be trusted (Iisakka 2006). However, according to our data, “generalised trust” does not have a significant (ANOVA) association with structural social capital, participation capital or dynamic capabilities of a firm. The same hold true with business trust. Trust in one’s business associates trust does not correlate with either structural social capital (Pearson’s correlation  $r=-.04$ ), participation capital (ANOVA) nor dynamic capabilities (Pearson’s correlation  $r=-.05$ ). In the other words in our data trust does not correlate either with the sources nor the consequences of social capital. The result is in line with the results of some previous studies. According to the analysis of Landry et al.



(2001), for example, trust is not a statistically significant factor in a firm's probability of innovating. Yli-Renko et al (2001), in their behalf, found that trust in key customer relationship is negatively associated with knowledge flows between firms. According to them (ibid.) one possible explanation is that as trust reaches a very high level, the perceived need to monitor others' actions diminishes, which may decrease processing of information and the amount of new knowledge acquired.

It seems, however, that trust has a tacit dimension, which is difficult to measure by direct questions. The important thing with trust, regarding social capital, is that it must have a bearing on one's action (see also Dasgupta 1988). Our data includes 37 enterprises which do not have network-type relationships at all. Variance analysis (ANOVA) shows that these enterprises do not differ from the others in the dimensions of e.g. firm size, investments in R&D, the level of proactiveness or the level of general or business trust. However, they are less dynamic. The mean value of the sum scale measuring firm's overall dynamic capabilities (DC) is 2.06 for the non-networkers and 2.59 for the networkers (ANOVA  $p < .001^{***}$ ).

We asked the 37 non networking enterprises for the reasons for not participating in networking (Figure 1).



**Figure 1. Reasons for not participating in network cooperation; the share of firms that answered "very important" or "somewhat important" (% , n=35).**

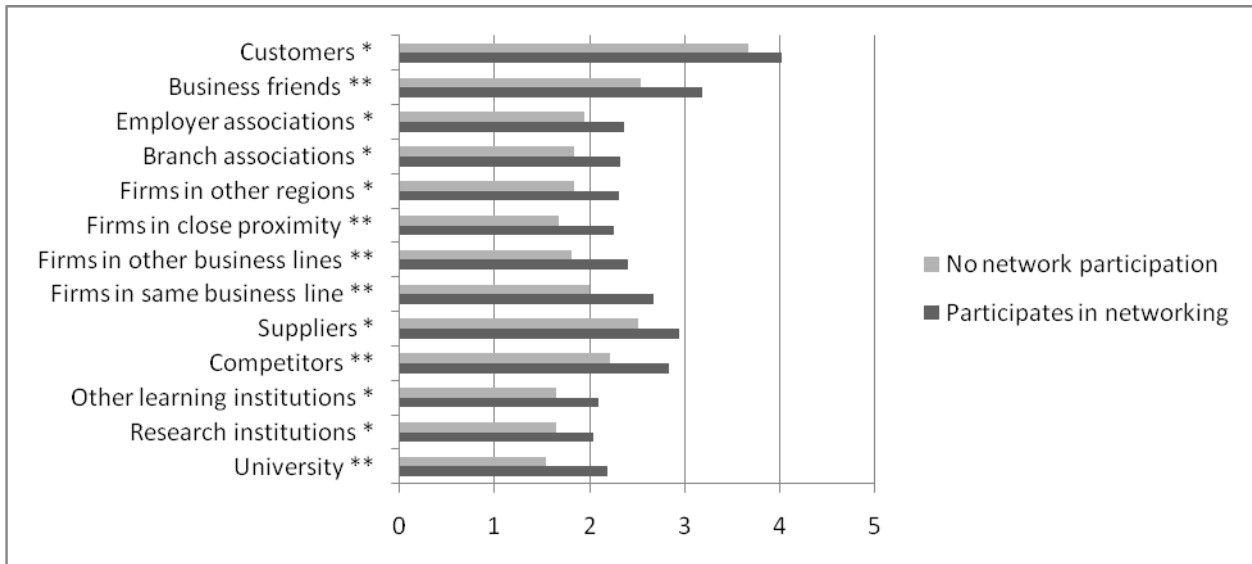
The most frequently mentioned reasons were the need to protect the firm's know-how from others and the need to remain independent. In other words, they do not accept the dependence and vulnerability potentially caused by close cooperation, or to put it in yet another way, they do not trust on networking. It seems that trust is an important trigger factor when making the decision of whether or not to participate in network cooperation (see also Cooke 2003). Those

without trust do not commit themselves to collaboration. Paradoxically the distrusting enterprises that are afraid of losing their specific know-how, and thus withdraw from joint activities are less dynamic than the others.

In the literature on firm dynamics it has been emphasized that dynamic capabilities of firms much depend on their ability to absorb external knowledge and localise the knowledge to their own knowledge base (e.g. DiMaggio and Powell 1983; Kogut and Zander 1992 and 1996; Cohen and Levinthal 1990). This importance of external knowledge sources for firm dynamics can be seen also in our data. The Pearson's correlation between the variables "Knowledge flows" and "Dynamic Capabilities" (DC) is .37 ( $p < .001^{***}$ ), which is an expected result.

The key question in our research setting is, "Is there a positive correlation between social capital and external knowledge flows?" The Pearson's correlation between the structural social capital and knowledge flows .31 ( $p < .001^{***}$ ), which implies that wide network type of relations enhance knowledge absorption. The same holds true with participation capital. The mean value of the sum scale measuring firm's external knowledge flows is 2.19 for those inactive in associational life and 2.57 for those who participate in associations (ANOVA  $p < .001^{***}$ ).

In the other words both structural social capital and participation capital enhance dynamic capabilities through knowledge absorption. Those firms active in networking and associational life get significantly more information from external knowledge sources, which then stimulate their dynamic activities. In the same vein Yli-Renko et al (2001) found that social interaction and network ties facilitate knowledge flows in key customer relationships. We can illustrate the difference by comparing the external knowledge flows of "networkers" and "non-networkers" (Figure 2). The networkers get more knowledge from their customers, suppliers and business acquaintances. They also get more knowledge from their competitors and other firms acting in both in the same and other business lines and located in the close proximity and in distance. This refers to the importance of weak ties and bridging social capital. Furthermore they get more information from associations of employers and public institutions such as universities and research institutions, i.e. "linking ties". (Figure 2)



**Figure 2.** Importance of some external knowledge sources dynamic capabilities in networking and non-networking firms: assessed by managers. (Anova,  $p < .001$ \*\*\*,  $p < .01$ \*\* ,  $p < .05$ \*)

Most of these external knowledge sources also correlate with the dynamic capabilities of the firms (see Table 5). As we showed earlier, close personal relations (bonding social capital) with the contacts do not correlate with innovation activity. Instead it is the interaction and communication related to “bridging” and “linking” social capital that basically enhances the firm dynamics.

**Table 5.** Importance of some external knowledge sources on dynamic capabilities.

University	0.30***
Research institutions	0.28 ***
Firms in other business lines	0.24 **
Other learning institutions	0.21 **
Branch associations	0.21 **
Firms in other regions	0.20 **
Competitors	0.17 **
Customers	0.15
Business associations	0.16 *
Business friends	0.14*
Firms in close proximity	0.13 *
Firms in same business line	0.10
Suppliers	0.07

Pearson’s correlations,  $p < .001$ \*\*\*,  $p < .01$ \*\* ,  $p < .05$ \*

## 5. Discussion

During the last decade, there has been wide agreement on the importance of dynamic capabilities on economic performance both at the level of firms and economies. Firms try to gain a competitive edge by making their production systems more flexible. At the same time, rapidly increasing literature has suggested that economic activities do not develop in a social vacuum, but instead take place in a social context. They are affected by the actors' social relations and social capital i.e. social networks, the network structure and social institutions. They may enhance economic activities by supporting trust and flow of information in economy and in some cases they can inhibit economic dynamism by increasing distrust and hindering information flow. There has, however, been dispute about the analytical power of the concept. The critics of the concept have stated that the "social capital theory" jams discrete issues into a single term, and is thus incapable of distinguishing between outputs and inputs (see e.g. Foley and Edwards 1997).

In this article, we suggested that when studying social capital and its outcomes it is reasonable to distinguish between the sources, consequences and mediating mechanisms of social capital. On the bases of the previous literature (Coleman 1988; Putnam 2000; Burt 1992) we proposed that trust and communication are social mechanisms (or social processes) which potentially mediate the sources and consequences of social capital.

Secondly, we analysed the importance of social capital on the dynamic activities of industrial SMEs located in Finnish periphery. Our analysis showed that a firm's capability to renew its operations correlates with proactive strategy. Social capital, as wide business networks and civic participation of a MD, was also shown to correlate statistically significantly with the overall dynamic capabilities of a firm. Instead, e.g. variables measuring regional factors do not correlate with dynamic capabilities. This implies that it is network interaction rather than economic geography *per se* which enhances dynamic capabilities of firms. In the peripheral context of Finland the network effects of social capital seem to be related more to firms and their networks than to regions (see also Breschi and Lissoni 2003). Often the competitive disadvantage of peripheral firms is thus a consequence of lack of networks more than just peripheral location. It is, however, easier to create networks in more favoured regions since there are more social density, potential customers, other firms and public actors located in these regions. (See also Cooke, Clifton and Oleaga 2005, 1074) In this sense location may have an indirect effect on networking and dynamic capabilities.

According to the analysis, trust or intensity of personal relations did not turn out to be significant factors for overall dynamic capabilities of firms. The overall level of business trust among the firms was high, and the firms who did not have network-type cooperation responded to trust as much as the others. On the other hand, one of the key reasons to remain outside of network cooperation is the need to protect the firm from the negative effects of knowledge spillovers. In other words, trust has a significant role when the firms deliberate their commitments. Paradoxically, the enterprises that are afraid of losing their specific know-how, and thus withdraw from joint activities, receive less knowledge from external sources and also less dynamic than the others. When they hedge themselves against the negative effects of knowledge leaks related to network activities, they at the same time rule out the positive spillover effects. The latter, however, seem to be more important from the point of view the dynamic capabilities of firms.

The result also implies that the tacit dimension of trust makes it difficult to measure trust by direct questions. It seems that it is not enough to measure the expressed willingness to trust others. Instead, we should be able to measure trust in action; do we actually trust, and what is the social scope and substantial domain of our trust.

In our data social capital enhances firm dynamics by enhancing knowledge spillovers in bridging networks. The firms that are active in their network cooperation gain more important information from external knowledge sources, such as business acquaintances, other firms and public institutions. According to the analysis, it is not close personal relations and “bonding social capital”, but “bridging” and “linking” social capital which enhance the knowledge flows between organisations. Andersson and Jack (2002) suggest that in the field of business social capital is basically a process of creating a condition for the effective exchange of information and resources. From the perspective of our data it is probably proactive strategy of firms combined with bridging and linking social ties that work together to create a condition for the effective exchange of information and thus enhance the “absorptive capacity” and “combinative capability” of small and medium sized firms. Networks that favours interactive learning and innovation is essential for small and medium sized industrial enterprises located in periphery. First, they do not locate in “innovative milieus” of cities where the economic structures and “creative capital” of diversified population breed the economic dynamism (Florida 2002). Small and medium sized companies in periphery also often lack the resources for their own R&D. They innovativeness and dynamisms is more dependent to external resources than those large companies with special marketing and R&D departments. Thus it is important for periphery based SMEs to collaborate with other firms and knowledge institutions to overcome these

limitations and create dynamic capabilities. They often can get competitive advantage only if they can connect themselves to social networks and social institutions that support continuous interactive learning processes and the exploitation of knowledge developed elsewhere. The results imply that if regional policy aims to promote the renewal capability of the industrial SME sector, it should, among other things encourage bridging networking activities of SMEs and stimulate their contacts with knowledge institutions.

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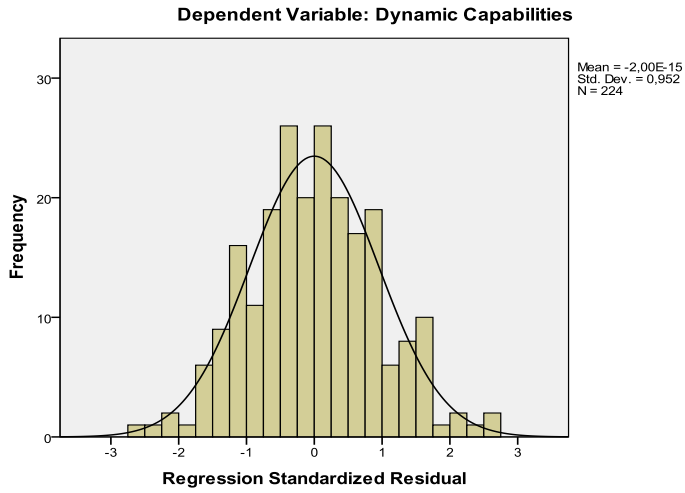
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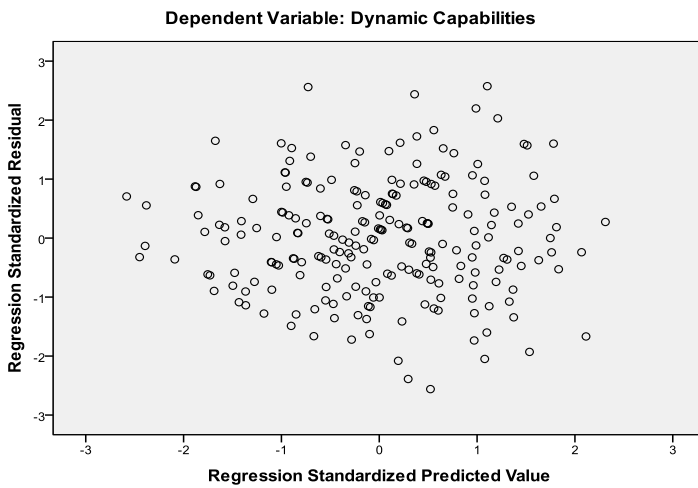


# Appendix 1. Diagnostical Analysis

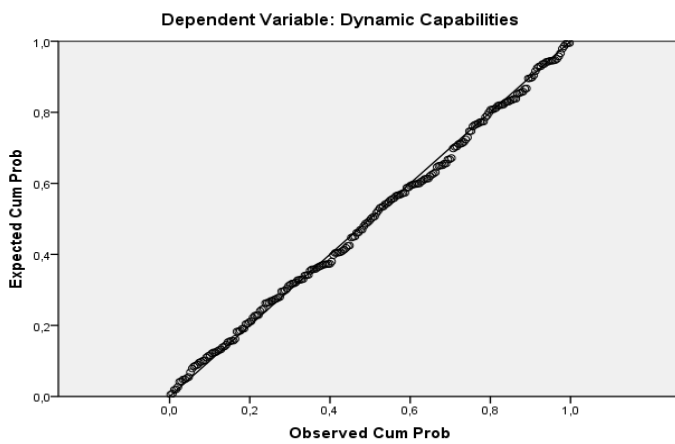
## Histogram



## Scatterplot



## Normal P-P Plot of Regression Standardized Residual



### Collinearity Statistics:

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	VIF	VIF	VIF	VIF	VIF
<b>Background characteristics</b>					
Firm size	1.165	1.485	1.719	1.792	1.798
Founding year	1.179	1.193	1.262	1.322	1.353
Technology level of industry	1.053	1.064	1.096	1.149	1.203
<b>Strategy</b>					
Proactiveness		1.141	1.193	1.227	1.243
Activeness of R&D		1.292	1.358	1.427	1.446
<b>Human and organisational capital</b>					
Educational level of manager:					
no vocational education (reference group)					
vocational school			2.173	2.403	2.440
folk high school level			2.573	2.915	2.949
tertiary education			2.427	2.784	2.877
Competence of employees			1.746	1,848	1.998
Commitment of employees			1.507	1.557	1.564
<b>Social Capital</b>				1.195	1.217
Structural social capital					
Participation capital::					
not participate (reference group)					
participate at least once				1.191	1.220
Relational social capital:					
key personnel of clients				1.234	1.235
key personnel of suppliers				1.315	1.335
people in the main competitors				1.195	1.214
representatives of the E&E Centre				1.272	1.310
researchers of the own branch				1.560	1.589
<b>Business environment</b>					
Public services					1.867
Private services					1.875
Enterprises of the same branch					1.217
Enterprises of the related branch					1.308