

# **Networking firms in a global economy. Impact of agglomeration economies and networking on international operation in small and medium-sized firms.**

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Paper presented at the Annual Congress of the Norwegian Association of Geographers  
Drammen, January 7-8<sup>th</sup>, 1999.

## **Introduction**

Spatially defined regions offer unequal access to resources of production and different distances to larger markets. This is the basic starting point in location theory. Classical location theory has focused on access to raw materials, semi-fabricated products, capital, infrastructure and labour. One fundamental question in classical analyses was to find a point in space where all the different inputs could be brought together with minimal transportation costs. Another how profits could be maximised when both input and output relations were taken into consideration. In most of the traditional approaches places are seen as passive points in geometrical space and geometrical relations between spatial objects are used to explain geographical phenomenon.

Alternatively, space could be seen as a product of human activity. Humans produce space through activities creating man made artefacts and built environments, by deciding that specific places are connected to a specific configuration of material objects and that particular actions take place in particular places and through human agency embedding places in a larger social context (Schatzki 1991). In this perspective subjective agency is the only source of action and hence of change. At the same time human agency also depend on the way social life is fixed to the material world and by that to spatial location or territorial context. The social world is therefore a product of human action, but this action is restricted by the material world as well as the social world already produced (Werlen 1993). 'The structural properties of social systems are both medium and outcome of the practices they recursively organize' (Giddens 1984:25).

Given such an understanding of space we could say with Pred that

'women and men make histories and produce places, not under circumstances of their own choosing but in the context of the already existing' .... and that 'the scope of human agency is enabled and constrained both by already existing power relations and their associated social logics, rules of behavior, and modes of regulation (social structures) and by the full array and relative location of

features humanly built into given geographical areas, by spatial patterns of transformed nature (spatial structure) (Pred 1990:9).

If human agency and structural context were the starting point for understanding production and reproduction of places, quite different aspects of economic life would be of interest in economic geography. Less emphasis would be put on access to raw material, distance to markets and transportation costs. More emphasis would be put on labour and its specific practice and knowledge, social meaning and norm-systems, structural requirements for innovative activities and so on. Focus would also be directed towards how economic activity, knowledge and innovations in a localised area corresponds with social and material structures of that particular area and how the 'system-integration' of a place is organised in a larger national or international context. In short how economic activities are embedded in social life and how social life also restricts behaviour and understanding of economic action.

Marshall's phrase 'the mysteries of the trade become no mysteries; but are as it were in the air' (Marshall 1938:271) tells us that even the Godfather of neo-classical economics had an understanding of the importance of social life in economics. His description of 'external economies ... secured by the concentration of many small businesses of similar character in particular localities' (Marshall 1938:266) describes a functional division of labour made possible by geographical proximity. A localised labour market could produce particular skills. A localised production system could develop economies of scale and new and more efficient technologies. Such an environment could also facilitate exchange of information and the diffusion of technological and commercial knowledge.

The debate on industrial districts has its root here. Also the frontrunner in classical location theory Alfred Weber realised that the static analysis of early neo-classical economics and the method of deduction made it impossible to develop a satisfactory analysis of the complex social processes behind agglomeration economies.

'The theory (of agglomeration) is not concerned with the dynamic interaction of operative tendencies toward agglomeration and resultant contrary tendencies toward deglomeration, but rather with the final effect of this process, since only this final effect alters the location situation' (Weber 1922:124).

### **Agglomeration economies and externalities**

Positive external effects are one important factor included in the phenomenon called agglomeration economies. This concept was introduced by Marshall and further developed by Pigou. This early use of the concept external economies was based on partial equilibrium models. In Marshall's mind externalities are scale economies 'dependent on the general development of the industry' (Marshall 1938:266). In modern economic welfare theory on the other hand, a Walrasian general equilibrium model is used. In this model externalities are present only if there is a divergence between private and social costs caused by imperfect markets.

Scitovsky's concept, pecuniary external economies, does neither correspond with the concept of (technological) external economies of general equilibrium theory. Pecuniary externalities refer to a situation under imperfect competition where economic actors are mutually interdependent through market transactions.

‘Investment in an industry leads to an expansion of its capacity and may thus lower the prices of the factors used by it. The lowering of product prices benefits the users of these products; the raising of the factor prices benefits the suppliers of the factors. When these benefits accrue to firms, in the form of profits, they are pecuniary external economies.’ (Scitovsky 1954:147).

If such scale economies exist, the private profitability of an investment will underestimate the social utility of this investment. One implication of the existence of pecuniary external economies would be a tendency to change the optimal scale of the firm in a direction of reduced size (Robinson 1965:341).

Perroux developed arguments on agglomeration and economic clustering based on Schumpeter’s analysis of innovations and economic growth combined with Scitovskys analysis of externalities (Perroux 1950). Here focus is directed toward dynamic growth processes and the importance of innovations, entrepreneurship and diffusion of technology. In an evolutionary perspective, disequilibrium is the only realistic approach to the analysis of growth and economic change. Under such circumstances the profit of a firm is a function of its own transactions plus the transactions of other firms. Thus, profitability and competitiveness is not only a function of innovative actions of a particular firm, but also induced via technological development and trading and information linkages to other firms. Innovations drive the process, externalities diffuse growth impulses and promote further technological development.

In an economy characterised by disequilibrium and combined with extensive linkages between firms, the growth injection will be much larger than in an economy where such linkages is not well developed. But externalities in Perroux’s mind are a dynamic force producing much more than static multiplier effects. The growth ‘pole’ concept thereby puts focus on technological change, the mutual structural interdependencies in a growth process, the clustering of growth in economic space and why and how specific sectors of the economy or some large firms play a key role in economic progress. Still, the analysis of these processes and how they work is diffuse and not very well conceptualised or understood.

There is a particular problem related to the confusion of economic and territorial space. Even if economic development is clustered functionally to particular sectors of the economy there is not a one to one correspondence that territorial clustering also will follow. So we talk about processes which could be territorially mobile as well as immobile.

Through endogenous growth theory and new trade theory a new interest in economic geography has emerged over the last decennium. Geographical space is thereby introduced as an important concept in mainstream economics. In the new perspective internal conditions, not external demand conditions in an economy are the most important growth stimulating factors. In these models economies of scale exist in relation to capital, more specific in the production of human capital or knowledge and technology (Romer 1986) (Krugman 1991). In other words, the marginal product of capital grows as the stock of capital expands. Put simply, the more we invest in knowledge the more the economy will grow. Under development of technology and accumulation of knowledge positive externalities are often produced. As an implication parts of newly developed knowledge will leak out from the entrepreneurial institution to the larger society and will be available to other institutions more or less as a free good.

The next question would be to identify the diffusion pattern of such spillover. Structural characteristics of the economy will be one important determinant, social phenomena such as culture, practices or language another. Some conditions will promote diffusion other would function as barriers. Territorial entities like the nation state or more narrowly defined regions will often act as a boundary for these kind of process.

Technological progress develops out of two basic processes: as a practice related process of learning by doing, by using, by interacting and so on, or as formalised research and development activity. Creativity and entrepreneurship is important, but also an institutionalised protection of innovations. With no legal or social barriers to diffusion, developed knowledge will soon leak out to competitors as externalities. If so, private firms will see no profitability in investing in R&D if the result of their investment will be available free of charge for competitors. For the society an under-investment in knowledge will be the result. Public R&D activities, property rights to knowledge and other legal or social mechanisms to protect innovations will, on the other hand, stimulate investments in knowledge. In such a case information is not instantly diffused and adopted and market power could therefore be allocated to the innovative firm. As a result market failure is introduced in the model of growth.

Innovative firms and related production systems are embedded in territorial entities like places, regions or nations. The development of economies of scale in relation to knowledge production, technological spill-over and institutional or spatial limits to the diffusion of such externalities, are therefore often connected to the functional/spatial context such systems operate in. Regions including dynamic industrial systems with scale economies in knowledge production would grow faster than regions not in command of such elements. As a result spatial differentiation in economic growth would appear.

A particular geographical problem would be to identify the territorial boundaries of these processes and in what sense geography matters in diffusion of specific types of spillover. Do spillover follow functional or territorial paths? Is it the local, regional or national level, which is the most important in defining innovation or knowledge systems? What kind of positive external effects are spatially mobile, and which are immobile and only shared by institutions included in a specific territory? Could it be that some factors are immobile in the early phase of the product/innovation cycle and made mobile later? These are important questions not possible to answer here, but crucial to address in the contemporary research in economic geography.

The whole debate on industrial districts emphasizes the local level as the boundary post (Brusco 1982, Storper 1995, Saxian 1994). In endogenous growth theory a mixture of the regional and national level is discussed (Krugman 1995). In evolutionary economics the national level is the most frequent frame of reference (Lundvall 1992, Nelson 1993). In the strategic management literature the nation state and in some extent the meso level is seen as a crucial determinant for developing competitive strength of individual firms (Porter 1990). We also can see an emerging interest in aspects of localised learning and regional innovation systems in geography (Camagni 1991, Amin 1994, Asheim 1996, Maskell et al. 1998).

### **Agglomeration and transaction costs**

Market failure and the existence of external effects are not only related to positive externalities. Negative externalities imply that firms can transfer costs to other firms or the

society as a whole, free of charge. The debate on environmental pollution is an example. Economic welfare theory would proclaim that these effects could be eliminated through the market if the public sector intervenes with taxes or subsidies. To Dahlman negative externalities and market failure is only one of the symptoms of an imperfect world (Dahlman 1979). The heart of the matter preventing 'Pareto optimal bliss from ruling sublime' is in his mind positive transaction costs and imperfect information. This includes costs related to the search and collection of information needed to execute a transaction, costs related to the negotiation and decision processes and in policing that contracts are fulfilled (Coase 1960). The cost of transactions could be reduced through legal or social mechanisms reducing opportunism, asymmetric information, oligopolistic market conditions and bounded rationality. This could be done through internalisation of transactions into the realm of a firm or by explicit or implicit contracting among firms as prescribed by the school of new institutional economics (Williamson 1985). But opportunism and asymmetries could also be prevented through social interaction and development of trust as prescribed by economic sociology (Granovetter 1985).

Trust develops in interaction between individuals. Trust is produced through experience and developed over time, through repeated purchases and contracting, through informal negotiations, mutual help when problems arise and common responses to occasional incidents (Johansson & Mattsson 1987). Getting to know about each other's idiosyncrasies in other words creates trust. This is best done through repeated interaction and sharing of the same social norms and values. Trust is needed to create a 'safe<sup>a</sup> environment where firms are willing to share their core skills with others. In a trustworthy environment co-operation is a 'take and give<sup>a</sup> relation where the economical and technological results of joint work is shared. In this process of learning, knowledge externalities will be produced. Some of these externalities will leak out to co-operative partners, others to the external world. If a firm produces externalities under such relations, it is included in an environment where the firm also takes advantages of externalities produced by other firms in the partnership. The sum gives competitive strength to all firms belonging to this environment. Physical and/or social proximity therefore seems to matter in communication and developing trust. Territorial proximity means short physical distance between actors and a social environment where individuals are socialised in the same way and understand the same language, so to speak.

In analysing the competitive strength of nations, Porter emphasises that factor creation is related to social, cultural, historical and economic conditions in a specific national context. Demand impulses from the home market is important in development of knowledge as well as a nationally well developed functional division of labour is of utmost importance in creating dynamic learning externalities and in utilising economies of scale and scope (Porter 1990). Competitive strength is therefore developed in an interplay between factor conditions, demand conditions and the existence of related industries competing on an arena characterised by tough rivalry and continues improvements in all aspects of economic activities.

Dynamic competition is therefore characterised both by rivalry and co-operation. In Porter's mind a structure including a couple of larger actors and several smaller in open competition is the best premise to develop entrepreneurship and innovations. A vertical and horizontal interplay between many actors in a production system also seems to be essential for a successful development. Again such interaction seems easiest to be realised inside territorial borders, under the jurisdiction of the nation state or inside regions of particular quality.

### **Agglomeration and geographical space**

If we follow the arguments of externalities, transaction costs and dynamic competition, territorial clustering could be of special value to economic actors. The local business environment could function as a social context which produces scale economies through external relations, offers an efficient division of labour including specialisation economies, opens up for economising with transaction costs, and promotes entrepreneurship and innovations and development of dynamic learning externalities and technological spill-over. We also know from agglomeration theory that territorial clustering of economic activities promotes other advantages as economising with transportation, information and infrastructure costs and also that negative externalities produced by physical clustering at least partly are transferred from the private to the public sector.

Agglomeration economies as well as positive external effects are theoretical concepts difficult to study. There is no obvious empirical phenomenon, which corresponds to these theoretical concepts. As far as we know no well functioning measuring instruments have been developed neither in the economic nor the economic geographical literature. We therefore have to use more or less suitable indicators as measurement of externalities or agglomeration economics. If we scale down the arguments about externalities and agglomeration economies to the micro level, some suggestions of what could be of value for a particular firm if included in such an agglomeration come forward.

- Access to skilled and qualified labour would be easier and cost efficient since search procedures would be simple and the need for internal training reduced. On the other hand knowledge developed internally in the firm would easier leak out as a result of larger mobility in the local labour market.
- The inclusion in a heterogeneous business environment could open for an externalisation of tasks, development of inter-organisational relations and by that a concentration on developing the core skills of a firm. The competitive forces in such an environment would push for specialisation and innovations, technologically as well as organisationally.
- Participation in inter-organisational relations could develop economies of scale and scope shared by members of the co-operative network.
- Social and cultural proximity could advance the building of trustworthiness and open for sharing information and developing cross skills.
- Physical proximity could ease communication when open-ended problems should be solved and long-standing interaction developed.
- The inclusion in such an environment would also facilitate access to positive externalities produced either individually or collectively. If technological spillover is mutually produced and shared, firms would be more open to invest in knowledge. If a firm feel safe that they will have some returns from sharing knowledge with a specific environment, this would advance investments in knowledge by both parties.

### **Small and medium sized enterprises and competitive advantages**

As economic organisations SMEs are continuously confronted by threats to their survival in normal competitive markets. In general, the survival of an organisation is dependent on its ability to acquire and maintain the resources needed to respond to environmental changes. The ability to reduce environmental uncertainty reflects the effectiveness of a firm (Pfeffer & Salancik 1978). In most instances a business environment includes a spatial dimension defining the territoriality of the firm and its linkages to the external world.

The firm-environment interface has a particular interest when SMEs are in focus. Compared to large firms SMEs reportedly face special challenges caused by a more stressed financial situation with low equity and poorer profits. They tend to have more problems than larger firms in adjusting to national or international laws and industrial standards, a shortage of business connections and international networks, and difficulties in organising adequate distribution (Bilkey & Tesar 1977). Many of these problems are connected to a lack of "critical mass" in SMEs (Attiyeh & Wenner 1979). Turnover, value added and profits per capita are generally lower in SMEs compared to larger firms (Rothwell & Zegveld 1982). Earlier research also provides evidence that SMEs suffer characteristic management problems.

The failure rate among SMEs is high. As a matter of fact, many small firms do not want to grow (Penrose 1959), but sheer survival is often their day to day strategy (Boswell 1973). Nor do small entrepreneurs often think strategically and, consequently, fail to anticipate and avoid threats. Even if they detect threats in time, they still lack personnel with the intellectual capacity and material resources needed to handle such challenges efficiently (Hull & Hjern 1987). In many smaller firms imitation is therefore more important to business behaviour than formal planning. But even imitation is dependent on access to information and skills to copy technology or business actions of other firms.

According to strategic management literature, assets of high specificity such as natural or technological resources, human assets and know-how (Reve 1990) represent the strategic core of a firm. Internal resources and management of the firm are concentrated on sustaining and developing these core skills. But in order to extract value from them, the firm has to link up with suppliers of material, components and services. These supplied skills can be embodied or disembodied in character. Their intangibility is often argued to be the reason for firms being actively involved in inter-organisational relations, preferring vertical co-operative arrangements to vertical integration. Intangibility is also one important reason why externalities only are accessible to firms included in a functional or territorial system of industrial relations. Geographical and social proximity could therefore be of crucial importance for SMEs in developing inter-organisational relations, sharing intangible skills and taking advantages of learning externalities.

Developing inter-firm relationships is a cumulative process of adjustment, investment and development of mutual trust, bonds and dependence. The adaptation process often advances as interactive learning enables firms to jointly create intangible cross skills which are difficult to imitate (Johansson & Mattsson 1987). Such processes also produce externalities. According to social exchange theory, social relations evolve slowly, often starting with minor episodes and transactions, which require only little trust and risk. Over time both parties can demonstrate increasing commitment and trustworthiness (Blau 1968).

Obviously, the general scarcity of human and material resources in SMEs is an important explanatory factor why smaller firms are less committed to international operation than larger ones. A major aspect of this is the quality of the manager. Smaller firms are very often dominated by an entrepreneur (Imai & Baba 1991). The advantage but also disadvantage of a dominant entrepreneur is her/his multiple control over the firm, ranging from shareholding to direct inspection on the shop floor. The manager's personal characteristics, such as education, work experience; social network and personality are therefore strongly intertwined with the organisation of the firm (Bouwen & Steyaert 1990). The ability of an entrepreneur to establish and develop social relations with individuals in other firms is of utmost importance in the

development of interfirm relations. Well-functioning and trustful social relations give access to external resources, to information not available in an open market and to specific fields of know-how for upgrading the capability of the SME concerned. On the other hand, the dominant position of the manager/entrepreneur can also be one of the main reasons for the mismanagement of a SME (Rainnie 1989).

Granovetter (1985) insists on an active role for personal contacts and structures in developing dynamic interfirm relations. This is based on the assumption that a particular value system is linked to these relations, the identification of partners being a critical factor in its formation. Social relations are established between individuals and tend to be long lasting. On the other hand, firm relations based on contracting will often tend to be more shortsighted in character. Open dialogue and intense interaction between partners are a matter of human agency. It often produces learning externalities, which also is in need of human interaction to be diffused.

### **Social and geographical proximity**

Given the relevance of social and cultural conditions in linking competence and creating learning and externalities, proximity can be assumed to be of importance in developing interfirm links. Its role is especially accentuated in the case of the interrelationship concerned being preoccupied with extensive dialogue to solve open-ended problems (Lundvall 1988). This is a common setting for SMEs, which are often involved in the production of customised products in intra-industry transactional arrangements where extensive communication is needed.

In the case of SMEs in particular, it can be argued that not only social but also spatial proximity to supplied skills is of importance in enabling these firms to take part in interfirm arrangements and develop these relations into dynamic and innovative exchanges (Harrison 1992). Smaller firms are more than large firms embedded in local production conditions through factors ranging from the skills and education of the manpower available, R&D institutions, communication facilities, and public support systems to the industrial environmental texture. It also could be argued that they are more dependent on their local environment for accessing positive external effects where scale economies are present. Having access to other elements of agglomeration economies could also be of crucial importance for the competitiveness of firms with marginal economy under strong competition.

Theoreticians of "industrial districts" from Marshall (1896) to Garafoli (1991) explain the dynamics of spatially concentrated SME-dominated industrial growth by the social and geographical proximity resulting in the extensive division of labour. A contingent historically based entrepreneurial culture supported by the availability of external economies therefore seems to be among the distinctive structural features of industrial districts.

Yet there are also many transactions which do not require proximity. Standardised operations with less need for dialogue and exchange of information can be safeguarded by routines and contractual agreements and can therefore be fairly easily performed over long distances (Scott 1988). For SMEs, with their shortage of internal resources and their embeddedness in a local business milieu, the role of social relations is probably also emphasised in relation to formalised contractual agreements. Assuming the special importance of trust for a SME, the proximity to business partners therefore tends to grow in importance both in horizontal and vertical relations.

## **A model for an empirical investigation**

From the above discussion it can be concluded that SMEs with limited internal resources are highly dependent on their environment and on access to external resources in order to supplement their own limited resource base. The successful development of a SME presumably demands a specialisation and concentrated effort to develop the internal core resources of the firm, further, an active use of external resources in the execution of specific production tasks, in services or in distribution and marketing. The entrepreneur/manager also plays a crucial role in establishing and developing contacts to external partners, especially in dynamic inter-firm relations based on the trustful exchange of sensitive information and where asset specific investments are involved.

Human relations dependent on social exchange and dynamic relations very often depend on trust. As we have argued earlier, proximity and location is therefore in focus. It can be supposed that a resourceful local business environment gives better and cheaper access to important information on technological or market development, easier access to well-qualified consultants, subcontractors and distributors, and better developed division of labour between firms. This again opens links to valuable tacit knowledge or external effects and includes the firm in a collective production of scale economies.

Thus, in accord with agglomeration theory it can be claimed that SMEs located in larger and more diversified business environments tend to win a competitive advantage over SMEs in rural areas where the business environment is small and less developed. Locational conditions also influence the factor side and the internal resources of SMEs, that is, their manpower, core technology and networks. Likewise, there are grounds for arguing that location also has an effect on the skills of the entrepreneur or manager, his/her work experiences and social networks as most small firm entrepreneurs locate their firm in the region they live.

## **Internationalisation and SME growth**

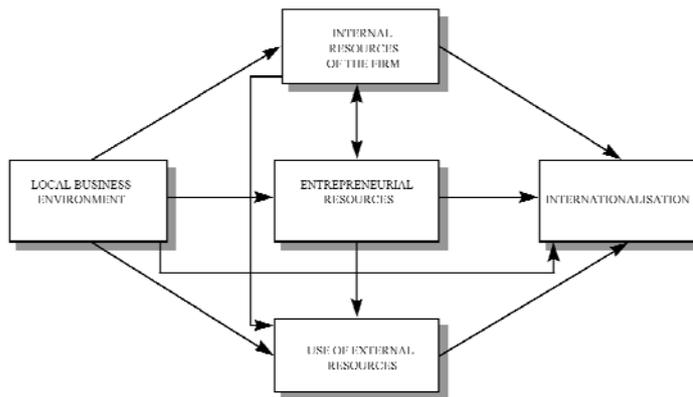
Developing and expanding the business activities of a smaller firm will often end in international sale, at least in small open economies like the Nordic countries. Theories about product cycles and firm development analyse the development of the firm as a sequential process from local into national and further out into international markets (Håkanson 1979, Cavusgil 1980, Bradley & Mitchell 1989). Internationalisation is here seen as a sign of maturity and competitive strength. A firm needs to be organised efficiently, have a skilled workforce, up to date production technology and competitive products to be able to compete on international markets. We could also argue that such a firm will be dependent on or at least helped by external resources and possibly a *local business milieu* producing such resources. As seen, human action, knowledge and inter-organisational relations are important in developing the skills necessary for this expansion.

Notwithstanding the arguments emphasising the role of *external resources* and local milieus in the development of SMEs, it is obvious that these firms are also first and foremost dependent on their own *internal resources* and products in their struggle to win market shares in foreign markets. The *manager* is one particularly important internal resource in small firms. Individuals promote social exchanges and development of inter-firm relations. The manager is leading the developing of business network of the small firm and is therefore of crucial importance in developing trustful relations which can open up for transfer of tacit competence to the firm from external sources. In particular, the ability of an entrepreneur to handle the

organisation-environment interface as well as social relations in an international context is obviously one crucial aspect of successful competition.

## Modelling internationalisation of SMEs

**Figure 1.** A conceptual model for internationalisation of SME



In the following empirical analysis a model as shown in figure one is guiding the analysis. Here success in international markets is a product of the quality of the internal resources of the firm, the competence and the social network of the manager and the firm's use of external resources. The model also indicates that the quality of the internal resources be it manpower, product or process technology as well as the manager's experiences and social relations will be influenced by the localised business environment of the firm. To what degree the firm uses external resources or is involved in inter-organisational relations will also in some way be influenced by the location of the firm.

Further we assume that agglomeration economies and positive external effects can influence all parameters through location or linkages. In this study we indirectly control for such economies of scale by comparing firm behaviour in firms on 'equal<sup>a</sup> terms (independent, same size group, same industry), but located in four different localised business environments. Alternatively we use indicators of the quality of the local business environment of the firm as another indicator of the possible existence of localised external and transactional advantages. This indicator is based on information about the local labour market, local educational institutions, local supply of producer services and material inputs, number of competitors in the region and the social and cultural conditions for business activities.

## Empirical setting

The empirical study reported here is based on a Nordic (Finland, Norway, Sweden) database including 274 firms with more than ten and less than two hundred employees. The tendency to export is very much a product of to which industry a firm belongs. For this reason only

firms from wood-processing industry (ISIC 33) and metal working industry (ISIC 38) are included in this study. This is industries with fairly high export-shares and a wide geographical distribution. The firms included are strategically drawn from four different types of regions. These regions (larger growing city, stagnating industrial city, small town and rural periphery) differ substantially in terms of size, location and structural characteristics. For example, the big cities under consideration have 200-500.000 inhabitants, industrial cities approximately 100.000, small industrial towns approximately 20.000, and rural peripheries have only minor municipal centres. As a whole, these four types of regions in three different countries form a diverse environmental setting for the analysis of how the structural features of a local business environment are reflected in internationalisation of SME's. For each of the 12 regions 25 firms were included in the initial survey. In the larger city regions a representative sample was drawn, in the three other types of regions almost the whole population inside our universe was included. For several reasons 26 firms were dropped.

## Operational variables

The theoretical concepts used in the model; local business environment, internal resources, management resources, external resources and internationalisation were measured by the following variables as shown in figure two.

**Figure 2.** Variables used to measure the theoretical concepts of the model

<b>INTERNAL RESOURCES</b>		
<i>HUMAN RESOURCES</i>	<i>PRODUCT</i>	<i>PRODUCTION PROCESS</i>
- share white collar	- type of product	- process technology
- level of education	- number of products	- technological level
- experience from other firms/industries	- product R&D	- process R&D
- language skills	- customisation	- automation
- change in skill level	- design skills	
	- technology	
	- quality	
	- supply skills	
	- price	
<b>LOCAL ENVIRONMENT</b>	<b>MANAGER/OWNER</b>	<b>INTERNATIONALISATION</b>
- country	- education	- export shares
- degree of urbanization	- working skills	
- supply of education	- language skills	
- quality of labour market	- local social relations	
- supply business services	- inter-regional relations	
- supply material/equipment		
- number of competitors		
- business climate		
	<b>EXTERNAL RESOURCES</b>	
	- sub contracts	
	- use of business services	
	- co-operative intensity	
	- depth of co-operation	

The operational variables included in the questionnaire were a compromise between an applied and descriptive use of the results, different competing interests of four researchers and lastly an option to test theoretical models. These compromises resulted in measures not always in correspondence with good measurement practice when testing theory. Thereby the validity of the variables were influenced in negative direction but still of acceptable quality.

Most of the operational measures used in the study are one dimensional, although some are the more preferred multidimensional measure, which secures a higher degree of reliability.

A factor model with orthogonal rotation (varimax) was lastly used to reduce the number of variables for later use in some of the regression analyses. The empirical analysis was developed stepwise in a path analytical approach. Multiple regression models based on all operational measures as well as on factor scores were analysed. In this article only the results from the compressed model are shown, but the results from alternative models are discussed.

The original variable list as shown in table one included 32 independent variables. By using factor scores this list was reduced to fifteen variables. Two factors (ENV1, ENV2) explained 61 % of the variance of the six variables measuring business environment. The first, ENV1, can be interpreted as a measure for *local supply of inputs* and the second, ENV2, interpreted as *local clustering of competing firms*. Three factors (HUM1, HUM2, HUM3) explained 71 % of the variance of the five variables measuring different dimensions of the human resources in the firm. The first is interpreted as the *share of white-collar employees*, the second as a *quantitative dimension of the workforce* and the third as an indicator of *the competence of the white-collar workforce*. Four factors (PROD1, PROD2, PROD3, PROD4) explained 67 % of the variance of the eight variables used to measure different dimensions of the products of the firm. The first has been interpreted as the firm's dedication to use resources to *develop products*, the second as the ability to *adjust products to customers needs*, the third as an indication of *product specialisation* and the last as an indicator of *price as the most important dimension with the product*. Two factors (TECH1, TECH2) explained 73 % of the variance of the four variables measuring different dimensions of the firm's production technology. The first factor can be interpreted as *the level of process technological competence* in the firm and the second as which *kind of process technology* (customised, batch, mass production) which is dominant in the firm. Two factors (MANG1, MANG2) explained 61 % of the variance of the five variables measuring dimensions of the manager's qualifications and social network. These factors can be interpreted as measuring the manager's *competence* (MANG1) and *social network* (MANG2). Lastly two factors (EXT1, EXT2) explained 69 % of the variance of the four variables used to measure different dimensions with the firm's use of external resources. The first measures *co-operative relations* and the second *purchase of external services*.

### **Predicting export activity**

These factors are used to predict the export share of the firm. In table one the result of a regression model based on these factors is shown. As shown this model is able to explain 42 % of the variance. As the numbers indicate, the most important explanatory factors of internationalisation of SMEs are the production technology of the firm. Both factors measuring the firm specific resources regarding production technology came out with positive and significant numbers. The more the firm is focused on large scale production (TECH2) and the more the production process is automated (TECH1) the more will the firm export. Two dimensions with the product of the firm also came forward as a predictor of international competitiveness. Firms active in product development (PROD1) which control a portfolio of several products (PROD3) are more successful on international markets than firms with no attention to this aspect of competitiveness. Lastly the analysis highlights the level of educational and practical competence of the manager (MANG1) as significant in explaining export level in the sense that the higher the educational level and the wider the work

experience of the manager, the more the firm export. The size and form of social network of the manager (MANG2) did not predict success in international markets.

**Table 1.** Regression analysis based on factor-scores with oblimin rotation. Standardised coefficients.

INDEPENDENT VARIABLE	DEPENDENT VARIABLE EXPORT
ENV1	-,0411
ENV2	-,0730
HUM1	,0993
HUM2	,0567
HUM3	-,0003
PROD1	,2057**
PROD2	,0536
PROD3	,1557**
PROD4	-,0831
TECH1	,1897**
TECH2	,3963***
MANG1	,1873**
MANG2	-,0906
EXT1	-,0433
EXT2	,0772
R2	,4710
Adjusted R2	,4185
p	,00005

\* p< .05 \*\* p< .01 \*\*\* p<.001

This result tells us that it is not necessarily firms with high achievement in innovative conduct which generally succeed in foreign markets, but firms focusing on highly efficient production of well established products. The explanatory factors identified seem to be indicators of maturity and larger scale in correspondence with cyclical models of firm development. Still, 'pure<sup>a</sup> measures of size only explained 10 % of the variance.

### **Does location and networking matters?**

Variables measuring aspects of the local business environment, several dimensions of the human resources of the firm (the manager not included) and the firm's relations to external resources did not predict internationalisation of the firm. Stated simply, this implies that SMEs export the same share disregarding what local business environment it is embedded in.

Further, firms are involved in interorganisational relations in the same degree if they are competing on the home market only or intensely in foreign markets. It also implies that the skills of the labour force do not differentiate between firms basically involved in home market operations and firms committed to export.

Most of the effects of externalities and agglomeration economies on competitiveness should indirectly be included in the parameters measuring local environment, business relations and the skills of the labour force. Alternative models using the whole set of underlying variables come to the same result in the sense that the explained variance was the same and the variables identified as significant predictors was the same more or less. There are therefore reasons to ask if processes producing externalities and agglomeration economies are of importance for the competitive strength of the firm, at least in our context?

Of course the indirect way we here measure externalities or agglomeration economies, is not very sophisticated. Alternative and more precise measures should be developed. One reason why we did not identify influences from the local environment or interorganisational relations could obviously be measurement problems. Still a deeper analysis of the data is necessary before we conclude that location and use of external resources and interorganisational relations do not influence the competitive strength of the firm.

As already said, this analysis was developed stepwise. Partial models analysed the relation between the local business environment and the resources of the firm one by one, be it personnel, manager, products, production technology and use of external resources. Intercorrelations between the different resource groups are therefore not taken care of in the partial models. In these models regression models including all variables and alternatively factor scores were analysed. A canonical correlation analysis was also executed.

These partial analyses came to the result that the parameters used to measure local business environment had a weak influence on the resources of the firm in all cases except the firm's use of external resources. Thereby location seemed to have some influence on some dimensions of the competence of the labour force, including the manager. Especially the mastering of foreign languages increased as the firms reported higher scores on their local business environment. Higher scores on the environmental dimension also predicted that the firm controlled more products of their own and contrary did not act as a subcontractor or producer of producer services like repair- and maintenance tasks. We also identified a weak tendency in the material that activities regarding both product and process innovation increased as the quality of the business environment rose.

Surprisingly the local environmental influence on social networking was identified as a weak negative relation between the intensity of social relations to most of the local business environment and qualities of the same environment. This tendency tells us that the weaker the local business environment, the more local managers are involved in *local* business interaction. We could not find any good theoretical explanation for this tendency except that missing supplies especially of producer services 'force' firms to co-operate locally. Alternatively that firms in weak local environments basically function as subcontractors to a local market. If so, this is more a matter of defensive action than dynamic networking described in the industrial district literature. No differentiation was found in external (links to the non-local world) relations of the firm following the strength of their local business environment. All over the local environment seems to have a very weak influence on the

international exposure of the firm both measured directly by region of location and through the intermediate local resource variables.

Our model best predict export shares in a regional context of rural periphery and industrial cities with an explained variance of 54 % and 48 % respectively. Least suited was the model to predict export shares of SMEs located in big cities (29 %). Here a more complex explanation seems to be needed. On the other hand, the model came out with more or less the same explained variance for all three countries. The same could be said about which industry (wood processing or metal working industry) the firms belonged to.

Interestingly, the predictor variables are different between countries and industries. In Norway the degree of specialisation and skills in production technology matched with the share of white collar employees in the staff best predicted the export share of the firm. In Finland the variable measuring if the firm controlled their own product was the best predictor variable followed by in what degree the Finnish SMEs were oriented towards large scale production.

Export share of the Swedish SMEs was best predicted by a combination of a sophisticated production process, the use of sub-contractors and in what sense the Swedish manager was fluent in several languages. The Swedish firms analysed showed a significant negative relation between focus on R&D in product development and the scale of export. This indicate again that in general it is mature products which is exported from Nordic SMEs and that it is basically the efficiency and quality of the internal production processes which determined the export share of the firm. It also illustrated that Swedish SMEs are much more involved in external inter-firm relations than their Nordic competitors. This certainly mirrors the overall importance of the mechanical industry in Sweden, the many large transnationals and the deep division of labour developed in this particular sector. In Norway and Finland such a fully developed production system is not easy to identify. Most of the SME sectors in these countries are autonomous firms not participating in sophisticated production systems.

**Table 2.** Export shares for firms actively exporting by country and industry

<b>Region</b>	<b>share exporter</b>	<b>total</b>	<b>average wood</b>	<b>metal</b>	<b>total</b>	<b>median wood</b>	<b>metal</b>	<b>N</b>
<b>Finland</b>	45 %	38 %	46 %	34 %	32 %	54 %	13 %	80
<b>Norway</b>	62 %	26 %	17 %	30 %	20 %	10 %	25 %	93
<b>Sweden</b>	62 %	36 %	40 %	33 %	30 %	45 %	30 %	101

Table two shows that 62 % of the SMEs in Norway and Sweden were active on the international arena. In Finland the same percentage was 45. The table also illustrates that the Finnish firms, if they exported, had the highest share exported and that these high values were related to the wood processing industry. Conversely, the export values for the wood processing firms in Norway were very low compared to the other two countries. This is in correspondence with the general importance of the forest industry in Norway compared to Finland and Sweden. Generally speaking the table also shows that the export shares are larger in the wood processing industry (lumber, doors, windows, furniture and fixtures etc.) than the metal sector (machines, metal products, tools, instruments, transport equipment etc.).

**Table 3.** Export shares for firms actively exporting by type of region and industry

<b>Region</b>	<b>share exporter</b>	<b>total</b>	<b>average wood</b>	<b>metal</b>	<b>total</b>	<b>median wood</b>	<b>metal</b>	<b>N</b>
<b>Rural periphery</b>	68 %	34 %	37 %	31 %	30 %	33 %	26 %	62
<b>Small town</b>	48 %	29 %	27 %	30 %	25 %	25 %	25 %	69
<b>Industrial city</b>	56 %	29 %	38 %	23 %	20 %	20 %	18 %	72
<b>Larger city</b>	56 %	37 %	19 %	42 %	30 %	30 %	45 %	71

Table three indicates that there are differences between regions. Most exporting SMEs are found in rural peripheral regions, least in regions characterised as small town dominated by a large economic actor, be it a paper mill or an iron and steel plant. Among active exporters the highest shares are found in the wood processing industry located in industrial, stagnating cities and in metal working firms located in larger, dynamic cities.

This result indicates that there could be different underlying processes going on in the wood processing industry compared to the metal working industry regarding the probability to export and compete on international markets. The export oriented wood processing firms seem to be raw material located in forest regions of the three Nordic countries in question. This means the rural periphery in all countries and industrial cities in Sweden and Finland. On the other hand exporting metal working SMEs seem to have a preference for a location in local business environments like the one we find in larger dynamic cities.

In the metal industry products would generally be less standardised and under a more continues development process compared to the wood processing industry. The wood processing firms probably have some comparative advantages from being located near the raw material source. Contrary, we would expect that the international competitive climate is tougher for smaller firms in the metal industry with fewer naturally based comparative advantages. The arguments about learning systems, innovations, networking and use of external resources therefore seems to be more in line with the reality of the metal working industry than the wood processing industry. In other words, is it different processes relating location to the internal and external resources available for a firm and the international competitiveness of the same firm depending on which industry the firm belongs to?

**Table 4.** Significant predictors of the importance of local business environment by industry

<b>DEPENDENT VARIABLE</b>	<b>independent variable</b>	<b>variable</b>
	<b>LOCAL BUSINESS ENVIRONMENT</b>	<b>WOOD PRODUCTS</b>
	<b>WOOD PRODUCTS</b>	<b>METAL PRODUCTS</b>
<b>HUM1</b>		+

<b>HUM2</b>		+
<b>HUM3</b>		+
<b>PROD1</b>		+
<b>PROD2</b>		
<b>PROD3</b>		
<b>PROD4</b>	+	-
<b>TECH1</b>		+
<b>TECH2</b>		
<b>MANG1</b>		
<b>MANG2</b>		
<b>EXT1</b>		
<b>EXT2</b>		(+)

If so, two different processes going in opposite directions could zero each other out in an aggregated analyses as the one executed here. To control for this the analysis of the influence the local business environment had on internal and external resources of the firm was split between the two sectors.

Table four sums up the results of this analysis. As shown, the local business environment could only predict a small share of the variance in the factor measuring in what sense the firm was primarily competing with standardised product where price is the most influential competing factor. This relation tells us that the stronger the business environment the more SMEs in the wood processing industry are competing on price. Wood processing firms in large dynamic cities operates in market segments where price competition is much more important than seen in rural peripheral regions. As a result firms in the most urbanised regions has not been able to develop competitive strength in an international context. They mainly produce for the local market in segments protected from external competition.

Quite opposite is the situation for SMEs in the metal industry. The standard of most resources available to the firm seems at least in some sense to correspond with the quality of the local business environment of the firm. The locational dimension could predict all three aspects of the standard of the human resource of the firm. A higher score on the environmental dimension indicate a higher score on the qualification of the staff, the share of white collar employees and the firm's activity in training and development of human competence. The table also indicate that a good business environment can predict that firms in the metal sector use more resources in product development, less on production of price sensitive products, have developed a higher technological standard in production and under doubt also buy more services from external sources. Still the predictive power of the localised capabilities is not strong. Local business environment seems to have some influence but other factors outside this model are obviously much more important.

Tentatively we therefore can conclude that territorial phenomenon have different influence on capabilities of the firm dependent of what industry is in question. Smaller firms in the metal industry seem to be more in line with the production conditions postulated in neo-Marshallian

analysis. Raw material related firms in the wood processing sector do not seem to be dependent on a dynamic business environment, not territorially neither functionally, to reach competitive strength in foreign markets.

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