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Bjørn Asheim

Industrial districts as
'learning regions'. A
condition for prosperity?

Bjørn Asheim
STEP
Storgaten 1
N-0155 Oslo
Norway

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Studies in technology, innovation and economic policy
Studier i teknologi, innovasjon og økonomisk politikk

Storgaten 1, N-0155 Oslo, Norway
Telephone +47 2247 7310
Fax: +47 2242 9533
Web: <http://www.step.no/>



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Table of contents

TABLE OF CONTENTS	III
1. INTRODUCTION	1
2. THE "MARSHALLIAN" INDUSTRIAL DISTRICT AND ENDOGENOUS TECHNOLOGICAL DEVELOPMENT.....	3
3. INDUSTRIAL DISTRICTS IN A POST-FORDIST "LEARNING ECO-NOMY"	7
4. CONCLUSION: "LEARNING REGIONS" AND THE ROLE OF FUNCTIONAL AND TERRITORIAL INTEGRATION.....	15
REFERENCES	19

1. Introduction

The future of industrial districts has been critically discussed during the last years. Some observers have raised questions about the long-run stability of industrial districts, arguing that they will be fragmented either through the take-over of the most successful SMEs by TNCs or the formation of hierarchies of firms inside the districts led by the most dynamic SMEs (Harrison 1994a, 1994b). Others suggest that some industrial districts will develop a "post-Marshallian" organisation of production, i.e. to become Marshallian nodes within global networks (Amin, Thrift 1992). As this will imply a reduced level of vertical disintegration locally, one could ask how "Marshallian" such nodes would eventually become? (Harrison 1994b).

While this position basically treats the changing role and function of industrial districts as problematic, caused by the globalisation process, another position looks at industrial districts as a specific stage of development in a process of industrialisation" (Dimou 1994). Garofoli has presented a typology of Italian industrial districts representing a redynamisation of the concept (Dimou 1994). This implies that industrial districts can pass through a possible development process from "areas of productive specialisation" via "local productive systems" to "system areas" as the most advanced form. In this view industrial districts does not represent a stable (or static) organisational model of industrial production. On the contrary, development and change should be looked upon as a "natural" part of the history of industrial districts.

Such a process of change could either result in a strengthening and reproduction of the typical "Marshallian" characteristics of the districts, as is the case with "system areas", in a "post-district" (in the meaning "post-Marshallian") organisational model, which were able to secure the continual growth of the regions involved, or in a circular and cumulative process of fragmentation leading to stagnation and decline in the previously prosperous districts. Most observers seem to agree, however, that technological capabilities are an important differentiating factor concerning the development and future prospects of industrial districts (Asheim 1994, Bellandi 1994, Brusco 1990, Crevosier 1994, Garofoli 1991a). Crevosier emphasises the importance of understanding how industrial districts "react to or generate radical innovations. Without making this point clear, it is not possible to make any prediction about the reproduction and the duration of such systems" (Crevosier 1994, 259).

The endogenous innovative capacity of the districts is of strategic importance for their future development. Bellandi sees "the assessment of the endogenous innovation capacities of the industrial districts ... (as) ... a key issue" (Bellandi 1994, 73). More specifically this means the capability of SMEs in industrial districts to break path dependency and change technological trajectory through radical innovations. In this paper factors enabling and constraining such structural change will be discussed. Special focus will be directed towards analysing the role and function of the specific "Marshallian" characteristics of industrial districts in the process of change. In my view the core of the question is related to the learning capacity of SMEs in industrial districts, which will be crucial to their future innovativeness and flexibility (Johnson, Lundvall 1991). Will the traditional "Marshallian" industrial district be able to secure

a sufficient learning capacity, or will it rather represent a barrier to a successful transformation of industrial districts into "learning regions"?

2. The "Marshallian" industrial district and endogenous technological development

Piore and Sabel (1984) highlighted permanent innovation as a vital characteristic of industrial districts, and a precondition for their continuous growth.. According to Piore and Sabel "the fusion of productive activity, in the narrow sense, with the larger life of the community" (Piore, Sabel 1984, 275) will secure the reproduction of the balance between cooperation and competition as well as the permanent innovation and adoption of new technologies.

What Piore and Sabel here emphasise, is an understanding of industrial districts as a "social and economic whole", where the success of the districts is as dependent on broader social and institutional aspects as on economic factors in a narrow sense (Pyke, Sengenberger 1990). Bellandi emphasises that the economies of the districts originate from the thick local texture of interdependencies between the small firms and the local community (Bellandi 1989). Becattini maintains that "the firms become rooted in the territory, and this result cannot be conceptualised independently of its historical development" (Becattini 1990, 40). This "Marshallian" view on the basic structures of industrial districts expresses the idea of "embeddedness" as a key analytical concept in understanding the functioning of industrial districts (Granovetter 1985). It is precisely the embeddedness in broader socio-cultural factors, originating in a pre-capitalist civil society, that is the material basis for Marshall's view of agglomeration economies as the specific **territorial** aspects of geographical agglomeration of economic activity, in addition to the functional (external) economies of localisation (Asheim 1992, 1994).

However, how "functional" are agglomeration economies in promoting innovations? On the one hand, Marshall maintains that the two most important aspects of agglomeration economies, "mutual knowledge and trust" and the "industrial atmosphere", will together have a positive effect on the promotion of innovations and innovation diffusion among small firms within industrial districts. On the other hand, Marshall was also aware of the fact that agglomeration economies as such do not guarantee that product and process innovations will take place.

Indeed, studies have shown that the "industrial atmosphere" of industrial districts can support the imitation, adaptation and diffusion of innovations among SME's (Asheim 1994). In the same way, the presence of trust can bring about the introduction of new technology into industrial districts, since mutual trust - in addition to reducing transaction costs - seems to be crucial for the establishment of non-contractual inter-firm linkages. Becattini conceives of this as a social process of collective self-awareness in which the decision to introduce a new technology, partly owing to the common system of values and attitudes prevailing in the districts, is perceived as "an opportunity to defend an already acquired position" (Becattini 1990, 47). It is in this sense that Becattini's statement that "a MID (i.e. a Marshallian industrial district) is either creative or it is not a (true) MID" (Becattini 1991, 104) should be understood.

The importance of territorial embedded agglomeration economies in promoting innovations concerns largely **incremental** innovations. As Marshall noted, "industrial districts can generate innovations by incremental steps, through a gradual improvement of the final product, of the process and of the overall production organization" (Bianchi, Giordani 1993, 31). Garofoli also maintains that industrial districts have a larger capacity to deal with gradual innovations than with "ruptures" (Garofoli 1991b). Thus, agglomeration economies can represent important basic conditions and stimulus to incremental innovations through informal "learning-by-doing" and "learning-by-using", primarily based on tacit knowledge (Asheim 1994). As Bellandi suggests, such learning, based on practical knowledge (experience) of which specialised practice is a prerequisite, may have significant creative content (Bellandi 1994). Thus, as a result of what Bellandi calls "decentralized industrial creativity" (DIC), the collective potential innovative capacity of small firms in industrial districts is not always inferior to that of large, research-based companies (Bellandi 1994). Still the fact remains, however, that, in general, the individual results of DIC are incremental, even if "their accumulation has possible major effects on economic performance" (Bellandi 1994, 76).

There are certain specific structural factors of contemporary industrial districts, which constrain innovative activity to largely incremental innovations (Asheim 1994):

- a) External economies are normally secured through vertical cooperation, most typically between commissioning and subcontracting firms. This limits the potential for horizontal technological cooperation.
- b) Normally there is a fierce horizontal competition in strongly competitive markets between firms producing the same parts or carrying out the same production functions.
- c) A characteristic of industrial districts is that they are made up of independent small firms with no single big firm acting as a centre for strategic decision-making. The problem, in this respect, is that they lack innovative capacity owing to a shortage of both human and financial resources to build up and support a necessary level of research and development capacity.

However, in an increasingly globalised world economy it is rather doubtful whether incremental innovations will be sufficient to secure the competitive advantage of SMEs in industrial districts. Crevosier argues that the reliance on incremental innovations "would mean that these areas will very quickly exhaust the technical paradigm on which they are founded" (Crevosier 1994, 259). In addition Bellandi underlines that "consistency (between DIC and MID) does not mean necessity. A number of difficulties may arise which can constrain and even bring to a halt DIC within an industrial district" (Bellandi 1994, 80-81).

In his advocacy for a transition from the original "industrial district Mark I" (i.e. districts without local government intervention) to "industrial district Mark II" (i.e. districts with considerable government intervention) Brusco points out that "industrial districts eventually face the problem of how to acquire the new technological capabilities which are necessary to revive the process of creative growth. It is here that the need for intervention appears" (Brusco 1990, 17). In another context, Brusco has claimed that "industrial districts are slow to adopt new technologies, lack expertise in financial management, have little of the know-how required for basic research, and are unable to produce epoch-making innovations" (Brusco 1992, 196).

Bellandi (1994) precisely emphasises the private and public institution-making as a condition for the reproduction of dynamic industrial districts with growth potentials. When difficulties concerning institution-making or the supporting local industrial policy arise in an industrial district, "the basic conditions which sustain DIC are easily impaired, and the life-expectancy of such a district is relatively short" (Bellandi 1994, 81). Such institution-making is part of what Amin and Thrift (1994) call "institutional thickness", which they claim is of critical importance for "the performance of local economies in a globalizing world" (Amin, Thrift 1994, v).

However, perhaps a more fundamental problem of Marshallian industrial districts is that their basic characteristics do not represent the most adequate means to meet the challenge of a post-Fordist "learning economy". The original rationale for industrial districts rests on the creation of "external economies of scale" (i.e. economies that are external to the firm but internal to the area) for groups of small firms as a competitive alternative to the "internal economies of scale" of big companies (Asheim 1994). According to Marshall "the economies arising from an increase in the scale of production of any kind of goods, ... fell into two classes - those dependent on the general development of the industry and those dependent on the resources of the individual houses of business engaged in it and the efficiency of their management; that is, into **external** and **internal** economies" (Marshall 1891, 371). Thus, external economies concern the productivity of the single firm and the efficiency of the production system, obtained through an external, technical division of labour between firms, "which can often be secured by the concentration of many small businesses of a similar character in particular localities: or, as is commonly said, by the localisation of industry" (Marshall 1891, 325). Marshall underlines the possibilities of dividing "the process of production into several stages, each of which can be performed with the maximum of economy in a small establishment" (Marshall in Whitaker 1975, 196-97; here quoted from Becattini 1989, 131).

Thus, Marshall's perspective was to secure the productivity and competitiveness of small firms through economies of localisation achieved by an extensive division of labour and strong product specialisation between firms in territorial agglomerations (industrial districts). The standard of comparison was the internal economies of scale of large firms. Even if the specific Marshallian interpretation of agglomeration economies can be said to stimulate the innovation process at the district level, their major impact was to secure the (informal) skills and social and ideological "qualifications" of the workforce. When using the term "industrial atmosphere" Marshall refers to factors of a "public good" character (Becattini 1990) emerged within industrial districts "in which manufacturers have long been domiciled, a habit of responsibility, of carefulness and promptitude in handling expensive machinery and materials becomes the common property of all" (Marshall 1986, 171). In this way "the agglomeration of industry in a district generates, in time, an aptitude for industrial work, and this aptitude communicates itself to most of the people who live in the district" (Bellandi 1989, 143).

These characteristics of a traditional (Marshallian) industrial district represent at least two fundamental problems with respect to generating endogenous technological development in contemporary industrial districts. The first problem is the one dimensional focus on efficiency and productivity as understood within a Fordist frame of reference, i.e. productivity growth as a result of standardised production.

Even if this has significantly changed in contemporary industrial districts, as economies of scope within SME's - as a result of new computerised production technique and a large increase in the demand for customised products - is as important as economies of scale in achieving high productivity, this does not guarantee a large enough innovation capacity to retain competitiveness in the globalised world economy. In a post-Fordist "learning economy" competition through innovativeness has gained increasingly greater importance. Camagni also argues that the industrial district approach represents a static perspective as it "considers the local relationships mainly in terms of locational efficiency" (Camagni 1991, 2).

The second problem concerns the "functionality" of Marshallian agglomeration economies with respect to endogenous innovation capacity. As already pointed out the territorial embedded agglomeration economies can promote incremental innovations. However, this is conditioned by the productive balance between the functional and territorial modes of integration (Asheim 1992, 1994). If a "lock-in" situation occurs, for example as a result of inability of SME's in industrial districts to change technological trajectory, the existence of a strong "industrial atmosphere" could be used to squeeze wages to remain competitive, which consequently, would result in a functional incapacity of the system of SME's to promote technological development. However, in more dynamic industrial districts with a less strong path-dependency the presence of "industrial atmosphere" can provide additional competitive strength through the willingness of committed workers to engage in the formation and workings of "learning organisations".

Lastly, it should be remembered that Marshall in his writings on the progressive role of industrial districts in generating industrial and economic growth is strongly influenced by the ideas of Spencer that evolutionary progress meant differentiation and integration (Hodgson 1993, Sunley 1992). However, while Sunley argues that Marshall's biological analogies result in a "consequent exaggeration of the efficiency and potential of industrial localizations" (Sunley 1992, 306), Hodgson (1993), from a perspective of the history of ideas of economics, sees the introduction of biological analogies as representing an improvement towards making economic theory more dynamic ("bringing life back into economics") compared with the dominating mechanical, static analogies. According to Hodgson, "Marshall saw the limitations of mechanical reasoning, and turned to biology in his search for inspiration and metaphor" (Hodgson 1993, 99).¹

¹ It is in this perspective the often quoted statement of Marshall (also quoted by Sunley (1992) that "the Mecca of the economist lies in economic biology rather than in economic dynamics" should be understood. Hodgson (1993) points out that the rest of the paragraph is very seldom referred to. Here Marshall writes: "But biological conceptions are more complex than those of mechanics; a volume on Foundations must therefore give a relatively large place to mechanical analogies; and frequent use is made of the term "equilibrium", which suggests something of a statical analogy" (Marshall, *The Principles of Economics*, 9th edn, Macmillan, London 1949, xii; here quoted from Hodgson 1993, 99).

3. Industrial districts in a post-Fordist "learning economy"

The major impact of Porter's book "The Competitive Advantage of Nations" reflects a change in the understanding of the strategic factors which promote innovation and economic growth. Porter's main argument for the importance of clusters, is that they represent the material basis for an innovation based economy. This argument is clearly based on Schumpeter's idea that "competition in capitalist economies is not simply about prices, it is also a technological matter: firms compete not by producing the same products cheaper, but by producing new products with new performance characteristics and new technical capabilities" (Smith 1994, 10). This is what Storper and Walker (1989) call "strong competition" between "quality-competitive" firms, i.e. firms which base their competitiveness on innovative activity resulting in product and process innovations, in contrast to "weak competition" between "price-competitive" firms, i.e. firms which meet tougher competition with cost (normally wage) and price reductions.

Porter's cluster is basically an economic concept indicating that "a nation's successful industries are usually linked through vertical (buyer/supplier) or horizontal (common customers, technology, channels, etc.) relationships" (Porter 1990, 149). However, he emphasises that "the process of clustering, and the interchange among industries in the cluster, also works best when the industries involved are geographically concentrated" (Porter 1990, 157).

These ideas are more or less the same as the ones Perroux, another Schumpeterian inspired economist, presented in the early 1950s. Perroux argued that it was possible to talk about "growth poles" (or "development poles") in an "abstract economic space", i.e. firms which are linked together with an innovative "key industry" to form an industrial cluster. According to Perroux the growth potential and competitiveness of a growth pole could be intensified by territorial agglomeration (Haraldsen 1994, Perroux 1970).

Thus, the main argument for territorial agglomerations of economic activity in a contemporary capitalist economy is that they provide the best context for an innovation based economy. This is strongly supported by modern innovation theory, originating from new institutional economics, which argues that "regional production systems, industrial districts and technological districts are becoming increasingly important" (Lundvall 1992, 3).

Modern innovation theory is developed as a result of criticism of the traditional dominating linear model of innovation as the main strategy for national R&D policies. The **linear model of innovation** was part of the Fordist era of industrial organisation and production, based on formal knowledge generated by R&D activity (codified scientific and engineering knowledge), large firms and national systems of innovation. Smith (1994) identifies the problem of this model along two dimensions. The first problem was "an overemphasis on research (especially basic scientific research) as the source of new technologies" (Smith 1994, 2). Within this perspective

a low innovative capacity could be explained by a low R&D activity. Consequently, technology policy in most western countries was directed towards increasing the level of basic research. The second problem was a "technocratic view of innovation as a purely technical act: the production of a new technical device" (Smith 1994, 2). The linear innovation model is, thus, "research-based, sequential and technocratic" (Smith 1994, 2).

However, "it is now recognised that technological innovation and its contribution to economic growth is punctuated by discontinuities, nonappropriabilities, and process of learning by doing, using and failing. Evolutionary theories of economic and technological change have now replaced the determinism of the linear model" (Felsenstein 1994, 73). This criticism implies another and broader view on the process of innovation as a technical as well as a social process; as a non-linear process, "involving not just research but many related activities" (Smith 1994, 6); and as a process of interaction between firms and their environment (Smith 1994). This implies a more sociological view on the process of innovation, in which interactive learning is looked upon as "a fundamental aspect of the process of innovation" (Lundvall 1993, 61). Furthermore, Lundvall emphasises that "learning is predominately an interactive and, therefore, a socially embedded process which cannot be understood without taking into consideration its institutional and cultural context" (Lundvall 1992, 1). Also Camagni emphasises that "technological innovation ... is increasingly a product of social innovation, a process happening both at the intra-regional level in the form of collective learning processes, and through inter-regional linkages facilitating the firm's access to different, though localised, innovation capabilities" (Camagni 1991, 8).

According to Lundvall and Johnson from Aalborg University, Denmark, one of the leading centres internationally of the new institutional economics, the concept of "learning economies" refers "first of all to the ICI (information, computer and telecommunication) - related techno-economic paradigm of the post-Fordist period. It is through the combination of widespread ICI-technologies, flexible specialisation and innovation as a crucial means of competition in the new techno-economic paradigm, that the learning economy gets firmly established" (Lundvall, Johnson 1994, 26). These perspectives of the "learning economy" are based on the view that **knowledge** is the most fundamental resource in a modern capitalist economy, and **learning** the most important process (Lundvall 1992), thus making the learning capacity of an economy of strategic importance to its innovativeness and competitiveness.

One of the consequences of the considerably more knowledge-intensive modern economies is that "the production and use of knowledge is at the core of value-added activities, and innovation is at the core of firms' and nations' strategies for growth" (Archibugi, Michie 1995, 1). Thus, in a "learning economy" "technical and organisational change have become increasingly endogenous. Learning processes have been institutionalised and feed-back loops for knowledge accumulation have been built in so that the economy as a whole ... is "learning by doing" and "learning by using" (Lundvall, Johnson 1994, 26).

The emphasis on interactive learning as a fundamental aspect of the process of innovation points to **cooperation** as an important strategy in order to promote

innovations. The rapid economic development in the "Third Italy", based on territorial agglomerated SME's, has drawn an increased attention towards the importance of cooperation between firms and between firms and local authorities in achieving international competitiveness. "It is the success of the industrial districts in securing inter-firm cooperation and channelling the competitive forces towards such constructive ends of quality upgrading and technical change that brought them to the attention of the international research community" (You, Wilkinson 1994, 276). According to Dei Ottati, "this willingness to cooperate is indispensable to the realisation of innovation in the ID which, due to the division of labour among firms, takes on the characteristics of a collective process. Thus, for the economic dynamism of the district and for the competitiveness of its firms, they must be innovative but, at the same time, these firms cannot be innovative in any other way than by cooperating among themselves" (Dei Ottati 1994, 474).

Many observers have pointed to the importance of collaboration between territorial agglomerated firms in promoting international competitiveness. Pyke (1994) underlines the close inter-firm cooperation and the existence of a supporting institutional infrastructure at the regional level (e.g. centres of real services) as the main factors explaining the success of Emilia-Romagna. Camagni points out "the **collective learning processes** that enhance the local creativity, the capability of product innovation and of "technological creation"" (Camagni 1991, 3). And You and Wilkinson are also of the opinion that "a high degree of cooperation may be an important ingredient of industrial success" (You, Wilkinson 1994, 275).

Thus, if these observations are correct, this represents new "forces" in the promotion of technological development in capitalist economies, implying a modification of the overall importance of competition between individual capitals. Of course, the fundamental forces in a capitalist mode of production constituting the technological dynamism are still caused by the contradictions within the mode of production (Asheim 1985). However, the combined effects of the globalised and de-regulated world economy and the reduced power of nation-states due to transfer of authority to supranational organisations (e.g. the EU) have resulted in an increased need for firms to establish organisational microregulation in order to improve the ability to control the growing complexity and insecurity in the increasingly competitive world economy through inter-firm cooperation. Lazonick argues, referring to Porter's empirical evidence (Porter 1990), that "domestic cooperation rather than domestic competition is the **key** determinant of global competitive advantage. For a domestic industry to attain and sustain global competitive advantage requires continuous innovation, which in turn requires domestic cooperation. Domestic rivalry is an important determinant of enterprise strategies. But the substance of these competitive strategies - specifically whether they entail continuous innovation or cut-throat price-cutting - depends on how and to what extent the enterprises in an industry cooperate with one another" (Lazonick 1993, 4).

In the literature on industrial districts from Piore and Sabel's book (1984) and until today it has been underlined that "the central feature of the "industrial district" is the balance between competition and cooperation among firms" (You, Wilkinson 1994, 259). Dei Ottati asserts that "the cooperate elements contribute in a decisive way to the integration of the system, while forces of competition keep it flexible and innovative. This is because competition in the particular socio-economic district

environment encourages better utilization of available resources and above all, development of latent capabilities and diffuse creativity" (Dei Ottati 1994, 476).²

Porter (1990) also has similar problems of acknowledging the large and increasing influence of cooperation on the promotion of innovations and competitiveness. According to Porter, "two elements - domestic rivalry and geographic industry concentration - have especially great power to transform the "diamond" into a system, domestic rivalry because it promotes upgrading of the entire national "diamond", and geographic concentration because it elevates and magnifies the interactions within the "diamond"" (Porter 1990, 131). And he concludes "that the most striking findings from our research ... is the prevalence of several domestic rivals in the industries in which the nation had international advantage. Rivalry has a direct role in stimulating improvement and innovation" (Porter 1990, 143). Furthermore, Porter maintains that "the broader effects of domestic rivalry are closely related to an old but often neglected notion in economics known as external economies" (Porter 1990, 144).

This ambivalence regarding the relationship between, and the relative importance of, competition and cooperation is basically caused by a traditional, Marshallian perception of industrial districts and external economies.³ This also means that the characteristics of the "learning economy" are not fully recognised. In this connection an important aspect of a "learning economy" is that "the organisational modes of firms are increasingly chosen in order to enhance learning capabilities: networking with other firms, horizontal communication patterns and frequent movements of people between parts and departments, are becoming more and more important" (Lundvall, Johnson 1994, 26).⁴

Another contrast to traditional Marshallian industrial districts is the increased importance of "the collectivist and institutional basis for successful coordination" (You, Wilkinson 1994, 265). According to Marshall, "the role of employers' and workers' organizations and the state was limited. By contrast, in recent discussions of industrial districts, collectivity in the form of direct inter-firm relationships, formal and informal institutions and public policy play a central role in establishing and guaranteeing business and labour standards, fostering innovations and technology diffusion and organizing education and training" (You, Wilkinson 1994, 266). This is in accordance with a "learning economy" in which "a wide array of institutional mechanisms can play a role" (Morgan 1995, 6). Thus, generally speaking "the institutional characteristics of the learning economy becomes a crucial question" (Lundvall, Johnson 1994, 30).

The organisational form of the new microregulation securing inter-firm cooperation is achieved either through global or local networks of close inter-firm relations as an

² This assertion obviously weakens her earlier referred statement (page 474).

³ Porter has an explicit reference to Marshall (in a footnote) when he discusses the relation between domestic rivalry and external economies.

⁴ In addition the emphasis on the importance of domestic rivalry and competition in influencing factor creation (Porter 1990), could reflect the survival of the view of "the orthodox economics in which co-operation is regarded exclusively as an attempt to distort prices and is therefore inefficient" (You, Wilkinson 1994, 275).

independent, third form of governance as an alternative to markets (of a globalised world economy) and hierarchies (of large corporations).⁵ Through networking the ambition is to create "strategic advantages over competitors outside the network" (Lipparini, Lorenzoni 1994, 18). Using this perspective on networks when discussing the relation between competition and cooperation within industrial districts, competitive advantage is achieved internally through inter-firm cooperation and exploited externally through competition with firms of the "outside" world. Lazonick argues that "to fight foreign rivals requires a suspension of rivalry in order to build value-creating industrial and technological communities. Unless social organizations are put in place that can engage in innovation, heightened domestic rivalry will lead to decline" (Lazonick 1993, 8).

Such networking is of strategic importance to SMEs due to their lack of financial and human resources and/or marketing capabilities, which restrict their innovative capacity. Thus, formal R&D activity has normally been out of reach for the majority of SMEs. Especially the organisation of innovation networks supported by the establishment of centres of real services, giving priority to horizontal inter-firm technological cooperation to ensure the adoption and diffusion of radical innovations, is very important.⁶ As earlier stated, one of the constraining factors in moving beyond the domination of incremental innovations in industrial districts is the fierce competition between subcontractors specialising in the same products or phases of production, and vertically linked to the commissioning firms. According to Håkansson, "collaboration with customers leads in the first instance to the step-by-step kind of changes (i.e. incremental innovations), while collaboration with partners in the horizontal dimension is more likely to lead to leap-wise changes (i.e. radical innovations)" (Håkansson 1992, 41). Thus, the promotion of horizontal inter-firm cooperation must have a central role in the future industrial policy" (Semlinger 1993).

However, this may require a change in the industrial organisation towards a more hierarchical group-formation of firms, which can be observed in several industrial districts in the "Third Italy" (Zeitlin 1992). According to Cooke "recent evidence from ... the Third Italy, suggests group-formation has enabled firms in industrial districts to outperform their sector generally" (Cooke 1994, 24). Most commonly these groups are formed by SMEs under competitive pressure aiming to stay competitive (Zeitlin 1992). In addition to providing SMEs with financial and human resources to increase the innovative capacity in order to improve their international competitiveness, the formation of groups can be a strategy for establishing a more systematic horizontal inter-firm technological cooperation.

The importance of horizontal relations between firms within networks with respect to promoting innovations highlights the qualitative aspects of networking, i.e. the type and structure of network cooperation. Networking results in new, planned forms of

⁵ In this connection it is important to distinguish between global and local networks. Global networks are constituted by functionally integrated global production systems dominated by large firms (TNCs), while the typical local network is a territorial integrated local production system consisting of SMEs (eg the industrial district as the ideal type).

⁶ Amin and Thrift emphasise "the need for enterprise support systems, such as technology centres or service centres, which can help keep networks of firms innovative" (Amin, Thrift 1995, 12).

industrial organisation in contrast to the anarchic results of a market-based externalisation process. However, these new ways of organising industrial production can take various forms. The specific new form of industrial organisation resulting from close inter-firm networking is represented by "quasi-integration" (Leborgne, Lipietz 1988). Quasi-integration refers to relatively stable relationships between firms, where the principal firms (i.e. the buyers) aim at combining the benefits of vertical integration as well as vertical disintegration in their collaboration with suppliers/subcontractors (Haraldsen 1995). According to Leborgne and Lipietz "Quasi-integration minimizes both the costs of coordination (because of the autonomy of the specialized firms or plant), and the costs of information/transaction (because of the routinized just-in-time transactions between firms). Moreover the financial risks of R&D and investments are shared within the quasi-integrated network" (Leborgne, Lipietz 1992, 341).

Leborgne and Lipietz (1992) distinguish between three different forms of quasi-integration. The most extreme case is called "vertical quasi-integration", where "the buyer has at its disposal the know-how of the subcontractor" (Leborgne, Lipietz 1992, 341). By contrast there is the case of "horizontal quasi-integration", when "partnership and strategic alliance link a supplier with specific technology to a regular customer of another sector of the division of labor" (Leborgne, Lipietz 1992, 341). The general case is, however, the intermediate situation of "oblique quasi-integration", where the customer orders "specific goods which are part of the process of production" (Leborgne, Lipietz 1992, 342), but where the supplier "is fully responsible for the process of production" (Leborgne, Lipietz 1992, 342). Leborgne and Lipietz (1992) maintain that the more horizontal the ties between the partners in the network are (i.e. networks dominated by oblique or horizontal quasi-integration), the more efficient the network as a whole is. Generally they argue that "the upgrading of the partner increases the efficiency of the whole network" (Leborgne, Lipietz 1992, 399).⁷

Such a process of upgrading can be illustrated by an example from the "Third Italy", where a firm started to cooperate with its suppliers in developing new products (i.e. product innovations) in order to institutionalise a continual organisational learning process. This cooperation played a central role in shortening the product cycle, improving the product quality and increasing the competitiveness of the firm (Bonaccorsi, Lipparini 1994). The firm redefined the relations to its major suppliers based on the recognition that "a network based on long-term, trust-based alliances could not only provide flexibility, but also a framework for joint learning and technological and managerial innovation. To be an integral partner in the development of the total product, the supplier must operate in a state of constant learning, and this process is greatly accelerated if carried out in an organizational environment that promotes it" (Bonaccorsi, Lipparini 1994, 144).

Lundvall and Johnson underline that "the firms of the learning economy are to a large extent "learning organisations" (Lundvall, Johnson 1994, 26). A dynamic

⁷ Haraldsen (1995) shows that the relations between "differentiated suppliers" and the buyers are characterised by "horizontal quasi-integration"; the relation between "specialised suppliers" and the buyers by "oblique quasi-integration"; while "vertical quasi-integration" corresponds to the relations between (capacity) subcontractors and their principal firms.

flexible "learning organisation" can be defined as one that promotes the learning of all its members and has the capacity of continuously transforming itself by rapidly adapting to changing environments by adopting and developing innovations (Pedler et al 1991; Weinstein 1992). Lundvall and Johnson add that "the firm's capability to learn reflects the way it is organised. The movement away from tall hierarchies with vertical flows of information towards more flat organisations with horizontal flows of information is one aspect of the learning economy" (Lundvall, Johnson 1994, 39).⁸

Thus, an important organisational innovation in a "learning economy" is the formation of "learning organisations" both at an intra-firm and inter-firm level, and at a district or regional level. At the intra-firm level industrial relations characterised by strong involvement of functional flexible, central workers is important in order to have a working "learning organisation". Scandinavian experiences have shown that flat and egalitarian organisations have the best prerequisites of being flexible and learning organisations. Such organisations will also result in well functioning industrial relations, where all the employees (i.e. the (skilled) workers as well as the managers) will have a certain degree of loyalty towards the firm. All experience shows that "the process of continuous improvement through interactive learning and problem-solving, a process that was pioneered by Japanese firms, presupposes a workforce that feels actively committed to the firm" (Morgan 1995, 11).

A strong and broad involvement within an organisation will also make it easier to use and diffuse informal or "tacit", non-R&D based, knowledge, which in a "learning economy" has a more central role to play in securing continuous innovation. "Transactions" with "tacit" knowledge within and between networking organisations require trust, which is easier to establish and reproduce in flat organisations than in hierarchical ones. According to Lipparini and Lorenzoni "a high dose of trust serves as substitute for more formalised control systems" (Lipparini, Lorenzoni 1994, 18; see also Lorenz 1992 and Sabel 1992). In organisations characterised by an authoritarian management style the attitude of the employees will often be to keep "the relevant information to themselves" (You, Wilkinson 1994, 270).

According to modern organisational theory and practice the challenges of the "learning economy" are increasingly being institutionalised as firm internal "development organisations". They represent the framework for carrying out the process of continuous improvement in productivity and competitiveness. The strategy behind such an organisational innovation is to make "labour productivity "endogenous" and raise it above market levels, hence not transferable to other firms" (Perulli 1993, 110).

At the inter-firm level we have already strongly advocated the similar importance of close inter-firm networking to secure horizontal technological cooperation. According to Brusco, it is "the fact of being a "system" rather than being a "single firm" that defines the degree of sophistication of these industrial structures" (Brusco

⁸ Becattini underlines similar aspects when he discusses the socio-material basis for a "learning economy": "Consequently, if creativity is regarded by some societies as a valuable asset, these societies should curb or even forbid those forms of organisation of the process of production which involve physical stress and tedium, and at the same time promote research and investment into the production of means of mitigating human fatigue, and methods of production capable of eliminating excessive repetitiveness in human activities" (Becattini 1991, 106).

1986, 194). In this way, the internal skill and competence of firms is strengthened through inter-firm collaboration, and can, furthermore, be supported by local structures outside the firm. This strategy could be characterised as "learning-by-interacting", of which the interactions between producers and users of intermediate products and between suppliers and users of machine tools and business services represent the main forms of cooperation. Such cooperation can result in a largely improved innovative capacity of SMEs within industrial districts. Russo concludes her analysis of technological development in Sassuolo, Emilia-Romagna by underlining the importance of "the interrelationships between firms and their proximity to each other. Together these provide the basis for the process of generation and adoption of new techniques" (Russo 1989, 215).

The spatial proximity of interacting firms is an important enabling factor in stimulating inter-firm "learning networks" involving long-term commitment. Håkonsson claims that "the importance of proximity is particularly noticeable in horizontal relationships, but it is not altogether absent in the case of vertical relations" (Håkonsson 1992, 125). In this way, the ability to generate "new knowledge by combining internal and external learning could then be a critical variable in understanding SME's innovative capabilities" (Lipparini, Sobrero 1994, 136).⁹ This implies an understanding of flexibility as primarily a function of the innovative capability of firms and districts, i.e. a more dynamic perspective than the traditional focus on internal and external flexibility caused by new computerised production equipment and vertical disintegration.

However, as emphasised by Bellandi (1994) and Brusco (1990) it is always a question of a potential collective innovative capacity of territorial agglomerated SMEs, which also has to be systematically supported at the district or regional level by a regional innovation policy. The aim of such a policy is through public intervention to support organisational innovations such as the "centre of real services" in the industrial districts of Emilia-Romagna (Brusco 1990), which have turned out to be successful in modernising the economic structure of the districts and, thus, have strengthened their competitive advantage. This could, together with institutional and social innovations in the local/regional institutional set-up, contribute to turning industrial districts into "learning regions". An important innovation in the institutional set-up of "learning regions" would be the establishment of a territorial embedded regional system of innovation (Asheim 1995), which could improve what has been called "systemic innovation" with reference to Baden-Württemberg (Cooke, Morgan 1994).

⁹ Camagni points out that such "interfirm networks may enrich the respective territorial environments or "milieux" through the opportunities they provide for information interchange, explicit or tacit know-how transmission, and skilled factors mobility through the networks" (Camagni 1991, 5).

4. Conclusion: "Learning regions" and the role of functional and territorial integration

Thus, based on modern innovation theory it could be argued that SMEs in industrial districts can have a rather large innovative capacity. This is also the basis of what the GREMI-group calls "innovative milieux", i.e. "the set, or the complex network of mainly informal social relationships on a limited geographical area, often determining a specific external "image" and a specific internal "representation" and sense of belonging, which enhance the local innovative capability through synergetic and collective learning processes" (Camagni 1991, 3). In this perspective, creativity and continuous innovation is considered to be a result of "a collective learning process, fed by such social phenomena as intergenerational transfer of know-how, imitation of successful managerial practices and technological innovations, interpersonal face-to-face contacts, formal or informal cooperation between firms, tacit circulation of commercial, financial or technological information" (Camagni 1991, 1).

However, the basic problem with the "innovative milieux" approach is that it, beyond referring to "industrial atmosphere" and different forms of incremental innovations, does not specify the mechanisms and processes which promote innovative activity more successfully in some regions than in others, i.e. "why localization and territorial specificity should make technological and organizational dynamics better" (Storper 1993, 14). Their focus is too much on what they call the "territorial logic" of development processes, which misses the central point of the "productive" balance of the functional and territorial modes of integration, which has been the key to the industrial and economic success of the industrial districts (Asheim 1992, 1994).¹⁰

Furthermore, the strong focus on the advantages of the territorial mode of integration increases the possibility of ignoring the danger of supporting economic and social structures which create "lock-in" situations through the "weakness of strong ties" (Granovetter 1985), which often characterise old industrial agglomerations of SMEs (Glasmeyer 1994).¹¹ Porter argues that "geographic concentration does carry with it some long-term risks, however, especially if most buyers, suppliers, and rivals do not operate internationally" (Porter 1990, 157). And Grabher points out what he calls an "embeddedness dilemma" with respect to major social, economic and technological changes (Grabher 1993). However, Camagni warns about such development tendencies when he maintains that "innovation networks and cooperation agreements become the strategic instruments that local environments may utilise in order to

¹⁰ Dimou argues along the same lines that "the industrial districts appears as an organizational fact, stemming from the interactions between an industrial dynamic defined at a global level and a social dynamic defined at a territorial level. As long as these two components of the district evolve in the same way - that is, as long as the territory regulates efficiently the industrial process - the district structure subsists through time" (Dimou 1994, 28).

¹¹ However, the balance between functional and territorial integration is also exposed to threats towards stronger functional integration from an extension of the time-space distancing of the production system through increased external ownership and control of local industry (Asheim 1992, Tolomelli 1990).

avoid an "entropic death" which always threatens too closed systems, and to keep on exploiting at the same time the advantages provided by their internal synergies, their industrial "memory" and atmosphere" (Camagni 1991, 5).

The challenge of "learning regions" is to increase the innovative capability of SME-based industrial agglomerations through identifying "the economic logic by which milieu fosters innovation" (Storper 1993, 14). According to Porter, "competitive advantage is created and sustained through a highly localized process" (Porter 1990, 19). This points at the importance of disembodied technical progress, i.e. progress "which can occur independently of changes in physical capital stock" (de Castro, Jensen-Butler 1993, 1), or "untraded interdependencies", i.e. "a structured set of technological externalities which can be a **collective asset** of groups of firms/industries within countries/regions" (Dosi 1988, 226), in explaining regional economic development. According to de Castro and Jensen-Butler "rapid disembodied technical progress requires ... a high level of individual technical capacity, collective technical culture and a well-developed institutional framework ... (which) ... are highly immobile in geographical terms" (de Castro, Jensen-Butler 1993, 8). Dosi argues that "untraded interdependencies" represent "context conditions" which generally are country- or region-specific, and of fundamental importance to the innovative process (Dosi 1988, 226; see also Storper 1993, 1995).

Moreover, this emphasis on regional specific "context conditions" points at the importance of the "lifeworld", which is constituted by the embedded socio-cultural structures of the civil society, especially to the innovative performance of territorial agglomerated SMEs (Asheim 1990, Nootenboom 1988). Habermas defines the lifeworld as the spheres of society where the interaction between people is based on communicative action (Habermas 1987). In the perspective of innovation theory the main point is that "system" and "lifeworld" are characterised by different forms of rationality. While the "system" of the "economy" and "politics" spheres of society is dominated by strategic, instrumental rationality, the "lifeworld" is dominated by a non-instrumental, communicative rationality. The dominating position of the instrumental, techno-economic rationality of modern industrial societies results in a colonisation of the lifeworld by the system, i.e. the reorganisation and instrumentalisation of the lifeworld to become part of the system (Habermas 1987).

This tendency for the "system" to colonise the "lifeworld" has consequences for innovative activity in a modern economy, as the non-instrumental, creative work of researchers and inventors will always represent an aspect of the instrumental innovation processes of firms and organisations. This implies that the contradiction between "system" and "lifeworld" can manifest itself even within central institutions of the "system" like firms, and can, thus, play a significant role with respect to "the innovative performance of the economy" (Lundvall 1993, 63).¹² Lundvall maintains that "the economy would become stagnant and plagued by tremendous transaction costs if economic agents were limited to actions based on instrumental and strategic behaviour" (Lundvall 1993, 58).

¹² Lundvall points out that "R&D departments are more oriented to communicative action while the legal and accounting departments are oriented most to strategic rationality" (Lundvall 1993, 59).

According to Lundvall, "the importance of interactive learning explains why instrumental and strategic behaviour, including opportunism, is mixed with communicative action and discursive rationality. The specific mix prevailing at a certain time and place affects the institutional set-up as well as the rate and direction of the process of innovation" (Lundvall 1993, 61). Thus, in this perspective interactive learning includes technical learning, communicative learning as well as social learning (Lundvall 1993). Lundvall adds that "cooperation in processes of technical learning tend to stimulate "social learning" and reinforce communicative rationality" (Lundvall 1993, 60).¹³

In this paper I have aimed to discuss the future of industrial districts in the perspective of the "learning economy". I agree that "there exists a viable, dynamic, competitive and socially desirable paradigm of small and medium-sized enterprise development, following the principle of the Italian industrial districts prototype" (Lyberaki, Pasmazoglou 1994, 509), conditioned by a transformation of the districts into "learning regions". Such "learning regions" will be able to avoid a "lock-in" of development, caused by localised path-dependency, through the formation of dynamic flexible learning organisations both at an intra- and inter-firm level. In a "learning economy" the competitive advantage of firms and regions is based on innovations, and innovation processes are seen as social and territorial embedded, interactive learning processes. In this way a "learning region" would be in the position of transcending the contradiction between functional and territorial integration, which in the past made the industrial districts so successful, but at the same time so vulnerable to changes in the global capitalist economy.

¹³ This view on the relations between "system" and "lifeworld" with respect to innovative activity resembles to a certain degree the opinion of the young Schumpeter when emphasising the central role of the entrepreneur in the innovation process, and his scepticism about the innovative capacity of large companies. Even if he later strongly modified this opinion, it is still an empirical fact that SMEs often are more innovative than large companies, especially with respect to product innovations in certain high-tech industries. Some large corporations even try to solve problems in connection with a weak innovativeness through systematic take-overs of innovative SMEs.

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Storgaten 1, N-0155 Oslo, Norway
Telephone +47 2247 7310
Fax: +47 2242 9533
Web: <http://www.step.no/>



STEP-gruppen ble etablert i 1991 for å forsyne beslutningstakere med forskning knyttet til alle sider ved innovasjon og teknologisk endring, med særlig vekt på forholdet mellom innovasjon, økonomisk vekst og de samfunnsmessige omgivelser. Basis for gruppens arbeid er erkjennelsen av at utviklingen innen vitenskap og teknologi er fundamental for økonomisk vekst. Det gjenstår likevel mange uløste problemer omkring hvordan prosessen med vitenskapelig og teknologisk endring forløper, og hvordan denne prosessen får samfunnsmessige og økonomiske konsekvenser. Forståelse av denne prosessen er av stor betydning for utformingen og iverksettelsen av forsknings-, teknologi- og innovasjonspolitikken. Forskningen i STEP-gruppen er derfor sentrert omkring historiske, økonomiske, sosiologiske og organisatoriske spørsmål som er relevante for de brede feltene innovasjonspolitik og økonomisk vekst.

The STEP-group was established in 1991 to support policy-makers with research on all aspects of innovation and technological change, with particular emphasis on the relationships between innovation, economic growth and the social context. The basis of the group's work is the recognition that science, technology and innovation are fundamental to economic growth; yet there remain many unresolved problems about how the processes of scientific and technological change actually occur, and about how they have social and economic impacts. Resolving such problems is central to the formation and implementation of science, technology and innovation policy. The research of the STEP group centres on historical, economic, social and organisational issues relevant for broad fields of innovation policy and economic growth.