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Localised learning and policy

Academic advice on enhancing regional competitiveness through learning

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Abstract

The theoretical perspective of "localised learning" has been accused of not only being "fuzzy", but also of being incapable of providing policy prescriptions. This paper sets out to discover whether deducting policy advice from the localised learning literature does in fact pose a problem, and if so, to contribute to its solution.

The first section of the paper reviews recent localised learning literature and finds its policy advice scarce indeed. The paper does not adopt the view, however, that the localised learning perspective *per se* is incapable of providing policy advice. On the contrary, the two following sections of the paper attempt a first step in this direction, as they deduct from the literature some general principles for formulating a localised learning policy, and point towards some policy means at hand for adhering to these principles. Central issues in need to be addressed when designing and implementing such a policy are also treated.

It is concluded that while the localised learning perspective is still in an early stage, it is well suited to inspire a much-needed new policy agenda for regional development.

Introduction

During the 1990s, the interrelated topics of *innovation* and *learning* have become particularly conspicuous within the literature on regional development. This is, of course, related to the emergence of new perspectives on innovation and learning within the organisational and business economics literature – notably literature on national economic issues (the *national innovation system*-approach) as well as evolutionary economics and the perspective on firm-level and network-level resources and capabilities (the *resource-based* perspective). However, the regional variety of this literature often rests to a significantly higher degree on research and methods from *economic*

geography. In itself, it somewhat represents a change of research paradigm within the geography field.

The argument about "*localised learning*" – put forward by e.g. Amin and Wilkinson (1999); Braczyk et al (1998); Cooke and Morgan (1998); Gertler (1999); Hudson (1999); Lawson and Lorenz (1999); Lorenzen (1999); Malecki and Oinas (1999); Maskell et al. (1998); Maskell and Malmberg (1999); and Storper (1997) – is, in short, a view upon regional development as dependent on co-localised and interconnected processes of technological development (*innovation*) and evolution of a range of social institutions (*institutional learning*). In an age of globalisation of production and codification of product and process knowledge, localised creation and utilisation of some non-ubiquitous product and process factors – most notably, tacit knowledge – is viewed as a valuable regional asset.

The growing acceptance that economic development has this important regional dimension has contributed to a shift in policy debates. After a period of legitimacy of central states and relative modest scope for regional policies (see e.g. Ciciotti et al, 1990; Hilpert, 1991), regions are, once again, at the heart of policymaking at the EU level as well as within many European nation states (Bianchi, 1993; Lindström et al, 1996; Koschatsky, 1997b; Malecki, Oinas and Park, 1999). Here, learning is of central concern. Significant confusion however persists as to how a regional learning policy may be designed.

The localised learning perspective is still in a proposal stage, yet awaiting terminological clarity and empirical testing. It presently functions as a fruitful theoretical melting pot, drawing inspiration from a variety of empirical works. More theoretical rigor and empirical theory testing may follow later. However, it has been criticised on grounds of not only its mainly qualitative method, but also because it – as is the case with e.g. the national innovation system literature – so far is of limited help in pointing towards policies that may enhance national or regional competitiveness through learning (see Markusen, 1999). The present paper sets out to discover whether deducting policy advice from the localised learning literature does in fact pose a problem, and if so, to contribute to its solution. The paper reviews contemporary literature, roughly published in the period from 1995 onwards. It does not aim at providing an overview of the vast literature on localised technological development – by now, a growing theoretical literature, several quantitative studies, as well as various case studies of regions within EU, OECD, or 3rd World countries.

Rather, it concentrates on the literature in which *policy advice* is expressed or from which such can be extracted.

Section I of the paper is dedicated to a review of recent localised learning literature. It summarises an emerging and at present somewhat vaguely stated argument about the relationship between regional competitiveness and localised learning, presenting the most central contributions to the literature. It further scans the literature for policy advice on localised learning.

Even though the academic advice on localised learning policy is found to be scarce indeed, the paper does not adopt the view that this is due to an inherent inability of the localised learning perspective of providing such advice. On the contrary, it attempts a first step in remedying its absence, as section II moves on to deducting from the literature some general principles for formulating a localised learning policy. Section III then points towards the main means at hand for adhering to these policy principles, as well as commenting on the process of designing and implementing localised learning policy.

Does the localised learning literature provide policy advice?

The localised learning argument

The general assumption underlying the localised learning argument is that with the increasing speed of globalisation (i.e. growing exports of both finished and semi-finished goods, and ubiquitification of production factors), differences in regions' learning abilities matter still more (Amin and Thrift, 1994; Maskell et al, 1998; Garnsey, 1998; Amin and Wilkinson, 1999).

Technological learning and economic growth

Unique, localised, and strongly differing knowledge bases and patterns of creating knowledge determine which regions achieve efficiency. Such efficiency rests in the *organisation* of local production systems made possible through the local knowledge base and patterns of knowledge-creation (Hudson et al, 1997), and with efficient organisation, even traditional, low-tech industries may grow and give rise to local economic prosperity (Maskell et al, 1998). Efficient organisation can be traced in continuous improvements of *processes* (local firms manage to produce products similar to those of firms elsewhere, but at higher speeds, greater flexibility, or lower cost). However, continuous innovation of *products* (broad and shifting ranges of products with

cutting-edge quality) is often stressed as the main reason for regional competitiveness.

Process and product innovation is clearly only a subcategory of learning, depending on a host of social processes not narrowly related to the creation and use of technology. For the purpose of this paper, however, process and product innovation is termed "technological learning", and localised patterns of process and product innovations referred to as *localised technological learning*.

Institutional learning

A significant turn within economics and economic geography in the 1990s is the more and more explicit coupling of economic performance with the existence of particular social institutions. Localised technological learning is seen as resting upon *localised institutional learning*: Development of a range of formal and informal local institutions. Formal institutions encompass a variety of local organisations: Associations, service-providers, schools and universities, and policy-making bodies. Informal institutions span from firm-level or network-level routines to community-level norms and conventions, facilitating trust and economic coordination. Here rests a significant part of what some scholars call *local bases of tacit knowledge* (see e.g. Brusco, 1996; Maskell et al, 1998; Amin and Wilkinson, 1999; Lorenzen, 1999), growing in relative importance for competitiveness as more and more other knowledge is codified and hence imitable. In a learning perspective, particular institutional environments are seen to facilitate technological learning and economic growth.

Even if the localised learning literature is on the verge of making a circular argument here concerning social institutions and learning (social institutions are seen as important for social institutions)[1], it is not trivial that increased learning ("learning capital") may lead to economic growth. Neither is it trivial that particular social formal and informal institutions ("social capital") may be correlated to economic growth. These propositions are, however, still subjectable to rigorous empirical testing[2].

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1 Mostly, this risk of circular arguing arises due to terminological soup.

2 One of the large-scale first attempts to test the correlations between learning, social capital, and economic performance at the regional level, is carried out in an OECD project on "Learning Cities and Regions".

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Localised learning literature and policy advice

The literature on the importance of social institutions for technological learning and regional competitiveness is by nature eclectic and seeks to a differing degree to incorporate theory from *economic sociology* (on e.g. social capital, the nature of informal institutions and the importance of social embeddedness); the *resource-based perspective* on firm-level and network-level resources and capabilities; and *new trade and growth theory* (on firm linkages and local multiplier effects), as well as empirical insights from a richness of empirical *case studies* of regions with innovative firms (e.g. the importance of highly skilled labour, university-industry linkages, and different public services).

Economic geography

Much of this work lies within regional studies or economic geography. Here, special issues have been published of various journals. NordREFO (1997, 3, edited by Heikki Eskelinen) concentrates on *Regional specialisation and local environment: Learning and competitiveness*, and contains a range of case studies of Nordic regions, as well as attempts of conceptualisation of general localised learning dynamics. No policy advice is included. A special issue of European Urban and Regional Studies (vol. 6, 1 1999, edited by Anders Malmberg and Peter Maskell) on *Localised learning and regional economic development* is a rather diverse collection of papers with varying scopes, one of which however discusses development policy (Glasmeier, 1999). Regional Studies (vol. 33, 4 1999, edited by David Keeble and Frank Wilkinson) is a special issue on *Regional networking, collective learning and innovation in high technology SMEs in Europe*, containing theoretical contributions on the nature of collective learning processes (Keeble and Wilkinson, 1999b; Capello, 1999) and regional competences (Lawson and Lorenz, 1999) as well as a range of case studies, but no explicit policy advice.

Other titles within regional studies or economic geography on localised learning encompass Lorenzen (1998), providing case studies of localised learning within a particular industry; Lorenzen (1999), empirically illustrating and testing the localised learning argument at both firm and market levels; and Maskell and Malmberg (1999), providing an elaborated account for the processes of localised learning, illustrated by detailed case studies, and concluding with some brief considerations on policy. Steiner (1998) is an anthology on *Clusters and Regional Specialisation*, and, treating regional production systems and specialisation at a higher level of sophistication than e.g. Rosen-

feld (1995), takes a broader scope than merely innovation. It contains an extensive policy section, where, in particular, Tichy (1998) is of interest. Ratti et al (1997) is an elaborated follow-up upon the GREMI approach to "innovative milieux" with both theoretical and case study based contributions, and chapters by Quévit and Van Doren (1997), and Kamann (1997) contain quite detailed policy advice.

The systems of innovation literature

Another significant body of literature is comprised by the theoretical and empirical work on innovation systems (i.e. the attempts of conceptualising and empirically describing how systems of firms, networks and institutions support firm-level innovation). National innovation systems are described by e.g. Lundvall (1992), Nelson (1993), and Edquist (1997).

The national innovation system literature interweaves with economic geography in the studies of *regional* innovation systems (e.g. Asheim, 1997; Asheim and Cooke, 1999; Braczyk et al, 1998; De La Mothe and Paquet, 1998). Braczyk et al (1998) is an edited volume, containing a richness of case studies of regions arranged according to a novel typology, and elaborated discussions of their dynamics. The concluding chapter (Braczyk and Heidenreich, 1998) lists suggestions for related learning policy.

Simmie's (1997) and Malecki and Oinas' (1999) edited volumes on *Innovation, networks, and learning regions* and *Making connections: Technological learning and regional economic change*, respectively, deal with regional innovation systems from a linkages perspective. The former is an edited volume in Ron Martin's series on Regional Policy and Development, focusing on the role of local institutions as much as linkages themselves. It is very heterogeneous and has neither synthesis nor explicit policy advice, but the chapters by Pratt (1997) and Komninos (1997) give overviews of recent technology transfer policies. Malecki and Oinas (1999) is considerably more coherent and contains some attempts on synthesis, but contains no elaborated policy section.

The resource-based perspective

The resource-based perspective (i.e. the growing field of literature that seeks to explain organisation of economic activity and competitive advantage through a focus on capabilities and learning) has not been particularly well developed when it comes to regional competitive ad-

vantage. A theoretical discussion can be found in Foss (1996)[3], and while Kogut (1990) discusses national competitive advantage in a resource-based perspective, empirical applications at the regional level can be found in Maskell et al (1998), Lawson (1999), Lawson and Lorenz (1999), and Lorenzen (1999).

Institutional economics

Since 1995, the perspective of localised learning has further had quite some impact within heterodox economic literature. For example, a special issue has been published of Cambridge Journal of Economics (vol. 23, 2 1999, edited by Ash Amin and Frank Wilkinson) on *Learning, proximity and industrial performance*. In this issue, a range of scholars from economics and business economics seek to give accounts for some basic properties of learning processes, and the connections between learning, localisation, and regional competitiveness. Even if the issue contains a richness of mainly theoretical contributions, no advice on policies is given.

A special issue of Environment and Planning A (27 1995, edited by Edward Malecki) on *Flexibility and industrial districts* spends considerable space illustrating the regional level of economic evolution and regional institutional peculiarities, and argues for the organic nature of such developments, but contains no policy advice either.

Policy literature

There have been very few attempts of bringing the diverse sources of inspiration and theoretical knowledge of learning processes together in contributions that give advice on coordinated localised learning policies. Most contributions concentrate on single possible elements of such policies (for example, finance or technology transfer agencies).

Rosenfeld (1995), Koschatzky (1997a) Archibugi et al (1999), and OECD (1999) are some of the few publications on policy alltogether. Rosenfeld (1995) is a fairly practical guide to policymaking for strengthening clusters of different types, and contains much specific advice, also on promoting learning. The book is an illustration of the paradox that scholars face: Its advice is much more applicable for policymakers than what is contained in more general and theoretically sophisticated contributions, but its high level of specificity narrows

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3 For a discussion of the theoretical aspects of extending the resource-based perspective beyond the firm level - to networks, clusters, or production systems of firms -, see also Foss (1999).

the scope for policy inspiration. Koschatzky (1997a) also takes a practical and eclectic view upon regional policy, concentrating on high-tech SMEs. Archibugi et al (1999) move solely at a national level (but see the contribution from Howells (1999)). The OECD (1999) publication takes the interplay between regional clusters and national-level innovation systems into consideration. Even if it spends considerable space reviewing existing innovation policies, some suggestions to new policies are made.

Concerning journals, many contributions related to localised learning policies can generally be found in European Planning Studies (see e.g. Bräunling, 1995; Cooke, 1996; Huggins, 1996; and special issues on *Globalisation, regional and local knowledge transfer* (vol. 5, 3, 1997, edited by Robert Hassink), and *Innovation networks, collective learning, and industrial policy in the regions of Europe*, (vol. 7, 6, 1999, edited by Franz Tödling). European Urban and Regional Studies (see e.g. Hassink, 1996a), or Regional Studies (see e.g. Ashcroft et al, 1995; Bass, 1997; Huggins, 1997a; Henderson, 1998; Longhi, 1999), also approach localised learning policy, but typically, they present evidence on particular cases of regional or national planning rather than seeking to explicate general policy advice. A few, brief, attempts at giving general advice have, however, been put forward. For example, Hassink (1996b) gives general advice concerning technology transfer agencies on the basis of a broad range of literature. Hudson et al (1997) base a very broad discussion – concentrating on the scope for policy rather than its content – on comparisons of "successful" European regions. Glasmeier (1999) bases her general – but not very explicit – policy advice on case studies and a survey, and suggests how to narrow the gap between information-using and non-using local firms, through exposing the less self-conscious and reflexive firms to the learning methods of more successful local firms.

In conclusion, only few attempts to explicate policy options are made in the existing localised learning literature, and contributions on policy that takes localised learning into account are rare indeed. The lack of policy advice in the localised learning literature can be ascribed to the state of emergence of the localised learning argument. Till now, most contributions have been dedicated to spelling out the basic theoretical argument and providing empirical illustration, while less attention has seemingly been paid to drawing broader conclusions.

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Principles of localised learning policy

Notwithstanding the relative poverty of the localised learning literature when it comes to policy advice, some of the assumptions and arguments that are common to most localised learning contributions do in fact provide a basis for sketching out principles for policy. What follows is an attempt to do so.

There is a need for localised learning policy

If we accept that learning to an increasing degree forms the basis for competitiveness, development policy should not primarily aim at lowering production costs. Competitiveness grounded in learning is primarily non-cost based, and a policy aimed at decreasing costs could even lessen the pressure on firms to learn[4]. Glasmeier (1999) thus points out that the role of policy is to move beyond correcting market failures (eliminating bottlenecks and providing access to information and technologies). Thus, a policy aiming at enhancing competitiveness and economic development through learning – a *learning policy* - is endemic.

Nation states continue to play a huge role for regional economic development, for example, through technology transfers, environmental policies and regulations of labour markets (Lundvall, 1992: Hudson et al, 1997). Nevertheless, there is consensus in the literature that, when learning is concerned, there is a growing scope (even a necessity) for policy at other scales. The main point in this respect is that learning processes may take place globally, but in many cases, there is a certain geographically delimitation to the industrial or political structures and networks of firms and agents in which learning is nested. The geographical areas in which learning is thus concentrated are often not nations, but regions – both large and small (the latter encompassing what is often termed "districts" or "localities"), and both within and across national borders. Hence, a *localised* learning policy is needed[5].

4 Of course, if production costs rise too much, even learning firms lose competitiveness: High labour costs threaten learning regions, too (Braczyk and Heidenreich 1998).

5 Sadly, not all regions are granted the political autonomy to design, fund, or implement such a policy.

There are limits to policy imitation

However, localised learning policies cannot be copied from region to region, partly because regions are embedded in different national economies and national systems of innovation, partly because of the *endogenous* specificities of regions. Hence, even if e.g. Garnsey (1998) argues that localised learning systems[6] have much to learn from each other, experiences with implementing clones of policies that have proved successful in other regions have been strongly discouraging.

During the 1980s (and, some would argue, throughout the 1990s), policy debates were dominated by a certain high-tech fascination, and in many countries (but possibly in the most determined way in France and Japan (Park, 1997)), localised learning policy has consisted in bringing together high technology industry and R&D into larger regions (e.g. the Japanese "technopolis" project (Bass, 1997; Park, 1997; Sternberg, 1997)), cities ("science cities"), or smaller localities ("science parks" or "technology parks")(Bass, 1997). Such ventures have often been aimed at creating altogether new localised learning systems, and have been highly costly and complex. The results have, however, largely been disappointing (Hassink, 1996b; Sternberg, 1997; Asheim and Cooke, 1999). Simply, it is very difficult to plan high-tech innovation through a top-down approach at the regional level. For example, Bass (1997) suggests that a major problem is to reach a significant quality level of R&D within local science parks (there are Japanese examples of local research facilities that are vastly inferior to national-level universities). A more general problem with technopoles is that spin-offs to the majority of local firms are often absent, and systemic effects thus limited.

However, experience from more modest and not necessarily interconnected policy measures – for example, *real services* in Italian industrial districts (see Brusco, 1992; Bianchi, 1993; Glasmeier, 1999) or technology transfer agencies in German Länder (Hassink, 1996a: Koschatsky, 1997b) – offers important alternative inspiration for localised learning policy. These more modest policies mostly support present economic activities within regions and hence sustain their present functioning, while stimulating bottom-up learning through offering local firms inspiration to change behaviour and innovate incrementally.

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6 Garnsey uses the term "innovative milieux".

Policy should conform to market processes

No matter what the empirical sources of inspiration for localised learning policy may be, in general, it should of course be designed in accordance with our present knowledge of learning processes (in the words of Maskell et al, 1998: 189 (emphasis in original), "... successful public policy *must conform to the market processes*, not try to work against them."). The notion of the enlightened policymaker, designing policy according to a superior knowledge of what industrial structure best becomes a regional economy, is of course unrealistic. As Glasmeier (1999) points out, instead of focusing on what regions should and should not supply firms with (and try and compensate some regions for being "peripheral", geographically or resource-wise (Maskell et al, 1998)), policymakers should take account of what goes on at the "bottom": Recognise firms as experimenting, learning organisations, and create a regional structural and institutional "infrastructure" that corresponds to their cognitive, behavioural, and strategic aspects of learning.

Three major points can be made.

Policy should facilitate both learning and unlearning

The first point has to do with learning vs. unlearning (Johnson, 1992; Lundvall and Johnson, 1994). A relevant question that must be addressed when designing localised learning policy is what the region in question looks like at present, and how it may change.

Societal and economic development (i.e. of nations, regions, and firms) is cumulative, and scholars frequently regard this path dependence of both firms and regions as an important explanation of competitiveness (see e.g. Garnsey, 1998; Maskell et al, 1998). When a cumulation of unique endowments of human capital and tacit knowledge provides a region with competitiveness, the logical role of policy would seem to be to *sustain* the localised learning system in existence.

However, regions change, or so do their environments. Economic organisation and learning systems may become obsolete relative to the nature of international market developments, and path dependence may result in technological lock-in and ultimately loss of competitiveness (as some Italian or German industrial districts now show signs of). When regional dynamics or external market environments thus shift, it is necessary to make firms learn as well as *unlearn* (i.e. shift their routines and technologies). This means that localised

learning policies should be able to shift from supporting firm behaviour and supporting a learning system to *changing* it. In the case of some peripheral regions, localised learning policy should even be able to *build* a localised learning system from a very low level, "creating" localised learning.

As mentioned, the notion of a localised learning policy that changes or builds regional learning is problematic, because policymakers would not know exactly which type of learning system to aim for (not to mention, how to achieve it). This means that being able to learn as well as unlearn is essential not only to firms, but to policymakers. A central role of localised learning policy is to help regional production systems preserve the positive results of a cumulative economic and institutional development while avoiding technological *and* institutional lock-in. Avoiding firm-level technological lock-in through inspiring firms to learn and unlearn means that the different local policymakers should also be willing to learn and unlearn – to combine concrete knowledge of the sectors in which the region is specialised with considerable flexibility and willingness to coordinate efforts (Koschatzky, 1997b; Glasmeier, 1999).

Policy should facilitate systemic and embedded learning

The second point is that technologies (and innovations) are becoming increasingly complex and socially embedded – i.e., systemic (Langlois and Robertson, 1995; Braczyk and Heidenreich, 1998). The division of labour between research and application is breaking down, and firms simply cannot undertake neither production nor innovation isolated from their customers and suppliers. In other words, learning, technological as well as institutional, is to a large extent an *interactive* process, strongly dependent on transfer of people, information and knowledge between a variety of agents (firms, customers, associations, universities, agencies, etc.) – a case first strongly made by e.g. Eric von Hippel (1988) and Bengt-Åke Lundvall (1988; 1992), and now having made its way into high-level policymaking (see e.g. OECD 1999).

Some knowledge embedded in individuals may be transferred with personnel, and hiring (or in-service training) and flows of people to new, spun-off, firms are important channels for this type of learning.

Knowledge transfer may also take place independent of the movement of people, and here, trade and other interactions between firms and between firms and other agents are central. Much literature has hence focused upon the ability of *linkages* between firms and

other agents to function as sources of information and/or knowledge transfer amongst firms and other agents – and hence to promote learning[7].

A collection of conceptual papers and case studies presented at an IGU conference and edited by Edward Malecki and Paivi (1999) describes the role of "connections" between firms and actors for knowledge transfer and technological learning. The collection is heterogeneous and presents different research streams without seeking a synthesis, but in general, connections between local firms are viewed as crucial for the general level of technological learning within regions. Several contributors (e.g. Asheim and Cooke, 1999; Malecki, Oinas and Park, 1999) also stress the need for cross-region linkages (vertical linkages to external customers or suppliers, horizontal linkages to external partner firms, linkages to external parent corporations or to external universities or research institutions) for obtaining new technological knowledge. A general policy theme in this respect is stimulating linkages of various kinds, to particular types of other firms (for example, knowledge-intensive business services (KIBS) such as consultants) and knowledge centres (for example, technological service centres, universities, or R&D facilities).

However, decentralised interactions between less knowledge-intensive firms – specialised users and producers – are also central for product development. The communication taking place between all these actors is dependent on the frequency of interactions as well as cognitive "code keys" that are present only after long periods of interaction, which is why some scholars have stressed that geographical proximity is conductive to interactive learning and viewed culturally homogenous regions as particularly capable of learning (see e.g. Lorenzen, 1999).

Policy should leave room for experimentation and variety

The predominantly decentralised nature of interactive learning is related to the third point that can be made about localised learning policy from a theoretical viewpoint, namely that learning has both *planned and organic* elements.

At the firm level, deliberate "search" for information and rules and procedures for innovating and testing procedures and products

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7 Another important function of inter-firm linkages for learning is that they give firms opportunities to specialise and hence upskill their labour force.

represent the planned elements of learning, while organic learning has a range of non-planned origins (for example, trial-and-error learning in interaction with suppliers or customers). At the network level, much organic learning thus stems from unplanned overall patterns of interaction between firms. At the regional level, some institutions and policies are planned and designed, but industrial and learning policies in a range of industrial districts – spanning from Italian low-tech districts to the high tech Silicon Valley – have co-evolved organically with dynamic localised learning systems as a result of a multiplicity of interactions between local economic and political agents.

A range of scholars (e.g. Asheim and Cooke, 1999; Braczyk and Heidenreich, 1998) emphasise that localised learning, albeit resting on organic growth, local embeddedness and unplanned linkages, may now be sustained only aided by planned, systemic elements and interconnected, coordinated policy measures. For example, not only regional identities and regional economic systems (like in the cases of Italian Emilia-Romagna or German Baden-Württemberg[8]) can be formed aided by policy, learning systems within regions may also – *should* also – be formed aided by policy. This means moving beyond real services. Given the nature of present and future competition, such non-coordinated policy measures are simply not enough for ensuring regional competitiveness: More *proactive* measures, directly aiming in propagating localised learning, are necessary.

However, an important consideration for policymakers is to recognise just when formalisation of an institutional base for localised learning is beneficial and when it is *not*. Conventions, norms, know-how, co-operative behaviour, and other organically developed structures and institutions may lose their functioning if they are sought codified and incorporated into formal institutions. Their tacitness and their spontaneous order may be the very reason for the dynamism they cause.

At any rate, aiming at creating *institutional thickness* in Amin and Thrift's (1994) perspective may result in *institutional overkill*: Too many isolated – and, in many cases, unnecessary – institutions (MacLeod, 1997: Malecki, Oinas and Park, 1999). Amin and Thrift themselves, however, argue with Grabher (1993) in favour of a broad variety of local institutions – even if there may be some redundancy –

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8 These regions were formed by merging former quite differing regions, in 1974 and 1952, respectively, and have since experienced substantial economic growth.

because of the potential for flexibility and institutional learning variety encompasses.

The decision of whether the sources of inspiration for a localised learning policy should be high-tech ventures or real services, whether it should aim at create a system, change it, or sustain it, in which way the interactive nature of learning should be taken into account, and to which degree policy should aim at planned learning, must surely be taken against the background of the industrial structure, institutional environment and other characteristics of the region in question. In short, a localised learning policy should be *tailored.*

Means of localised learning policy

Tailoring a regional mix of policy means is the central task for policymakers who want to promote localised learning[9]. Section III presents a range of means of localised learning policies that support different of the policy principles mentioned above – mainly, they facilitate both learning and unlearning, and take the systemic and embedded nature as well as organic elements of learning into account.

The contributions to the localised learning literature often concentrate on one of two models of localised learning. Put simply, it is often assumed that systems of firms within high-tech industries learn through *knowledge centres and external sources* (e.g., local and national universities and linkages to leading-edge firms in national and transnational innovation systems), providing the newest (codified) knowledge, while other – typically, systems of SMEs within traditional industries – may continue to rest mainly on *local* (dispersed and often tacit) knowledge, mainly achieved through local firm-level and interactive learning. Obviously, this distinction is artificial, as most regional learning systems probably rest on both logics of learning. At any rate, to make a region build on existing knowledge while avoiding lock-in (i.e. adhering to the policy principle of facilitating both local learning and unlearning), localised learning policy should combine

9 It should be noted that many *national* policy means of course have an influence on firm and regional level learning. Those means demanding major investments or regulatory measures - like large public R&D projects, building up of international-level universities and formulation of patent laws - may best be undertaken at the national level. Networks of agents and the social institutions that coordinate their actions and interactions are best addressed at the regional level, but there is also a significant regional scope for policies of investment, education, training, and public R&D.

means to achieve a beneficial balance between local firm-level and interactive learning, and knowledge inflows from sources outside the region.

For the sake of clarity, this section first presents policy means that may promote local firm-level and interactive learning, followed by the means for promoting learning from knowledge centres and linkages to outside the region. In the end of the section, some comments on designing and implementing policy are given.

Policy means for promoting firm-level learning

Training

First of all, education and training of the workforce of firms (i.e., "individual" learning) must be seen as important policy measures for developing knowledge within the region.

Typically, views on education have been coupled to discussions of its impact on the flexibility of local labour markets. While there is no doubt that in many regions, a high general flexibility of the local labour force and a high level of cooperation in local industrial relations are important preconditions for economic success (Hudson et al, 1997), education and training should also be analysed in terms of how it increases the local stock of knowledge in the guise of human capital. This view on education as a means to enhance localised learning applies both to sustaining existing systems and creating new ones (a means to a development policy for peripheral regions).

Different types of labour have different influences on learning. While highly educated workers (for example, with an university degree) matter for many product innovations (Edquist, 1997)(see also the section below on university education), Bradley and Taylor (1996) note that skilled workers are central to many process innovations. For example, Danish, German, or Italian experiences demonstrate the importance of skilled labour for product innovation[10]. Providing skilled labour and keeping its skills up-to-date through local specialised technical schools and in-service training programmes are crucial policy means for supporting such localised learning.

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10 The picture is however complex given the widely differing know-how and competencies of what is termed "highly educated" and "skilled" labour and the variety of in-house training and in-service courses offered in different countries.

The role of training of management is little explored, even if the design and implementation of it typically differs from other education. The participation of managers to in-service training often depends upon close cooperation between educational institutions and firms, and courses aimed at enhancing firms' capacity for innovation are often most fruitfully provided along with other industry services – what Asheim and Cooke (1999: 172) term "soft infrastructure of enterprise support for business development and management training for technology growth and support".

Support for experimentation in existing firms

Another important policy means is to promote organisational learning within single firms. As mentioned in section II, this does not only encompass achievement of new knowledge, it also necessitates experimentation and relevant unlearning of routines at the firm level. The great differences in how learning processes are organised in different firms – for example, to which extent technological learning is formalised and concentrated in R&D departments, and how the qualification level of the work force influences learning – makes it difficult to approach this on a policy level. Rosenfeld (1995), however, rests a policy recommendation upon a general behavioural assumption. He notes that because managers are risk averse, it may be necessary to stimulate firm-level experimentation with new technologies and training by *grants*. At any rate, easy access to *finance* of experiments (e.g. new process technology) is crucial for indigenous knowledge creation in the guise of firm level experimentation. For example, Huggins (1996) points out that in the case of New South Wales, funding and means of finance for projects related to technological innovation was a missing crucial factor.

Support for spin-offs

A spin-off (a formation of a new firm) can be viewed as another important form of firm-level experimentation – because it typically represents both product and process innovations that cannot be undertaken by the existing firm from which the spin-off takes place. Of course, if linkages remain between the existing and the new firm, there is scope for continuos interactive learning as a supplement to the experimentation represented by the spin-off. In any case, financial support for entrepreneurial activity and other services (mainly, information and technology advice) offered by e.g. *incubator centres*

(Pleschak, 1997) should be stressed as a crucial means of a localised learning policy aiming at enhancing indigenous knowledge creation.

The need for finance for entrepreneurs does not only apply to low-tech regions. Sternberg and Tamásy (1999) lean on the case of high-tech Munich when recommending support for spin-offs (helping employees with capital to start up own businesses), and Longhi (1999) stress that the success of ambiguous high-tech projects necessitates the coordination by local authorities of a broad range of services, including finance. For example, a science park in French Sophia-Antipolis clearly illustrates how the creation of a localised high-tech learning system where smaller firms (and more industries) also participate was preconditioned by policy measures aiming at creating research facilities and qualified labour (in this case, through creating a local university), *plus* provision of supporting services for local SMEs (in particular, finance).

Some additional *information services* may also be required to promote both firm-level experimentation and spin-offs, partly because they may provide information of new technological possibilities or market developments, partly because they may enhance managers' knowledge of sources of financial aid and government support.

Policy means for promoting interactive le arning

The general rate of learning at the firm level (and hence, indigenous knowledge creation in the region) can also be enhanced by stimulating the interactive, organic, learning between local firms. A bottom-up policy approach that acknowledges the interactive dimension of knowledge creation and dissemination encompasses stimulating a general high level of linkages between local agents.

Nurturing more learning agents

Some successful localised learning systems like Silicon Valley or more traditional industrial districts seem to nurture an abundance of linkages between local firms. However, for some systems that are very specialised or are dominated by a few large firms, there may be some idea in stimulating the richness and diversity of local firms by encouraging start-up of new firms. A critical mass of specialised suppliers is a necessity for learning dynamics of production systems (Maskell et al, 1998). For example, knowledge-intensive business service providers (KIBS), which often have a great impact on interactive learning but are absent in many localised learning systems, could be promoted.

Promoting a cluster structure

Relevant policy measures for entrepreneurial support can be provision of start-up capital, *brokering* arrangements for joint ventures (e.g. though employing professional and knowledgeable mediators or facilitators, "animateurs" (Cooke, 1998) or "impannitores"[11]), and technical assistance (Rosenfeld, 1995). Information services may again play a crucial role, partly in informing managers of the economic scope of vertical or horizontal cooperation, partly to inform them of possible local partners (catalogues of suppliers, customers, or partners for horizontal joint ventures), also allowing firms to *shift* partners when necessary. Again, some scholars warn against institutional "overkill", which may hamper entrepreneurship rather than promote it (MacLeod, 1997: Malecki, Oinas and Park, 1999).

There has however been quite some success of policymakers in enhancing the scope for specialisation and co-operation between local firms through propagating *industry standards* or quality *certification* systems. Enhancing the quality consciousness of local customers – creating local critical customers in a Porterian (1990) perspective – has e.g. been on the agenda in the regional learning policy of some German Länder (Bräunling, 1995). Sternberg and Tamásy (1999) stress the need for local formal institutions like supplier certification networks and *supply chain associations* for the successful relationships between large firms and SMEs of high-tech Munich.

A general concern of learning policy aimed at local linkages should be creating a prosperous balance between competition on product quality *and* (vertical and horizontal) cooperation (Hudson et al, 1997), like in the Italian industrial districts (see e.g. Brusco, 1992). For the purpose of achieving a balance between competition and co-operation, Enright (1995) proposes to identify particular *activities* about which firms may cooperate. If carefully planned, there may be great innovative potential in promoting cooperation across traditional industry boundaries, integrating various service providers and manufacturers into particular projects that have to rely on firms from different industries (e.g. as seen in Baden-Württemberg, a multimedia

11 Such brokers should be knowledgeable, in the sense that they have experience from industry, but be *neutral*. Thus, they should be employed by government, or be different industrialists that are empowered in turn. This mechanism - giving *shifting* stakeholders responsibility and power - may also be used in solving other problems of social order, if social conventions alone cannot do so.

project)(Braczyk and Heidenreich, 1998). Sternberg and Tamásy (1999: 375) point out that a local balance between cooperation and competition within such clusters of firms is crucial in order to avoid oligopolies and technological lock-in[12]. In the case of Munich, local policy measures aiming at ensuring "... that rivalry permeates the cluster [...]" was necessary.

Promoting cooperation, communication, and trust

However, it is clear that excessive cooperation and too little competition is not the dominant problem within many regions. Quite the opposite, simply trying to create a diversity of local firms through financial and informational services may not be sufficient policy to stimulate localised learning through linkages. Many SMEs may not be willing to initiate new cooperations, because the entrepreneurial visions of their managers are less directed towards specialisation and cooperation as such, and they may rest on routines that do not allow them to respond to the specialisation and interaction possibilities offered by the local production system (Glasmeier et al, 1998). Hence, different "network programmes" have become common policy in many regions.

One aspect of these is to enhance the *information content* of interactions between independent firms. In general, it is broadly recognised that small and large firms achieve information differently (with different cognitive capabilities and through different channels)(see e.g. Fuellhart, 1999; Lorenzen, 1999), and learn differently, and policy aiming at improving networks should take that into consideration. Information exchange between large firms has been little explored empirically, as has the general problems of cognition and communication when interacting, and thus, there is limited policy advice in the literature on this (but see March Chorda, 1995; and Autio, 1998). Concerning SMEs, Rosenfeld (1995) points to positive Scandinavian policy experiences with formalised "knowledge groups" of a few firms that exchange experiences and advice and thus stimulate interactive learning. This, mostly horizontal, interactive learning is qualitatively different from the day-to-day learning between users and producers, and is open to promotion by policy.

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12 This is in the spirit of Nelson (1991), who argues that a multiplicity of firms within a system helps avoiding excessive rents and stimulates innovation.

Another important aspect of network policy is enhancing an institutional environment supporting inter-firm *trust*. The policy message within a growing body of literature is that we should look at informal social institutions (conventions, norms, or in another, less clear, term "social capital"), because they enhance economic coordination through facilitating trust. An important point in this respect is that when trust is interorganisational (i.e. built step-by-step between two partners), it may lock a firm into a cooperation even when it is inefficient, whereas *social* trust (i.e. common within a whole group of firms, not all having experience with each other) provides firms with possibilities to shift cooperative relations within the group, maintain flexibility, and learn. Common conventions and norms may also improve inter-firm communication, because they function as common cognitive "code keys" usable for the information "gatekeepers" of the firms in question (see e.g. Storper, 1997; Salais and Storper, 1997; Lundvall and Maskell, 1998; Lorenzen, 1999). Localised social trust, cooperation, and efficient communication facilitates localised networking and efficient economic organisation - making growth possible even in traditional industries that experience decline in other regions (Hudson et al, 1997).

The anthology edited by Ash Amin and Nigel Thrift (1994) contains comments by the editors on regional "thickness" of both formal and informal institutions. Their brief policy discussion concentrates on the schism between globalisation and the scope for regional policy, but contains no explicit advice on localised learning. Philip Cooke and Kevin Morgan have been participating actively to the debate on localised learning for a decade, and have largely based their policy arguments on studies of famous growth regions like Emilia-Romagna and Baden-Württemberg. Much of the policy advice contained in e.g. Cooke and Morgan (1994; 1998), Cooke (1996), Morgan and Nauwelaers (1999) – as well as others with direct experience with industrial districts (e.g. Brusco, 1996) – concerns creating supportive regional environments of informal institutions.

Social conventions and norms may arise organically through daily life within the region (enhanced by geographical proximity and hence scope for frequent interactions between agents), but some informal institutions can be promoted by policy. For example, Cooke, Morgan (1994; 1998), and others make clear that informal institutions are often grounded in quite formal structures like civic associations. Rosenfeld (1995) gives specific policy advice of how to create social capital on the basis of formal institutions: Government should support

managers in creating other civic associations than chambers of commerce, because the latter often are dominated by consumer services. More focused, alternative associations of managers can function as "...settings for interacting on a professional basis and thereby building trust" (Rosenfeld, 1995: 125). Further, he notes that social conventions that associate business failure with personal failure may make potential entrepreneurs too risk adverse to start up own business. Surely, it is difficult for regional policy to alter such collective conventions, let alone organisational cultures within single firms. It may, however, be possible in a longer run to change cultures through information services and through offering education and courses at both management and employee levels. Huggins (1997a) illustrates the severe difficulties of UK local Training and Enterprise Councils in creating learning networks, while Henderson (1998) describes the experiences of the Welsh Development Agency in stimulating inter-firm learning through network building.

A last observation concerning the promotion of cooperation and linkages between independent firms is that it is not always fruitful. Henderson (1998) stipulates that deliberate attempts in stimulating inter-firm networks must take into account that in some cases, managers are right when they do not see any economic scope for further partnerships, and policy that haphazardly promotes new partnerships may be harmful, or, at best, a waste of effort. The networks that firms are already engaged in are mostly organically developed, more specialised than those created through political efforts, and may actually have a greater learning content. Thus, policymakers should, first, be modest in their expectations regarding the effects of planned networks (networking is a long and cumulative process), and moreover, decide carefully vis-à-vis existing networking activities which new activities should be supported. This is consistent with the experiences from the Danish Network Programme (Gelsing and Nielsen, 1997; Lorenzen, 1999).

Policy means for promoting knowledge centres and links to the outside

While some firms thus create and disseminate knowledge interactively through a broad range of collaborations, others depend more on *linear* flows of knowledge from knowledge centres (universities, research centres, or large firms). Asheim and Cooke (1999) argue that organic development and dissemination of (mainly tacit) knowledge amongst SMEs, supported by real services is no longer sufficient in today's

competitive environments. Thus, together with ensuring a local advanced *telecommunications* infrastructure, they prescribe building regional formal institutions that propagate transfer to SMEs of (codified) knowledge from knowledge centres, such as "partnerships between large, private firms, government, universities, intermediate agencies, research institutes, and small firms", and "technology centres to supply expert services for technology transfer from knowledge centres such as universities and research institutes ..."(Asheim and Cooke, 1999: 172).

Many scholars stress that within most industries, *inflow of knowledge from central and external sources* is necessary to maintain a high level of learning. Even if a localised learning system is highly dynamic, local knowledge is simply not enough (in many cases, exactly the ability of localised learning systems for utilising knowledge from external sources in combination with local knowledge is what provides them with competitiveness). Empirical findings even suggest that the broader the range of linkages a firm uses as information and knowledge sources, the more it learns (Glasmeier, 1999). Knowledge centres often play a significant role for the inflow of external knowledge into localised learning systems.

University education

As mentioned above, education is a central means of enhancing local knowledge, and in particular university education provides an inflow of outside knowledge to the region. A certain high-tech fascination has made its way into the discussions of the role of education for localised learning, and most empirical work seems to have been done on the presence of highly qualified labour in high-tech regional learning systems (see e.g. Bradley and Taylor 1996; Simmie 1997b). The policy implications of such studies are clear: Enhance the quality of local universities and the utilisation by local firms of highly educated workers and in-service university courses (see e.g. Edquist, 1997), or *attract* highly educated labour from the outside. Due to the role of highly educated labour, Malecki, Oinas and Park (1999: 269) blur the distinction between learning policies and general welfare policies, stressing the importance of "… investment and promotion of quality-of-life areas or amenities such as arts or culture to attract workers in knowledge-based activities".

As mentioned, not only highly educated labour is of importance for localised learning, and as a basis for learning policy, it seems more fruitful to investigate the use of different knowledge bases within par-

ticular industrial and learning activities, rather than maintaining the problematic distinctions between high-tech and low-tech industries and highly skilled, skilled, and non-skilled labour. As Rosenfeld (1995: 128-129) notes: "the ... challenge is to build an education system that will be flexible enough to sustain the core competencies of a region's clusters and not focus narrowly on occupations". Thus, even if there is general agreement in the literature that education and training matter enormously for the learning capacity of regions, one should be careful giving policy advice of which types of education to promote, and how to design regional educational systems. Clearly, the focus often applied in the literature on highly skilled labour and high-tech innovations has left little space for a discussion of which types of education that should be promoted in order to enhance different types of learning.

Stimulating public research and providing technology transfer infrastructure

Universities and other public organisations play a central role for some localised learning systems because they carry out R&D that may be too specialised or too expensive for local firms to carry out, and function as a pool of locally developed codified knowledge. The degree to which the localised system firms may use this central source of knowledge for learning purposes of course depends on the quality of linkages between public research providers and local firms. Here, technological support services or technology transfer infrastructure (intermediary structures between universities, public research institutions, and SMEs – for example, university liaison officers or consultants (Maskell et al, 1998), and technological centres) often play a central role. Such infrastructure may not only provide technology in a narrow sense to local SMEs, but also provide general information, including that of "trends unfolding outside the immediate local area" (Glasmeier, 1999: 82). Technology transfer infrastructures and information services are mentioned by Hassink (1996a) as a major field within regional policy aimed at stimulating technological innovation (other fields being technological aid schemes to support the innovativeness of firms financially; and technology centres for business start-ups). The services provided by the Steinbeis Foundation in Baden-Württemberg are often mentioned as an object lesson (e.g. Grabher, 1993; Cooke and Morgan, 1994; Hassink, 1996a).

Huggins (1996) however gives the example of New South Wales, where the fact that firms were not sufficiently *aware* of the

technological support services available may partly explain their low level of technological innovation. Clearly, in cases like this, technological services in combination with information services would improve on this – plus, it would ceteris paribus increase the utilisation of particularly knowledgeable local firms providing services (knowledge-intensive business services, KIBS).

Hassink (1996a; 1996b), Huggins (1996; 1997b), and Pleschak (1997) give some advice on technology centres. While Pleschak (1997) lists the accomplishments of German technology and incubator centres, Hassink (1996a&b) notes that the successes of technology policies are surprisingly limited in many European regions: "... Particularly, studies that reveal the lack of links between SMEs and technology transfer agencies cast doubt on the effectiveness of technology transfer infrastructures" (Hassink, 1996a: 287). This means that substantial effort should be devoted to understanding the institutional preconditions for communication between firms (particularly SMEs) and service providers.

Attracting multinational corporations

Multinational corporations (MNCs) are often seen as other important sources of knowledge inflow to regions, due to their direct investments or their utilisation of local subcontractors. Longhi (1999) provides an empirical example of French Sophia-Antipolis of how high-tech knowledge can flow into a localised learning system through the presence of influential and knowledge-intensive French and MNC branches in a local science park[13]. Young et al (1994) provide a policy framework for attracting investments from MNCs, "territorial marketing" or "inward investment attraction". Their basic point is that because MNC investments are broadening their scope to more components of the value chain, and changing their form away from greenfield projects towards joint ventures, acquisitions and alliances, inward investment policies should be coordinated to other regional policies (of e.g. network creation), in order to capture the potential benefits from the investments.

Formulating a policy aimed at providing a region with up-to-date knowledge is not a question of either attracting MNC branch

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13 However, there was no local targeted policy of attracting these firms in the region, and thus the paper concentrates on ex-post policies aiming at providing supportive facilities and including SMEs and related industries into the emerging innovation system.

plants or promoting indigenous development of SMEs – it is a question of efficiently *coupling* these approaches. Such a policy may encompass "... supplier development, skills enhancement to support reinvestment programme, possibly even export promotion" (Young et al, 1994: 157) -- for most regions implying a coordination between the investment agencies and other policy bodies.

Similar to SME policy, policy aiming at improving on knowledge inflows with the aid of MNCs should pay attention to communication and coordination problems. Some regional projects of creating technopoles or attracting MNCs have failed to create localised learning due to lack of linkages between the high-tech ventures and the regional system of firms, and communication problems stemming from cognitive or "cultural" differences between technocrats and practitioners (Hassink, 1996b; Sternberg, 1997; Asheim and Cooke, 1999). Similarly, Simmie (1997b) notes that while many "peripheral" regions have poor access to information due to their few linkages to external firms and other sources of information, some regions *with* abundant linkages to e.g. MNCs have limited potential for absorbing technological knowledge due to a low level of education and lack of capital and physical infrastructure.[14] Again, the role of local institutions for providing the basic infrastructure for absorbing new knowledge must be viewed as crucial. Policy should seek solve such problems through education, and through creating a local institutional environment that propagates trust and aids communication.

Utilising large firms

There is also a growing literature concentrating on the role of large local firms for learning and knowledge dissemination. Due to the role of some large firms that are embedded in local production systems for coordinating these systems, innovative large firms may function as coordinators of localised learning systems. Patchell, Hayter and Rees (1999a&b) thus point out that connections between large and small local firms should be analysed more thoroughly when making policy. An empirical contribution on this relationship is Sternberg and

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[14] It should also be noted that a reason for the limited spin-off in terms of knowledge transfer to local firms may be that the activities undertaken locally by the MNC are more aimed at utilising cheap local labour than hooking up with local suppliers or partners. This is a classic theme within the MNC literature.

Tamásy (1999), stressing that in the case of Munich, local formal institutions may play a large role for maintaining the innovative dynamics of the relationships between large firms and SMEs.

Apart from their potential for coordinating localised learning, large firms often function as local learning systems' information channels to external sources of technological knowledge, the outside, due to their greater number of linkages to international markets and outside institutions, as well as their greater information collecting and processing abilities. However, if large firms monopolise information from outside, they may function as information gatekeepers rather than as information channels.

Patchell, Hayter and Rees (1999a&b) also point to the potential of large local firms for connecting local SMEs to MNCs. Ideally, large local firms have a larger potential for strategic action vis a vis MNCs in virtue of their size. Local policy aimed at enhancing knowledge inflows from MNC should thus be designed with an eye on the large local firms as much as the SMEs.

Implementation of localised learning policy

As mentioned, localised learning policy should be tailored to each region through finding the right combination of policy elements. However, the *process* through which the policy is designed may be problematic. In the literature, there is significant agreement that in order to succeed, the process of designing and implementing learning policies has to be close cooperation between public and private associations, and between policy bodies and both local firms and labour (Rosenfeld, 1995; Glasmeier, 1999). This has been the lesson learned from a range of successful regions, spanning from Italian low-tech industrial districts to Japanese high-tech regions. The process of policy formulation may be more efficient at the regional and local level than nationally, as local policymakers may be more able to design practices on the basis of feedback from local entrepreneurs. However, local policymaking is also often strongly path dependent, and it is an open question whether some external – for example, national – political interference is not needed at times in order to inspire local policymakers to unlearn inefficient practices.

Further, the *implementation* of policy may be less or more efficient – and there may again be advantages of the regional level compared to the national level. For example, Rosenfeld (1995) points out that there are great advantages if various public services are concentrated in local "one-stop centres", offering services, information, and government programs. The concentration of services

in such centres would decrease costs of particular SMEs in acquiring information. He adds that if centres are arranged around the structure of the regional cluster of firms (offering a range of different services for the narrow range of firms present) rather than around a mission (offering a narrow range of services, like training or R&D functions, for all types of firms) it would improve their efficiency substantially. Glasmeier (1999) agrees that local service providers should offer a range of both practical and more complex services. Managers must be "lured" by service offers that they perceive as relevant into participating to complex, collective learning mechanisms.

Concluding remarks

The perspective of localised learning has every potential of becoming a rich and rapidly advancing research field. However, many of its core concepts and issues are still blackboxed, its causal explanations are indeed tentative, and its empirical base heterogeneous. For example, there is much empirical evidence and little theorisation on R&D and technology policy, whereas there is much theorisation, but little empirical evidence on social capital and the role of social institutions.[15]

This lack of coherence of course spurs some controversy about the implications of localised learning itself, and about the present strong policy focus on regions and learning. Hudson (Hudson et al, 1997; Hudson, 1999) argues about regionalisation and marginalisation that because what drives regional development is competition between regions, there must be losers when some regions prosper. Even if this may not be true – because learning may make everybody better off, even under intensified competition (this is a good example of an issue about which empirical data is still lacking) – it is a fact that e.g. the strong EU policy focus on regional learning tends to disguise the fact that within those regions that seem economically successful, localities may continue to be depressed. A local rather than a large-region scale may be more useful when applying some elements of learning policy, and there is still some way to go before this important level of policymaking is recognised. Promoting such a political recognition is a major task for scholars working within the localised learning field,

15 A Nordregio project, "Competitiveness, Localised Learning and Regional Development Policies", and an OECD project, "Learning Cities and Regions", are two ongoing research projects both aiming at promoting conceptual clarity as well as adding to empirical knowledge.

and clearly demands their argument to be developed further, as well as more focused empirical work.

There is quite some consistency in the literature that localised learning policy should not be aimed at adopting models of development from other regions. What matters is to create an indigenous – those inspired by the resource-based perspective would even maintain "unique" – mode of economic development in terms of both product specialisation, industrial structure, and institutional environment. In short, what provides regional competitiveness is a unique local stock of knowledge and way of employing it.

The diversity of the dynamics of the existing localised learning systems and the structures and institutions that support them means that it is difficult to give general policy advice. Further, learning processes are essentially closely related to many aspects of both economic and social life, and *learning* policies should thus be closely coordinated with other policies. Many scholars list transport and communication infrastructure as necessary for learning and some (e.g. Malecki, Oinas and Park, 1999) even include policies aimed at art and culture. Such areas of social life are seen as related to learning, both directly in cognitive terms and indirectly in attracting highly educated labour. Furthermore, a variety of policies aiming at maintaining general social order (collective agreements and law on wages, working conditions, contracts, copyrights, etc.) can be said to promote cooperation and economic coordination, and hence interactive learning. Hence, an analysis of localised learning could easily conclude with a policy section resembling a catalogue of ideas.

The present paper has also contained a list of ideas, but has sought to categorise the policy means in the list according to their ability to adhere to some central principles. Not only the listed available policy means, but also the principles of localised learning policies have been deducted from the localised learning literature. Thus, even if the localised learning perspective is still weak in terms of terminological coherence, it does contain a core of arguments that is well suited to inspire a much needed new policy agenda for regional development. While the principles of this agenda have to await larger-scale empirical testing, case study evidence not only supports the principles, but also act as a source of regional benchmarking and inspiration for new policy means. That the localised learning perspective has been founded on a case study method may thus prove not to be its weakness, but its central advantage.

References

Amin, A. and N. Thrift (1994) *Globalisation, institutions, and regional development in Europe,* London: Oxford University Press.

Amin, A. and F. Wilkinson (eds.)(1999) "Learning, proximity and industrial performance," *Cambridge Journal of Economics,* vol. 23, 2, Special issue.

Archibugi, D. et al (Eds.)(1999) *Innovation policy in a global economy*, Cambridge: Cambridge University Press.

Ashcroft, B. et al (1995) "UK innovation policy: A critique," *Regional Studies* vol. 29, 3, pp. 307-311.

Asheim, B. (1997) "Learning regions in a globalised world economy: Towards a new competitive advantage of industrial districts?", in Conti, S. and M. Taylor (Eds.) *Interdependent and uneven development: Global-local perspectives*, Aldershot: Ashgate.

Asheim, B. and P. Cooke (1999) "Local learning and interactive innovation networks in a global economy", in Malecki, E. J. and P. Oinas (Eds.) *Making connections: Technological learning and regional economic change*, Aldershot: Ashgate.

Autio, E (1998) "Evaluation of RTD in regional systems of innovation", *European Planning Studies*, 6, pp. 131-140.

Bass, S. J. (1997) "Japanese research parks: National policy and local development", *Regional Studies* vol 32, 5, pp. 391-403.

Bianchi, P. (1993) "Industrial districts and industrial policy: The new European perspective", *Journal of Industry Studies* vol 1, pp. 16-29.

Braczyk, H-J et al (Eds.)(1998) *Regional innovation systems,* London: UCL Press.

Braczyk, H-J and M. Heidenreich (1998) "Regional governance structures in a globalized world," in Braczyk, H-J et al (Eds.) *Regional innovation systems*, London: UCL Press.

Bradley, S. and J. Taylor (1996) "Human capital formation and local economic performance," *Regional Studies* vol. 30, 1, pp. 1-14.

Brusco, S. (1992) "Small firms and the provision of real services", in Pyke, F. and W. Sengenberger (Eds.) *Industrial districts and local economic regeneration*, Geneva: ILO.

Brusco, S. (1996) "Global systems and local systems," in Pyke, F. and W. Sengenberger (Eds.) *Local and regional response to global pressure: The case of Italy and its industrial districts,* Geneva: ILO.

Bräunling, G. (1995) "An innovation-based industrial strategy for the new German Länder," *European Planning Studies* vol. 3, 4, pp. 511-529.

Capello, R. (1999) "Spatial transfer of knowledge in high technology milieux: Learning versus collective learning processes," *Regional Studies* vol. 33, 4, pp. 353-366.

Ciciotti, E. et al (Eds.)(1990) *Technological change in a spatial context: Theory, empirical evidence and policy,* Berlin: Springer-Verlag.

Cooke, P (1996) "Building a twenty-first century regional economy in Emilia-Romagna", *European Planning Studies* vol. 4, 1, pp. 53-62.

Cooke, P (1998) "Introduction: Origins of the concept," in Braczyk, H-J et al (Eds.) *Regional innovation systems*, London: UCL Press.

Cooke, P. and K. Morgan (1994) "Growth regions under duress: Renewal strategies" in Baden-Württemberg and Emilia-Romagna, in Amin and Thrift (Eds.) *Globalisation, institutions, and regional development in Europe,* London: Oxford University Press.

Cooke, P. and K. Morgan (1998) *The associational economy: Firms, regions and innovation*, Oxford: Oxford University Press.

Morgan, K. and C. Nauwelaers (1999) *Regional innovation strategies: The challenge for less favoured regions,* London: Jessica Kingsley Publishers.

De la Mothe, J. and G. Paquet (Eds.)(1998) *Local and regional systems of innovation*, London: Kluwer Academic Publishers.

Edquist, C. (Ed.)(1997) *Systems of innovation: Technologies, institutions, and organizations*, London: Pinter.

Enright, M. (1995) "Regional clusters and economic development: A research agenda," in Staber, U. et al (Eds.) *Business networks: Prospects for regional development,* Berlin: De Gruyter.

Eskelinen, H. (Ed.)(1997) "Regional specialisation and local environment: Learning and competitiveness," *NordREFO* 1997, 3, Special issue.

Foss, N. J. (1996) "Higher-order industrial capabilities and competitive advantage," *Journal of Industry Studies*, vol. 3, 1, pp. 1-20.

Foss, N. J. (1999) "Networks, capabilities, and competitive advantage," *Scandinavian Journal of Management*, 155, pp. 1-15.

Fuellhart, K. (1999) "Localization and the use of information sources: The case of the carpet industry," *European Urban and Regional Studies*, vol. 6, 1, pp. 39-58.

Garnsey, E. (1998) "The genesis of the high technology mileu: A study in complexity," *International Journal of Urban and Regional Research* vol. 22, 3, pp. 361-377.

Gelsing, L. and K. Nielsen (1997) "Promoting inter-firm networks in industrial policy: Danish evidence," Unpublished working paper, Aalborg: Department of Business Studies, Aalborg University.

Gertler, M. S. (1999) "Globalisation, regio nal economic transition and learning: Restructuring, renewal and the role of culture," in Friedrich-Schiller-University Jena, (Ed.) *Economic and cultural transition towards a learning city: The case of Jena*, pp. 33-56, Paris: OECD.

Glasmeier, A. K. et al (1998) "The relevance of firm-learning theories to the design and evaluation of manufacturing modernization programs," *Economic Development Quarterly* 12, pp. 107-124.

Glasmeier, A. K. (1999) "Territory-based regional development policy and planning in a learning economy: The case of 'real service centers' in industrial districts," *European Urban and Regional Studies* vol. 6, 1, pp. 1999.

Grabher, G. (1993) *In praise of waste: Redundancy in regional development*, Berlin: Edition Sigma.

Hassink, R. (1996a) "Regional technology policies in the old and new Länder of Germany: Case-studies from Baden-Württemberg and Thuringia", *European Urban and Regional Studies* vol. 3, 4, pp. 287-303.

Hassink, R. (1996b) "Technology transfer agencies and regional economic development," *European Planning Studies* vol. 4, 2, pp. 1996.

Hassink, R. (Ed.)(1997) "Globalisation, regional and local knowledge transfer," *European Planning Studies*, vol. 5, 3, special issue.

Henderson, D. (1998) "Building interactive learning networks: Lessons from the Welsh medical technology forum," *Regional Studies* vol. 32, 8, pp. 783-787.

Hilpert, U (Ed.)(1991) *Regional innovation and decentralization: High tech industry and government policy*, London: Routledge.

von Hippel, E. (1988) *The sources of innovation*, Oxford: Oxford University Press.

Howells, J. (1999) "Regional systems of innovation?," in Archibugi, D. et al (Eds.) *Innovation policy in a global economy*, Cambridge: Cambridge University Press.

Hudson, R. et al (1997) "Developing regional strategies for economic success: Lessons from Europe's economically successful

regions?," *European Urban and Regional Studies* vol. 4, 4, pp. 365-373.

Hudson, R (1999) "The learning economy, the learning firms, and the learning region: A sympathetic critique of the limits to learning," *European Urban and Regional Studies*, vol. 6, 1, pp. 59-72.

Huggins, R (1996) "Innovation, technology support and networking in South Wales," *European Planning Studies*, vol. 4, 6, pp. 757-768.

Huggins, R (1997a) "Local business co-operation and training and enterprise councils: The development of inter-firm networks," *Regional Studies* vol. 32, 9, pp. 813-826.

Huggins, R. (1997b) "Competitiveness and the global region: The role of networking," in J. Simmie (Ed.) *Innovation, networks, and learning regions?,* London: Jessica Kingsley Publishers.

Johnson, B. (1992) "Institutional learning", in Lundvall, B-Å (Ed.) *National systems of innovation: Towards a theory of innovation and interactive learning,* London: Pinter.

Kamann, D-J (1997) "Policies for dynamic innovative networks in innovative milieux," in Ratti, R. et al (Eds.) *The dynamics of innovative regions: The GREMI approach,* Aldershot: Ashgate.

Keeble, D. and F. Wilkinson (Eds.)(1999a) "Regional networking, collective learning and innovation in high technology SMEs in Europe," *Regional Studies*, vol. 33, 4, Special issue.

Keeble, D. and F. Wilkinson (1999b) "Collective learning and knowledge development in the evolution of regional clusters of high technology SMEs in Europe," *Regional Studies*, vol. 33, 4, pp. 295-304.

Kogut, B. (1990) "The permeability of borders and the speed of learning among countries," in Dunnning J. H. et al (Eds.) *Globalization of firms and the competitiveness of nations,* Lund: Lund University.

Komninos, N. (1997) "After technopoles: Diffused strategies for innovation and technology transfer," in Simmie, J (Ed.) *Innovation, networks, and learning regions?,* London: Jessica Kingsley Publishers.

Koschatzky, K. (Ed.)(1997a) *Technology-based firms in the innovation process: Management, Financing, and regional networks,* Heidelberg: Physica-Verlag.

Koschatzky, K (1997b) "Innovative regional development concepts and technology-based firms," in Koschatzky, K (Ed.) *Technology-based firms in the innovation process: Management, Financing, and regional networks,* Heidelberg: Physica-Verlag.

Langlois, R. N. and P. L. Robertson (1995) *Firms, markets, and economic change: A dynamic theory of business institutions*, London: Routledge.

Lawson, C. (1999) "Towards a competence theory of the region", *Cambridge Journal of Economics*, 23, pp. 151-166.

Lawson, C. and E. H. Lorenz (1999) "Collective learning, tacit knowledge, and regional innovative capacity", *Regional Studies*, vol. 33, 4, pp. 305-318.

Lindström, B. et al (1996) *Regional policy and territorial supremacy*, NordREFO 1996, 2.

Longhi, C. (1999) "Networks, collective learning and technology development in innovative high technology regions: The case of Sophia-Antipolis," *Regional Studies*, vol. 33, 4, pp. 333-342.

Lorenzen, M. (Ed.)(1998) *Specialisation and localised learning: Six studies on the European furniture industry*, Copenhagen: CBS Press.

Lorenzen, M. (1999) *Localised learning and community capabilities: On the organisation of knowledge in markets, firms, and communities*, Copenhagen: Samfundslitteratur.

Lundvall, B-Å (1988) "Innovation as an interactive process: From user-producer interaction to the national system of innovation," in G. Dosi et al (Eds.) *Technical change and economic theory*, London: Pinter.

Lundvall, B-Å (Ed.)(1992) *National systems of innovation: Towards a theory of innovation and interactive learning*, London: Pinter.

Lundvall, B-Å (1994) "The learning economy", *Journal of Industry Studies* 1, pp. 23-42.

Lundvall, B-Å and P. Maskell (1998) "Nation states and economic development: From national systems of production to national systems of knowledge creation and learning," in Clark, G. L. et al (Eds.) *Handbook of Economic Geography*, London: Oxford University Press.

Macleod, G. (1997) "Institutional thickness and institutional governance in Lowland Scotland," *Area*, 29, pp. 299-311.

Malecki, E. J. and P. Oinas (Ed.s.)(1999) *Making connections: Technological learning and regional economic change*, Aldershot: Ashgate.

Malecki, E. J., Oinas, P. and S. O. Park (1999) "On technology and development," in Malecki, E. J. and P. Oinas (Eds.) *Making connections: Technological learning and regional economic change*, Aldershot: Ashgate.

Malmberg, A. and P. Maskell (Eds.)(1999) "Localised learning and regional economic development," *European Urban and Regional Studies*, vol. 6, 1, Special issue.

March Chorda, I. (1995) "Technopolian strategies: At the edge of an innovation-driven territorial approach," *International Journal of Technology Management*, vol. 10, pp. 894-906.

Markusen, A. (1999) *Fuzzy concepts, scanty evidence, policy distance: The case for rigor and policy relevance in critical regional studies*, Mimeo, May 1999.

Maskell, P. et al (1998) *Competitiveness, localised learning, and regional development: Specialisation and prosperity in small open economies*, London: Routledge.

Maskell, P. and A. Malmberg (1999) "Localised learning and industrial competitiveness," *Cambridge Journal of Economics*, vol. 23, 2, pp. 167-186.

Nelson, R. R. (1991) "Why do firms differ, and how does it matter?" *Strategic Management Journal*, 12, pp. 61-74.

Nelson, R. R. (Ed.)(1993) *National innovation systems: A comparative analysis*, Oxford: Oxford University Press.

OECD (1999) *Boosting innovation: The cluster approach*, Conference proceedings, Paris: OECD.

Park, S-C (1997) "The Japanese technopolis strategy", in Simmie, J. (Ed.) *Innovation, networks, and learning regions?*, London: Jessica Kingsley Publishers.

Patchell, J., Hayter, R. and K. Rees (1999a) "Innovation and local development: The neglected role of large firms", in Malecki, E. J. and P. Oinas (Eds.) *Making connections: Technological learning and regional economic change*, Aldershot: Ashgate.

Patchell, J., Hayter, R. and K. Rees (1999b) "Business segmentation and location revisited: Innovation and the terra incognita of large firms," *Regional Studies*, vol. 33, 5, pp. 425-442.

Pleschak, F. (1997) "Technology and incubator centres as an instrument of regional economic promotion," in Koschatzky, K. (Ed.) *Technology-based firms in the innovation process: Management, Financing, and regional networks*, Heidelberg: Physica-Verlag.

Porter, M. E. (1990) *The competitive advantage of nations*, New York: The Free Press.

Pratt, A. (1997) "The emerging shape and form of innovation networks and institutions," in Simmie, J. (Ed.) *Innovation,*

networks, and learning regions?, London: Jessica Kingsley Publishers.

Ratti, R. et al (Eds.)(1997) *The dynamics of innovative regions: The GREMI approach*, Aldershot: Ashgate.

Rosenfeld, S. Aa (1995) *Industrial-strength strategies: Regional business clusters and public policy*, Washington: The Aspen Institute.

Salais, R. and M. Storper (1997) *Worlds of production*, Cambridge: Harvard University Press.

Simmie, J. (Ed.)(1997a) *Innovation, networks, and learning regions?*, London: Jessica Kingsley Publishers.

Simmie, J. (1997b) "The origins and characteristics of innovation in highly innovative areas: The case of Hertfordshire," in J. Simmie (Ed.) *Innovation, networks, and learning regions?*, London: Jessica Kingsley Publishers.

Sternberg, R. (1997) "New industrial spaces and national technology strategies: The case of Kyushu and the Japanese 'Technopolis strategy'," in Simmie, J. (Ed.) *Innovation, networks, and learning regions?*, London: Jessica Kingsley Publishers.

Sternberg, R. and C. Tamásy (1999) "Munich as Germany's no. 1 high technology region: Empirical evidence, theoretical explanations and the role of small firm/large firm relationships," *Regional Studies*, vol. 33, 4, pp. 367-378.

Tödtling, F. (Ed.)(1999) "Innovation networks, collective learning, and industrial policy in regions of Europe," *European Planning Studies*, vol. 7, 1, special issue.

Quévit, M. and P. Vaan Doren (1997) "The problem of innovative milieux and territorial structural adjustment policies," in Ratti, R. et al (Eds.) *The dynamics of innovative regions: The GREMI approach*, Aldershot: Ashgate.

Steiner, M. (Ed.)(1998) *Clusters and regional specialisation: On geography, technology, and networks*, London: Pion.

Storper, M. (1997) *The regional world*, New York: Guilford.

Tichy, G. (1998) "Clusters: Less dispensable and more risky than ever," in Steiner, M. (Ed.) *Clusters and regional specialisation: On Geography, technology and networks*, London: Pion.

Young et al (1994) "Targeting policy as a competitive strategy for European inward investment agencies," *European Urban and Regional Studies*, vol. 1, 2, pp. 143-159.