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## Chapter 15

### Towards Understanding Proximity, Distance and Diversity in Economic Interaction and Local Development

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#### Introduction

The various contributors to this volume have made us travel through recent industrial histories in various places across the globe – in Sweden, Norway, Austria, Germany, France, United Kingdom, Israel, Russia, China, Taiwan, Argentina, Canada. Other countries, regions and places have been mentioned in passing. The authors who have guided these travels have their backgrounds in somewhat different theoretical approaches. Yet, they all share in common the kinds of concerns that were outlined in the introduction to this volume (Chapter 1) bearing on *the significance of proximate (local/regional) relationships for successful economic interaction, economic performance, and regional development*. As a reminder, note that what we will in the following refer to as ‘local’ may mean also ‘regional’. The distinction between these two notions can be made but it is not necessary for our discussion. It may be a contextual matter when economic agents are located ‘in proximity’, or are involved in ‘proximate relations’. It may mean ‘being able to have a face-to-face chat about goings on in our business every once in a while, say, once a month’, or it may mean ‘working together on a daily basis’. Both conditions usually can be fulfilled locally or regionally.

Now, we come back to the very problem of local vs. non-local relationships. What is the significance of proximate vs. more distant relationships for successful economic activity? In trying to find ways to answer that question, we come back to the puzzle we arrived at in the end of Chapter 1. We identified three avenues in the economic geographical literature along which various scholars have tried to move ‘beyond the local’. While we found the mere idea of the ‘non-local’ too unspecific to be helpful in discussing processes that are not restricted to the local scale, we concluded that conceptualizations in terms of broader geographical scales and network relationships spanning various distances seemed to make sense in their own right. Additionally, as has been evident in Chapter 1 and throughout this volume, an essential ingredient for understanding the spatial-relational characteristics of economic activities is detailed knowledge about the nature of those activities, the actors carrying them out, as well as how the local environment provides support in the activities. What we will do here, therefore,

is to develop a conceptual framework that may help to characterise different types of regions according to the nature of economic activity in terms of innovativeness and maturity. This, we believe, will give us an indication of the position of their firms in wider industrial systems, and thus helps us speculate on the various aspects of what is 'non-local' in the firms' external relationships. The framework, in turn, will be used to reflect upon the various empirical cases presented in Chapters 2 to 14 of this volume. We build on the insight gained from the empirical evidence, and provide a re-interpretation through a discussion along the following lines.

We start by restating some of the main lines of the recently emerging critique of the idea that local relationships are most conducive for successful economic performance (the 'localization thesis'). Building on Chapter 1, we will briefly restate the meaning of the 'non-local' in terms of systems or processes occurring at other scales than the local and in terms of network relationships crossing space. We will also discuss the broader meaning of (relative) 'proximity'. Subsequently, we will open up the discussion revived across disciplines in recent years concerning the relative significance of *diversity* (associated with variety and urbanization economies) vs. *specialization* (associated with homogeneity, uniformity, and localization economies). More specifically, we will argue that a move from the Marshallian conceptualization of 'proximity and homogeneity' to an increasing emphasis also on 'distance and diversity' serves to elucidate the growing variety in effective forms of regional economic development. Our suggestion is that the discussion should centre on the search for, and elaboration of, relevant dimensions of analysis that help us understand the role and combinations of specialization and diversity of regional development in a manner that moves beyond discussions on 'urbanization and localization economies'. Then, we will suggest that the role economic actors and local economic systems play in various types of production and innovation systems is influenced by two key factors: innovativeness and maturity. This suggestion provides a basis for crafting a typology of nodes in production systems, and enables us to speculate on the general nature of those nodes, and on the significance of the various combinations of proximity vs. distance, homogeneity vs. diversity for economic performance. We will suggest to locate the case studies presented in this volume within the typology as evidence of its usefulness. We conclude with suggestions concerning the significance of (relative) proximity in economic development and how this relates to notions of regional development.

### **Proximity vs. distance; or beyond the local with 'scales' and 'networks'**

As outlined in Chapter 1, a lot of the literature has recently concluded (or assumed) that local – in some sense proximate – relationships are most conducive for economic interaction and the performance of firms and their surrounding local economies. The reasons cited have ranged from efficiencies in the functioning of the local economic systems to the role of various social ties fuelling economic relationships (Malmberg & Maskell 1997; Amin & Cohendet 1999; Keeble & Wilkinson 1999; Maskell & Malmberg 1999;

Sternberg 1999; Edquist & Rees 2000; Oerlemans et al. 2000; Oinas 2000; Porter 2000).

Regardless of the strength of these arguments, the primacy of local relationships has been questioned in the economic geography literature, and it has been suggested that non-local relations often constitute important avenues for carrying out successful economic interaction (see e.g. Amin & Thrift 1992; Amin & Cohendet 1999; Blanc & Sierra 1999; Oinas 1999; Oinas & Malecki 1999; Burmeister 2000; Gilly & Torre 2000; Oinas 2000; Bunnell & Coe 2001; Beugelsdijk & Cornet 2002; Oinas & Malecki 2002; Malmberg 2003; Morgan 2004; Simmie 2004; Wolfe & Gertler 2004). Besides, the broad interdisciplinary literatures on the internationalization of trade and transnational corporate activity that has been booming since the 1970s concerns centrally the importance of non-local relationships. The question is what the significance is of local linkages in relation to non-local linkages, particularly given the latter's alleged key role in sustaining economic competitiveness. Two themes, arising from discussions in Chapter 1, appear to be particularly relevant in this context.

First, the non-local is important because economic agents participate in economic *systems and processes* that operate on *other scales than the local* (Brenner 2001; Lagendijk 2002). Most obviously, such systems include the arenas in which economic agents are primarily inserted, such as markets, sectoral systems of production and innovation systems, that are organized at national and international scales. Also, economic agents are part of wider social systems affecting economic processes in manifold ways. They may be related to, or manifested in, say, fashions and tastes, women's status in a community or in business life, political participation, levels and contents of education, religious values, national or international regulations related to natural resource extraction, and technological systems. Such varied processes play a role in economic activity through the direct participation of economic agents in social relations governed by them (membership or participation in a nation, community, or social group that is not locally bound), or indirectly through network relations with participants in such processes. Instead of 'participation', we might also use Granovetter's (1985) 'embeddedness' to refer to the relationship agents have to the various social processes (Dicken 2004). Such wider environments set some of the basic conditions, rules of the game and directions for economic activity. Being properly plugged in these environments is vital for competitive survival. What this view calls for, essentially, is to pay more attention to how regional economic networks and clusters are *inserted* in the global economy, how they act as kinds of spatially concentrated 'modules' in 'global' production or innovation systems.

Second, the non-local is important because economic agents (employees, managers, firms, business units) can form links or relationships with actors located in *other* places to strengthen their joint competitive position. When such relationships are not one-time only, they are called networks (personal or interfirm; Oinas & Malecki 2002; Malmberg 2003). The strength of such networks is based on the fact that, especially in more strategic settings: 'A far friend is worth more than a good neighbour' (Beugelsdijk & Cornet 2002). This means that intense communication and interaction do not necessarily entail spatial propinquity, and sometimes distant relations prove more important

than close ones. In practice, many economic activities are organized through 'near-far networks' (Amin & Thrift 2002). While certain aspects, such as sequential delivery and on-site technology development, are organized through proximate relations, many other aspects rely on 'distanced' forms of interaction.

Recent theoretical and empirical work provide support for the two views. Contributions on globalization (Dicken 2004) and power geometries (Massey 1999; Yeung 2004) underscore the notion that local processes and actions should be seen as part of wider, socially and politically constructed, economic and non-economic networks and systems. The idea that the local is not always the dominant cradle of competitiveness is supported, in particular, by theoretical work undertaken in the 'Proximity School' (Rallet & Torre 1999; Gilly & Torre 2000) and by a spate of empirical work, including many of the contributions to this volume. Furthermore, proximity between agents *as such* does not necessarily create economic relationships (Burmeister & Colletis-Wahl 1997, p. 235). A locally successful butcher and a young investment banker who happen to live as neighbours are not likely to engage in interaction with economic significance – even if they enjoy their neighbourhood, have similar tastes in music, and watch football on television on Sunday afternoons. For (well functioning) economic relationships something else needs to be established between economic actors than just geographical proximity.

In the words of Rallet (1999, p. 375): 'Geographical proximity is effective only if it coincides with the existence of organisational relationships'. In many cases, it appears that local linkages do not form out of necessity, but they result from strategic preferences of local businesses. In his interpretation of industrial districts as 'knowledge communities', Loasby (1998) argues that the endurance of local linkages primarily depends on the inclination of leading businesses to continue to do business with local partners and to help local firms to improve their performance. Similarly, Rees (in this volume, p. **Error! Bookmark not defined.**), points at the *discretionary* power of firms with respect to local linkages and clustering:

Yet the existence of an industrial cluster does not compel each firm to collaborate in research and development activities. Some firms may opt for a strategy of independence, self-reliance and relative isolation due to a distrust of potential collaborators or a perceived need for secrecy to remain competitive. Neither does the existence of an industrial cluster require firms to collaborate locally. In reality, while some firms may actively collaborate within the cluster, other firms may favour of links outside of the cluster in order to access distant sources of know-how. (...) These diverse strategic options mean that industrial clusters can exhibit varying degrees of local and non-local collaboration and a substantial internal heterogeneity of corporate innovation strategies.

At the cognitive level, Nooteboom (2000) has discussed the issue in terms of (relative) *cognitive distance*. When people are able to understand each other's mental processes and the activities in which they are engaged, their *cognitive distance* is short enough to enable communication – which is the basis for any economic interaction. When focusing on particular activities and the

competences needed for implementing them, we can speak of competence-based proximities related to specific sets of activities. Oinas and van Gils (2001) propose to discuss such distances in terms of (relative) *resource relatedness*. Besides specific activity sets, such resource-relatedness may also be effective at the system level. Various shared *system-specific* similarities may bring individuals 'closer'. We may refer to them as creating (relative) *institutional distances* (or, institutional resource relatedness) (Oinas & Van Gils 2001). Institutional distances may stem from differences in political, cultural, economic, or technological systems. In sum, we can speak of 'proximities' or 'distances' in terms of the characteristics of the contexts in which actors have a common experience. Those relate to similarities or differences in organizational, technological, geographical, or historical context (cf. Blanc & Sierra 1999). All this discussion amounts to the quite simple point: different actors find it easier to relate to each other when they share some similarities either in their operations or operational environments, even when this happens at a distance.

Thus, in some conceptualizations, what is called 'proximity' is not purely a spatial issue. Instead, the various types of relative distance operate at different geographical scales and in network relations crossing different distances as discussed above. Hence, a key question concerns the role *spatial* proximity may have in overcoming the various forms of cognitive distance. This remains a heavily contested issue; it is far from clear whether spatial proximity should be regarded as a facilitating, but far from necessary factor, or whether it should be assigned a much more fundamental role. The line of research in regional economics that relies on large data sets of R&D related patent or innovation counts is only able to *assume* localized knowledge spillovers, rather than demonstrate them, as Breschi and Lissoni (2001) show in a thorough critique. The same goes for the economic geography literature that aims to give more detailed accounts on how proximate relations affect learning and innovation leading to competitiveness: actual learning processes are not demonstrated to give proof for the proximity effect (Oinas 1999, 2000). It seems safe to hold that local relations have advantages that are not so easily attainable or not attainable at all in non-proximate relations (cf., e.g., Storper & Venables 2004). Yet, it is not clear how these advantages play out in relation to the more distant relations that actors necessarily also create with extra-local actors for knowledge sharing purposes (Oinas & Malecki 1999; Oinas & Malecki 2002; Bathelt et al. 2004).

So, in regard to all these various 'distances' we are probably right to conclude that 'the closer the better' – for that part of economic interaction that requires something shared on which interaction can build upon. Interaction may be easiest face-to-face and when partners in interaction know each other well, including each other's competences, tasks, and operational environments, broadly speaking. But, as Nooteboom (2000, p. 72) reminds us, when agents are too similar in terms of knowledge disposition, the relationship becomes uninteresting from the point of view of being a source of novel ideas in the race for competitiveness. Suitable distance between what is shared and what is novel for each party in an economic relationship carries out satisfactory results: shared competences and (or) cultural codes enable communication; differences bring about complementarity and lay the basis for the emergence of novelty, innovation. Indeed, the key point about economic

relationships is complementarity; relationships with external parties are established to complement what an economic agent does not have and cannot create on its own. Thinking solely on relative 'distances' between economic agents, we can conclude that a range of configurations of 'proximities' and 'distances' may support well functioning relationships. This discussion demonstrates the need to understanding *diversity* – to which we come back below.

The conclusion we can draw about the significance of geographical proximity at this point is that other 'proximities' based on *sharing something in common* may possibly be more important than physical proximity and thus support relationships over space. Social proximities may arise from participation in systems or processes that operate or cover broader scales than just the local, as discussed above. Simple examples – such as broadly shared skills in the English language among educated people, football playing skills among youth around the world, basic abilities to use computers across social strata in a range of countries – show the significance of this point. All in all, it remains a theme for future conceptual and empirical study whether physical proximity is imperative for certain activities, for instance those that heavily depend on 'buzz' or 'noise', or stories, rumours and gossip (Amin & Thrift 1992; Grabher 2002; Storper & Venables 2004).

Another conclusion we can draw at this point is that economic geographers should pay more attention to the specific *contents* of relationships, beyond the simple association of physical proximity vs. distance with, for instance, transfer of tacit vs. codified forms of knowledge. Given the discussion here, statements about *learning* and *innovation* requiring proximity are too general. More specifically, we should ask: What kind of learning are we talking about? In what overall networks or system does learning take place, and how are regions plugged in? What kinds of alliance are formed within this overall context, at what spatial scales and in what spatial settings? What parts of innovation networks might require proximate relationships? If the contents of economic relationships arise from the need to build upon complementarities among economic agents, as we assume they do, it is important to map resource availability and complementarities within and between regions, to determine where and how proximate relations may gain significance, actual or potential. To gain further insight into the substantive aspects of local linkages and resource complementarity, we will now return to the theme introduced in the introductory chapter, namely diverse vs. specialized local economies.

### **Innovation in regions: diversity in specialisation**

The interest in diversity as an important asset for regional innovation emerged from a long-standing discussion on the role and nature of agglomeration economies. As argued in Chapter 1, the minimal conclusion that we may derive from this literature is that in many instances it is localization/specialization that is more conducive for economic growth through its impact on production activities and productivity, while diversity brings the best results in terms of innovation and long-term adaptability (Harrison et al. 1996; Capello 2002). Yet another result, notably emerging from empirical observation, is that both types of economies often go hand-in-hand, and are

often difficult to distinguish analytically (Gordon & McCann 2000). Similarly important is the lesson Martin and Sunley (2003) draw from their observations on recent research on spatial clusters. Clusters, in their view, are not just loci of specialization but essentially combine diversity and specialization, whether or not the criterion for diversity/specialization is based on industry counts.

The implication is, then, that diversity should not be seen solely as a core characteristic of urbanization. With increased emphasis on innovation, there is a tendency also to understand localization in terms of diversity, in which diversity refers not so much to the division of labour as to variation in competencies and creativity. In the prevailing perspective, specialization is sometimes substituted by related notions of homogeneity, localization, and even coherence. The meaning of these notions in contemporary discussions largely refers to approximately the same phenomenon: the geographical concentration of actors in the same and related industries benefiting from mutual knowledge spillovers, and the favourable local conditions for this phenomenon. A key author in the regional economics literature, Griliches (1992, cited in Feldman & Audretsch 1999, p. 412) characterises knowledge spillovers as arising from 'working on similar things and hence benefiting much from each other's research'. There are four issues that we need to point out here. First, actors 'working on similar things' tend to be rivals and not necessarily engaged in direct interaction as Maskell (2001) has recently pointed out (see also Malmberg & Maskell 2002). Even without explicit interactions they may benefit from an 'ongoing sequence of variation, monitoring, comparison, selection and imitation of identified superior solutions' (Maskell 2001, p. 944). Second, however, it is not necessarily evident, that such actors get access to each others' knowledge bases even if they are co-located (Breschi & Lissoni 2001). Third, even if actors 'working on similar things' are rivals and thus compete on the product market, they may still interact and collaborate in creating or mobilizing jointly useful resources (Oinas 2002). Fourth, following the line of argument built upon in the previous section, if economic agents work on 'similar things', it does not necessarily mean that they work on exactly the same things. When working on 'similar things' (i.e., in the same industry or business), interaction may be built on a combination of something shared (that enables interaction) and something different (that provides the grounds for complementarity) as argued above. It follows that if actors in 'specialized' areas engage in direct interaction, it is not similarity strictly speaking but some degree of diversity that makes firms a) interact for the purpose of knowledge sharing, or b) monitor and imitate each other as competitors.

At the core of the notion of diversity, then, is the idea that novelty springs out easier when people and firms with diverse knowledge bases and skills encounter each other, innovate through creating novel combinations, and commercialise them. What follows such activities also has to do with diversity, in the sense of 'making a distinction': a novel combination (innovation) is a key to succeeding on the market in the long run vis-à-vis competitors (e.g., Maskell et al. 1998; Porter 2000). All together, this brings Rallet and Torre (1999: 380) to proclaim an overhaul of the established Marshallian perspective: '[t]he diversity and heterogeneity of the elements composing the local economies can become factors of development, whereas, in the Marshallian approach, it is the specialization and homogeneity of the

economic, social and cultural fabric which are searched for'. Their characterization of 'specialization and homogeneity' harks back to the literature on industrial districts in the course of the 1980s and 1990s, and can also be found in recent discussions related to clusters (Cooke 2002).

Against this conceptual and empirical background, what we find problematic in the literature on the economies of localization (specialization) and urbanization (diversity) is the relatively narrow notions of diversity vs. specialization. It is mainly discussed in terms of industrial multiplicity. This is obviously largely because of the empirical nature of the problem and that measurements have been developed to show whether diversity or specialization lead to innovation and growth. It is easier to measure numbers of firms in industries and innovation counts and patents per industry than the extent to which imaginative ideas move around in people's heads – even though Florida (2002b; 2002a) has recently opened up new lines of empirical research to unravel the multiplicity of sources of (urban) creativity, leading to the innovative performance of economic actors.

The above observations make us take a broad look at diversity. Diversity does not stand in contrast with specialization. On the contrary, it forms an essential ingredient of specialization, for instance through the way it produces resource variation within a (specialized) cluster. At the same time, diversity manifesting at itself at the level of a regional economy, and may induce modifications in a region's economic activities and specialization. The implication is that we should include in our discussion a broad variety of issues ranging from industrial sectors to technological, organizational, cultural, ethnic, artistic, political, ideological, educational, occupational, gender-based, age-group-based and life-style related, etc. sources of variety – issues that go beyond those measurable in terms of industrial sectors and R&D related data.

This discussion does not suggest abandoning the lessons to be learned from studies on the advantages of 'localization' and 'urbanization', and the challenges that remain in understanding their effects on the performance of firms and regional economies. Rather, we suggest that apart from the need to understand *diversity vs. specialization* in regions *in terms of the range of industries or clusters* of them in a region, we also need to account for *diversity vs. specialization* in regions *in terms of the range of resources (natural resources, physical assets, and individual and collective competences) available within industries or clusters of them*. As a definitional note, at this point, our understanding of clusters owes to Porter (2000; 2002a), Maskell (2001), Malmberg and Maskell (2002), and Cooke (2002), and we regard clusters as involving co-located private, public or semi-public agents engaged in enhancing the competitiveness of actors building on the cluster-specific resource base. Clusters involve firms engaged in collaborative and/or competitive relations. This means they are not necessarily engaged in direct production-related interaction, even though they may interact in enhancing the shared cluster-specific resource base. This takes place through the shaping of 'club goods' (Lagendijk, 2000).

At the level of both industries and clusters, diversity may prove fruitful for innovation as novelties arise from complementarities. In specialized (uni-industry or uni-cluster) regions, complementarity is achieved through variety arising within the set of specialized activities; in diverse (city-)regions this may additionally happen through inter-industry complementarities (cf. Jacobs

1969) in cases when some cognitive proximity, possibly created by the use of related resources, brings actors in contact (as discussed above). Additionally, complementarities may arise from interaction or monitoring and imitation across space. These processes may arise from network partnerships or from participating in systems operating in wider scales than the regional (see above).

So, we have arrived at similar conclusions concerning proximity vs. distance' and diversity vs. specialization: both come in different combinations. How are we to figure out what outcomes different combinations bring about in different types of regions? Our suggestion here is that we need to gain more understanding of the particular roles economic agents (and local concentrations of them) play in broader economic systems and processes. For this purpose, we propose to identify two dimensions that help us characterise regional actors and their roles in economic dynamics.

- The first dimension is the strength of innovative capability. In contemporary economies, the ability to innovate is generally regarded as the essential means to create and maintain competitive advantage at the level of firms, regions, and nations (Porter 1990). Then, we presume that this ability places firms (and their geographical surroundings) in different positions in systems of interlinked economic activity that often span regional or national boundaries. The positions acquired in these systems corresponds to the level and diversity of economic activity carried out in them, and influences their external relations.
- The second dimension is the maturity of a business, as captured, e.g., in business cycle approaches. We presume that actors engaged in the early stages of the development of a new kind of business (product-market combination) have to be involved with considerably different activities compared to those involved in an already thriving or consolidated business. We also postulate that maturity also influences the kind and extent of firms' external relationships.

While these are not themes initially addressed, they emerge as more or less explicit issues in the empirical sections of the book. Further below, they help us build a typology of regions where the dimensions of proximity vs. distance and diversity and specialization play out differently.

### **Degrees of innovativeness and spatial knowledge dynamics**

It is evident from the above that if there is one process in which diversity is paramount it is innovation. Adopting the view that innovation is an interactive process spanning many firms and other organizations (Lundvall 1992), diversity has two important functions. First, diversity feeds the innovation process, as argued above. Second, economic agents play different roles in innovation processes, in terms of division of labour as well as in a more hierarchical sense. Higher degrees of innovativeness provides positions that enable the exertion of control over other actors in those systems. Innovative processes may thus be interpreted in system terms, under labels such as 'technological systems' (Carlsson & Stankiewicz 1991; Carlsson 1994),

'innovation systems' (Nelson 1993; Braczyk et al. 1998) or merely 'production systems'. These labels go hand in hand because all production systems are based on some sort of technologies which form 'systems' in their own right, and all production systems involve various degrees of innovative dynamics which can be regarded as 'innovation systems'.

The most innovative agents tend to be the driving forces in such systems. But at each point in time, there are also other, less innovative or non-innovative actors that have just enough skills to adopt externally developed technologies, or organizational and work procedures (cf. Cohen & Levinthal 1990). In other words, involvement in innovation systems ascribes various *roles* to the participants, and those roles correspond to the participating agents' degree of innovativeness. To some degree, such roles go hand in hand with characteristics and capacities in local environments. Oinas and Malecki (2002) assume that specific parts of innovation systems are region-specific, and hence characteristically outcomes of the operation of regional innovation systems in different stages of development (even though the characteristics of those parts are not necessarily determined by the regional environments). Oinas and Malecki (ibid.) call the distinct parts of innovation systems 'genuine innovators', 'adapters' and 'adopters'. Genuine innovators are centrally placed in innovation and production systems, while adapters and adopters are more peripherally placed. In more detail:

- *Genuine innovators* are those (groups of) actors that experiment with novel combinations ('new to the world' innovations) and give rise to 'best practices' in specific industries or sectors. This may be due to the *local diversity* of activities that feed into the imaginations of the innovating actors, or it may be due to their high *external connectedness* which provides the needed *diversity* for innovative ideas.
- *Adapters* are actors 'that engage in steady improvements, incremental innovations, possibly leading gradually to high quality. Through imitation of best practice, collaboration or foreign direct investments, they are able to adopt new innovations from external sources and improve them in an incremental fashion.
- *Adopters* sustain 'regional imitator systems', that are latecomers in regard to best practices but they may become skilful in using yesterday's innovations adopted from, or implanted by, external sources. Thus, they form parts of innovation systems due to their specialization in more routine parts of production, or even just assembly.

It should be noted as a complicating matter, however, that many real world regions may host actors at varying levels of technological sophistication, and especially diverse regions may host actors belonging to different technological systems (Oinas & Malecki 2002). Furthermore, the distinction between 'more or less innovative' is essentially conceptual, and is not easily subjected to direct measurement. Yet, it may serve the purpose of broad characterization as will be undertaken below.

The typology based on degrees of innovativeness also contains some suggestions concerning how diversity and specialization combine in production and innovation systems. *Genuine innovators* are assumed to build their innovativeness on either sectoral or resource diversity in the region

and/or through external connections. Genuine innovators are also likely to be members of an industrial cluster, either in a uni-or multi-cluster region. The lesser degree of innovativeness in *adapting firms* is likely to rely on the incremental build-up of specialized competences while their regional surroundings may be either specialized or more diverse. The nature of their actors and the lower degree of dynamism in the regional economy are likely to result in lower velocity in the circulation of diverse ideas in general and across firm or industry or cluster boundaries in particular. *Adopters* are likely to be more narrowly specialized in terms of both internal competences and regional surroundings.

### **Business cycles and maturity**

Apart from degree of innovativeness, the maturity of the activity firms are engaged with is a feature that characterises them as well as the production and innovation systems in which they partake. These are issues that will be discussed briefly below.

Like products (Vernon 1966) and innovations (Nooteboom 1999, 2000) also clusters of similar and related firms go through cyclical stages of development (see Chapter 7 by Arne Isaksen in this volume for a brief introduction to Porter's discussion on the emergence, evolution, and potential decline, of clusters). Porter's (1998) dynamic view on cluster development suggests that clusters gradually develop into entities where firms thrive because they gain a) increasing cost-based advantages as *specialization* increases (static productivity) as well as b) advantages leading to innovation and productivity growth due to the support gained by the co-location of an increasing *variety* of actors involved in creating knowledge spillovers and supplying specialized services (cf. Porter 2000). Not contradicting Porter, but focusing in more detail on the processes of building the *specialized* cluster-specific competences (i.e., the resource side), Maskell (2001) argues that clusters enhance the ability to create knowledge through *variation* and a *deepened division of labour*. 'Parallel experimentation' and 'testing' among firms doing similar things in clusters (ibid., p. 928) increase the diversity of solutions and lead to effective comparison, selection and imitation (ibid., p. 930). Coupled with Porter's (1998) ideas, we can interpret this argument as leading to the hypothesis that, when an industry evolves and matures, diversity grows *within specialization* through the expansion of the knowledge bases and other specialized resources in cluster-specific activities. However, when a cluster consolidates further, its knowledge and resource base may narrow, resulting in a lock-in and the reduction of diversity. Such processes may be at play in regions that host one or several clusters, and in regions that host nodes in geographically dispersed systems of production.

While much could be said about the link between industrial evolution, resource development and space (cf. Boschma & Lambooy 1999), our interest primarily lies in the relationship between the evolution of regional production systems and the development of local vs. non-local linkages. Our case studies indicate that particular phases of development come with specific changes in the nature of, and balance between, local and non-local production. In general, starting and thriving industries that turn out to be successful may

show a strong outward orientation to detect market opportunities and follow technological development, combined with an internal orientation towards resource development. In later stages, 'mature' industries may become more inward-looking and even insular, with the possible threat of a myopic attitude and lock-in. Survival of production may then only be secured by rebuilding external orientation and linkages.

Such an evolution should not be understood in mechanistic terms. Indeed, while maturity may eventually lead to lock-in and decline, it should not necessarily be equated with a loss of innovativeness. Some regions are capable of renewing themselves as external conditions change. There are many established, 'mature' clusters (e.g. Silicon Valley, media industry and biotech in South-East England). On the other hand, new 'peripheral' production systems may emerge that mainly consist of *adapters* or even *adopters*. While such regions may be 'immature' in the sense of internal development and the overall regional economic profile, their development is heavily dependent on the inflow of knowledge from 'core' clusters dominated by *genuine innovators* (e.g. the 'adapter' media and biotech clusters in Germany, electronics clusters in Ireland and Scotland, or *adopter* manufacturing clusters in Asia and other developing countries).

### **Typology of nodes in production systems**

What follows from the above discussions on innovativeness and maturity is the idea that we need to discuss parts of production systems (of goods and services) separately. Just as the idea of spatial innovation systems suggests that innovation is a historically evolving process that potentially involves many actors in multiple places and regions, the same holds to production (and distribution) systems. 'Globalization' captures this idea (Dicken 2004). Some systems are more local than others, but our analytical categories should be able to capture the diverse spatial structures of them. This requires that we develop ideas of the nature of the different elements or nodes in the systems. This is what we aim to do in this section. It will help us in bringing together the preceding discussions of different aspects of production systems: proximity, distance, diversity, specialization, innovativeness, maturity. We believe this will highlight some key issues in contemporary discussions on the success of individual firms, and the systems in which they are involved in different regional environments.

Our discussions above concerning degree of innovativeness and maturity of business are 'cross-tabulated' in Table 15.1. The two dimensions allow for a more detailed specification of nodes in production systems in terms of their position in the overall innovation hierarchy (leaders and followers). This, as was suggested, is relevant for conceptualising the significance of local vs. non-local relationships. Similarly, maturity of business was shown to be likely to bear consequences especially on issues of diversity. Table 15.1 presents nine kinds of node in production systems that we propose can be detected in contemporary economies. They may be networks, clusters, or individual firms (Oinas 2000). Below, we discuss each type in turn.

### **Table 15.1. Typology of local production nodes based on innovativeness and maturity**

		<b>- Maturity -</b>		
		<i>Emerging business</i>	<i>Thriving business</i>	<i>Consolidated business</i>
<b>- Innovativeness -</b>	<i>Local economy with 'genuine innovators'</i>	<b>I Initiators</b> (primarily product oriented)	<b>II Innovative leaders</b> (product and process oriented)	<b>III Consolidated leaders</b> (process oriented)
	<i>Local economy with 'adapters'</i>	<b>IV Creative followers</b> (niche producers)	<b>V Strategic followers</b>	<b>VI Consolidated followers</b>
	<i>Local economy with 'adopters'</i>	<b>VII Searching followers</b>	<b>VIII followers</b>	<b>Solid IX Peripheral (isolated) followers</b>

### *I Initiators*

Initiators refer to innovating entrepreneurs or entrepreneurial corporate actors ('intrapreneurs') investing in new businesses. If the business is novel to the world, the innovators have to go through the arduous process of creating markets for their products and mobilising internal and external resources for getting the production processes flowing. New forms and structures of communication and interaction need to be built. Emerging systems of production (potentially giving rise to clusters) generally benefit from high levels of collaboration amongst equally capable partners in horizontal (but complementary) relations (Langlois 2003). In particular, the developmental process should result in conventions and institutions that assist the creation, exchange, selection and combination of knowledge, and hence the shaping of a 'knowledge community' (Loasby 1998). In other words, participating firms need to create new products and services as well as new processes *and* they have to create the initial conditions in which they can commercialise the novelties that they come up with. These emerging systems are the potential Silicon Valley types of cluster of the future. Yet, in their initial phase, emerging clusters are vulnerable to external competition potentially arising from similar cluster developments elsewhere. It is only when clusters become more established, through amassing a more diverse resource base and achieving efficiency benefits through internal specialization and process innovation, that it can fully acquire and consolidate a leading position (Norton 1992).

### *II Innovative leaders*

When an emerging cluster of initiating firms becomes more established, and is able to leave potential competitors behind, it may turn into the leading centre of an industry. This means that the firms turn into 'leaders' that are at the forefront of innovation and play a leading role in an industry's dynamism. When evolving from initiators into leaders, firms will devote more attention to other types of innovation besides product innovation, notably process innovation and developments in organization and marketing. Clusters thus turn into what Amin and Thrift (1992) depict as 'Neo-Marshallian' nodes in

global networks, a position that Grabher (2002) aptly demonstrates in the case of advertising. Such nodes generally act as collective communication centres, centres of expertise and financing and key sites of regulatory power in the respective industries, and are therefore difficult to challenge. In 'leader' concentrations, core processes of innovation, coordination of production and market development take place, to a large extent, through local linkages. Non-local linkages are significant, but primarily as channels of control, and the gathering of intelligence on market and technology development elsewhere (Amin & Thrift 2002).

### *III Consolidated leaders*

When leading firms largely focus on consolidating their central position in an established industry, their innovative capacity will increasingly be geared to maintaining their relative cost-efficiency vis-à-vis competitors, plus marginal product changes induced by shifting market demands. Because their competitive edge thus tends to narrow to benefits stemming from process advantages, it will be easier for other firms and upcoming clusters to challenge the position of the leaders. Post-1960 developments in the automotive and shipbuilding industries, in which Western producers were confronted with upcoming Asian tigers, illustrate this development. Indeed, what these examples show is how firms that have been in a leading position for a long time run the risk of becoming inattentive, thus losing their strength even beyond the point of being able to catch up with upcoming competitors (as happened for instance in the case of European shipbuilding). There are also examples, however, of consolidated leaders that, after confrontation with fierce competition, have managed to revivify as 'innovative leaders', as illustrated by the German and French car industry. The latter requires that the subordinate role of non-local linkages, inherited from the 'leader' period, is replaced by a strong outward orientation and the capacity to absorb external knowledge (such as Just-in-Time production and logistics in the automotive industry).

### *IV Creative followers*

Due to their relatively high competences in specific areas of expertise, creative followers are quick to adopt new technologies and are able to start adjusting and incrementally innovating those technologies. They do not, like 'initiators', stand at the birth of a range of entirely new products, but they are able to successfully develop product and process variations, and exploit (new) market niches. They are valuable supporting partners in early stages of production. They adopt and adapt easily, but are likely to be under the power of the initiators during the period when the business is in an emerging stage. Many high-tech clusters, characterized by a dynamic pool of complementary capabilities based on close interaction between firms, research centres and universities, fall under this category. Yet, while the role of internal local linkages is highly significant, non-local linkages are equally vital for knowledge transfer and development (often in the form of strategic alliances), for the development of supply chains and marketing channels.

An interesting case is where creative followers turn into key specialists. This happens when the followers depending on initiators in the emerging business

stage remain in close contact with the leaders of the business, learning their trade so well that the leaders increasingly become dependent on their specialized competencies (like in the case of the Korean producers of Nike's sports shoes; Donaghu & Barff 1990). The initiators/leaders then have to share power with the followers when decisions need to be made in specific stages of product development, production process, design or implementation.

#### *V Strategic followers*

Whereas creative followers derive their competitive advantages from their product-based technological capabilities, strategic followers are primarily geared to using established technology and practices to compete with leader firms. Competition is based primarily on imitation plus variation, for which they heavily rely on non-local linkages oriented towards leaders and their main areas of activity. Strategic followers achieve competitive advantages in various ways. They may strategically target specific market areas outside the main markets served by the innovative leaders, adapting production to local market conditions. They may also go for challenging innovative leaders in their main market areas by launching a cheaper or better value imitation brand. For instance, the electronics, telecom and automotive industries, as well as businesses built on the Internet, abound in examples where new industrial concentrations of production have emerged on the basis of imitation. The same is achieved in bio-medical industries through recycling patents. There are also examples where innovative leaders liaise with strategic followers to expand the mass production of the more standard variants of successful products which is the case in a range of industries from home electronics to mechanical engineering and fashion goods.

#### *VI Consolidated followers*

Followers that after a period of success remain focused on a particular niche, market area or imitation brand are likely to gradually lose their competitive edge. Two risks are particularly at stake. First, leading firms can, by pursuing similar market or production-oriented strategy as the followers, close the gap and erode the followers' advantages. Second, external market conditions can change, affecting the position of all firms, leaders and followers alike, operating in a particular branch. While leader firms – especially innovative leaders – might be aware of such shifts due to their more advanced technological, organizational and searching capabilities in innovation, consolidated followers might be handicapped through their narrow focus on varying on the leaders' present activities. An example of followers losing out along both these lines is the way PC 'clone' producers, after having posed a successful challenge to initial leaders like IBM, were outcompeted by a small number of leading computing firms (like Dell and Compact) that were innovative in process development, distribution and marketing.

#### *VII Searching followers*

Firms with little innovative capacity may still be able to create new concentrations of economic activity because of business opportunities in

easily adoptable competence areas left by more innovative firms. The reasons that such opportunities are left to them can vary. Firms can operate in shielded market areas, or in growing industries with an acute shortage of production capacity, or they may benefit from specific advantages stemming from successful branding and marketing strategies. It can also be the case that firms are ready and quick to learn the required low-level skills crucial for a particular part of a production process but relatively peripheral to its innovative core (Oinas & Malecki 2002). This may involve clustered or non-clustered firms – or firms in a cluster that has previously produced to another industry or branch of business. The most crucial condition for firms to develop along these lines is that they are able search and absorb the required knowledge on the basis of relatively extensive webs of non-local linkages. They are internationally known for their capabilities to produce high-quality output in specific industries. They also carry the potential to become higher level players in the business.

#### *VIII Solid followers*

When the sectoral, regional and/or firm-specific conditions for growing on the basis of adoption are durable and firms manage to upkeep the required level of competence, thriving concentrations of businesses may result. Such concentrations are generally supported by what Cooke (1995) describes as 'low road' policies of keeping wages and taxes low and providing favourable conditions for 'back office' and assembly activities of foreign investors. Yet while critical observers have pointed at the large risks of 'low road' benefits to be quickly eroded because of the 'ubiquitous' availability of their core competencies, under conditions of growth and market segmentation 'low road' production may be surprisingly persistent. In the European context, relevant examples are the 'growth peripheries' of Spain (Lagendijk 1993) and Ireland (O'Donnell & Walsh 1995). Like in the previous cases, well functioning non-local linkages for scanning and obtaining external knowledge and resources, plus sufficient absorptive capacities, are essential. In 'growth peripheries' these capacities are obtained primarily through (attracting) direct foreign investments.

#### *IX Peripheral (isolated) followers*

The most peripheral and vulnerable kinds of firm in our matrix are found among 'peripheral (or isolated) followers'. This group includes simple economic activity often in peripheral locations. Also, when the markets in which 'solid followers' operate mature and show reduced growth, or when 'consolidated followers' lose their creative capacities and downgrade to mere imitators, firms in those groups will end up in the 'peripheral follower' group. Because firms will enjoy benefits from neither innovative capacities nor market developments, their position is highly unstable. This position is generally compounded by poorly working non-local linkages and limited absorptive capacity. In effect, the only condition under which such a concentration can endure is when it enjoys isolation and protection for instance in the form of market barriers or the possession of licenses. Because of their double disadvantage (poor innovation and market conditions) it is difficult for firms to (re)gain prospects, as has been illustrated for many years by established

clusters in old industrial and de-industrializing areas such as in Northern England,

**Table 15.2 Positioning the case studies**

		<b>- Maturity -</b>		
		<i>Emerging Business</i>	<i>Thriving business</i>	<i>Consolidated business</i>
<b>- Innovativeness -</b>	<i>Local economy with 'genuine innovators'</i>	<b>I Initiators</b> Ch. 13: capital goods projects	<b>II Innovative leaders</b> Ch. 5: automotive industry, Austria; Ch. 7: science-based clusters, Oulu, northern Jutland; Ch. 9: ICT leaders, U.S., Japan	<b>III Consolidated leaders</b> Ch. 6: metal industry, UK; Ch. 11: chemical metallurgical and mechanical industry, Porsgrunn, Norway
	<i>Local economy with 'adapters'</i>	<b>IV Creative followers</b> Ch. 2: information design, Sweden; Ch. 7: other science-based clusters, EU; Ch. 10: medical biotech, Canada	<b>V Strategic followers</b> Ch. 2: rock music and film clusters Sweden Ch. 3: sock and stocking districts, China; Ch. 7: 'traditional clusters', EU Ch. 8: packaging machinery, Germany Ch. 9: ICT cluster, Taiwan	<b>VI Consolidated followers</b> Ch. 12: electronics, UK
	<i>Local economy with 'adopters'</i>	<b>VII Searching followers</b> Ch. 11: chemical metallurgical and mechanical industry, Mo and Glomfjord, Norway	<b>VII Solid followers</b> Ch. 14: traditional industries, Russia	<b>IX Peripheral (isolated) followers</b> Ch. 4: Arab entrepreneurs, Israel

the Ruhr area or the Basque Country. Yet the latter two regions also show that through gradual improvements in innovative capacities and/or shifting the market focus firms are able to move into the direction of 'strategic followers'. We may speculate that nodes I+IV+VII, II+V+VIII, and III+VI+IX respectively form parts of distinct production systems, but this may be shown to vary in careful analyses of actual production and innovation systems.

### **Positioning the case studies**

In Table 15.2 above we use the typology to interpret the empirical evidence gathered from the chapters of this volume, and speculate on how the different characteristics of economic activity and the corresponding economic relationships function together. The results should be read as a broad, tentative interpretation. Since the kind of perspective which we use here has partly been elaborated and refined after the original studies were undertaken, we must sometimes engage ourselves in a bit of speculation, and we do not intend to capture all specifics in the sometimes quite detailed case studies. Furthermore, as usual in creating typologies, real cases are not likely to correspond fully to the ideal types presented in Table 15.1. However, we feel that we are able, at the very least, to give some grounds for formulating hypotheses that could be put into more careful scrutiny.

It should not come as a surprise that only a few of the empirical cases exemplify genuine innovator regions. This is perhaps a useful reminder of the fact that a large chunk of firms and regions across countries are not involved in the kinds of creative clusters that much of the literature has discussed in recent years. In our interpretation, many case studies converge on the 'strategic follower' category. This involves clusters that have a certain level of innovative capacity, which enables them to capture a significant, albeit a non-core position, in a particular industry. External links play a key role for knowledge absorption, embedding in supply chains and market development. The two sets of cases classified here, the Hultsfred rock music and Västra Götaland film clusters (Sweden), discussed in Chapter 2 by Power and Hallencreutz and most of the EU 'traditional' clusters studied by Isaksen (Chapter 7) use external knowledge and practices to produce for local (national, EU) markets. Other clusters, notably the Datang sock and stocking cluster (Chapter 3 by Wang et al.) and the German packaging machinery cluster (Chapter 8 by Moßig) have obtained an international market position on the basis of local brands. The Taiwanese ICT cluster at Hsinchu, finally, is embedded in global chains of innovation and production through the presence of foreign branch plants and direct relations to leading design centres in the industry such as Silicon Valley, in the U.S. (Chapter 9 by Wang). Parallel to this variation in external linkages and positions, internal linkages also play different roles. While the Swedish cultural and Hsinchu ICT cases show strong internal knowledge transfers, in the Chinese socks and stocking industry and German packaging machine industry internal linkages are primarily oriented to trading and supply chain development.

A second concentration can be found in the category of 'creative followers'. This category contains activities with a recent history that benefit from fruitful relations between business and research. The Eskilstuna (Sweden)

information design cluster developed around a local university college seem to fall under this category (Chapter 2 by Power & Hallencreutz). Other candidates are most of the science-based clusters in Chapter 7 (Isaksen) and the medical biotech case in Vancouver (Chapter 10 by Rees). The latter is a particularly good example of how internal knowledge relations are complementary to external linkages that serve to tap in the knowledge base of 'leading' firms, and how 'pipelines' to external sources of expertise (Owen-Smith & Powell 2004) are created and nurtured through strategic alliances.

Eight cases are placed in the *genuine innovators* categories, although the grounds for this classification could be debated. Besides the reference to ICT industry in the U.S. (Silicon Valley) and Japan as part of the Taiwanese case study, the Austrian automotive case (Chapter 5 by Tödtling & Trippl) is regarded a representative of an 'innovative leader'. This is based on the recently regained technological capacity of its innovative leading firms to dominate specific parts of the European automotive supply chain, and its strongly increased level of local integration, although certain segments of the cluster would rather classify as 'strategic followers'. Two science-based clusters from Chapter 7 also fit the 'innovative leader' label, namely the technology cluster in Oulu and the communication cluster in Northern Jutland. The UK capital goods case (Chapter 14 by Alderman) tells a double message. It is clear that complex engineering projects requiring substantial transfer and adaptation of technology demand spatial proximity. They also manifest the high level of collaboration between partners with complementary assets characteristic of 'initiator' clusters. However, this spatial proximity and collaboration is only facilitated temporarily and confined to particular parts of the entire innovation and design process. The underlying spatial configuration and dynamics is one of global networks partially between temporary localized nodes orchestrated by global firms. Unlike the traditional forms of spatially concentrated innovative clusters, there is hardly any durable integration within the local economy. A case of consolidation on the other side of the spectrum is the mature metal industry cluster in Sheffield (Chapter 6 by Watts et al.), which is strongly locally rooted but has lost its leading position in the industry. The cluster manages to survive, however, thanks to its capacity to tap in external knowledge. The relatively diversified industrial community in Porsgrunn, Norway (Chapter 11 by Karlsen & Lindeløv) seems to have grown into a solid industry leader in specific technology areas even though the advantages it created with an earlier radical innovation have eroded with subsequent development of novel technologies by competitors. Interestingly, the key producer in this community, Hydro, maintains both strongly local and international R&D collaborations, varying by branch.

Another case where maturity is accompanied by an increasing dominance of non-local relations is the South Hampshire (UK) electronics cluster (Chapter 12 by Taylor), classified under 'consolidated followers'. Under the condition of increased internationalization and reduction in demand, locally integrated production chains have given way to parallel lines of external control and dominance. As a consequence, the role of local linkages has narrowed from learning and competence sharing to a mere coping and survival. The overall result is fragmentation and a disembedding from the local economy, threatening the survival of the industry.

Finally, there are three cases of *adopters*, again varying from 'emerging' to 'consolidated'. The two industrial communities (Glomfjord and Mo) in northern Norway as studied by Karlsen and Lindeløv (Chapter 11) manifest the development of partly externally controlled plants in relatively small industrial milieus with differing but relatively low levels of industrial diversity. The research intensity is low and external relations are maintained for the purposes of technological learning but independent localized learning processes are also nurtured by linkages in the local economies. Glomfjord particularly shows a shift from full external control to increased local learning relations as part of production and interaction with customers. The outcome is one of a relatively stable, gradually learning economic activity providing useful employment and wealth to the surrounding areas. The case of the transformation of Vyborg's local economy consisting of an assembly of diverse production units (Chapter 14 by Kosonen) illustrates the radical changes the Russian industry has passed through after the collapse of the Communist rule. This case shows a shift from full external control to increasingly locally based forms of governance. While new forms of external control remain important, local partnerships are forged that sustain local relations in production. If innovativeness has not lead to diversity in the form of novel commercial innovations, it certainly has lead to variety in the ways in which the new Russian entrepreneurs organise their firms, production networks and ownership structures under the recently emerging institutional conditions. This diversity has merely been the basis for survival in the conditions during the past 15 years or so, marked by high turbulence and uncertainty. Foreign investment has added to this diversity, and helped keep some production units alive. Finally, the study of the Arab entrepreneurs in Nazareth (Chapter 4 by Schnell & Sofer), presents a case of enforced isolation that hinders the development of essential non-local linkages. While this economic activity is well embedded locally, within a wider context it is seriously under-embedded. The capacity to catch up technologically and expand market outlets is therefore severely limited, darkening the economic outlook for the entrepreneurs involved.

### **Concluding notes**

Economic geography has always shown moves towards, as well as shifts away from, its Marshallian legacy. After a period of a strong reorientation towards Marshallian thinking and regional development, the present debate seems to be turning towards a post-Marshallian agenda. At least a call has gone out to balance the focus on the local/regional level and proximity with an interest in what has been defined broadly as the 'non-local' and the 'distant'. Two theoretical perspectives dominate in the debate, one inspired by the image of (international) networking, and one addressing the concept of scale. In this volume we have approached the issue by examining regional positions, and the role of the (non-)local therein. This allowed us to develop a conceptually and empirically grounded contribution to the debate on the Marshallian legacy.

As we have tried to argue in this concluding chapter, our studies here endorse a move from the Marshallian viewpoint featuring proximity and

homogeneity to an emphasis on distance and diversity. Yet, such a move should not be associated with a development of non-local linkages becoming more important than local linkages, or of a shifting balance between local and non-local scales. What Marshallian work has irrevocably shown is that, even in an era of 'globalization', territorial dependencies and strategies remain a dominant factor. What we have discussed and observed here is a variety of ways in which regional clusters, nodes, or just concentrations of production or services are embedded in broader systems of production, innovation and distribution. Our main contribution lies in providing what can be labelled as a middle-level conceptualization of regional development based on a characterization of industrial dynamics and the historical unfolding of regional development trajectories. Obviously, the three-by-three matrix resulting from our discussion only captures a small fraction of the complexity involved in the relationship between varieties in economic activity in space. Its main aim is to take a few steps forward in systematising our thinking concerning the relationships between a variety of actors in proximity, over distance and on different scales, and concerning the role of diversity in these relationships. Both continued theoretical and empirical analysis of processes and systems operating at different scales as well as analyses of network relationships within and across scales will provide further important insights into how they affect economic development. Obviously, further 'groundwork' needs to be done to enhance a post-Marshallian perspective on local development. Yet it remains our hope that our thinking will contribute to the collective effort of understanding factors affecting local development trajectories in differing economic and institutional circumstances.

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