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## Embedding Stand-Alone, 'Local Buzz' and 'Global Pipeline' Firms; a Plea for a Less Traditional Regional Innovation Policy

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## **Embedding stand-alone, ‘local buzz’ and ‘global pipeline’ firms; a plea for a less traditional regional innovation policy**

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### **Abstract**

This paper deals with regional innovation policy. After Porter (1990), this type of policy usually focuses on creating clusters of innovative firms. Many regions do not have clusters, however, let alone vibrant ones based on the co-evolution of business and institutional practices oriented towards innovation. Evidence from the Utrecht, Gooi en Eemland region in the Netherlands (Atzema and Visser 2005b) indicates that it is not necessary to have clusters to stimulate regional innovation. This is interesting from the point of view of other European regions lacking clusters and/or suffering from an ‘innovation paradox’, as is the case for the region under review. The Utrecht, Gooi and Eemland region lodges large numbers of ‘creative’ people (cf. Florida 2002) but simultaneously underperforms in traditional innovation measurements. It has no clear ‘face’ in terms of innovation, due to a series of factors: the embryonic state of clustering in but a few subsectors, the mostly social and informal nature of network ties between entrepreneurs and other actors at the regional level, the international level at which much innovation-oriented networking takes place, the lack of connections between these networks at different spatial scales, the type of innovation (client-oriented, creative, non-technical and combined forms of innovation, translated into change management and new practices of client firms), and the innovation strategies of firms, which fit with the three channels explained by Bathelt *et al.* (2004): seeking and combining international knowledge with one’s own (constructing ‘global pipelines’), strengthening regional ties, contact and identity (‘local buzz’), and relying on one’s own resources for innovation (‘stand aloners’). From a viewpoint of regional innovation policy, the challenge is to connect these three categories of firm strategies. Such can be done in several ways. One is to use the abundant social capital in the region, strengthening the economic relevance of existing regional networks by constructing national and in some cases indeed ‘global pipelines’. The second is to display leadership and to formulate a ‘community argument’ for innovation, dealing with three sub questions: why must I innovate, interact, and do so at different spatial scales? This is to steer the available ‘local buzz’ towards innovation and enhance its economic relevance. The third is to correct for the policy myopia on clusters. The price we pay for the Porterian approach to competitiveness and innovation is that a significant number of firms individually engaging in innovation efforts tend to be neglected. As they do not participate in ‘global pipeline’ and ‘local buzz’ processes, they do not enrich nor benefit from these processes, may relatively easily leave the region once required, and may be less effective in terms of the speed and effectiveness of innovation. A more inclusive regional innovation policy may prevent this to happen.

## **Introduction**

Knowledge, learning and innovation are increasingly critical to the economic performance of firms, regions and nations (OECD 2001). In economic geography, learning and innovation processes are seen to be confined to specific regional settings (see e.g. Camagni 1991; Becattini 1987 and 1989; Cooke 2001; Asheim 1996). During the 1990s, Michael Porter (1990, 1998, 2000) stimulated the attention for so-called clusters of firms in innovation research and policy. Porter's approach to clustering has been criticized for bringing along serious conceptual, theoretical and methodological problems (see Martin and Sunley 2003). Yet, his ideas are very popular among policymakers around the world (Roelandt and Den Hertog 1999; Boekholt and Roelandt 2000; Den Hertog, Bergman and Charles 2001; Observatory of European SMEs 2002; Sölvell, Lindqvist and Ketels 2003; Dutch Ministry of Economic Affairs 2004). Hospers (2005, p. 452) notes that "everywhere in Europe policy-makers aim for (..) the creation of 'high-tech clusters', especially in information-, bio- and nanotechnology". In Europe, USA, New Zealand and Australia only, more than 500 cluster initiatives have been reported (Sölvell, Lindqvist and Ketels 2003, p. 10). Also in other continents, policymakers aim at boosting existing or creating clusters (see e.g. ECLAC 2005 for Latin America).

In our view, there are at least four problems with the way policy makers around the globe have been using the Porterian approach to clustering, productivity, innovation and competitiveness. One is the risk of duplicating efforts, producing excess capacity, strategic failure, and competition on costs in stead of innovation. A second is that many regions do not have clusters or only a few embryonic ones, notwithstanding the so-called 'cluster enthusiasts' (cf. Martin and Sunley 2003) who put "the promotional cart before the analytic horse (..)", seeing clusters where they look and reorienting policy efforts accordingly. A third problem is that one cannot create clusters, due to nature of local self-augmenting processes (cf. Brenner (2004), the corollary difficulty to select adequate policies and measures, and the role of industry-specific and regional conditions in shaping the probability, timing and location of clustering processes. A fourth problem is that the focus on clusters overlooks other possibilities to stimulate innovation, and may even go at the expense of so-called 'stand-alone' and perhaps also 'global pipeline' firms (cf. Bathelt *et al.* 2004).

The observation that many regions lack vibrant clusters and the idea that one cannot create clusters are two starting points for this paper. The goal is to show that a regional policy is possible stimulating innovation based on a *non-clustered innovative milieu*. This is both feasible and necessary. It is feasible, because all we need is some traditional, initial and particular strength in a region to build upon (cf. Hospers 2005), a number of innovative (and impatient, eager, curious people in) firms, network efforts (no matter the spatial scale at which these take place and inter-firm alliances thus develop), and a need to solve possibly related bottlenecks. It is also necessary, as a complementary policy orientation based on a non-clustered approach is less risky than cluster promotion initiatives where *a priori* clusters can hardly be found.

So, the key question of this paper is if and what type of innovation policy is possible in the absence of endogenous clustering processes. We ask the following specific questions:

- How relevant is the situation of regions lacking (vibrant) clusters?
- How to detect innovative firms in such settings?
- How to realize and strengthen the innovation potential of these firms?
- What is the role for policies and public support to stimulate innovation in regions lacking clusters?

Our method is simple but difficult. It is a *plea* for a regional innovation policy that moves away from clusters and stimulates innovation based on a *non-clustered approach to an innovative milieu*. This plea is based on insights in innovation processes derived from cognitive theory (Nooteboom 2000, 2004), evolutionary theory (Boschma and Lambooy 1999, Boschma and Frenken 2006), and on empirical evidence collected in the Utrecht, Gooi & Eemland region in the Netherlands (Atzema and Visser 2005b).

The paper is structured as follows. In Section 1, the Porterian approach to clustering and innovation is scrutinised. In Sections 2 regions lacking clusters are considered, including and with emphasis on the Utrecht, Gooi & Eemland region. A method to detect innovative firms in such regions is described and evaluated in Section 3. Various profiles of innovative firms in the Utrecht, Gooi & Eemland region (in terms of the type, strategy and geography of innovation) are elucidated in Section 4. Section 5 reports the analysis of bottlenecks in the innovation climate in this region. Section 6 asks the policy question whether and what type of policies are appropriate. Conclusions are presented in Section 7.

### **Section 1: The Porterian approach to clustering and innovation**

Knowledge, learning and innovation are increasingly critical to the economic performance of firms, regions and nations (OECD, 2001). In the literature on innovative milieus (Camagni, 1991), industrial districts (Becattini, 1987 and 1989), regional innovation systems (Cooke, 2001) and learning regions (Asheim, 1996), learning and innovation is seen to be confined to specific regional settings. The pace of innovations-driven economic growth therefore also differs across regions, while key innovations are assumed to take place in only a limited number of world-class regions. An important argument in the above literature is that geographical proximity facilitates knowledge sharing and interactive learning and innovation of firms (for a critical assessment of this argument, see Boschma 2005).

In the course of the nineties, the well known pleas of Michael Porter (1990, 1998, 2000) stimulated the attention for regional clusters of firms in innovation research and policy. According to Porter, clusters involve groups of firms operating in related branches of industry at the level of final products, raw materials, equipment, machinery and services. Vertical and horizontal linkages are platforms for functional and technological interactions beyond mere input-output trading linkages. In fact, there are interactions between four sets of factors that constitute a ‘competitive diamond’: firm strategy, structure and rivalry; factor input conditions; demand conditions; and related and supporting industries. The more developed and intense the interactions between these factors and the actors involved (competitors, users and producers of intermediary and final products, producers of complementary goods and services), the greater will be the productivity, innovativeness and export growth of the

firms and sectors concerned. Although Porter (1990, p. 156-57) mentioned the importance of geographical concentration of firms to enhance the working of clusters, he did not explicitly include a spatial aspect in the original cluster definition. Later, however, he wrote that “the enduring competitive advantages in a global economy are often heavily localised, arising from concentrations of highly specialised skills and knowledge, institutions, rivalry, related businesses, and sophisticated customers” (1998, p. 5). Hence, Porter (1998, p. 197) defined clusters as geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also co-operate.

Porter’s approach to clustering has been criticized for bringing along serious conceptual, theoretical and methodological problems. Hence, Martin and Sunley (2003) argue for a “cautious and circumspect use of the notion [of clusters], especially within a policy context: the cluster concept should carry a public policy health warning”. In our view, there are at least four problems with the way policy makers around the globe have been using the Porterian approach to clustering, productivity, innovation and competitiveness, which we explain below.

- ***Strategic failure***

With their omnipresent wish to create clusters in high-tech areas, authorities hope to be able to copy the success of well-known ‘best practices’ of regional clustering as found in for example California (US), Bavaria (Germany), Sophia-Antipolis (France) and Oulu (Finland) (Hospers, *op cit.*). However, with his approach to industrial clusters and innovation Porter called upon countries and regions to focus on their (particular and traditional) strengths, and not to imitate the successes of others (Jacobs and Lankhuizen 2006, p. 247). The tendency of imitation in industrial and innovation policy runs the risk of producing excess capacity, strategic ‘government’ failure (see Nooteboom 2004 for a critical assessment of Dutch innovation policy, which can be generalized to other countries and regions where governments select technologies and/or sectors which they believe will sustain and fuel future development), and competition on costs in stead of innovation—the low road to (industry) development.

- ***Not all regions have vibrant clusters***

On the contrary, many regions do not have clusters, or a few embryonic ones, especially from the viewpoint of administrative regions. To sustain this point, we part from an economic-geographic cluster definition that emphasizes endogeneity, variety and complexity. Separating the cluster from the network concept, Visser and Boschma defined clusters as ‘geographical concentrations of firms involved in the same of similar activities, which may, but need not specialise, subcontract and co-operate with one another’, and networks as ‘strategic, purposeful, preferential, sometimes repetitive and usually co-operative interactions between firms and other organisations, which may, but need not operate in close vicinity’ (2004, p. 801). Considering the basic feature and essence of clusters—a long-term endogenous process of geographical concentration, multiple reasons and concentration logics can be found in the economic, regional science and economic geographic literature (from Marshall 1890 onwards), yielding a variety of clusters in the real world (see table 1). Understood as geographical concentrations, clusters are thus out there, which is different from the position of ‘cluster enthusiasts’ (Martin and Sunley 2003), who put

“the promotional cart before the analytic horse (...)” and believe that “the detailed structure and workings of a cluster will become obvious soon enough once we begin to think about an activity in cluster terms”. Once we separate clusters from networks and stress the two processes underlying these concepts (geographical concentration and cooperative interactions respectively, see Visser and Boschma 2004; Atzema and Visser 2005a), wishful thinking can be avoided and we do not see clusters everywhere we look. Few regions have vibrant clusters, some have an embryonic or dying one, and most (administrative) regions do not have any cluster at all.

- ***One cannot create clusters***

Few elements of the clustering processes mentioned in table 1 can be produced on the basis of public efforts only, especially those not related with access to natural resources (local formations) and proximity requirements of customers (local complexes). Brenner (2004) argues that clustering is due to local self-augmenting processes (LSAPs) that cause higher entry and lower exit rates, which in turn can be the result of start-ups (due to a higher numbers of spin-offs and/or better access to venture capital in the cluster), relocation (of firms from elsewhere moving into the cluster), and incumbent growth (due to enhanced innovation and/or cost reductions in the cluster, which in turn are related with pure spillovers, intra-cluster cooperation, and human capital accumulation). Brenner specifies four conditions to obtain LSAPs: a. there should be positive feedback between actors within or across firm populations and/or with local conditions (e.g. the labour or capital market); b. this positive feedback should increase more than linearly with the size of factors (self-augmentation); c. the time frame of the factor and changes in the firm population need be (roughly) the same; and d. the process should be local.

Not all LSAPs known from the cluster literature fulfil these conditions (for an overview, see Brenner 2004, p. 42-55). Hence, policymakers have a hard time selecting the right (effective) cluster creation measures. Next, while LSAPs constitute a necessary condition for clustering, industry-specific and regional conditions are also important, constituting the sufficient conditions for clustering. Regarding industry-specific conditions, the strength of some LSAPs appears to differ across industries, e.g. start-up and innovation rates, the number of spillovers, the role of buyer-supplier linkages, human and venture capital. Not all industries have the characteristics to favour clustering, and where clustering occurs, it is not always caused by the same mechanisms. Regarding regional conditions, exogenous factors, historical events, stochastic events (e.g. the arrival of pioneers and actions of leader firms) and the strength of LSAPs influence the probability of clustering and explain why in certain regions clusters developed. However, we can not explain yet the exact location, timing and development speed of clusters. More work should be done comparing regions hosting clusters with regions not having any clusters, so as to gain more insight in the regional conditions that make the difference. Until then, policymakers creating clusters are, one may say, gambling.

- ***Opportunity costs of cluster policies can be high***

The focus of regional policymakers on clusters, often within the administrative borders of their jurisdiction, overlooks other possibilities to stimulate innovation, and may thus go at the expense of so-called ‘stand-alone’ (individual innovators) and ‘global pipeline’ (internationally networking) firms (see Bathelt et al. 2004, Atzema and Visser 2005b).

The above problems and risks are especially relevant for regions lacking vibrant clusters (see footnote 1 and 2). Below, we introduce such regions in the Netherlands, with a focus on the Utrecht, Gooi & Eemland region in the Netherlands.

## **Section 2: Regions and clusters**

In the Netherlands, there are but a few endogenous regional clusters that can be classified as innovative clusters (see table 1; Wever and Stam 1999; Raspe, Van Oort and De Bruine 2004; oral communications with Alfred Kleinknecht—a prominent innovation researcher in the Netherlands). Considering high-tech industries, the region surrounding Eindhoven is possibly an example of a technologically advanced and innovative cluster (Visser 2000), where both concentration and co-operation processes underpin the innovative and competitive performance of firms (Visser and Boschma 2004). In agricultural sectors, horticulture in the Westland region (Koopmans 2005) and floriculture in Aalsmeer, Naaldwijk and Westland (Stevens 2006) are examples of very competitive clusters. There are also cases where concentration processes do not seem to yield high levels of competitiveness (any more). This is the case of footwear production in Northern Brabant, port-related activity in Rotterdam (a growing cluster based on the expansion of the volume of trade with China and other Asian countries, but not so much innovation, see De Langen 2004), the shipbuilding industry in the Northern provinces of Friesland and Groningen (which fared well over the last years, but see Van Klink and De Langen 2001 for an analysis of strengths and weaknesses) and tapestry production in Genemuiden. Other cases are labelled clusters, but display more the characteristics of private-private or private-public networks operating at a national and/or international level than of any regional clustering process. This may be the case of e.g. the ‘Wageningen’ food valley, the biotech cluster in Leiden (Van Geenhuizen 2006), Amsterdam and/or Utrecht, and high-tech textiles in Twente (Benneworth and Hospers 2005). Finally, there are processes that are too embryonic to classify in the light of the cluster typology in table 1 (e.g. the Media cluster in the Northern wing of the Randstad). Ergo: only a few Dutch regions can stimulate an endogenous process of clustering of innovative firms and adaptive institutions.

Considering the relevance of concentration processes and presence of innovative clusters in the Utrecht, Gooi & Eemland region, the region has got a few specializations, but the identified clusters in the Media, Business Service, IT consultancy and Chemical subsectors are embryonic in at least two ways: a) the concentration and specialization ratios oscillate between 1,25 and 3, which is low compared with other cases, for example, clusters in Italy researched by Capello and Faggian (2005); b) our data indicate that there is no relation between the rather ‘light’ concentration processes in the region and the innovativeness of firms.

The Utrecht, Gooi & Eemland region is also peculiar in that it scores low on most traditional innovation indicators while at the same time it lodges many people in the so-called ‘creative class’ (cf. Florida 2002). Elsewhere, we used the term ‘innovation paradox’ to describe this situation (for an overview, see table 2). The relative importance of the service sector in the Utrecht, Gooi & Eemland region, where innovation often takes the form of incremental innovation in business processes in a setting of client/provider relationships, may contribute to an explanation for this

situation. Next, the many small firms in the region may undertake innovation on their own and stay out of sight of statistics and (regional) policymakers. Another reason may be the spatial scale of relationships of firms and other actors in the region. Due to its central position within the Netherlands, the region lodges firms that mostly serve national and international markets. Next, the Utrecht University—an important knowledge producer, largely maintains international linkages. Finally, people that live in the Utrecht region often work elsewhere, while people working in the region often live elsewhere; the regional labour market is thus open and is not spatially related with any sort of clustering process (Atzema and Visser 2005b).

The next sections show that there are innovative firms in the region, but clear relations with the incipient clustering processes seem to be absent (for analytical details, see Atzema and Visser 2005b, p. 40-51). The result is that regional innovation in the case under review has no clear face in terms of clusters, and also in other ways.

### **Section 3: Tracing innovative firms in regions lacking clusters**

It is not at all easy to track innovation by firms in a business service-sector and small-firm dominated regional economy lacking high-tech clusters and not renowned for being an innovative hot spot. So, we used a rather experimental method to learn to what extent firms in the region are innovative, how they behave to foster innovation, how they cope with the uncertainty, complexity and uniqueness of these processes and the bottlenecks involved, how they solve these problems, and whether clustering and/or networking processes are helpful in this regard. To achieve these goals, a three-step approach was chosen, the first one comprising a survey among experts to identify innovative firms, the second step consisting of a telephone interview with high ranking firms on a list (resulting from step 1) of the most innovative firms in the region, and a third step complementing the previous one, based on a mail survey among all innovative firms on the list.

For step 1, we carefully selected and approached 100 public and private experts, of whom 53 helped us to turn a 'long list' of 697 potentially innovative firms into a 'short list' of 100 firms (for a detailed description of the methodology, we refer to Atzema and Visser 2005b, p. 33-38). Hence, we obtained an expert-based ranking of 100, in their view most innovative firms in the region of Utrecht, Gooi & Eemland. The experts mentioned a total of 311 firms in various industries and sectors, many of which would have gone unnoticed in traditional innovation studies. A count of the number of independent 'votes' of experts for these 311 firms enabled the identification of 100 firms receiving the highest number of votes.

For step 2, we approached the first 40 firms on the list, of which 24 agreed to cooperate and answer questions regarding the business area of the firm; the degree, type and spatial impact of innovation; the relevance and content of the innovation strategy; the importance and characteristics of leader firms; and the role of the regional context in the innovation process (see annex 4 in Atzema and Visser 2005b for the list of questions).

For step 3, we sent a mail survey to all firms on the list of 100 most innovative firms, asking additional questions on the role of internal and external sources of knowledge



during the innovation process, the spatial origin of these sources, the relevance of bottlenecks to access and exploit these sources, and the nature and form of individual and/or collective solutions for these bottlenecks. The last data proved to be useful to draw policy lessons in a region such as the one under review: suffering from an 'innovation paradox' and lacking clusters.

#### **Section 4: Innovative firms in the Utrecht, Gooi & Eemland region**

The innovation paradox of the region Utrecht, Gooi & Eemland can be solved. There are innovative firms in the region, but they show up in a variety of sectors, industries and activities (see Atzema and Visser 2005b and section 2 of this paper), while the nature of their innovation efforts makes them hard to detect. Firms appear to be especially strong in creative, non-technical and combined (involving product and process aspects) forms of innovation. Dynamic capabilities show up 'downstream', where firms connect new knowledge with clients and markets, translating this into change management and new business practices of client firms. Next, firms in the region innovate in a variety of ways. One relatively large group of firms (about 40 percent) actively seeks and combines international knowledge with its own. These firms construct 'global pipelines' with firms and institutes elsewhere in the world. Another important group of firms (about 35 percent) seeks to strengthen regional ties and identity, mutual contact and commitment, and creative linkages involving firms and institutes at the regional level. They foster 'local buzz' so as to enhance their profits. A final proportion of firms (25 percent) can be labelled 'stand alone' firms, which once located in the region but never developed regional ties with a view to innovation. All these aspects make innovation hard to detect in the region. Finally, it is interesting that neither geographical and social-cultural proximity nor other aspects of the regional innovation milieu are important to sustain the innovativeness of firms. Firms focusing on 'local buzz' processes of course adhere more importance to regional factors, but they constitute a minority. Most firms state that regional factors are relatively unimportant. They are located in the region for historical reasons (studies), because the region is 'strong in weak ties' (social networks, pleasant atmosphere, good living conditions, etc.), and because of the quality of the labour market.

All in all, the conclusion is that regional innovation has no clear face, not only due to the previously observed embryonic state of clustering in but a few subsectors and the weak relation with innovation in the region, but also due to the type of innovation processes taking place within firms, the different innovation strategies of firms, the mostly social and informal nature of network ties between entrepreneurs and other actors at the regional level, the international level at which much innovation-oriented networking takes place and 'strong ties' thus occur, and the lack of connections between these networks at different spatial scales. As a result, experts lack agreement regarding regional innovation in terms of sectors, clusters, and firms. They ended up mentioning so often one particular firm in the otherwise not so innovative nor important financial service sector in the Utrecht, Gooi & Eemland region, so that it ranked highest on the short list and could take pride in being called the most innovative firm in the region. This firm surely merits all credits, but the outcome did not help much to clarify the rather diffuse innovation profile of the Utrecht, Gooi & Eemland region.

## **Section 5: Bottlenecks in the innovation climate**

Above, we observed that innovation is daily practice in a wide set of economic activities within the region, but the efforts seem to be fragmented, disconnected and not well coordinated. Additional data were collected during the mail survey to verify this last hypothesis. When asked about the use of different sources of knowledge during the subsequent stages of an innovation process (from a new idea, the development of a product prototype, its adaptation to market and other requirements, on to its introduction in different final markets), firms state that they primarily use internal sources of knowledge (for an overview of these sources, see table 3; for details, see Atzema and Visser 2005b, p. 61-71). They are only relatively open towards external inputs during the first stage of the innovation process, when they scan the globe for new knowledge. After this point, however, firms appear to rely on internal resources. Once they need to market a new product, they open up once again towards external inputs and co-operation with other parties, this time not at the global but more often at a European or national level.

It is remarkable that firms hardly use regional sources during the product development and adaptation stage, despite arguments in favour of such a strategy (see e.g. Rutten 2002). Could it be that regional knowledge sources are not interesting enough? The data suggest that this may be the case. The quality of regional sources of knowledge (innovation policy initiatives, competitors, suppliers and knowledge institutes) is relatively poor (see table 4). Firms lack relevant know-how in other firms in the region, they miss visionary policymakers displaying leadership, platforms to exchange ideas with clients and suppliers, and a regional atmosphere that stresses the urgency, interactive nature and spatial complexity of innovation. This is important for all firms: 'local buzz', 'stand alone' and 'global pipeline' firms. They may want to use regional inputs, but cannot do so in their absence and/or substandard quality. For example, 'stand alone' firms state that they are satisfied with the quality of internal sources of knowledge, but also report bottlenecks, such as the challenge to combine exploitation and exploration of knowledge, insufficient possibilities to keep track of fast developments in their relevant market and technology context, the risk of making a wrong choice, and a lack of strategic capacity and trust in the necessity and utility of change and innovation. Here, external sources may help, including regional input, but as said, the two worlds do not connect. Next, 'global pipeline' firms say that they are satisfied with the quality of international sources of knowledge, but also indicate that they require 'face2face' dialogue while exploiting these linkages. If so, there may be an opportunity organizing such contacts within the region, but this requires responsive policies and a high quality of assets in the region. Another option in this regard is to involve stand aloners, if the latter can contribute to the networks.

A second important weakness reported in the regional innovation climate relates with the absence of a strategic vision on the importance of innovation for firms and the regional economy. What is the use of innovation for firms, people, the economy and the region? A 'community argument' (cf. Hirschman 1970) is missing, and should deal with the following subquestions: why must we innovate, why is interaction with external knowledge sources useful to stimulate innovation, and why do so at various spatial levels, in clusters and/or networks, regional and global?

A final point is that firms operating individually in innovation processes (the ‘stand aloners’) may become less effective in terms of the speed and market fit of their innovations. Next, we have seen that (geographical and social-cultural) proximity and other aspects of the regional innovation milieu are not important to sustain or elevate the innovativeness of firms. Firms focusing on local buzz processes adhere some importance to these factors, but they are a minority. Most firms told us that regional factors are relatively unimportant, which makes it easy to leave the region if such is required by market or other circumstances. Put differently, the regional innovation climate is not a pull factor for innovative firms in the region, nor for innovative firms considering to relocate. Hence, our plea to pay attention to ‘stand alone’ firms. Involving them in ‘global pipeline’ and ‘local buzz’ processes and proposals is good for everyone: the ‘stand aloners’ will be more effective in innovation processes, they will less easily leave the region, and they may contribute to innovation processes at the regional and international level.

### **Section 6: Whither and what type of policies?**

Above we saw that firms in the Utrecht, Gooi & Eemland region are strong in creative, non-technical and combined forms of innovation, connecting new knowledge with clients and markets, translating this into change management and stimulating new business practices. These capabilities potentially mean a lot for the Dutch economy, as the Netherlands scores high in terms of scientific knowledge production, but low in new product development and marketing. The region could thus become a window for Dutch innovations going elsewhere. Policymakers could focus on this unique profile of the regional economy, advertise and broadcast it nationally and internationally, thus realizing the potential of a demand-focused, service-intensive and non-clustered regional economy.

Another challenge for regional policymakers is to connect the three groups of firms reported above. ‘Stand-aloners’ are potential innovation partners for regional and international networks, while regional networks should open up involving external actors and reorienting their agendas from social and short-term economic towards long-term innovation goals. Hence, policy should focus on: a. enhancing the economic relevance and extending the geography of current social networks within the region; b. orienting and steering the local buzz towards innovation by formulating a ‘community argument’; and c. involving ‘stand-alone firms’ in networking processes, as they may benefit, have much to give and may otherwise leave the region. In short, the region should do more with its social capital, strengthening existing network initiatives but making them more relevant, constructing pipelines beyond the regional borders, and involving outsiders, thus not only stimulating knowledge flows ‘outside-in’ and ‘inside-out’ (cf. Wolfe and Gertler 2004) but also within the region.

A final point in the case of the Utrecht, Gooi and Eemland region refers to the urgent need to formulate a ‘community argument’ for innovation: why must I innovate, why can it better be done by interacting with others, and why do so at various spatial levels? One respondent said that an answer to these questions would unleash “an enormous will and potential to innovate” in the region (Atzema and Visser 2005b).

This could enhance the poor quality of regional knowledge sources compared with international sources.

Going beyond the particular case of a region that we took as an example in this paper to show that regional innovation policies need not be cluster-based, and better not be cluster-based in case there are no clusters to stimulate, we refer once more to table 3, 5 and 6: the innovation, cooperation and optimization matrix respectively. The innovation matrix in table 3 helps to qualify the innovation strategies of firms in a particular region in terms of 'stand alone', 'global pipeline' and 'local buzz' strategies. It also helps to recognize spatial biases and omissions in the firm strategies, which is useful in policymaking aimed at striking a balance between the exploration and exploitation of traded and untraded, internal and external, as well as regional and international sources of knowledge. Untraded interdependencies (cf. Storper 1995) in innovation processes may be based on co-operation between two or more firms; see the co-operation matrix in table 5. Policymakers could take these options into account, stimulating forms of co-operation which are absent but useful to foster regional innovation, e.g. in the areas of innovation (due to knowledge complementarities and for the sake of speedy and effective learning), education & training (due to positive externalities), along with internationalization, marketing and/or knowledge infrastructure (due to indivisibilities of investments and positive externalities). While doing so, it is wise to pay attention to table 6, so as to timely vary and switch between spatial scales of co-operation, as both regional (clustering) and international (networking) processes have their pros and cons.

One last remark on cooperation. It may be attractive to cooperate, but yet not be effective, however, due to the insufficient quality of prospective partners, the collective action problem of 'free-riding' (Olson 1971) and the transaction cost-theory related risks of unwanted spillover, dependence, conservatism and credibility (Nooteboom 1998, Visser & Lambooy 2004). The quality of governance of these risks, problems and bottlenecks differs across space, however, and so does the potential and capacity of firms, regions, networks and clusters to cope with threats and seize opportunities (De Langen and Visser 2005; Visser and De Langen 2006). Policymakers could aim at solving specific governance issues by funding and monitoring so-called brokers (e.g. high-level and experienced employees of R&D institutes, training centers, consultancy firms, information brokers, business associations, or other experienced individuals), whose roles are to:

- reduce transaction costs in the case of relatively small and infrequent transactions,
- serve as a guardian of hostages,
- act as a filter against spill-over: express trust in both parties, so that these need not to inform each other,
- build intentional trust, distinguishing between mistakes and opportunistic behavior,
- act as a boundary spanner, if spill-over is feared while expanding a network including outsiders, and to
- connect networks where needed, disconnect them later, mediating opposition, and enabling parties to get away with maximum damage control (Nooteboom 1999).

We motivate this recommendation as follows, in line with the comments made in section 1. Innovation policy based on the *a priori* selection by policymakers of technologies and/or clusters runs a high risk of failure, due to the unpredictability of innovation (Nooteboom 2000 and 2004). Policymakers should therefore focus on facilitating processes that may, in unexpected manners, lead to innovation. The risk of failure when investing in innovation projects need to be largely private, but investment in facilitating processes can be a collective or public responsibility, because of collective action problems, transaction costs and positive externalities. This is what we mean with a *non-clustered innovative milieu*: facilitate cooperation and networking processes no matter their spatial scale; it is the most responsible and least risky path to follow in cases of regions lacking vibrant clusters.

## **Section 7: Conclusion**

This paper aimed at showing that a regional innovation policy based on a *non-clustered innovative milieu* is necessary (see section 1). The cluster approach to regional innovation may lead to imitation in industrial and innovation policy, and bears a risk of producing excess capacity, strategic and collective ‘government’ failure, and cost-based competition instead of innovation. Next, few regions have vibrant clusters, some have an embryonic or dying one, but most have none. Thirdly, one cannot create clusters. This is due to uncertainty regarding factors constituting local self-augmenting processes (which makes it hard to select effective cluster creation measures), industry-specific conditions (which tell whether clustering may or may not occur, and which mechanisms are relevant) and regional conditions (which influence the likelihood of clustering and can explain why in certain regions clusters developed, but not the exact location, timing and development speed of clusters). So, policymakers creating clusters are, in a way, gambling. Finally, implementing cluster policies in the absence of vibrant clusters has important opportunity costs.

A regional innovation policy based on a *non-clustered innovative milieu* is also feasible (see section 6). All we need is some traditional, initial and peculiar strength in the region to build upon, along with innovative firms, network efforts at various spatial scales, and a need to solve some related bottlenecks. The case of the Utrecht, Gooi & Eemland region is but an example of what can be done once one focuses on a specific situation in a region, analyzing the situation without being biased towards a cluster-based innovation policy. Certainly, where endogenous clustering processes have taken place over a long time period and still produce positive effects for clustered firms, policymakers have something to build upon and could be useful. In many regions, such clusters are absent however. As one cannot create them (see also table 1), it makes more sense to follow an approach considering various sources of knowledge: traded and untraded, internal and external, regional and international (see table 3); stimulating co-operation where this serves innovation (see table 5); solving possibly associated governance bottlenecks (see section 6), and paying due attention to the pros and cons of regional (clustering) and international (networking) knowledge production processes (see table 6).

## References

- Asheim, B.T. (1996), Industrial districts as 'learning regions': a condition for prosperity. *European Planning Studies* 4, pp. 379-400.
- Atzema, O. and E.J. Visser (2005a), Clustering advantages in the Dutch software industry. In: O.A.L.C. Atzema, P. Rietveld and D. Shefer, *Regional Configurations, Land Consumption and Sustainable Growth*. Cheltenham/Northampton: Edward Elgar Publishing, pp. 94-125.
- Atzema, O. and E.J. Visser (2005b), De unieke innovatiekracht van de regio Utrecht, Gooi & Eemland: een bedrijfsgerichte benadering. Rapport in opdracht van de provincie Utrecht, VNO-NCW Midden, Kamer van Koophandel Utrecht, Kamer van Koophandel Gooi en Eemland.
- Atzema, O. and E.J. Visser (2006), Research manual on clusters and networks for the Firm & Region course. Utrecht: Utrecht University, Faculty of Geosciences, Bachelor program Human Geography and Planning; Utrecht School of Economics, Minor program Economics and Geography.
- Bathelt, H., A. Malmberg and P. Maskell (2003), Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography* 28 (1), pp. 31-49
- Becattini, G. (ed.) (1987), *Mercato e forze locali. Il distretto industriale*. Bologna: Il Mulino.
- Becattini, G. (ed.) (1989), *Modelli locali di sviluppo*. Milano: Il Mulino.
- Benneworth, P. and G.J. Hospers (2005), The region of Twente: towards a second R&D hotspot. In: P. Benneworth, *Bringing Cambridge to Consett? Building University-Centred Entrepreneurial Networks in Peripheral Regions*. Newcastle upon Tyne: CURDS, pp. 19-43.
- Boekholt, P. and T.J.A. Roelandt (2000), Clusterbeleid in internationaal perspectief. *Economisch Statistische Berichten Dossier* 4283, pp. 30-31.
- Boschma, R.A. (2005), Proximity and innovation: A critical assessment. *Regional Studies* 39 (1), pp. 61-74
- Boschma R. and K. Frenken (2006), Why is economic geography not an evolutionary science? Towards an evolutionary economic geography. *Journal of Economic Geography* 6 (2006), pp. 273-302.
- Brenner, T. (2004), *Local industrial clusters: existence, emergence and evolution*. London and New York: Routledge.
- Camagni, R. (1991), Local Milieu, uncertainty, and innovation networks: Towards a new dynamic theory of economic space. In: Roberto Camagni, ed., *Innovation Networks: Spatial Perspectives*. London: Belhaven Press, pp. 121-44.
- Capello, R. (1999), Spatial transfer of knowledge in high technology milieu: Learning versus collective learning processes. *Regional Studies* 33 (4), pp. 353-365
- Capello, R. and A. Faggian (2005), Collective learning and relational capital in local innovation processes. *Regional Studies* 39 (1), pp. 75-87.
- Cooke, P. (2001), Regional innovation systems, clusters and the knowledge economy. *Industrial and Corporate Change*, 10, no. 4, pp. 945-74.
- ECLAC (2005), *Aglomeraciones en torno a los recursos naturales en América Latina y el Caribe: Políticas de articulación y articulación de políticas*. Santiago de Chile: División de Desarrollo Productivo y Empresarial, ECLAC books no. 88
- Florida, R. (2002), *The Rise of the Creative Class*. New York: Basic Books

- Gordon, I.R. and P. McCann (2000), Industrial clusters: complexes, agglomeration and/or social networks? *Urban Studies* 37, pp. 513-532.
- Hertog, P. den, E.M. Bergman and D. Charles (2001), *Innovative Clusters: Drivers of National Innovation Systems*. Paris: OECD.
- Hirschmann, A.O. (1970), *Exit, Voice, and Loyalty: responses to decline in firms, organizations, and states*. Cambridge Mass.: Harvard University Press.
- Hospers, G.J. (2005), 'Best practices' and the dilemma of regional cluster policy in Europe. Outlook on Europe, *Tijdschrift Sociale en Economische Geografie* 96 (4), pp. 452-457.
- ING (2004). Innovatie Monitor Midden-Nederland. Economisch Bureau ING, September 2004
- Jacobs, D. and M. Lankhuizen (2006), De Nederlandse exportsterkte geclusterd. *Economisch Statistische Berichten* 91 (4487), pp. 247-249.
- Kleinknecht, A.H. (1996), Regionale variatie in innovatie. In: O. Atzema & J. van Dijk (ed.), *Technologie en de regionale arbeidsmarkt*, Assen: Van Gorcum, pp. 17-28.
- Klink van, H. A. and Langen de, P. W. (2001), Cycles in industrial clusters: the case of the shipbuilding industry in the Northern Netherlands. *Tijdschrift Sociale en Economische Geografie*, vol. 92, nr. 4 pp 449 – 463.
- Koopmans, R. (2005), Het belang en de kwaliteit van coördinatie in het Nederlandse groenteglastuinbouw cluster. M.Sc. thesis University of Utrecht, Faculty of Geosciences, Utrecht
- Langen de, P.W. (2004), The performance of port clusters: a framework to analyse cluster performance and an application to the seaport clusters of Durban, Rotterdam and the lower Mississippi. Rotterdam: Erasmus University, PhD thesis.
- Langen de, P.W. and E.J. Visser (2005), Collective action regimes in seaport clusters: the case of the lower Mississippi port cluster. *Journal of Transport Geography* 13: 173-186
- Martin, R. and P. Sunley (2003), Deconstructing clusters: chaotic concept or policy panacea? *Journal of Economic Geography* 3, pp. 5-35.
- Ministry of Economic Affairs (2004), *Pieken in de Delta*. The Hague: Ministry of Economic Affairs, Directorate Spatial Economic Policy
- Nooteboom, B. (1998), *Management van partnerships*. Schoonhoven: Academic service.
- Nooteboom, B. (1999), Innovation and inter-firm linkages: New implications for policy. *Research Policy* 28, pp. 793-805.
- Nooteboom, B. (2000), *Learning and innovation in organisations and economies*. Oxford: Oxford University Press
- Nooteboom, B. (2004), Innovatie: theorie en beleid. Rede uitgesproken bij de openbare aanvaarding van het ambt van hoogleraar in de bedrijfswetenschap aan de Universiteit van Tilburg, 8 november 2004, pp. 8-33.
- Observatory of European SMEs (2002), The characterisation of European regional clusters. Hoofdstuk 4 in *Regional clusters in Europe*, Brussels: European Commission enterprise publications 3, pp. 27-40.
- OECD (2001), *Science, Technology and Industry Outlook: Drivers of Growth: Information Technology, Innovation and Entrepreneurship*. Paris: OECD.
- Panne, G. van der & A.H. Kleinknecht (2003), Van Stanford naar Zandvoort. *Economisch Statistische Berichten* 88 (4403), pp. 236-238.

- Porter, M.A. (1990), *The competitive advantage of nations*. London: MacMillan Press.
- Porter, M.A. (1998), *On competition*. Boston: Harvard Business School.
- Porter, M.A. (2000), Location, competition and economic development: Local clusters in a global economy. *Economic Development Quarterly* 14 (1): 15-34.
- Pyke, F. (1992), *Industrial development through small-firm co-operation: Theory and practice*. Geneva: International Labour Organisation.
- Raspe, O., F.G. van Oort and P.J.M. de Bruine (2004), *Kennis op de Kaart. Ruimtelijke patronen in de kenniseconomie*. Rotterdam/Den Haag: Nai/Ruimtelijke Planbureau.
- Roelandt, T.J.A. and P. den Hertog (1999), *Boosting innovation: the cluster approach*. Paris: OECD proceedings, OECD.
- Rutten, R. (2002), *The entrepreneurial coalition: knowledge-based collaboration in a regional Manufacturing network*. Academisch proefschrift: Tilburg: KUB.
- Senter (2001), *Hot spots: ruimtelijke patronen van innovatie in Nederland*. Den Haag: Ministerie van Economische Zaken.
- Sölvell, Lindqvist and Ketels (2003), *The cluster greenbook initiative*. Stockholm: Bromma tryck AB.
- Stevens, L. (2006), *Snijbloemcluster Westland: gevangen tussen schaalvergroting en ruimtegebrek? Een empirisch onderzoek naar het ruimtelijk en functioneel aanpassingsgedrag van Westlandse snijbloemtelers sinds 1995*. M.Sc. thesis University of Utrecht, Faculty of Geosciences, Utrecht.
- Storper, M. (1995), The resurgence of regional economics, ten years later: the region as a nexus of untraded interdependencies. *European and Urban Regional Studies* 2, pp. 191-221
- Visser, E.J. (1996), *Local sources of competitiveness: Spatial clustering and organisational dynamics in small-scale clothing in Lima, Peru*. Amsterdam: Tinbergen Institute, PhD thesis.
- Visser, E.J. (1999), A comparative analysis of clustered and dispersed firms in the small-scale clothing industry in Lima. *World Development* 27 (9), pp. 1553-1570.
- Visser, E.J. (2000), De complementariteit van clusters en netwerken [The complementarity of clusters and networks]. *Economisch Statistische Berichten* Dossier 4283, p. 35.
- Visser E.J. and Boschma R. (2004), Learning in districts: novelty and lock-in in a regional context. *European Planning Studies* 12 (6), pp. 793-808.
- Visser, E.J. and P. de Langen (2006), The importance and quality of governance in the Chilean wine industry. Forthcoming in *GeoJournal*.
- Wever, E. & E. Stam (1999), Clusters of high technology SMEs: The Dutch case. *Regional Studies* 33, pp. 391-400.
- Wolfe, D.A. & M.S. Gertler (2004), Clusters from the inside and out: local dynamics and global linkages. *Urban Studies*, 41 (5/6), pp. 1071-1093



**Table 1: Cluster typology**

Cluster type	Concentration logic	Business effects
<b>Local formation</b>	Location decision based on a shared and <i>dominant location factor</i>	Static: transport costs ↓
<b>Local industry</b>	Market imperfections make <i>local external economies</i> important: a pool of specialized labor, enhanced supply of specialized infrastructure and services, and information ‘spillovers’ enable especially small firms to survive and grow	Static: transport, transformation, and search costs ↓
<b>Local complex</b>	<i>Specialization</i> , outsourcing of non-core activities, and co-operation for static purposes (e.g. shared problem-solving for quality management, information exchange for logistic cost/service optimization) enhance the competitiveness of internationally operating firms	Static: transport, inventory, transformation, and transaction costs ↓ Flexibility, quality ↑
<b>Local alliance</b>	Dynamic forms of <i>inter-firm co-operation</i> (see table 3) promote the exchange of information, interactive and collective learning, thus enhancing the competitiveness of internationally operating firms. The joint actions and collective investments bring along coordination problems and require governance based on institutional (contracts, norms, values) and relational (social ties, mutual identification and empathy, reputation effects) embeddedness	Static: emphasis on transaction cost reduction. Dynamic: 1 <sup>st</sup> and 2 <sup>nd</sup> order learning ↑
<b>Local milieu</b>	<i>Co-evolution</i> between local institutions, markets (capital, labor), public policy and business practices. Public actors implement cluster, place and phase-specific policies. Flexibility of specialists in teams within and across firms, in and beyond the cluster. Combination of local ‘buzz’ knowledge and global ‘pipeline’ knowledge. Constant renewal of cognitive distance so that P [novelty] ↑.	Static: as in complexes and alliances. Dynamic: sustained 2 <sup>nd</sup> order learning.

Sources: own elaboration based on Capello 1999; McCann and Gordon 2000; Visser and Boschma 2004; Atzema and Visser 2005a

**Table 2: Innovation in the Utrecht, Gooi & Eemland region according to traditional indicators**

Indicator	Situation in the Utrecht, Gooi and Eemland region	Remarks
R&D intensity (fte years as a % of employment in the region)	Industry: average Services: above average, but not in the top category of Dutch regions	Source: Kleinknecht 1996
R&D expenditure per square km: - density: R&D expenditure per km <sup>2</sup> - intensity: R&D wage sum divided by total wage sum per km <sup>2</sup>	Density: above average, but lower than top category of Dutch regions Intensity: average, and much lower than top category of Dutch regions	Source: Senter 2001
Z-scores of the number of R&D jobs divided by the total number of jobs in a municipality	Relatively low scores, with the exception of a few municipalities (De Bilt, Weesp and Muiden) scoring higher than average	Source: Raspe, Van Oort and De Bruine 2004
Number of patents per 1000 firms	Average (this observation holds for Midden-Nederland, however, a larger region comprising also the Utrecht, Gooi & Eemland region)	Source: ING 2004
Number of new product announcements in professional magazines	Average to below average (idem)	Source: Kleinknecht 1996; Van der Panne and Kleinknecht 2003
Share of workers in innovative firms, regarding technological and non-technological innovations	Technological innovation: above average in municipalities in the Gooi subregion; in other municipalities average to low Non-technological innovation: above average in Utrecht and Amersfoort municipalities; in other municipalities average to low	Source: Raspe, Van Oort and De Bruine 2004
Number of knowledge workers	Above average, relatively high, if not the highest, in the Utrecht, Gooi & Eemland region	Source: Raspe, Van Oort and De Bruine 2004

Source: elaborated on the basis of Atzema and Visser 2005b

**Table 3: Sources of innovation**

	Internal to the firm	External to the firm	
		Intraregional	Extraregional
<b>Traded</b>	<i>Not applicable</i> (no trade occurs within firms)	<i>Learning-by-interacting with trading parties:</i> <ul style="list-style-type: none"> <li>- upstream, with suppliers of necessary input</li> <li>- downstream, with customers</li> <li>- in diagonal linkages with suppliers of complementary input</li> <li>- Learning-by-borrowing/hiring specialists for limited time periods</li> </ul>	<i>Learning-by-interacting with global trading parties:</i> <ul style="list-style-type: none"> <li>- upstream, with suppliers of necessary input</li> <li>- downstream, with global buyers</li> <li>- in diagonal linkages with suppliers of complementary input</li> </ul>
<b>Untraded</b>	<i>Learning based on internal activities:</i> <ul style="list-style-type: none"> <li>- learning-by-doing (effect of experience),</li> <li>- learning-by-using (effect of expertise),</li> <li>- learning-by-experimenting (effect of curiosity), and</li> <li>- learning-by-monitoring (system feedback).</li> </ul>	<i>Learning-by-spillovers:</i> <ul style="list-style-type: none"> <li>- 'horizontal observation' of tacit knowledge, and</li> <li>- monitoring and selection of best practices</li> </ul> <i>Learning-by-informal interaction:</i> <ul style="list-style-type: none"> <li>- horizontal advice: what, how, how much to make</li> <li>- joint problem recognition: awareness raising, interpreting external signals, sense making</li> </ul> <i>Learning-by-cooperation in local networks:</i> <ul style="list-style-type: none"> <li>- advice and joint problem recognition as above, and</li> <li>- joint problem solving: investment in training, R&amp;D, innovation, internationalisation, marketing, infrastructure, etc.</li> </ul>	<i>Learning-by-cooperation in international networks:</i> exchange of information, ideas and knowledge in 'communities of practice' comprising: <ul style="list-style-type: none"> <li>- homogeneous actors: firms involved in the same branch (competitors), chain (suppliers, buyers) or cluster (diagonal linkages)</li> <li>- heterogeneous actors: academics, consultants, 'strange ducks'</li> </ul>

Sources: own elaboration based on Visser 1996, Storper 1995, among other sources

**Table 4: Quality of the innovation climate in the Utrecht, Gooi & Eemland region** (according to innovative firms in the region; factors ranked from good to bad quality)

	Number of respondents	Average score	SD
Presence of attractive partners in the region	20	2,30	1,13
Risk of unwanted spillover of information in case of inter-firm co-operation within the region	19	2,31 **	1,06
Degree of cognitive distance within the region (high = attractive)	20	2,45	0,94
Willingness of spin-offs to interact with mother firms	20	2,50	1,00
Drive of employees towards intra and entrepreneurship	22	2,73	1,03
Quality of the regional labour market (human resources)	22	2,82	1,10
Flexibility of the regional labour market (rules)	22	2,82	1,01
Risk of free-rider behaviour in case of inter-firm co-operation within the region	19	3,00	0,88
Risk of ending a co-operation agreement due to uncertainty about the effects of learning and innovation	20	3,00	0,97
Quality of innovation initiatives of other public actors	20	3,05	1,23
Quality of the atmosphere in the region regarding innovation	20	3,10	1,07
Quality of the knowledge institutions in the region	19	3,26	1,37
Presence of inspiring firms in the region	20	3,30	1,30
Quality of innovation policies of local and regional government	20	4,05 *	1,36

Notes:

- We measure quality on a scale from 1 to 5, where 1 implies a very good evaluation (very high, very much, very large, very good) and 5 implies a very bad evaluation (very low, very few, very small, very bad)
- \*: this factor has a significantly lower score than the other factors (t-test with P error = 6%)
- \*\*: this factor has a significantly lower score than the risks of spillover and uncertainty about benefits (t-test with P error = 10%).

Source: Atzema and Visser 2005b

**Table 5: Co-operation options**

	<b>Two actors (firms and/or others)</b>	<b>Multiple actors (firms and/or others)</b>
<b>Vertical linkages</b> (at the branch level and/or in chains)	Dialogue regarding applications, form, quality, process efficiency and price of products	Supply-chain integration: integral logistics management
<b>Diagonal linkages</b> (across sectors)	Joint product development, outsourced R&D	Porterian megaclusters: technological spillovers between sectors
<b>Horizontal linkages</b> (competitors)	<ul style="list-style-type: none"> <li>- Exchange of resources: workers, machines (to avoid overinvestment at the firm and/or collective level)</li> <li>- Joint purchasing</li> <li>- Joint investment in machines</li> <li>- Joint R&amp;D, risk sharing and technology exchange</li> <li>- Joint sales (for higher volumes and/or a broader assortment)</li> <li>- Also, blocking competition</li> </ul>	<ul style="list-style-type: none"> <li>- Joint purchasing</li> <li>- Joint investment in machinery, infrastructure, training, innovation, marketing (image, brands), internationalization</li> <li>- Joint R&amp;D</li> <li>- Joint sales (for higher volumes and/or broader assortment)</li> <li>- Joint lobbying: public services, policies (e.g. trade-related)</li> <li>- Also, blocking competition</li> </ul>
<b>Lateral linkages</b> (complementary products)	- As in horizontal, but now cooperation is both easier (less competition) and more difficult (co-operators have less in common)	- As in horizontal, but now cooperation is both easier (less competition) and more difficult (co-operators have less in common)

Source: own elaboration based on Pyke 1992 and Visser 1996, in Atzema and Visser 2006

**Table 6: Dynamic effects of clusters and networks**

	<b>Advantages regarding innovation performance and governance of co-operation</b>	<b>Disadvantages regarding (innovation) performance and governance</b>
<b>Clustering</b>	<p><i>Selection, consolidation (assimilation) and generalisation (diffusion) of knowledge:</i></p> <ul style="list-style-type: none"> <li>- shared perception of problems to be tackled</li> <li>- ‘horizontal copying’</li> <li>- vertical specialisation, interaction and learning</li> <li>- socio-cultural context, regional institutions, and various forms of proximity may reduce transaction costs of co-operation</li> </ul>	<p><i>Risk of technological, cognitive and institutional lock-in:</i></p> <ul style="list-style-type: none"> <li>- strength of local technological trajectory may prevent effective perception of problems to be tackled; lack of strategic skill and short-term mindedness</li> <li>- diminishing returns of ‘horizontal copying’ and interactive learning at the local level</li> <li>- institutional paralysis reproducing e.g. distrust by lack of courage and experience</li> </ul>
<b>Networking</b>	<p><i>Differentiation and new combinations of knowledge, speeding up and radicalizing innovations:</i></p> <ul style="list-style-type: none"> <li>- making explicit one’s own knowledge and combining it with knowledge of others</li> <li>- possibility of optimizing learning and innovation efforts by seeking dissimilar, but not too different and therefore hard-to-understand partners</li> </ul>	<p><i>Cognitive and behavioral risks:</i></p> <ul style="list-style-type: none"> <li>- too much cognitive distance between the partners creates chaos in stead of new combinations, interactive learning and innovation</li> <li>- risk of dependence due to specific investments in bridging cognitive distance, risk of international spillover of knowledge, risk of adverse selection (partners do not prove to be as interesting as one thought at the beginning)</li> </ul>

Source: own elaboration based on Visser and Boschma 2004