in Blien U. et Maïer G. (eds), *The Economics of Regional Clusters, Networks, Technology and Policy*, 2008, E. Elgar, U.K., 320 p.

ANDRE TORRE

FIRST STEPS TOWARDS A CRITICAL APPRAISAL OF CLUSTERS

Introduction

The essential character of the geographical concentrations of populations and economic activities, of the phenomena of polarization and of the spatial concentrations of companies has often remained inconceivable for mainstream economists, and that for a simple reason: the impossibility to systemize the forces of concentration in a model characterized by equilibrating effects, which ban all possibility of medium-term development of one part of the economy at the expense of another. One had to wait for Krugman (1991) whose work shattered this dogma and introduced a universal model that allows for an acceptable consideration of spatial polarization in standard economics.

Parallel to this movement in geographical economics, which partly includes endogenous growth as well, a similar development occurred, which influenced the analysis of local development processes by particularly stressing the phenomena of spatial concentration of innovation and research activities. It is Porter's work about clusters (see e.g. Porter, 2000). His work met with even greater response than that of Krugman, since it is not limited to economics but directly influences the principles applied by policy makers at the local as well as at the national level. Today clusters are considered as the basis of local, even national, policies, in many countries (e.g., the United Kingdom, Germany, the Netherlands). For example, in France they served as the basis of recent reflections about the "Systèmes Locaux de Production" (Local Systems of Production) and relate to the very new "Pôles de compétitivité" (Poles of competitiveness). Astonishingly, they are also often regarded as major tools for development by the important advocates of a globalized economy (see OECD, 2001 and 2005, World Bank, 2002).

Again, this means a rediscovery of the past, but, in a sense, a more troubling one. While the increment contributed by the New Economic Geography is quite easily understandable, the contribution of Porter is much less clear. At first sight, the success of the story is even more intriguing. In fact, Porter's theses show an astonishing similarity with concepts that were carefully developed before by various branches of spatial and industrial analysis. Let us quote growth poles, industrial districts, milieux and local production systems on the production side, and technopoles, technological districts and innovating milieux in the field of innovation. Is it simple tracing, imitation, or a revival of arguments explaining spatial concentration factors and the resulting advantages?

The success of the concept of clusters remains therefore a source of reflections and debate (see European Urban and Regional Studies, 2005). And although we appreciate the belated rediscovery of already well established evidence, and especially of the fact that it is taken into account by policies and public decisions, we

may also wonder about the validity of the concept, and about its normative character. In other words, if we adhere without reservation to the hypothesis that space is polarized, what is the value of the explanations of this polarization advanced in the cluster approach? And, consequently, how should we value the justifications of the beneficial character of this concentration and of the decisions which can support favourable to it?

This chapter aims at the following: to question the relevance of the cluster concept as regards both the theoretical hypotheses subjacent to this analytical construct and the elements advanced with regard to the success of the industrial policies based on the application of this method to local development processes. Initially, we propose elements of definition of the cluster concept, before we approach the reasons for the success of this concept. Then we try to elucidate the heroic theoretical hypothesis in terms of knowledge transmission, underlying this model. We discuss then the disadvantages of cluster generating policies, before coming back to the concept of clusters and concluding with a presentation of the most profound, but also most traditional, causes for the processes of spatial agglomeration of research and innovation activities.

1.1. Elements of definition

Since Porter (1990, 2000) revived the term cluster already employed by Schumpeter, its success seems unstoppable. This concept pleases the specialists in local development and regional planning, who recognize it as a powerful tool of intervention, but causes sleepless nights to the researchers, who struggle to agree on its definition.

Indeed, if clusters constitute a new way of qualifying the local forms of organization of the innovation activities, it is neither easy to define their exact contents, nor to distinguish them clearly from concepts already in use: innovative milieux, technopoles, technological districts... Porter himself does not help much when he states that a cluster is "... a group of geographically closed firms and associated institutions, interconnected within a particular field and linked by common elements and complementarities". Similar remarks could be made regarding the majority of localised collection of firms. So Feser (1998) can note, that "in spite of the intense interest in industrial clusters in the policies of economic development in Europe and in North America, there is little consensus on the definition that specifies clusters, the dynamics which underlies their growth and their development, as well on the initiatives aiming at forming and reinforcing them". However, their success has not slackened, and seldom has an economic concept caused such passions, in particular within the framework of territorial policies.

Initially the concept of cluster was applied to the so-called success stories, whose best-known example is Silicon Valley. It combines within a limited geographical space small high-tech electronics companies and is bound together by confidence and purchase-sale relations such as to allow the operation of an extremely high-performing local network of producers. Creation of technology, innovation and high profit rates are to be found within this system, which is characterized by a strong attention of local public authorities and financial organizations such as the venture capitalists and the business angels. The success of Nokia can illustrate another facet

of clusters, more directly centred on installing relationships of technical complementarity and subcontracting at the local level. The Finnish cluster, which was formed around the firm leader in mobile telephony, rests above all on the exploitation and the development of a competence in technologies of information and communication. This competence is shared by all the firms present at the local level and has been nurtured by the authorities via technological policies in favour of the R&D and the development of human resources. Extremely competitive on an international level, it is based on a localised network connecting Nokia and its suppliers, often equipment suppliers. Similarly, a noria of firms of less importance knew how to create niches, particularly in the field of telecommunication, and then to develop a powerful local web of high-tech companies related to the centre of the system.

Thereafter, the concept of clusters tended to open up in all directions; towards systems of lower technology, systems with less favourable performance and towards a tool of local and national economic policy (OECD, 2001 and 2005). From the point of view of development policies, it was thus considered that creating synergies between local companies is always beneficial, in particular as the circulation of knowledge is necessary for the proper operation of organized systems. Therefore, all the policies seeking to promote networking of companies appeared valid, because they can only lead to an increase in competitiveness, the organization in “local networks” necessarily turning out to be superior to other types of operation, in particular decentralized ones. Though admissible as an advertising argument that aims at attracting companies or subsidies to a given location, this position is obviously not supported from the point of view of the scientific analysis. Other evidence is essential.

1.2. The reasons of success

But why then is the concept of cluster so successful, on a political as well as on an academic level? It is certainly not because of the clearness or the precision of its definition. Indeed, it is characterised by a substantial vagueness and inaccuracy, which has often been pointed out in the respective literature (see for example Martin and Sunley, 2003 or Taylor, 2005). This inaccuracy increases proportionately with the number of reformulation proposed. Not only has it turned out to be impossible to assign precise and well tallied analytical contents to the concept of clusters, but also has it been noticed - as Porter himself seems to recognize – that the latter can vary significantly according to the public authority or decision maker implementing it. Moreover, as the term is far from defining a coherent and precisely limited geographic area, studies vary widely as to the special limits of clusters, from the reach of innovation activities to districts or sometimes even regions.

Following Martin and Sunley (2003), it is reasonable to think that the success of the term cluster derives largely from the deliberately vague character of its basic concept and its variations (see however the attempt of Dunning, 2000). This permits the term to correspond to various types of localization and to adapt easily to a great number of issues/circumstances concerning the local development or technological constraints. The successive embellishment of an already soft concept makes it possible to appropriately reflect changing modes and thus remain "marketable". This vagueness,

desired or involuntary, certainly constitutes an asset when one tries to popularise policies by trendy and versatile catchwords.

From a scientific point of view it can be argued that the concept of clusters is so successful because it rests on four major theoretical pillars, which – according to the literature on innovation processes and policies – refer to numerous advantages as to performance and competitiveness of local systems and networks of economic actors:

- it is related to the concepts of the economy of knowledge, or "new economy", and directly addresses the question of the dissemination of knowledge on the local level, underlining the crucial character of the interactions between the members of the same network of individuals. The knowledge does not circulate in the air, as implied by Marshall's argumentation, but is exchanged between agents or groups located within a geographical space through the relations between them. This is particularly true for academic research, whose repercussions seem largely local (Acs, 2000)
- it allows a transfer to the local and inter-company level of the concept of network externalities, which assured the success of the approaches in terms of transport and communication infrastructures. The benefit drawn from its use by any member of the network is directly related to the presence of other members, thereby integrating the participants of the cluster within a community of common and shared interests;
- it refers to the concept of vertical integration of companies realizing extra profits. In fact it is rather a quasi-integration, which gives the companies an advantage in the market, thanks to the pooling of certain infrastructures and to reduced costs of transaction between participants of the same production process. This is particularly due to the importance of non-commercial relations (Karlsson, 2005). Commercial relations however are not to be neglected, just as performance criteria, which have always been at the centre of attention paid to clusters, in particular as development tools;
- finally, clusters are not presented as closed systems, which are completely or strongly isolated, but on the contrary as structures which pay special attention to the relations with the outside, either through other agents or through national or supranational policies on. Thus they immediately appear like agents of globalisation, by profiting from their comparative advantages in terms of localization or externalities of proximity in a process of competition which includes companies and institutions looking out for markets.

Furthermore the respective literature states that the possibilities of forming a cluster often depend upon the presence of certain basic characteristics of local structure, the presence of which is necessary but not sufficient. These are in particular the divisibility of the production process (the good or the service involving various firms by making use of their respective competences), the presence of low transport costs (to ensure the commercialisation of the production), the existence of local knowledge interactions based on such concepts as the installation of trust relations (development of networks) and the ability of the system to adequately react to market changes (flexibility of the production processes).

1.3. An underlying heroic theoretical hypothesis

As we have seen, the concept of cluster echoes concerns with regard to four great fields of economic and organisational science, which explain part of its success with researchers. However, this description does neither allow us to understand, from an analytical point of view, the true nature of the cluster approach nor the subjacent hypotheses on which it rests. These hypotheses refer above all to the approach in terms of innovation and the economy of knowledge. To better understand the nature of clusters, it is necessary to reconsider the theoretical hypotheses underlying this approach and to justify, from an analytical point of view, the systematic promotion of the regrouping and approximation of innovation activities. It rests on the particular view of innovation processes, which are thought to be based on the transfer and mutualisation of knowledge primarily resulting from face to face relations. It is thus the particular nature of innovation activity which requires the co-localization of research and development activities. As a consequence it justifies the existence of clusters and the need for their promotion.

The theoretical foundation of this approach can be summarized as follows. Above all, innovation activities are, particularly nowadays, connected to the possibility of producing or adapting knowledge, especially scientific knowledge resulting from public or private research. It is within this context that one can speak about a knowledge economy (Foray, 2000), based primarily on the evolution and rapid renewal of knowledge. However, this knowledge shows a particular characteristic, which extends to all activities of innovation, and that is their imperfect appropriability. While a traditional private good becomes the exclusive property of the person who owns or manufactured it, the same does not apply to knowledge as its creators find it difficult to lay claim to it. This is the case with other (semi)public goods as well: they can be reproduced or imitated. Therefore a system of patents supporting the protection of new knowledge was set up in order to prevent that the innovators are immediately deprived of the results or benefits of their work.

But the limits of patents are evident, they cannot protect the entire process of innovation because they act *ex post* and are not supposed to relate to all the mental activities either. In fact, the non completely appropriable character of knowledge (including the case of already existing patents) results in numerous spill-over effects, which spread from one innovative firm to other companies of the same sector, or connect researchers from various organizations. These are the famous knowledge spill-over effects which benefit companies that possess a basis of knowledge compatible with that of the innovators. They also support the development of contemporary economies, as is underlined for example by the theory of endogenous growth.

So far nothing has been said as to the local or remote character of this dissemination of knowledge, which can easily take place between very distant firms, for example by the means of Internet, telephone or fax, or - more simply - thanks to technical manuals. However, empirical observations show a tendency towards spatial concentration of research and innovation activities, in a small number of countries, some areas, and finally within particular and clearly delimited geographical areas, such as the technopoles, cities, science parks, and university campuses. In the knowledge economy approach it is thus deduced that it is in fact the characteristics of these spill-over effects that support the co-localization of the research and innovation

activities. The form taken by the knowledge and its methods of diffusion would inevitably lead to the agglomeration of those economic units that want to profit from it, and would a priori exclude those from the knowledge benefits which are too far from its source. The naturalist hypothesis is running.

The argument in favour of spatial concentration rests on the particular character of knowledge, which can be divided, following Polanyi (1962), into two distinct but sometimes complementary categories: tacit knowledge and codified knowledge. The latter consists of all the written sources or those easily available in handbooks or publications. It can spread over substantial distances without difficulties, and thus be reproduced or duplicated by people completely unfamiliar with the initial process of its creation (note that this interpretation goes in the direction of patentability and the attribution of specific property rights to individuals or legal entities). Tacit knowledge, on the other hand, cannot cope with distance. As it can only be copied by means of observation, practice, or learning, and is encoded in human beings and their daily behaviour it can only be transmitted in face to face contacts. So its role in the co-localization of research activities and innovative enterprises is evident. It is only within spatially anchored communities that tacit knowledge can really be transmitted and transferred. Hence it is necessary to organize the innovation at the local level, to support spatial connections, or to create and promote clusters.

This line of reasoning suffers from an important deficit at the analytical level. It is based on the idea that the spill-over effects are due to the public character of knowledge, which implies its weak appropriability by its producers and allows its easy transfer into the economic system. But, at the same time, it is maintained that it is the tacit character of this very knowledge, i.e. strongly appropriable and not easily transmissible, which justifies the need for face to face relations rather than remote interactions! Thus, there are two contradictory theses, the first of which explains the dissemination of innovations and knowledge, and the other the delimitation of its diffusion to the local level. To take one example, absolute consent to the thesis of tacit knowledge diffusion, favourable to face to face relations, would at the same time prohibit any possible diffusion and thus remove any interest in co-location from firms involved in the same type of innovation process. But still, it is exactly this argument which is most often advanced in support of policies favouring the polarization of research and innovation activities.

To make things clearer, let’s come back to the line of reasoning. It is said that the presence of tacit knowledge justifies the need for geographical proximity in innovation activities. Indeed, this knowledge would be strongly appropriable and not easily transmissible. This would justify the need for face to face relations, and thus for geographical proximity. At the same time, one speaks about geographical spillovers, the mechanisms by which knowledge is diffused in space. But why does knowledge spread? Because it is a public property that cannot be appropriated. As it cannot be appropriated, it diffuses to other companies, including competitors. There are two ways to resolve the contradiction between the appropriability of the knowledge implied in spillovers and the non-appropriability of tacit knowledge. 1) Either tacit knowledge is appropriable, and consequently there are no localised spill-over effects because knowledge cannot be diffused. Therefore, companies cannot benefit from each other, whether they are close or remote. Tacit knowledge is then a good like any other and one does not speak about its diffusion any longer. We are left with codified knowledge, which does not care about distance, and therefore cannot be

used to justify the need for geographical proximity. 2) Or knowledge (tacit and codified) is a non-appropriable good. Then, it can diffuse, no matter if over short or long distances. Thus, either we adhere to the hypothesis of the existence of tacit "knowledge" and give up the idea of spillovers. In this case, we get knowledge goods, exchanged on markets like traditional goods, and which are not externalities any longer. Or we preserve the hypothesis of non-appropriable knowledge. In this case we forget about tacit knowledge, which is in contradiction to the non-appropriability, and admit the idea that knowledge diffuses irrespective of distance.

1.4. Disadvantages of clusters, or the negative effects of geographical proximity

In order to go further with the critical evaluation of clusters, we will now analyse them from the point of view of their existence and their applicability to economic policy. Indeed, clusters do exist, and they have advantages which are often stated in the respective literature or in policy documents. On the other hand, reference is rarely made to possible disadvantages connected with the spatial agglomeration of firms, in particular when they are concerned with innovation processes.

To evaluate the policies promoting clusters and seeking to support their creation and installation, it is necessary to take into account negative dimensions of proximity, particularly of geographical proximity. This aspect, largely neglected in the literature, is present for example in Boschma (2005) or Rallet and Torre (2005), who show that the various forms of proximity together display disadvantages. If we concentrate on geographical proximity only and apply this scheme of analysis to the question of clusters, we note that the vicinity of innovating firms, located within the same local system, is likely to give rise to various problems. They constitute many obstacles to the promotion of the clusters as policy tools for knowledge transfer. They can be subsumed under three categories.

First, there are difficulties connected with the vicinity of the firms within a local system of innovation. Above, we examined the range and the limits of the approaches which insist on the diffusion of innovations and knowledge at the local level and which regard this characteristic as an opportunity for the development of the system as a whole. However, we have to note that the opposite result is always possible. Indeed, and as the business intelligence approach shows, the geographical proximity between competitors can turn out strongly negative for firms which develop top-level innovations. This is particularly true for clusters where similar activities take place, i.e. clusters dedicated to one industrial activity and its derivatives, or when firms with complementary activities related to the same production network are co-located. In this case, knowledge leaks and industrial espionage are facilitated by the vicinity, just as the recruitment of engineers specialized in state-of-the-art technologies. These practices, which are extremely common within technopoles, for example, do not at all facilitate the local development of the system. They endanger the effort of innovation and threaten the expected benefits. They may contribute to discouraging firms from innovation activities, or lead them to move to more favourable areas.

Furthermore, there is the risk of a negative lock-in of the system. Although the process of spatial lock-in has often been praised, this feedback mechanism can, on the other hand, work against the local system and involve it in a regressive spiral.

Two negative scenarios may evolve. The first is connected to the rigidity of the productive trajectories caused by a group that is more sensitive to its internal rules and processes than to the requests and changes coming from the outside. Thus we note the existence of local systems which lock-up in excessive specialization or get trapped in mono-activity. This makes them vulnerable to changes in their competitive situation or to the exhaustion of the production logic. This absence of flexibility can lead to the loss of "mature" clusters, incapable of reform with regard to innovations coming from outside; an ironic fate for activities intending to be innovative. The second scenario is that of the confinement to a localist state of mind. This risk, which rather affects "small" clusters, leads to the difficulty of acceptance and integration of new entrants, whether they are companies or scientists, and thus hampers the renewal of human capital in the respective area.

Lastly, as Bathelt et al. (2004) underline, it is quite possible that the internal bonds within the cluster, however numerous, are only slightly favourable to the transfer of knowledge or innovation. In fact, as these authors note, the dynamic clusters run the danger of routinizing or banalizing the internal relation in favour of exchanges with the outside. In this case, the local relations often rest on weak ties only. The firms, which share the same knowledge base, are satisfied with their presence and with communication constrained to the execution of routine tasks. This level of weak exchange (or local buzz), if it is of interest for the cohesion of the system, therefore only transfers incremental innovation and supports neither the transmission of knowledge nor synergies in innovation and research. On the contrary, exchanges with the exterior of the cluster (or global pipeline) could turn out much more advantageous in terms of innovation policies, as they are carriers of radical innovations between remotely located companies. On this level there are the strong ties between organizations with different competences.

1.5. Return to the concept of cluster

Before proceeding to a final consideration of the notion of network in analytical terms, it will be useful to come back to the concept itself and its many meanings. In fact, the term cluster itself often leads to confusion and sometimes requires broader definitions and extensive content. In order to bring structure into this vagueness, we propose the following procedure, which consists in bringing back the definition of cluster to its simple basic elements. The objective here is to take the cluster approach seriously and try to give a coherent interpretation, starting from simple analytical components. We will retain only two of them, which seem inalienable: 1) the relations between productive agents are localised; 2) they are organized. From this postulate, we can build a table (adapted from Feser, 1998), which seeks to reveal and classify the various forms of clusters which were derived from Porter’s original concept. Thus it becomes possible to identify the various forms of clusters and to exclude other types of local organization models from this definition.

Table : Where are the clusters today?

		Organisation of the inter-firm relations	
		Strong	***Weak***
Localisation of inter-firm relations	***Strong***	1. Cluster à la Porter	3. Cluster tied to a resource or to local history
	Weak	2. Cluster without definite local base	4. Sparsed activities

Box 1 represents the case initially identified by Porter, since it combines at the same time important degrees of localization and organization, with simultaneous existence of what could be called geographical and organized proximities (see below). Box 2, characterised by strong inter-firm relations but weak local embeddedness, can correspond to the definition of a cluster analyzed at the national or regional level in a broad sense. Box 3, which associates weak internal local bonds with a strong spatial concentration of firms, characterizes many production systems that are probably not included in the initial definition of Porter. But today they constitute the main target of innovation policies seeking to create synergies at the local level. We can imagine that certain poles of competitiveness are found in this category. The same applies to "clusters" identified in various emerging markets. Box 4 is obviously not of any interest, since this does not integrate any of the two components of the concept of cluster.

Here again one perceives all the difficulty of analysing clusters. In their canonical definition they should correspond only to box 1, but it is clear that today they strongly extend towards boxes 2 and 3. Moreover, we should not neglect the fact that clusters sometimes follow a life-cycle, which leads them from their formation to maturity through successive stages corresponding to transformations in the internal organization of production and innovation. Following the OECD we can, for example, imagine, that clusters in formation are characterized by attempts to establish the relations between local actors and by the training of network practices in the framework of the production of incremental innovations, before the companies develop complementary activities and participate in collective training in the context of the production of strongly conceptualized innovations. In all cases, the normative dimension that today is connected with the concept of clusters forces us to identify different categories and to identify stages of growth and modes of evolution.

1.6. Towards an analysis of clusters by returning to the fundaments of economy

It is evident that the precise definition and the demarcation of clusters pose problems and that they remain largely irreducible in an analytical approach, irrespective whether they are the conditions of knowledge circulation, of the delimitation of

geographical borders or of the type of relevant technologies. However, it is quite difficult to deny the reality of concentration of laboratories and innovating companies in the same geographical areas, or even the existence of numerous clusters. The latter could just be the consequence of policies aiming at their creation. The spatial concentration of innovation and research activities in specific areas constitutes an irrefutable fact. But from a theoretical point of view there is a lack of valid interpretations.

Clusters do exist, their number is on the increase and cluster related policies gain importance from day to day. What are the reasons for such a success? It is important to give an explanation for the existence of clusters and for their success. Such an explanation should not be limited to the circumstances of public or local policies but faces the economic and social conditions of the generation and the reproduction of innovations. If such an analytical point of view is adopted, it turns out that the existence of clusters seems in fact to rest on three important factors, which largely return to the most traditional elements of economic analysis:

- first of all, *economic relations are embedded in social networks*, and the latter often have strong territorial bases. From this perspective, localised networks of innovation are explained not so much by the functional necessity of face to face contacts in order to exchange knowledge. Rather do they exist because the co-operation is established between researchers or engineers who belong to different organizations but have graduated from the same university or belong to the same social or family network (Grossetti and Bes, 2001). Geographical proximity is more an economic cause of spatial agglomeration than a social effect deduced from the embedding of economic relations in inter-individual relations (it is not enough to put two agents face to face within the same space to obtain synergies, it is also necessary that they belong to the same network or share common representations). Moreover, it is clear that the passage of time and the history of the localised systems largely condition the success of the local interactive processes ;

- then *the geographical framework of economic interactions is (very) largely conditioned by the interplay of the institutions*. However, today geographical proximity seems to be a powerful factor for legitimizing these institutions (self-valorization of the local). Thus local policies institutionally produce geographical proximity as a privileged mode of economic interactions. The quest for synergies between local actors has become the basis of most local development policies. Evidence thereof are technopoles, technological parks or poles of competitiveness, which are created with large public subsidies and often lead to a co-localization of the agents without notable synergy effects. In fact, recently carried out investigations of inter-firm co-operations show that, in the majority of cases, the firms cooperate with organizations not located in the same area, (Freel, 2002; Tether, 2002) and that interactions of proximity are relatively weak.

- finally, if we now come to the existence of clusters, we must be aware that *very often completely traditional economic factors can explain the success of these local agglomerations*, even in the absence of any strong synergies (see Gordon and Mc Cann, 2005). We will mention just three of them. The first rests on attractive real estate prices: often real estate prices are kept on very

attractive levels by the public authorities in order to attract companies or research laboratories, which see there an opportunity to settle and operate cheaply. The second lies in a series of above all financial and fiscal advantages (tax rebates, temporary or full relief, exemptions etc.). These are offered by local communities with the aim of attracting companies and leading them to settle in a special zone. The last, which should not at all be neglected, is the argument about local labour markets, as put forward by the New Geographical Economy (Krugman, 1991). It is obvious that companies seek the proximity of firms working in the same field or in related sectors as they aim at finding a reservoir of workers that are skilled and available on the local market. This point was particularly underlined in the case of the most qualified engineers and of the *star scientists*.

Conclusion

This work aimed at reconsidering the definition of clusters and to contribute some elements of comprehension to their success, both from an analytical point of view and from the viewpoint of public policy. After having evaluated the range of the concept and cast a critical eye on the theoretical bases and applications of clusters in terms of industrial policy, it seems possible to draw a first conclusion from this analysis. The existence of and the interest in clusters stem from three essential factors, which have nothing to do with the transmission, of whatever kind, of innovations, as is often claimed. The first factor is the embedding of economic relations in strongly localized social networks. The second is the part institutions play in setting up the geographical framework of economic interactions, and the third is the more traditional factor of local attractivity due to land prices, taxation or local labour markets.

However, as they allow to reflect the organized character of innovation at the local level and to imagine adapted support policies, the success of clusters is not due to chance. Supported by public recommendations such as the stipulation of standards, support for start-up companies, R&D or technology transfer and forming the basis of a local innovation policies concentrating on certain dimensions of technology, they can be regarded as the driving forces of a regional or even national systems of innovation. Given this result we shoul ask the following. Aren’t clusters most useful as tools of public policy, where these local systems reveal their full potential and show their real usefulness? Isn't it the principal interest of this concept in its operational character? This is what the success of clusters in finalized public actions suggests.

Bibliography

Acs Z., 2002, *Innovation and the Growth of Cities*, Edward Elgar, 247 p.

Bathelt H., Malmberg A., Maskell P., 2004, "Clusters and Knowledge: Local Buzz, Global Pipelines and the Process of Knowledge Creation", *Progress in Human Geography*, 28, 1, 31-56.

Dunning J., 2000, *Regions, Globalization and the Knowledge-Based Economy*, Oxford University Press, Oxford.

European Urban and Regional Studies, 2005, n° spécial : *Clusters and Change: Endogenous and Exogenous Influence on Regional Growth Dynamics*, Lorenzen M. (ed.).

Feser E.J., 1998, "Old and New Theories of Industry Clusters", in Steiner M. (ed.), *Clusters and Regional Specialisation*, Pion Ltd, London.

Foray D., 2000, *L'Économie de la connaissance*, Repères, La Découverte, Paris.

Freel M., 2003, "Sectoral Pattern of Small Firms Innovation, Networking and Proximity", *Research Policy*, 32, 1-20.

Grossetti M., Bes M.P., 2001, "Encastrements et découplages dans les relations science-industrie", *Revue Française de Sociologie*, 42, 2, 327-355.

Gordon I., Mc Cann Ph., 2005, *Clusters, Innovation and Regional Development*, mimeo London School of Economics, London.

Karlsson et al., 2005, *Industrial Clusters and Inter-Firm Networks*, Edward Elgar, London.

Krugman P., 1991, "Increasing Returns and Economic Geography", *Journal of Political Economy*, 99, 3, 483-499.

Markusen A., 2000, "Des lieux-aimants dans un espace mouvant : une typologie des districts industriels", in Benko G., Lipietz A. (éds.), *La richesse des régions. Pour une géographie socio-économique,* PUF, Paris.

Martin R., Sunley P., 2003, "Deconstructing Clusters: Chaotic Concept or Political Panacea?", *Journal of Economic Geography*, 3, 1, 5-35.

OCDE, 2001, *Innovative Clusters, Drivers of National Innovation Systems,* OCDE, Paris, 420 p.

OCDE, 2005, *Business Clusters, Promoting Enterprise in Central and Eastern Europe*, OCDE, Paris, 242 p.

Porter M., 1990, *The Competitive Advantage of Nations*, The Free Press, New York.

Porter M., 2000, "Locations, Clusters and Company Strategy", in Clark G., Feldman M., Gertler M. (eds.), *The Oxford Handbook of Economic Geography*, Oxford University Press, Oxford.

Taylor M., 2005, "Clusters: the Mesmerizing Mantra", communication au colloque *Regional Growth Agendas*, 28-31 mai, Aalborg, Danemark.

Tether B.S., 2002, "Who Co-Operates for Innovation, and why? An empirical Analysis", *Research Policy*, 31, 947-996.

Torre A., Rallet A., 2005, "Proximity and Localization", *Regional Studies*, 39, n° 1, 47-60.

World Bank, 2002, http:/www.worldbank.org/poverty/scapital/whatso.htm .