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# Clusters and temporary geographical proximity

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## Introduction: from polarization to clusters

The works of Perroux, Myrdal or Hirshman, as well as concrete observations and field interventions have, for a long time, convinced economists of the importance of the phenomenon of polarization and of the benefits of studying spatial concentrations of both productive and innovative activities. But the central significance of the geographic agglomeration of economic activities remained beyond the understanding of mainstream economists for one simple reason: the impossibility of modelling the spatial concentration of activities on the basis of the equilibrium theory according to which the medium term development of one part of the economy at the expense of the other is impossible. It was not until the publication of Krugman's works (1991), the introduction of the Dixit-Stiglitz model of imperfect competition (1977) and the recent advances in international trade theory, that this dogma was destroyed, allowing for the introduction of a universal model enabling mainstream economists to take into account the phenomena of spatial agglomeration.

With the return of polarization, and the emergence of poles of competitiveness and other networks of excellence, cities, local systems of production, rich regions, under-developed countries found their place in the world of economics and were integrated in models that were coherent with the corpus of neoclassical economics as a whole. In parallel with the development of Economic Geography, a similar shift occurred a little later and had an impact on the analysis of local concentrations, and of the processes of economic development, by underlining the importance of the phenomenon of spatial concentration of innovative and research activities. The force behind this shift was Porter's works (see, for example, Porter 2000) on clusters. Porter's works have had an even greater impact than those of Krugman, as they are not limited to economics but also directly influence politician's decision-making at local and national level. Clusters are today considered as the basis of local, and even national, politics in many countries (UK, Germany, the Netherlands...). In France, for example, they serve as a basis for reflection on local systems of production, and are comparable to the new Poles of Competitiveness. Even more surprising, they are often considered by the great institutions of the global economy as major tools of development (see OECD, 2001 and 2005, or the World Bank, 2002).

Although one can easily understand how the New Economic Geography have contributed to enrich the Perrouxian approaches (the possibility of providing a credible model of the latter), that of Porter is far less clear and its implications more intriguing at first glance. Indeed, Porter's theories share a disturbing similarity with concepts carefully developed beforehand by different schools of thought of the spatial or industrial analysis. These include, to mention a few: the concepts of growth poles, industrial districts, localised production systems and milieus in the field of production, or the technopoles, technological districts and innovative milieus in the field of innovation activities.

The success of the notion of cluster, of its applications and variants gives rise to mixed feelings (See *European Urban and Regional Studies*, 2005). Although the late rediscovery of obvious facts, and above all their being taken into account of by politicians and decision-makers have given us reason to rejoice, there is also adequate reason to question the validity of this concept and of the normative nature attached to it. In other words, if one accepts without question the idea that space is polarised, how much worth are the explanations for this concentration proposed by the approach in terms of clusters? And how does one evaluate the arguments defending the existence of this concentration and of the decisions favouring it?

This article has one purpose: to question the relevance of the concept of cluster. More particularly, we propose to re-examine the concept of clusters basing ourselves on the main theoretical foundations of the economics of proximity. We believe that this re-examination will enable us, first of all, to qualify the validity of the cluster-based approach, and second of all to re-think the principles of the spatial concentration of innovative activities on the basis of more classical factors of concentration such as the local labour markets, the window dressing effects or tax or real estate related advantages. In the first section of the paper, we propose a critical presentation of the notion of cluster in terms of proximity analysis, and show how using two types of proximity (geographical and organized) can qualify the central significance of clusters as tools of knowledge transfer (I). In the second section we discuss about the relations between organized proximity and temporary geographical proximity on the one hand and clusters formation on the other hand, and conclude with a presentation of the more profound causes of the processes of spatial concentration of research and innovation activities (II).

## **I. A critical assessment of clusters in terms of proximity analysis**

It has been underlined in the literature that clearly defining clusters and their boundaries is problematic, and that one can hardly give a convincing analytical interpretation of their existence, whether in terms of the conditions of knowledge diffusion, of the definition of the geographic boundaries of clusters or of the relevant type of technology (see for instance Feser, 1998; Martin and Sunley, 2003; Taylor, 2005). Yet, one cannot easily deny the existence of concentrations of innovating firms and laboratories in the same geographic areas, nor that of clusters, even though the latter are the consequence of policies promoting their creation. The spatial concentration of innovation activities and research within small areas has become an undeniable reality, but one that has not been satisfactorily interpreted from a theoretical point of view.

It is therefore necessary to provide an explanation for the existence of clusters and their success, an explanation that does not merely take into account public and local policies but also the economic and social conditions of the genesis and reproduction of innovations. It is for this purpose that we mobilise the foundations of proximity analysis, which we believe, can

provide relevant answers to the question of the existence of clusters. By revealing the negative aspects of geographical proximity, this approach will also enable us to point to certain limitations of the policies promoting networking between local actors.

### *1.1. Geographical and organized proximities: a reminder*

Let us start by mentioning the foundation stones on which the analysis of proximity is based, such as they are defined by Torre and Rallet (2005) for example.

We retain a simple definition based on the distinction between two types of proximity, called geographical proximity and organized proximity respectively (Gilly and Torre, 2000; Pecqueur and Zimmermann, 2004). As its name indicates the former is geographically based whereas the other is not. It is the nature of both types of proximity that distinguishes them.

- *Geographical proximity* expresses the physical distance between two entities (individuals, organisations, towns...) weighed by the cost in time and money of covering that distance. It has two main characteristics:

- It is binary: Naturally there are infinite gradations (more or less far from, more or less close to) but the purpose of examining geographical proximity is to determine whether one entity is “far from” or “close to” another.

- It is relative, doubly relative: Firstly the geographical distance on which the distinction between proximity and distance is based is relative to the means of transport available to get from one point to another. We weigh the physical distance by transport time and/or cost. Secondly, geographical proximity is not objective. Individuals make a “judgement” of the distance that separates them. However, although it is social in nature (determined by the means of transport available) and subjective (based on a judgement), geographical proximity can be, at a time  $t$ , considered as a given element of physical space representing a constraint that is imposed, at that time  $t$ , on the actors to undertake their actions.

- *Organized proximity*, which is relational in essence, is understood as the ability of an organisation to make its members interact. The organisation facilitates interactions within itself, or at least, makes them easier than with entities situated outside the organisation. Two main reasons explain this:

- Belonging to an organisation translates into the existence of interactions between its members, inscribed - as the evolutionist language puts it - in the *genes* or routines of the organisation. This is what is called the *logic of belonging* of organised proximity: two members of an organisation are close to each other because they interact, and because their interactions are facilitated by the (explicit or implicit) behavioural rules or routines that they follow. Thus, other things being equal, cooperation will, *a priori*, develop more easily between researchers and engineers belonging to the same firm, the same technological consortium or the same innovation network.

- The members of an organisation are said to share one system of representations, or set of beliefs<sup>1</sup>, and the same knowledge. This social relation is mainly tacit. This is what is called the *logic of similarity* of organised proximity. Two individuals are considered close to each other because they “are alike”, *i.e.* they share a same system of representations, which facilitates their ability to interact. Thus two researchers belonging to the same scientific

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<sup>1</sup> This obviously does not mean that all the beliefs of the members are identical but that there is a common core of beliefs through which the organization identifies itself as one collective entity. Furthermore, the common corpus of beliefs can be based on the representation of the organization as a place of conflicts.

community will be able to cooperate more easily because they not only share the same language, but also the same system of interpretation of texts, results...

These two logics are partly complementary, and partly substitutable. They are complementary in that the shared representations limit the possibility of interpreting the formal rules differently and thus make coordination effective through rules, whereas interactions founded on tacit representations are generally based on a minimum number of explicit or tacit rules (for example conventions or contracts between scientific laboratories). But the *logic of belonging* and the *logic of similarity* are also partly substitutable: in an informal community, that is an organization with no strong explicit rules, a low level of cooperation between the members can be compensated by the existence of strong behavioural cohesion and of converging representations that facilitate interaction. It is the case of communities of researchers, which are not highly structured formally but characterized by a strong cohesion resulting from an international homogeneity in their members' levels of education.

### 1.2. Clusters and Proximities

The intersection of both types of proximity provides a framework for analysing the different models of spatial organization of activities. Thus the “winning” clusters are characterized, just as industrial districts, by the existence of both organized proximity and geographical proximity. Not only are the cluster’s firms located in the same area (geographical proximity) but they are also closely interrelated and form strong relationships with one another – in terms of technology exchange and knowledge transfer, naturally. This is the ideal situation which all decision makers dream of reproducing in their zone of influence...

Unfortunately, although the model represented in the central box of figure I is widely discussed in economic literature, it is but one model among others in the game of proximity and is not that common in reality. Indeed, organized proximity - which consists of functional relations (interactions) or relations between people sharing the same « identity » (common beliefs and cognitive maps) and which is based on organisation rather than location - often exists without any geographical proximity. Similarly, firms might be in a situation of geographical proximity without having organized proximity relations. These cases correspond to the other boxes of Figure I, which we are going to use as a reference point for our discussion.

**Figure I : Clusters and the two types of proximity**

	Organized proximity	
Geographical proximity	OP + GP = CLUSTERS	Geographical proximity
	Organized proximity	

Let us start with the “ideal” situation (clusters) in which both organized proximity and geographical proximity are combined. In this model, geographical proximity – which in this case cannot be distinguished from the co-location of activities in the same zone – is permanent in nature. Firms or laboratories are situated on the same site and therefore located at short distances from one another. Furthermore, these entities have formed relations of organized proximity, such as client-supplier relationships, exchanges of know-how or various cooperations. But how does this alchemy occur? A phenomenon which, according to the map of research and innovation activities, remains exceptional.

But what of the other boxes in Figure I? What do they teach us about how clusters should be analysed and about their possibilities of existence?

As far as geographical proximity is concerned, it cannot alone ensure interactions between actors, and even less facilitate knowledge transfer at local level. In situations where geographical proximity exists but organized proximity does not, the economic actors are concentrated in the same area but are not directly related to one another. Although it might facilitate interaction (random meetings for example), geographical proximity is not in itself a coordination tool. Many development projects of this type, prematurely called technopoles or parks of scientific activities, have ended up as cathedrals in the desert because they were founded on geographical proximity alone. Not only does the emergence of synergies prove extremely difficult to foster, but a lack of roots in their new local environment prompts many newly settled enterprises to relocate again. All it takes for these firms to move somewhere else, and in the process ruin all hopes of creating a cluster locally, is for them to believe that relocating somewhere else – in proximity of a larger firm for example – will be more advantageous.

Analysing this case, which clearly shows that geographical proximity or institutional interventions cannot alone ensure the creation of interactions, helps eliminate the confusion between agglomeration and localized relations, a confusion that can too often be found in empirical literature (see for example some studies on geographical spillovers, Feldman 1994, Jaffe et al 1993). Indeed, one cannot infer from the co-location of actors that the latter have relationships with one another, and even less that they have chosen to locate in the same place as others in order to find this type of relationship. Co-location, whether it is chosen or imposed, can result from very different causes, some of which prove absolutely unrelated to the wish to transfer knowledge or to the tacit dimension of the knowledge exchanged.

### *1.3. On the negative effects of geographical proximity*

To go further in the analysis of clusters, and evaluate the adequacy of the policies that promote them, it is necessary to take into account the negative aspects of proximity, and in particular of geographical proximity. This aspect, too often neglected in literature, is discussed by Boschma (2005) who shows that both types of proximity have their drawbacks; thus an excessive similarity in the references and skills of the firms belonging to the same network (and therefore too much organized proximity) may cause sclerosis and a loss of creativity, which can lead to their undoing when faced with competition; and strong community ties can sometimes cause segregation phenomena such as those affecting certain urban or peri-urban residential areas.

If we only bring in geographical proximity in our framework of analysis of clusters, we find that the co-location of innovating firms, situated in the same local innovation system, is likely

to generate various problems, which can be divided into three categories. They are obstacles to the promotion of clusters as tools of knowledge diffusion policy.

1) The first type of difficulty is that related to the geographical closeness of the firms situated in a local innovation system. We have examined, above, the scope and limitations of the approaches that insist on the diffusion of innovation and of knowledge at local level and consider this characteristic as an opportunity for the development of the system as a whole. But in fact, the inverse result can occur as well. Indeed, as the economic intelligence approach has shown, geographical proximity between competitors can be highly negative for firms that produce high tech innovations. This is particularly true in clusters of similar activities, i.e. clusters dedicated to one specific industry and its related activities, or clusters of firms with complementary activities related to the same production chain. In this case, knowledge leaks and industrial espionage, as well as the recruitment of engineers specialised in high technologies, are facilitated by the geographical closeness of the firms. These practices, which are common in technopoles for example, not only do not facilitate the development of the local system, but also endangers the efforts for innovation and their potential benefits. They may even discourage firms from innovating or prompt them to relocate to a safer environment.

2) The other type of difficulty is the risk of negative *lock-in* of the system. Indeed, although the virtues of spatial *lock-in* processes have often been extolled, this circular mechanism can perfectly have the inverse effect and negatively impact the system, locking it into a regressive spiral. Two undesirable situations may then occur. The first is related to the rigidity of the production trajectories engendered by a community that is more sensitive to its internal rules and regulations than to demands emanating from external actors and to changes in the outside world. Thus, some local innovation systems lock themselves into situations of extreme specialisation, or condemn themselves to mono activity, which places them at the mercy of changes in the competition conditions or in a position of having to face the obsolescence of certain production systems. This lack of flexibility, which results from the combination of geographical and organized proximity, can lead to the fall of “mature” clusters that are incapable of reforming themselves in the face of changes in the outside world. This is paradoxical for a self-proclaimed innovation system! This inflexibility goes hand in hand with the second scenario in which the system locks itself in a “localist” mindset. This risk, which threatens “small” clusters more than others, results in a reluctance to accept and integrate new comers, be they entrepreneurs or scientists, and therefore in some difficulty in renewing the human capital in the zone considered. Here again, it is the combination of both types of proximity that pose a problem.

3) Finally, and as Bathelt et al (2004) appropriately underline, it is quite possible that the inter-firm ties existing within the cluster, however many there might be, might be unfavourable to knowledge and innovation diffusion. Indeed, as noted by these authors, in dynamic clusters there is a risk of routinisation of the internal relations between firms, with a growing preference for relations with outside actors. In this case, the local relationships often rest on weak ties. Indeed, the firms, though they share the same knowledge base, are merely present there and only communicate with each other in relation to the realization of the daily tasks. This low level of exchange (or local buzz), although it serves the cohesion of the system, can only be conducive to incremental innovations and does not facilitate knowledge transfer or promote effects of synergy in terms of research and innovation. Yet, exchanges with external actors (or global pipeline) could prove much more beneficial in terms of innovation policies, as they can generate radical innovations that can be transferred between distant firms. It is at this level that strong ties can be formed between organisations possessing different skills and knowledge.

## II. Clusters: back to the basics

Analysing the concept of clusters from the perspective of proximity has enabled us to understand the reasons why the organisational and institutional dimensions are determinant for the success of clusters. We have also found that geographical proximity also has negative aspects that can lead to promiscuity; indeed, far from contributing to the success of knowledge transfer, it can on the contrary cause the senescence of the local systems by preventing them – through its excesses – from renewing themselves.

Here again, analysing clusters in terms of proximity will help us identify the logic behind other forms of functioning, and above all understand what makes them credible systems of knowledge and innovation diffusion. We will then be able to get back to the question of clusters and will identify more easily the reasons for their existence and their success, which are less related to the need to facilitate the transfer of knowledge, than to more traditional localisation factors.

### *II.1. The fundamental role played by organized proximity relations*

The analysis of the various projects of development of local innovation systems undertaken around the world reveals one constant: Geographical proximity alone is not sufficient for the creation and the proper functioning of clusters; it must be activated by organisational and institutional actions (Filippi and Torre, 2003). In other words, to realize the full potential of geographical proximity, it is necessary to mobilize the logic of belonging and the logic of similarity of organized proximity:

- From the organizational point of view, this implies the implementation of collective actions at local level, and above all of common projects. The latter may consist in collaborations between different firms or laboratories for the joint development of products, in technical support or mutual help provided within the community, or in cooperation projects jointly undertaken by firms or research laboratories. The local skills and knowledge serve one goal shared by a group of co-located participants. It is under these conditions that the potential benefits of geographical proximity can be realized and contribute to the development of synergies within the local system. *Here, geographical proximity appears to be activated by the mobilization of the organized proximity's logic of belonging;*

- But the role of the institutional dimension in the mobilisation of the potential benefits of geographical proximity must not be underestimated. As the example of the Hshinsu Technopole (in Taiwan) has shown, public incentive policies alone are not sufficient. The emergence of synergies within a local system that was created *ex nihilo* depends on one main condition: the members must already be related to one another, they must share representations or have a common goal for the future. It is the case in Hschinsu with common references to common values such as mutual solidarity between members of the same ethnic group. Thus, *it appears that geographical proximity is activated by the mobilisation of the organized proximity's logic of similarity.*

Another important factor is the role played by history and time. Longhi has shown (1999) for example, that in the case of Sophia Antipolis, it was over time that a local network of innovation and knowledge transfer was developed. Indeed the transition from the juxtaposition of R&D activities – attracted by tax related advantages – to a system characterised by organized relations, was made possible by the evolution of interactions between people. The relationships between the local actors were woven little by little; young

employees of the laboratories have created start-ups linked to mother companies and the children of managers and researchers, brought up in the region and educated in the local universities or engineering schools, now have deep roots in the region and wish to live and work in the Nice metropolitan area, so as to take advantage of their network of contacts and relations. The logic of similarity is at play here, with the gradual creation - through successive trust producing interactions - of relations of belonging and of common representations.

## *II.2. Temporary geographical proximity*

But there is another, stronger, argument in favour of the non-constitution of clusters. It is that of temporary geographical proximity. Far from denying the role of space in the implementation of innovation processes, recognizing the existence of moments of temporary geographical proximity helps put in its rightful place the need for face-to-face interactions, which though undeniable, does not justify the systematic creation of clusters entirely dedicated to this type of activity. The finding underlying this approach is the following: Thanks to increasing mobility possibilities, the need for geographical proximity, which is real for certain types of interactions - in particular for services or the sharing of knowledge - can be fulfilled temporarily through travelling, without the interaction leading to the permanent co-localization of the partners. Individuals' mobility enables them to have face-to-face interactions during which information and knowledge - particularly tacit knowledge - can be exchanged; exchanges which in no way necessitate the constitution of clusters.

Firstly, as several studies have shown (Weterings, 2005; Gallié and Guichard, 2005), the need for geographical proximity is generally not permanent in innovation and knowledge production activities. It concerns certain phases of the interaction and depends on the firm's or innovation's life cycle: the phase of negotiation in a transaction, the definition of guidelines and the organizational framework of cooperation, the realization of its initial phase in the case of a technological alliance, the necessity to share equipment in the experimental phase of a common research project or to exchange knowledge and above all to know personally the researchers (colloquium) belonging to a scientific community, the implementation of common scientific protocols... Geographical proximity can become necessary when the complexity of a project increases; or it might prove necessary in order for the participants to a project to be able to validate their trust in each other, a validation which is difficult to achieve from a distance. Short or medium-term visits are then sufficient for the partners to exchange - during face-to-face meetings - the information needed for cooperation or for the construction of trust. Thus, permanent co-localization is not necessary even for activities where physical interaction plays an important role in the coordination. This is what we call the need for temporary geographical proximity (Torre and Rallet, 2005).

There is no denying that face to face relations remain indispensable for certain types of interactions, in particular to solve problems related to the heterogeneity of reasoning modes or those related to the processes of deliberation and negotiation. However, the intensity of the need for face-to-face relations varies according to the phase of the process, as shown by the example of transfers of technology in the sector of bio-technologies (Gallaud and Torre, 2004). In this sector, the cooperations between firms consist of successive phases that condition their relation to space. The role played by geographical proximity diminishes with time. It is complementary of organized proximity during the phase of co-production of fundamental, tacit and contextual knowledge. Its role diminishes subsequently during the phase of absorption of the knowledge produced during the scientific phase, which implies a re-contextualisation of the latter in order to test it in various situations. Finally, it is often



replaced entirely by organized proximity in the phases dedicated to the design of prototypes and clinical trials or to the codification of research results. Only two types of situations necessitate face-to-face interactions:

- The launch of innovative projects, in particular in cases where the actors have very different knowledge bases and where the project is not very structured (Rallet and Torre, 2000);
- Cases of conflict management between innovators (Gallaud and Torre 2004), proximity facilitating consultation between the participants regarding the use of communication tools.

These moments of temporary geographical proximity can occur, as we have just seen, in the context of face-to-face meetings between people involved in the same project. But they are also made possible by organisations whose purpose is precisely to enable people to meet, to exchange information and knowledge. Fairs and congresses, for example, enable firms to meet, exchange ideas, and give them an opportunity to develop trust with each other. There is indeed geographical proximity here, but it is organized by institutions that specialise in this type of activities. The same solution to a similar problem is provided by conferences of researchers or of high tech specialists, during which projects or collaborations are conceived, and during which individuals can build trust relationships that can later be developed from a distance. Here again, geographical proximity combines with the effects of organized proximity developed with the help of organisations that specialise in this task.

The recognition of the existence of a temporary geographical proximity based on individuals' mobility has direct implications on the question of clusters, as it calls into question the necessity for firms involved in an interactive research or innovation process to be located in the same area. Indeed, the needs for permanent or temporary geographical proximity are then different according to whether the firm faces a problem related to a choice of location or to the search for a new partner for an innovative project (Gallaud and Torre, 2004):

- In the case of firms entering a new sector, the choice of location varies according to the size of the enterprises. Large, multi-unit firms can choose to set up their R&D department in a single large laboratory, thus benefiting from scale economies and avoiding the duplication of research programs; or they might prefer to create several small laboratories in proximity of their main clients, in order to more quickly understand the latter's needs. SMEs, however, because of limited financial and human resources, have to locate in proximity of other firms or organizations whose role in terms of innovation is crucial;

- In the case of firms that are already established and which are not necessarily located in proximity of organizations with which they wish to cooperate on innovation, there are several possibilities: create a joint venture, relocate the staff in charge of innovation projects, either for the whole duration of the projects or only for short periods of time. The most frequently chosen solution consists in simultaneously assigning some employees to different projects located in different areas, the employees in question travelling to the different locations when necessary.

Thus, the bigger the firm, the more easily it adjusts its localizations to the temporal nature (permanent, temporary...) of the need for geographical proximity. Thus, big firms can more easily fulfil the need for geographical proximity by de-localizing part of their staff, including for relatively long periods of time; whereas smaller firms (very small enterprises or small SMEs) are often forced to adopt a permanent co-localization even when they only need temporary geographical proximity. Big firms, group subsidiaries or universities can bypass the constraint of co-localization by sending teams of researchers or doctors for short or prolonged visits to distant research centres for example. These solutions are possible thanks to the important volume of human resources available to them. However, in the case of

smaller organizations, the need for geographical proximity is often a determining factor of localization, one person being appointed to tasks that are part of different phases of the R&D process. They are then forced to settle near other firms or laboratories, even if they only need geographical proximity during one phase of their R&D process. This raises a question: could clusters, as a form of organization, be more efficient for smaller, or less rich, firms than for others?

## *II.2. Clusters: the primacy of organized proximity and the return to the fundamentals of economics*

It is now apparent that geographical proximity is not a factor of coordination if it is not activated by organized proximity. In some situations, the latter can even prove sufficient for the establishment of interaction relationships. Thus, the central thesis of those who try to legitimise the primacy of clusters is largely invalidated; indeed, even tacit knowledge can, in certain circumstances, be transferred and shared from a distance. Could organized proximity alone be sufficient, and function without geographical proximity? Despite the fact that some authors exclusively praise the virtues of clusters, the answer to this question seems to be yes. This is evidenced by situations in which supra-local organized relations occur: multi-unit firms, global networks of firms, national or international professional communities... As it is not geographic in essence, the organization has the ability to “travel through” territories and to cross their frontiers. It is located in space, does not ignore territories, but is neither defined nor limited by them: a multinational firm is a good example of this type of organization. The coordination of these long distance relations rests on the sharing of norms and standards (such as ISO 9000 standards), the existence of formal rules and common representations and on individuals’ mobility.

Yet, not only do clusters exist, but their numbers are increasing and more and more policies are implemented to promote their development. What are the reasons for such a success? It is clear that the need for geographical proximity in the coordination of innovation and research activities, and in particular in the exchange of tacit knowledge, cannot alone explain the geographic concentration of actors. The existence of clusters rests on several other factors:

- Firstly, *economic relations are embedded in social network*, and the latter often have strong territorial roots. In this perspective, the existence of localized networks of innovation is less due to the functional need for face to face relations in order to exchange knowledge, than to the fact that cooperation occurs between researchers and engineers belonging to different organizations but originating from the same university or belonging to the same social and family network (see Grossetti and Bes, 2001; or Dupuy and Torre, 2006). Geographical proximity is not so much an *economic cause* of agglomeration as a *social effect* of the embeddedness of economic relations in inter-individual relations. Face-to-face interaction between two actors cannot alone generate synergies; the latter can only develop between two individuals who belong to the same network or share common representations. Furthermore, as the case of Sophia Antipolis clearly shows, the passage of time and the history of the localized innovation systems are key factors in the success of the local interactive processes;
- Secondly, *the geographical context of economic interactions is largely conditioned by the role of institutions*. And nowadays, geographical proximity appears to be a factor legitimising these institutions (valorisation of the local in itself). Thus, local policies produce geographical proximity institutionally as a privileged mode of economic interactions. The search for synergies between local actors has become the

basis for most policies of local development. This is evidenced by the development of technopoles, technological parks or poles of competitiveness created with the financial support of the public authorities, and which often lead to a co-location of actors without necessarily generating significant effects in terms of synergy. Indeed, recent surveys about interfirm cooperations show that in most cases the firms cooperate with organizations that are not located in the same region (Freel, 2002; Tether, 2002) and that proximity based interactions are relatively rare.

- Finally, with regard to the life of clusters, it is important to remember that the success of these local agglomerations - even in the absence of strong synergies - can often be explained by traditional economic factors - in which case there are no strong synergies between the different firms located in the agglomeration (See Gordon and McCann, 2005). We shall discuss three of these factors. The first is related to attractiveness based on land prices: the public authorities often maintain the prices of plots at attractive levels in order to attract enterprises or research laboratories, the latter seeing in these low prices an opportunity to set up and function at a reasonable cost. The second factor lies in a series of advantages, such as tax and financial advantages (tax abatements, temporary or permanent tax exemption...) offered by the local authorities in order to attract enterprises and convince them to set up within their zone of activity. The third factor, which cannot be ignored, is related to the New Economic Geography argument concerning the local labour markets (Krugman, 1991). Enterprises naturally seek to locate their activities in proximity of other firms that belong to the same or to related sectors of activity so as to be close to a pool of qualified labour available on the labour market. This point was highlighted earlier in the case of highly qualified engineers or “star scientists”.

## **Conclusion**

Based on the foundation stones of proximity analysis, our study has aimed to show that the important success of clusters in terms of industrial policy is rooted in geographical and organized proximity relations. The existence and relevance of clusters result from three main factors. The first factor is related to the embeddedness of economic relations into highly localized social networks, the second is that of the role played by institutions in the construction of geographical environments of economic interactions, and finally there are more traditional factors such as the attractiveness of some local areas in terms of land costs, tax, or labour markets.

Thus, because clusters offer an opportunity to ponder about the organized nature of innovation at local level and to think about appropriate support policies, they have experienced a success that has nothing to do with chance. Because they serve as a basis for the implementation of public recommendations such as the development of norms, aid to start-ups, R&D or technology transfer, and as a foundation for innovation policies destined to concentrate on certain dimensions of the technological phenomenon, clusters may be considered as a driving force behind regional, or even national innovation systems. Isn't it as tool of public policy that this type of local system reveals its potential and true value? Doesn't the main interest of this notion reside in its operational dimension? That is what their success with public decision makers, and in particular the policies adopted and implemented by the latter, lead one to believe; all the more so as clusters contribute to highlighting two main essential principles of the relation between innovation and space: 1) The innovation process rests largely on organisational and institutional factors, 2) innovation is not self sufficient and depends on the support it receives.



## BIBLIOGRAPHY

- 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.
- Dixit A. & Stiglitz J., 1977, Monopolistic competition and optimum product diversity, *American Economic Review*, 67, 3, 287-308.
- Dunning J., 2000, *Regions, Globalization and the Knowledge-Based Economy*, Oxford University Press, Oxford.
- Dupuy C. & Torre A., 2006, : Local Clusters, trust, confidence and proximity, in Christos P., Sugden R. & Wilson J. (eds), *Clusters and Globalisation: The Development of Urban and Regional Economies*. Edward Elgar, Cheltenham UK, Northampton USA.
- European Urban and Regional Studies*, 2005, special issue on “Clusters and change: endogenous and exogenous influence on regional growth dynamics”) (ed. M. Lorenzen).
- Feldman M. (1994), *The geography of innovation*, Economics of Science, Technology and Innovation, Kluwer Academic Publishers, Dordrecht, Boston, London, 155 p.
- Feser E. J. (1998), Old and new theories of industry clusters, in Steiner M. (ed), *Clusters and regional specialisation*, Pion Ltd, London.
- Filippi M. & Torre A., 2003, Local organisations and institutions. How can geographical proximity be activated by collective projects?, *International Journal of Technology Management*, 26, 2-4, 386-400.
- Freel M., 2003, Sectoral pattern of small firms innovation, networking and proximity, *Research Policy*, 32, 1-20.
- Gallié E.P. & Guichard R., 2005, Do collaboratories mean the end of face-to-face interactions? An evidence from the ISEE project, *Economics of Innovation and New Technologies*, 14, 6, 517-532.
- Gilly J.P. & Torre A., 2000, *Dynamiques de Proximité*, L'Harmattan, Paris.
- Grossetti M. & Bes M.P., 2001, Encastremets 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, Londres.
- Jaffe A.B., Trajtenberg M. & Henderson R. (1993), Geographic localization of knowledge spillovers as evidenced by patent citations, *The Quarterly Journal of Economics*, August, 577-598.
- Karlsson & 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.
- 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, 420p.
- OCDE, 2005, *Business clusters, promoting enterprise in central and eastern Europe*, OCDE, Paris, 242p.
- Pecqueur B. & Zimmermann J.B., 2004, (eds), *Economie de Proximités*, Hermès, Paris.
- 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 to the Congress “Regional Growth Agendas”, 28-31 May, Aalborg, Denmark.
- Tether B.S., 2002, Who co-operates for innovation, and why? An empirical analysis, *Research Policy*, 31, 947-96
- Torre A. & Rallet A., 2005, Proximity and localization, *Regional Studies*, 39, n° 1, 47-60.

Weterings A., 2005, *The effect of inter-organisational relationships and spatial proximity on the innovative performance of software firms in the Netherlands*, Communication to the Congress “Regional Growth Agendas”, 28-31 May, Aalborg, Denmark.  
World Bank, 2002, <http://www.worldbank.org/poverty/scapital/whatso.htm>