Routledge
Taylor & Francis Group

Economic Geography

ISSN: 0013-0095 (Print) 1944-8287 (Online) Journal homepage: https://www.tandfonline.com/loi/recg20

The Innovative Milieus Approach: Toward a Territorialized Understanding of the Economy?

Olivier Crevoisier

To cite this article: Olivier Crevoisier (2004) The Innovative Milieus Approach: Toward a Territorialized Understanding of the Economy?, Economic Geography, 80:4, 367-379, DOI: 10.1111/j.1944-8287.2004.tb00243.x

To link to this article: https://doi.org/10.1111/j.1944-8287.2004.tb00243.x

Economic Geography 80(4): 367–379, 2004.

The Innovative Milieus Approach: Toward a Territorialized Understanding of the Economy?

Olivier Crevoisier

Institute of Economic and Regional Research, University of Neuchâtel, Pierre-à-Mazel 7, CH-2000 Neuchâtel, Switzerland
olivier.crevoisier@unine.ch

Abstract: Space has always been more or less present in economic theories. Nevertheless, traditional approaches, as well as the so-called new economic geography, introduce space subsequently. Economic theories are first built independently of spatial and temporal contexts, for example, through costs varying according to distance. The innovative milieus approach is based on the ideas that space—or, more precisely, territory—is the matrix of economic development and that economic mechanisms transform space. This article describes innovative milieus as an ideal type that articulates three paradigms: the technological paradigm, which stresses innovation, learning, and know-how as the most important competitive advantages; the organizational paradigm, which emphasizes the role of networks, competition, and rules of cooperation, as well as relational capital; and the territorial paradigm, which accounts for the role of proximity and distance and stresses the idea that competition occurs between regions. The originality of the innovative milieus approach is that it considers these three paradigms as a whole, thus providing a stabilized set of concepts that allow for an understanding of economic development processes in their space and time contexts.

Key words: Innovative milieu, territory, innovation, learning.

Spatial economics, via the new economic geography (NEG), are in fashion. Authors, such as Krugman, have not hesitated to say that they are saving economic geography by applying the philosophy of economics to space! Nevertheless, representatives of NEG are frequently criticized, especially by geographers, for both their oversimplified or even simplistic conception of space and history and for their lack of knowledge of the work of geographers (see, e.g., Sheppard 2001; Sunley 2001). Although we can justifiably question what this movement is bringing to economic geography, we should not forget that some economists and social scientists have tried to build a so-called territorial approach to economic problems. The innovative milieu is one of them.

What is meant by a *territorial* approach? Spatial economics and NEG integrate space only in a second phase; the economic phenomena are first developed and conceptualized independently from their spatial and temporal contexts, and only then is space reintegrated, for example, in the form of costs linked to distance (Crevoisier 1996).

Research on innovative milieus was originated by economists and social scientists, not by geographers. It was one of the first in those fields (for the history and respective positioning of the various territorial innovation models, see Moulaert and Sekia 2003) to be used to state the spatial aspects of economic changes, and above all vice versa; that is, the way in which territory—via collectives of actors—shapes innovative processes and codetermines their evolution. Territory is understood as a space made up of a set of relationships between players (individuals or collectives) and between players and their material environment. This space is the subject of various intentions and appropriations that mark it. Territory is the result of the action of human beings on the

space over time—a space as it has been handed down to us by the actions of men and women in the past.

Using territory as a point of departure also means that all the elements of the economic system are not interconnected. There are aspects that are linked and those that are not, and those that more or less form a system and those that do not. In addition, each territory has unique, specific aspects and elements that are similar to those found elsewhere. Territories can thus be compared but never assimilated with one another. The process must, by its nature, be *situated* and *dated*. The utility of such a process is clear for the actors of the society (e.g., public authorities and companies) because they can grasp changes in economic activities primarily by means of a localized, specific reality.

Such an approach must not be confused with a simple "application" of economic theory, particularly economic theory. The main criticism of so-called territorial approaches is that they lack a rigorously formulated and integrated theory or deal only with case studies. This is by no means the case; a territorial approach to economic problems is based on a different epistemology that is becoming more and more clearly affirmed. In the wake of institutional approaches (Hodgson 1998), it is the consubstantial interdependence between theory and reality that researchers seek to assess that is at the heart of the innovative milieus approach. It is here that the research is clearly different from most work in economics today: work that still maintains a separation from the theory, on the one hand, and from its application, on the other.

This article presents the main concepts that constitute the innovative milieus approach. First, it briefly describes the general research program conducted by GREMI (the European Research Group into Innovative Milieus). Second, it presents an overall view of the conceptual framework developed by the group. This framework is an *ideal type* and should not be understood as a general theory of innovation. Third, it briefly summarizes the past two surveys conducted by GREMI on urban milieus and on the construction of natural and cultural resources.

The GREMI Research Program: A Reminder

The GREMI research program has so far been characterized by a close, systematic interaction between on-site work and theorization. Each inquiry, by producing examples and counterexamples, has made it possible to develop the concept of innovative milieus. During the first investigation, the innovative milieu was just a black box. In fact, in the mid-1980s, Philippe Aydalot's hypothesis was that "something," localized on the regional level, made it possible to understand why certain regions were more dynamic than others. GREMI I (Aydalot 1986) and GREMI II (Maillat and Perrin 1992) revealed what companies found in the region or beyond it during innovation processes. GREMI III (Maillat, Quévit, and Senn 1993) explored innovative networks and showed their spatial, local, and extralocal functionings; this survey made it possible to define the principle concepts. GREMI IV (Ratti, Bramanti, and Gordon 1997) was centered on comparing the trajectories of regions that are active in identical sectors (regional production systems for shoes, textiles, watchmaking, and the like). These regions, active in identical technological and market environments (i.e., the same sector), underwent singularly different types of evolution, ranging from disappearance to strong growth. The contrasts can nevertheless be explained by means of factors that are linked to the territory. The conceptual findings progressively developed around the notion of the innovative milieu took this point into consideration.

On the basis of Aydalot's hypothesis, the black box was thus opened and then filled, thanks to a close interaction between theoretical research and fieldwork. This taste for empirical research is certainly the binding factor within GREMI. Made up of researchers who focused on regional produc-

tion systems, the group was somewhat heterogeneous at the outset. What permitted it to remain alive is, without doubt, a common taste for empirical research and a willingness to question explanatory frameworks by means of case studies. In other words, induction based on reality took precedence over the desire to preserve schemes that were admittedly rigorous but were not in line with reality. The GREMI surveys are thus a perpetual questioning of developed concepts in which taking risks is accepted (Stengers 1995).

An Ideal Type of the Economic Development of Territories

On a theoretical level, the concept of the innovative milieu has moved from a black box to a *stabilized conceptual framework.* It does not constitute a definitive, formalized theory. Nevertheless, a consensus has been reached on the questioning (explaining the success of regions that develop and the failure of those that become blocked), the concepts (innovative milieu and innovation networks), and the methods (priority given to the inductive approach). Today, the innovative milieus approach systematizes the main questions related to spatial economic dynamics. It makes it possible to qualify the evolution of technology and the interactions between actors, on the one hand, and the spatial and temporal forms that these processes take, on the other hand.

The innovative milieus are articulated around three particularly important axes from the point of view of current changes: technological dynamics, changes to territories, and organizational changes. Each of these axes leads to the major concerns of the society and to a vast quantity of specialized literature. In this sense, the innovative milieu is an integrating concept, a synthetic analytical tool for analyzing and understanding current economic changes. Including elements of geography, techno-economics, and organizational aspects, it is not a specific academic discipline, but it does raise an original ideal type.

The Technological Paradigm

The *technological paradigm* stresses the role of technology and, more widely, of innovation within the current changes taking place in the economic system. In the countries of Western Europe, the high salaries and costs, in general, plus pressure by emerging countries, lead to the need for competition in the form of differentiation. The development of new techniques and new products is a way of preserving the competitiveness of these areas. *Innovation* cannot be reduced to investment in research and to developing or registering patents. Kline and Rosenberg (1986) clearly demonstrated that all the production functions are concerned; innovation can originate within a company's relationship to its market but also in its manufacturing processes or its related services. Linking the mobilization of various resources and competencies may eventually lead to economic success. Technically, innovation can be understood as the result of articulating the resources of the company and its environment: relations with companies upstream or downstream, the overall dynamics of the sector, the appearance of new techniques in other sectors, relations with other actors within or beyond the region, and so forth (see Figure 1).

Innovation is thus, above all, a process of differentiation from the competition: differentiation of the sector from others, differentiation of the company from its competitors, and so on. Differentiation in markets is impossible without differentiation of the underlying resources and the organization. Over time, innovation and *rendering the resources increasingly specific* (Colletis and Pecqueur 1995) appear as two sides of the same process. The processes of apprenticeship and of constituting new know-how are the long-term consequences of placing new products on the market and the creation of new techniques. The development of new products and new techniques over time provokes a progressive differentiation of types of *know-how* and the technical culture of the milieu in relation to its envi-

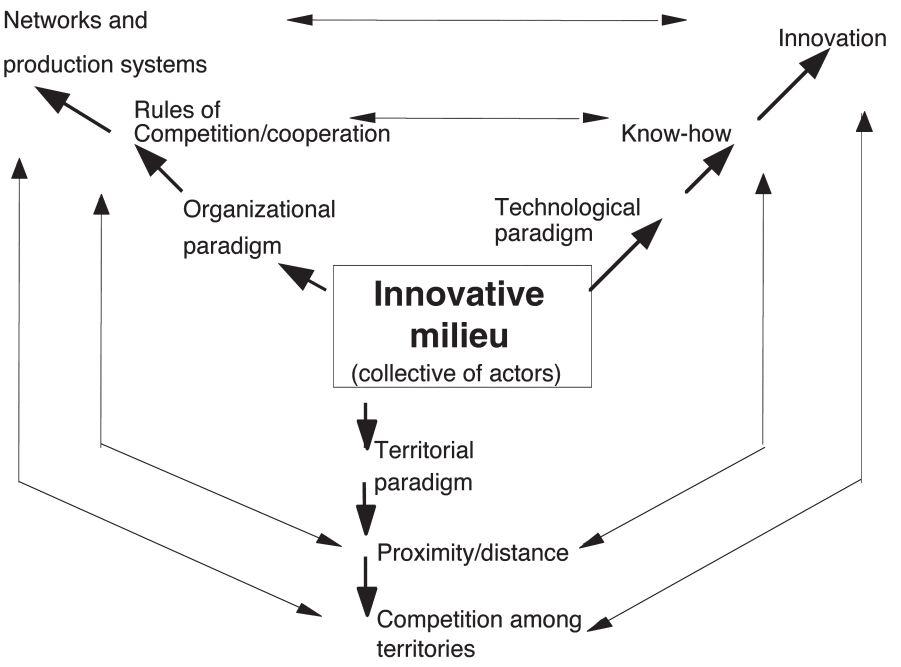

Figure 1. The paradigm of innovative milieus and development: territorialized economy.

ronment (Crevoisier, Fragomichelakis, Hainard, and Maillat 1996). In the field of specific resources, particularly of know-how in addition to its own dynamics, the company becomes largely dependent on its territorial environment—the resources that it can mobilize either nearby or farther away.

This process of becoming more specific and of differentiation must not, however, be understood as a progressive breakaway from the overall evolution of techniques and markets. Although the innovative milieu will certainly be based on a certain number of routines and on knowledge accumulated in the past, it will go beyond them. It is this process of going beyond that is at the heart of innovation. Innovation is the result of mobilizing part of these resources to design and implement an innovative project. It is thus a process of *rupture/filiation (or break/continuity)* that characterizes the evolution of techniques and products: a vision that approaches the Austrian school of innovation and economic evolution (Gaffard 1990).

The Organizational Paradigm

The *organizational paradigm* takes into account the mechanisms that permit or prevent coordination among actors within a milieu. A company, particularly a small- or medium-sized enterprise (SME), is never more than one element inserted within a production system and a territorial system. This insertion, however, takes place through the establishment of relations with other companies within its environment that supply its inputs or purchase its products and services. It also takes place by means of a territorial anchoring that permits the company to mobilize resources and to take its place in the local innovation and support networks within the regional production system.

The coordination mechanisms are at the heart of the innovative milieus, since they express the functional and territorial aspects. To describe the local rules concerning competition or cooperation is to express the functional complementarities and the division of labor that are organized locally. These

local networks also contribute to maintaining and reproducing the border between the milieu and the exterior, in the sense that they define which actors constitute part of the local coordination system and which do not. This special capacity for coordination is also essential from the point of view of competition with other production systems. Competitiveness is as much a result of the organizational capacity for adaptation as it is of the technical content of the know-how, products, and procedures.

Beyond the capacities for coordination, the functioning of the milieus generates noncommercial interdependencies over time or a *collective* that is the result of the progressive emergence of a division of labor and of modalities of cooperation. Cooperation is not permanent, but it leads to the constitution of *relational capital* in the sense that the local actors identify specific resources and know-how to gain access to them. The existence of relational capital indicates that the ways of mobilizing resources are not of a monetary nature alone. Values (entrepreneurial, family, and professional) that are in force within a milieu also lead the various actors to contribute to innovation and production with a view to a social investment that permits them ultimately to operate on a basis of trust and reciprocity.

This aspect of innovative milieus leads to other, more specialized, approaches to the problems of coordination, from Williamson's (1985) distinction among hierarchy, market, and network to the economics of conventions ("L'économie des conventions" 1989) and to more recent notions, such as untraded interdependencies (Storper 1995), governance (Stoker 1998), or economies of proximity (Torre and Gilly 2000). In more general terms, all these approaches are qualified as institutional economics (Hodgson 1998).

Work on coordination and spatial proximity has given rise to several explanations, none of which has been universally accepted (Grossetti, Autant-Bernard, Carrincazeaux, Corroleur, and Massard 2003). The *cultural* explanations stress the fact that socialization, on a regional basis, generates a certain number of common cognitive points of reference and behavioral norms. Other, *informational* explanations emphasize the low level of formalization of certain areas of knowledge, often qualified—in a somewhat questionable way—as "tacit." This low formalization would render face-to-face confrontation essential. Finally, *relational* explanations highlight the fact that organizations and formal institutions always need individual relationships. These are the embeddedness theories initiated by Granovetter (1985) or White (2002).

The innovative milieus approach makes no choice between the various theories; each can be pertinent in a given situation. It nevertheless stands out because it stresses the accent on the way in which these relations—which all refer to a former constitution, to a path dependency—are mobilized during the innovation process. This mobilization can be of a cultural, informational, or relational nature, or all three at once. It will revive part of these relations by making them evolve parallel to the innovation process, while rendering other relations outdated. Thus, the *rupture/filiation* process also concerns the forms of coordination among actors within a milieu and with the exterior.

The Territorial Paradigm

Innovation does not appear in space uniformly. The *territorial paradigm* takes these differences into account and shows that territory as an organization can generate resources (e.g., know-how, competencies, and capital) and the actors (e.g., companies, innovators, and support institutions) that are necessary for innovation. Know-how appears in the form of specific resources that are unique to certain territories and are regularly regenerated by economic activity and the various training, research, and more general support institutions that are present in the region. Know-how is not historical residue. In more general terms, local development capacities, such as entrepreneurial activity or strong links between the production system and the support institutions, are

treated as local constructs on the basis of particular local conventions that permit the milieu to become constituted as such and to respond in a more or less adequate way to changes in markets and techniques.

According to the innovative milieus approach, territory is understood as an organization that links companies, institutions, and local populations within a process of economic development. The approach stresses an *opposition between proximity and distance.* What is close (within the milieu) is either different (e.g., specific know-how) or better known and mobilized differently (competition/cooperation and relational capital) from what is farther away. This conception of proximity is, of course, always constructed and relative. It cannot be reduced to a short physical distance, but it certainly marks boundaries between what falls within the milieu and what is outside it. It is close to proxemics (Moles and Rohmer 1978) in the sense that the actors in the milieu will establish a hierarchy among the resources located nearby and those that are farther away. This is thus a question of spatiality and interaction between humans and their close or distant environment. What is close is the subject of less *uncertainty* (Camagni 1991), of better *knowledge*. Usually, we approach uncertainty by means of its temporal aspect, which leads to an irreducible lack of knowledge about the future. Uncertainty also has a spatial dimension, however: all things remain equal "elsewhere," and "elsewhere" is more difficult to know than is "here." This concept of proximity, constructed largely on the basis of human modalities of perception and of the constitution of knowledge, is different from the economies-of-proximity approach (Torre and Gilly 2000), which places a greater emphasis on the way in which organizations are deployed in space, constructing "organizational proximities" that take human cognitive capacities into account to a lesser extent.

The spatiality of innovative milieus thus naturally includes physical space, institutional space, and the like, but it also includes the space of consciousness, space as it is perceived and experienced. Local companies and the territory are linked within the regeneration of the specific local resources that mark the difference between one region and another on a level of innovation. It is in this way that SMEs are largely dependent on the resources that they can mobilize within their own milieu (Torrès 2003). It is the milieus that generate the economic activities. In this perspective, microelectronics would not have seen the day without Silicon Valley! Companies cannot be considered all-powerful entities that produce their environments unilaterally. For this reason, we speak of the *competition of territories* in the innovative milieus approach, not of competition among companies—a competition that is born of innovation on the basis of specific resources.

An essential element of the innovative milieus approach is that these three paradigms should be considered simultaneously as three aspects that cannot be dissociated from reality. There is thus no hierarchy that would mean, for example, that the organizational aspect is more important or imposes its logic over technology. This element differentiates the innovative milieus approach radically from other theoretical approaches, such as that of the industrial economy or that of transaction costs. In the industrial economy approach, the territory (proximity, distance, nation) is deduced from the functioning of the industry. It is the industrial dynamics that "produce" the space and give it its characteristics (Crevoisier 1996). Consequently, it is impossible to understand how a given space will structure industrial dynamics or acquire its own autonomy. Inversely, for geography, space comes first. Space is the basis on which populations, cities, and economies are based. A given innovation is never the fruit of a particular space. In the innovative milieus approach, the three paradigms are considered ontologically equal. This point is questionable for some geographers, who think that territory cannot be considered one pillar of economic geography or just a perspective for organizational and technological processes (Bathelt and Glückler 2003). This issue is not debated

in the GREMI approach, mainly because the research on innovative milieus originated in the fields of economics and the social sciences. To summarize, the innovative milieus approach proposes an overall vision of territorialized economic development that is characterized by competition through *innovation,* not through production costs; an *organization* of the productive system based on networks, not on hierarchical or market mechanisms; and competition among *territories,* not among companies.

The Rupture/Filiation Process

Having described the various areas that are given preference in the innovative milieus approach, I now discuss how the regional development process takes place within the perspective of innovative milieus. Over time, a milieu remains innovative by mobilizing the resources constituted by the past that are then adapted to new techniques and markets and are incorporated within new products: this is the *rupture/filiation* process (see Figure 2) mentioned earlier. This process is characterized by the interplay between the milieu, which has the resources (e.g., know-how and relational capital) and the innovative networks that mobilize these resources and bring them up to date by means of an innovation process. During the course of this process, the territory is alternately the *matrix* on which the innovation networks develop and the *imprint* left by these networks on the milieu's resources.

This rupture/filiation process supposes a movement between the "hardware" (i.e., the material and organizational part of the economic activities) and "software" (i.e., perceptions, representations, knowledge, and know-how) of regional economic structures. Innovation is considered as a cognitive process that has to pass through the human brain at one moment or another. In more precise terms, we can break down this cognitive process into two phases.

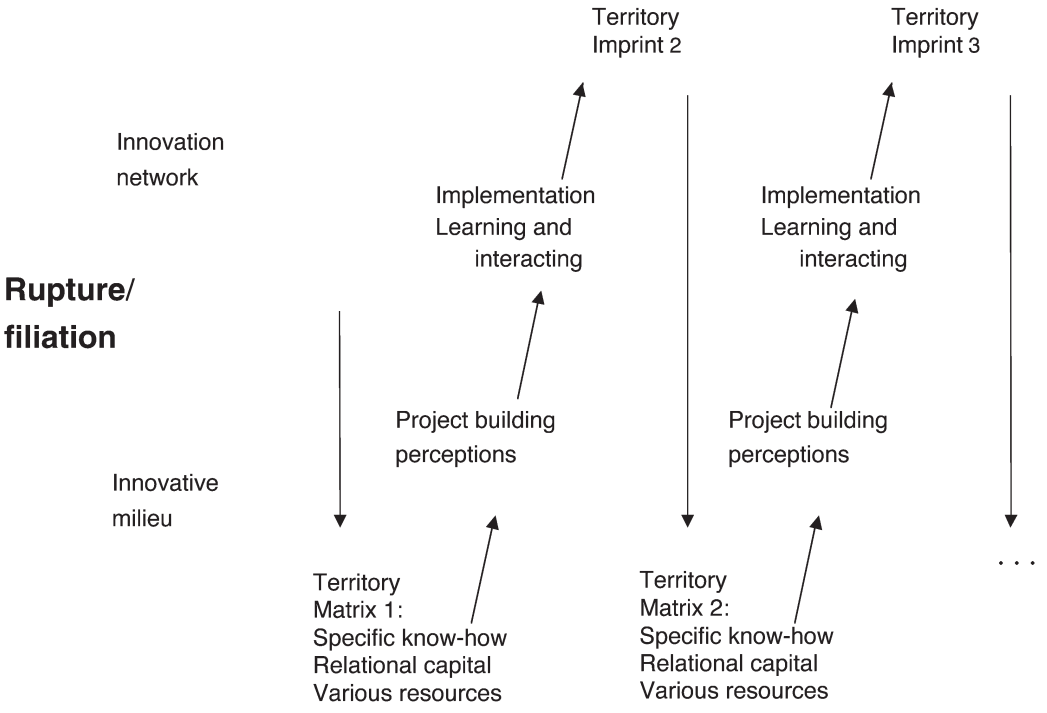

Figure 2. The rupture/filiation process of innovative milieus.

First, there is an apprenticeship process in the true sense of the term—the way in which a certain type of know-how, a competence reflecting the specialization of the milieu, is developed. This process requires human capacities for mastering, in a concrete way, production processes: capacities that include technical competencies but also relations with a clientele, organizational processes, and so forth. This know-how is one of the basics behind the differentiation of spaces. In fact, traditional examples of regions that have developed (e.g., "technopoles," industrial districts, and financial centers) are based largely on the *specific content* of knowledge on a regional scale. Moreover, this knowledge leads not to isolated individuals who are ready to move within space, but to collectives that are far less mobile.

The second phase of this cognitive process involves the capacity to perceive constraints on and opportunities in the markets and within the evolution of techniques and then, on the basis of the resources within the region, to imagine and formulate innovative projects. Hence, a region that has major resources does not necessarily constitute an innovative milieu. In this case, attitudes that reject innovation or new forms of organizing work, cultural or social differences, or simply the lack of imagination can block the emergence of innovative processes. The innovative milieu is characterized by a capacity, shared by a certain number of actors, to construct a joint representation of a possible project, to go through the necessary learning process, and to implement the new competencies thus developed in an effective way (see Figure 2).

Naturally, these two "phases" are closely interdependent. The identification of realistic innovative projects on the scale of international markets requires a consideration of the resources that can be mobilized in the region. The functioning of these elements brings with it a progressive and joint differentiation of the elements of the milieu in relation to its environment. The result is a milieu that possesses specific resources, rules for functioning, its own territory, and, on a deeper level, a technical culture and a culture of interdependencies. These elements are the imprint of the former functioning of the system. To the extent that the milieu remains dynamic, these elements once more become resources. An innovative milieu functions in a temporality of innovation and change while referring back to the former functioning of the system. There is a particular accent on *rupture/filiation*. The territory is both the imprint of the former functioning of the milieu and the matrix of its transformation.

Of course, the *entire* economy cannot be understood thanks to the ideal type developed earlier. Hierarchies exist and often become stronger. The markets frequently impose their own logic, breaking certain interdependencies. This vision appears necessary and sufficient, however, to grasp the basic problematic of the GREMI, that is to say the capacity to explain the differences in the trajectories of regional development. All in all, the innovative milieu appears to be a particular case within systems of spatial innovation (Oinas and Malecki 1999) that are potentially multiregional and multinational. The innovation processes can be understood only by considering the multidimensional context (e.g., economical, political, and cultural) and the multiscale context (local, national, and international) in which they take place.

This perspective seems close to Storper's (1997) "holy trinity" and to the subsequent developments that have been made on this base, especially by Bathelt and Glückler (2003). The perspective and developments developed in parallel. The main differences are the following. First, the innovative milieu is clearly centered on a collective of actors who act on space, technology, and territory. Second, it involves integrated and operational conceptual and methodological tools on a regional scale. The innovative milieus approach makes it possible to reveal these phenomena and explain them, but it does not provide a comprehensive framework about economic geography or regional science. In this respect, it is closer to other work: studies on industrial districts, for

example, that describe and explain the developmental trajectories of various industrial regions by placing particular emphasis on local coordination mechanisms or "technopoles" that are based on the creation and use of scientific and technical knowledge.

The more recent concept of the *learning region* (Asheim 1996; Asheim and Cooke 1999; Maillat and Kebir 1999; Boschma 1999) is also federative, but poses more problems from the viewpoint of empirical analysis. The specificity of the innovative milieus approach is that it is centered on the process of innovation and of rupture/filiation on the levels of both apprenticeship and coordination. A survey of innovative milieus begins with the—relatively easy—identification of the new products or technologies that have been developed in a region. The process then moves on to the networks and milieus. This approach mobilizes, above all, qualitative tools (semidirective interviews, in particular) and makes it possible to identify the ruptures and the filiations that mark the evolution of a production system. Some studies, however, have presented the effects of milieus in quantitative terms (see, e.g., Capello 1999a, 1999b). The concept of a learning region is looser and, to my knowledge, does not yet make it possible to reconstitute regional trajectories. As far as the more general positioning of the innovative milieus approach within the different trends of economic thought is concerned, readers would benefit from consulting in-depth work by Bramanti and Ratti (1997).

The innovative milieu thus constitutes an ideal type that makes it possible to compare the realities of the various regions. In empirical work, this approach makes it possible to position all regions. All regions do not possess innovative milieus; some of them are organized in networks of competition/cooperation but do not innovate, while others innovate, but local forms of cooperation are not identifiable. *The goal of the innovative milieu is not to exhaust reality, but to make it possible to decipher it within a world that is marked by innovation and structural change, by means of a local/global dialectic, and by an economy of networks.* As an ideal type, the innovative milieu makes it possible to understand the way in which what is local shapes what is global; by default, it makes it possible to understand the absence of autonomy in the development of a region.

Recent GREMI Surveys

The conceptual framework of the innovative milieu just presented has been stabilized since the GREMI survey on regional trajectories (Ratti, Bramanti, and Gordon 1997). Since then, the objective of the GREMI group has been to apply the innovative milieus approach to fields that are of particular interest. The GREMI V (Crevoisier and Camagni 2000) was dedicated to urban milieus, and the GREMI VI (Camagni, Maillat, and Matteaccioli 2004) focused on natural and cultural resources.

Urban Milieus: Innovation, Production Systems, and Anchoring

The city, understood as a social entity that is devoted to exchange, interaction, and economic efficiency, shares numerous characteristics with the milieus. First, proximity underpins scale economies but, under certain conditions, also presents advantages of a dynamic character, as revealed by apprenticeship, economic and social innovation, and creativity in general. A city always tends to be considered a privileged place for creating something new: the effect and cause of its economic and political power. Second, a city shares with a milieu its capacity to network and to work with what is local alongside what is global. Finally, the most astonishing similarity between the two concepts is the relational, synergetic element. As Camagni (2000, 2–3) noted:

> However, when we move on to empirical analysis, real cities have systems that are much more complex than non-urban milieus with industrial specialisations. In cities, economic activity is much more diversified, the physical

> environment is more of a constraint to the economic and social organisation because of land costs, mobility costs and labour costs; in general, the redundancy of relations is greater there and the price to pay for this redundancy is large in terms of money and collective wellbeing. Moreover, the size and form of cities have evolved directly in the direction of metropolisation. In a metropolis, the economic and residential activities no longer become organized into localised and easily identifiable sub-systems. The city, which has become complex, can virtually no longer be seen in terms of a local milieu: its territory is now divided into production systems that may possibly be organised in the form of *several* milieus.

The main question thus is as follows: to what extent and with what limitations can the city be interpreted as a milieu, and to what extent can we pinpoint, within the urban or metropolitan context, production subsystems that are capable of developing the collective processes of synergies and apprenticeships that we call milieus? In what way could the urban context be more efficient in these areas than regions, which are less densely populated but can nevertheless be equally well organized and certainly less costly? In clear terms, in what way would an *agglomeration*—typical of the urban environment—be more efficient than would the *proximity* that characterizes milieus?

Another aspect of this question is this: what are the relations between technological change and the urban context? By asking this question, the economic historian Mokyr (1995, 5) concluded, somewhat peremptorily and provocatively: "All the same, by questioning the assumptions underlying the hypothesis and looking in some detail at historical case studies, it is possible to show that easy generalizations about the positive role of cities in technological progress are historically false." Mokyr also stated that "a more careful examination of the evidence reveals that notwithstanding a priori arguments, urbanization has been neither necessary nor a sufficient condition for technological change" (p. 19). Applying the innovative milieus approach to this question allowed researchers to conduct empirical studies that yielded some results.

Studies carried out within the framework of GREMI V illustrate these different questions. The innovative milieus approach was applied to highly varied contexts: on the one hand, production systems within metropolises (e.g., communication, fashion, and logistics in Milan and fashion and finance in Paris) that are typical of advanced tertiary sectors and, on the other hand, regional production systems that are divided among urban and nonurban spaces within a region (e.g., logistics in Verona, tourism in Evora, and machine tools in Jura). It made it possible to distinguish among the differentiated trajectories that link the economic innovation processes, the modalities of competition/cooperation and of governance, and, finally, spatial organization. Naturally, these results are not exhaustive within the urban problematic: the city, the milieu, and innovation are relatively autonomous units and are articulated with each other only at certain times and under certain conditions. They nevertheless make it possible to shed light on some aspects of the city that are linked to economic production.

Cultural and Natural Resources: How Do "Objects" Connect to Production Systems?

There are plenty of natural or cultural "objects" in the environment, including natural heritage, knowledge, and works of art. It does not mean that these "objects" constitute *resources.* Only their integration into a production system make them productive. Therefore, the question is this: how does the identification and mobilization of an object take place, and how do players connect these objects to—eventually new—markets? At certain periods, one can assist in relinking objects bequeathed by history, more or less disconnected from economic activity, to new production systems. For example, the decline of mountain agriculture has left behind it landscapes and a heritage of culture and of buildings that in some regions have been rehabilitated and

revalorized for tourist uses. Such conversions, however, cannot be taken for granted. The capacity of local milieus to make use of the elements of their environment that were handed down by their history is often fraught with obstacles.

Thus, the way in which the production system deals with these resources influences "objects" and the endowment of the environment. Do we assist in their erosion or depletion or in the renewable growth of resources? Cultural heritage, for instance, whether material or nonmaterial, is particularly sensitive to the types of social processes that are applied to them.

Furthermore, the incorporation of "cultural" or "natural" objects in monetary circuits and the selling to customers of goods and services that have cultural content affect the global functioning of a local community. The ideal type of milieu made it possible to explore, in a systematic way, the various case studies (Camagni, Maillat, and Matteaccioli 2004). Let us take the example of a former asphalt mine that was converted into a tourism complex. The "object"—initially the ore and, in the end, the galleries, machinery, and cultural heritage—and the "production system"—initially a mining company with an international market and, in the end, the local tourism operators and cultural associations—interacted through time and space. These interactions and transformations shaped the resource and could be "read" in the case study through the ideal type of milieu. The latter appeared at certain periods, coupling abandoned galleries with potential tourism services and mobilizing regional expertise in the design of exhibitions (see Kebir 2004 for details). An interesting empirical result is that innovative milieus seem particularly effective in relinking abandoned "objects" at the local scale to new economic circuits.

Conclusions

The idea that regional milieus exist that favor or block innovation was developed and conceptualized by Aydalot in the mid-1980s. Today, the innovative milieus approach is a systematic tool for analyzing and comprehending the dynamics of spatial economics. To what extent does it remain up to date from the research point of view? We can identify two axes.

First, the approach, as it is formulated today, can be applied to various fields. The GREMI V survey (Crevoisier and Camagni 2000) attempted to build an understanding of the links between the urban context and urban dynamics, on the one hand, and the evolution of production systems (economic innovation), on the other hand.

The second direction taken by research, as yet barely sketched out, consists of reconsidering the concepts and theories of economic science from the territorial point of view. As I discussed earlier, the territorial approach to economics is based on the idea that the simplest notion cannot be conceived independently of its spatial and temporal contexts. In this sense, the innovative milieus approach made it possible to construct a more in-depth understanding of *innovations* that are based on territories. Nevertheless, there are numerous notions or economic concepts that should be reconsidered in this way; savings and investment, competition, cooperation, capital/labor substitution, the company, income, and resources are all notions that should be systematically defined in their spatiotemporal form, not in an abstract manner. In fact, the problem for economic science today is not to construct *more* theories—since there are already numerous and contradictory theories—or to identify the *single correct* theory. The difficulty is more one of identifying and understanding the economic mechanisms that operate in a concrete context because the spatial and temporal contexts give these mechanisms highly diverse forms. The difficulty of providing a scientific explanation of economic dynamics thus appears to arise not from the fact that the "right" theories have been identified but, rather, from the fact that *insufficient work has been done on the relation between the fundamental mechanisms of the economy and their insertion in time and space.* More precisely, the territory is both the

imprint and the matrix of competition, of cooperation, and of combinations of capital and labor by technology. Economic changes and those of the territorial and temporal framework are mutually explanatory. For example, to my knowledge, the underlying spatialities of Keynes's theory (1936) or of neoclassical approaches have never been clarified. We can, however, adopt the hypothesis that these are only specific cases of more general economic mechanisms inserted in spatial and temporal contexts that give them their specific form. National territories, with their own economic circuits and a relatively short temporal horizon, would thus shape Keynes's theory; a scattered space with instantaneous adjustments determines the mechanisms that are considered in the neoclassical approach.

Within the directions taken by GREMI, the notions of comparative advantage (Camagni 2002), the external value of money (Corpataux, Crevoisier, and Thierstein 2001; Crevoisier, Corpataux, and Thierstein 2001), and resources (Camagni, Maillat, and Matteaccioli 2004) have already been raised. These notions constitute the breaking of new ground in research. The innovative milieus approach, despite its limitations regarding its goals and results, is today perhaps the most rounded approach.

References

Asheim, B. 1996. Industrial districts as "learning regions": A condition for prosperity? *European Planning Studies* 4:379–400.

Asheim, B., and Cooke, P. 1999. Local learning and interactive networks in a global economy. In *Making connections: Technological learning and regional economic change*, ed. P. Oinas and E. Malecki, 145–177. Aldershot, U.K.: Ashgate.

Aydalot, P., ed. 1986. *Milieux innovateurs en Europe* [Innovative milieus in Europe]. Paris: GREMI.

Bathelt, H., and Glückler, J. 2003. Towards a relational economic geography. *Journal of Economic Geography* 3:117–44.

Boschma, R., ed. 1999. Learning and regional development: Theoretical issues and empirical evidence. *GeoJournal* [special issue] 49(4).

Bramanti, A., and Ratti, R. 1997. The multi-faced dimensions of local development. In *The dynamics of innovative regions: The GREMI approach*, ed. R. Ratti, A. Bramanti, and R. Gordon, 3–45. Aldershot, U.K.: Ashgate.

Camagni, R., ed. 1991. *Innovation networks: Spatial perspectives*. London and New York: Belhaven Press.

———. 2000. Foreword ("avant-propos"). In *Les milieux urbains: Innovation, systèmes de production et ancrage* [Urban milieus: Innovation, production systems and anchoring], ed. O. Crevoisier and R. Camagni, 1–5. Neuchâtel, Switzerland: EDES.

———. 2002. On the concept of territorial competitiveness: Sound or misleading? *Urban Studies* 39:2395–411.

Camagni, R.; Maillat, D.; and Matteaccioli, A., eds. 2004. *Ressources naturelles et culturelles, milieux et développement local* [Natural and cultural resources, milieus and local development]. Neuchâtel, Switzerland: EDES-IRER.

Capello, R. 1999a. A measurement of collective learning effects in Italian high-tech milieux. *Revue d'Economie Régionale et Urbaine* 3:449–68.

———. 1999b. SME clustering and factor productivity: A milieu production function model. *European Planning Studies* 7:719–35.

Colletis, G., and Pecqueur, B. 1995. Politiques technologiques locales et création de ressources spécifiques [Local technology policies and creation of specific resources]. In *Economie industrielle et économie spatiale* [Industrial economics and spatial economics], ed. A. Rallet and A. Torre, 445–63. Paris: Economica.

Corpataux, J.; Crevoisier, O.; and Thierstein, A. 2001. Exchange rates and structural adjustment of regions: A conceptual framework to anticipate the Euro. Paper presented at the Regional Transitions Conference, Regional Studies Association, Gdansk, Poland.

Crevoisier, O. 1996. Proximity and territory versus space in regional science. *Environment and Planning A* 28:1683–97.

Crevoisier, O., and Camagni, R. 2000. *Les milieux urbains: Innovation, systèmes de production et ancrage* [Urban milieus: Innovation, production systems and anchoring]. Neuchâtel, Switzerland: EDES.

Crevoisier, O.; Corpataux, J.; and Thierstein, A. 2001. *Intégration monétaire et région: Des gagnants et des perdants* [Monetary integration and regions: Winners and losers]. Paris: L'Harmattan.

Crevoisier, O.; Fragomichelakis, M.; Hainard, F.; and Maillat, D. 1996. *La dynamique des savoir-faire* [The dynamics of know-how]. Zurich: Seismo.

Gaffard, J.-L. 1990. Innovation et changements structurels [Innovation and structural change]. *Revue d'économie Politique* 3:325–82.

Granovetter, M. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology* 91:481–510.

Grossetti, M.; Autant-Bernard, C.; Carrincazeaux, C.; Corroleur, F.; and Massard, N. 2003. Proximité et activités de R&D [Proximity and R&D activities]. In *Entreprises et territoires* [Enterprises and territories], C. Dupuy and A. Burmeister, 71–90. Paris: La documentation Française.

Hodgson, G. 1998. The approach of institutional economics. *Journal of Economic Literature* 34:166–92.

Kebir, L. 2004. *Ressources et développement, une approche institutionnelle et territoriale* [Resources and development: An institutional and territorial approach]. Ph.D. thesis, Université de Neuchâtel, Neuchâtel, Switzerland.

Keynes, J. M. 1936. *The general theory of employment, interest and money*. London: Macmillan.

Kline, S., and Rosenberg, N. 1986. An overview of innovation. In *The positive sum strategy*, ed. R. Landau and N. Rosenberg, 275–305. Washington, D.C.: National Academic Press.

L'économie des conventions [The economy of conventions]. 1989. *Revue économique* 2:40.

Maillat, D., and Kebir, L. 1999. "Learning region" et systèmes de production territoriaux [Learning region and territorial production systems]. *Revue d'économie Régionale et Urbaine* 3:429–47.

Maillat, D., and Perrin, J.-C., eds. 1992. *Entreprises innovatrices et développement territorial* [Innovative firms and regional development]. Neuchâtel, Switzerland: GREMI, EDES.

Maillat, D.; Quévit, M.; and Senn, L., eds. 1993. *Réseaux d'innovation et milieux innovateurs: Un pari pour le développement regional* [Innovation networks and innovative milieus]. Neuchâtel, Switzerland: GREMI, EDES.

Mokyr, J. 1995. Urbanization, technological progress, and economic history. In *Urban agglomeration and economic growth*, ed. H. Giersch, 3–38. Heidelberg, Germany: Springer.

Moles, A., and Rohmer, E. 1978. *Psychosociologie de l'espace* [Psychosociology of space]. Tournai, Belgium: Casterman.

Moulaert, F., and Sekia, F. 2003. Territorial innovation models: A critical survey. *Regional Studies* 37:289–302.

Oinas, P., and Malecki, E. 1999. Spatial innovation systems. In *Making connections: Technological learning and regional economic change*, E. Malecki and P. Oinas, 7–33. Aldershot, U.K.: Ashgate.

Ratti, R.; Bramanti, A.; and Gordon, R., eds. 1997. *The dynamics of innovative regions. The GREMI approach*. Aldershot, U.K.: Ashgate.

Sheppard, E. 2001. How "economists" think: About geography, for example. *Journal of Economic Geography* 1:131–36.

Stengers, I. 1995. *L'invention de la science moderne* [The invention of modern science]. Paris: Flammarion, collection Champs.

Stoker, G. 1998. Cinq propositions pour une théorie de la gouvernance [Five proposals for a theory of governance]. *Revue Internationale des Sciences Sociales* 155:19–30.

Storper, M. 1995. *L'économie de la région: Les relations comme actifs économiques* [The economy of a region: Relations as specific assets]. Paper presented at the ASRDLF Colloquium, Toulouse, France.

———. 1997. *The regional world. Territorial development in a global economy*. New York: Guilford Press.

Sunley, P. 2001. What's behind the models. *Journal of Economic Geography* 1:136–39.

Torre, A., and Gilly, J.-P. 2000. On the analytical dimension of proximity dynamics. *Regional Studies* 34:169–80.

Torrès, O. 2003. Petitesse des entreprises et grossissement des effets de proximité [Smallness of firms and magnification of proximity effects]. *Revue Française de Gestion* 144:119–38.

White, H. 2002. *Markets from networks. Socioeconomic models of production*. Princeton, N.J.: Princeton University Press.

Williamson, O. 1985. *The economic institutions of capitalism: Firms, market, relational contracting*. New York: Free Press.