

A New Approach of Innovation: from the Knowledge Economy to the Theory of Creativity Applied to Territorial Development

Jean-Alain Héraud^{1,2}

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Abstract The general idea of this paper is the fact that the theory of innovation cannot be completed as long as the idea of creativity is not introduced in the analysis of the cognitive processes involved. Too often, in innovation studies, novelty is considered as pure knowledge creation. The new approach of creativity in management science, economic geography, or sociology of innovation has revealed the importance of other ingredients than knowledge: entrepreneurship, serendipity, imagination, etc. In particular, creative cities are not just knowledge-based territories. For addressing the issue of creative territories, we need first to define creativity in general and in different domains: in science (discovery), technology (invention), or economy (innovation), as well as in artistic, cultural, or societal fields. We will underline the necessity to be creative in policy design as well. It is not enough to build knowledge infrastructures and to promote human capital or attract “creative people.” Are there recipes for the creative governance of geographical entities? What can we learn from the application of standard policies? And from the new policy paradigms like the Smart specialization strategy of the EU? At microeconomic level, entrepreneurs and creative organizations must deal with the exploration/exploitation issues and find an acceptable tradeoff. Territories must also find relevant governance structures and procedures for the “creative” design of development strategies. In this perspective, they can rely on certain actors of the innovation process, like knowledge-based business services, and some talented individuals, for implementing the necessary distributed intelligence.

Keywords Innovation · Knowledge · Creativity · Entrepreneurship · Territory · Policy

✉ Jean-Alain Héraud
heraud@unistra.fr

¹ BETA, Université de Strasbourg and CNRS, Strasbourg, France

² Faculté des Sciences Economiques et de Gestion, 61 avenue de la Forêt Noire, F-67000 Strasbourg, France

Introduction

In this article, we start from the assumption that the theory of innovation is incomplete as long as the notion of creativity is not introduced in the description of the cognitive processes involved. In other words, we advocate the idea that a realistic socioeconomic theory of innovation cannot be reduced to pure *economics of knowledge* in the sense of Kenneth Arrow's *learning by doing* or to the macroeconomic approach of endogenous growth (initiated by Arrow and developed by Paul Romer). In the "real" world, knowledge capital accumulation does not systematically work in a smooth linear way, and radical innovation completely escapes such a theoretical framework. Even the evolutionist approach (for instance Nathan Rosenberg's *learning by using* or Bengt-Åke Lundvall's *learning by interacting*) is not fully relevant from our point of view, because it mainly considers networks of information and knowledge at the core of the process, overlooking other dimensions of the creative process. Furthermore, the literature on national systems of innovation "tends to focus on the formal science and technology system, as though learning was synonymous with and confined to R&D activities" (Morgan 2004, p.15). We need an approach of innovation including all forms of knowledge (formal as well as tacit) and some other aspects of individual and collective creativity that are indeed of cognitive nature but do not correspond to the usual economic concepts of information or knowledge—in the Arrow (1962) tradition. For example, as underlined by Morgan (2004), even if information diffuses rapidly across organizational and territorial borders, the *understanding* does not. Many complex cognitive aspects explain why entrepreneurial capabilities, which are essential for innovation, strongly depend on cultural, organizational, or geographical contexts. Therefore, the availability of new knowledge is just a part of the story. Cohen and Levinthal (1990), with the concept of absorptive capabilities, underlined the complementary aspect of organization's *ability to exploit it*. The application to territories is possible but quite more complex because a territory is a rich articulation of organizations and institutions, and its perimeter is often difficult to define. Trying to understand the specific creativity of regions or metropolises is the aim of this paper.

The innovation process is definitely not restricted to the sole mechanisms of exchange and recombination of knowledge, particularly when such mechanisms are embedded in territorial and institutional or organizational settings where issues of cultural attitudes, beliefs, trust, etc. play a central role, like in Becattini (1992)'s definition of *industrial districts* or Maillat (1995)'s analysis of *innovative milieus*. This is all the more important if we consider societal innovations founded on participative creativity (Moulaert and Nussbaumer 2008), but even in the case of innovations that are mainly implementing technological inventions, collective creativity within and between *knowing communities* (Amin and Cohendet 2012) is essential, and such processes cannot be understood without considering institutions and psychosocial attitudes. Collective creativity is being often developed in specific places, resulting from the interaction of different communities, organizations, and institutions, and it is difficult to consider separately the notions of creativity and territory.

In this article, we try to apply the theory of creativity to the issue of territorial development. In a simple logical approach, we would first address the general concept of creativity (for instance Sternberg 2008) and then decide on what sort of territory we apply it: administrative regions, geographical proximities, polarized areas (of

metropolises), innovation clusters, etc. But such linear thinking is not relevant for our topic as far as we consider that the territory *is defined by its creative characteristics*, not given in advance; conversely, creativity cannot be fully understood without taking into account the interplay of many *territorially embedded factors*. Let us globally assume the existence of “creative territories” (of various types) or potentially creative territories that public policies could help to reveal. We are looking for an evolutionary concept of territory; this object being evolving in time and largely defined by the projects, not just by the heritage.

In the following two sections, we will first address the issue of innovation in terms of territorial creativity, then explain the systemic interplay of individual and collective levels in the creative process. The last three sections are devoted to innovation policies in relationship with creativity and the role of specific micro-actors in the policy design.

Innovation as a Result of Creativity in Territories

As underlined in the introduction above, a large part of the literature in economics of knowledge tends to consider, at least implicitly, that the new pieces of knowledge are produced by recombination of existing pieces from the present stock. Such a process does certainly express a form of creativity but not at the highest degree of novelty. Radical innovation cannot be produced without a dramatic change of perspective. If innovation was only a question of knowledge, then the actors responsible for innovation (the *entrepreneurs* as defined by Josef A. Schumpeter) would just be extremely *learned* persons. As the literature on creativity told us (Sternberg 2008), the most innovative managers are not necessarily those who have accumulated the maximum of knowledge, but those who are able to design new representations of the future, and who knows how to share their visions, to enroll allies. Innovation and entrepreneurship imply knowledge but cannot be reduced to pure knowledge processes.

Schumpeter used the expression “creative destruction” as he described the process of innovation and its consequences. He underlined the disruptive aspect of innovation in terms of old activities replaced by new ones (disruption of the global economic *circular flow*), but also the fact that, in times of economic crisis, the partially destroyed economy is a favorable context for innovative strategies. The global mechanism produces long-run business cycles. Mensch (1979) has given empirical evidence of the role of innovations in such historical cycles and proved that the swarm of innovations in specific periods is not strictly correlated in time with scientific revolutions. Inventions can wait a certain time before giving rise to innovation. Qualitative jumps occur in economic development as well as in science, but not necessarily articulated in a global science-technology-economy system.

At the level of the microeconomic creative process also, radical creation appears disruptive (breaking knowledge structures). Managerial expressions like “thinking out of the box” express discontinuity in the cognitive routines. Electric bulbs did not derive from a systematic effort of improving the technology of candles. Therefore, the issue in paradigmatic changes is not learning but *de-learning*. Radical innovations implement new cognitive schemes, and their success depends on the capacity to oppose knowledge routines. This is the reason why, as stated above, a significant part of the innovations cannot be considered as an application of learning processes. If technological progress

and commercial innovation were only the result of learning by doing and research and development (R&D) efforts, then money, professional skills, and good planning methods would be enough to ensure the optimal rate of innovation in the economy. The history does not confirm such a simple model. *Creativity* in the purest sense—breaking current rules of thinking—is always present in the process of innovation, and not only in the major historical revolutions.

The notion of *territory* is also linked to innovation in the history of economic thought. Alfred Marshall was not only one of the founding fathers of the neoclassical theory (in particular the theory of production) but he was also in a way the first theorist of the dynamics of territories. The history of the industrial revolution—initially taking place in specific locations like the Manchester region—had a very strong influence on his analytical work. He gave the first example of positive “external” economies of scale when describing the knowledge externality produced by the “clustering” of innovative firms in a territory. The industrial revolution was a real paradigmatic change of the socioeconomic system, and this disruptive, unexpected event took place in an area which happened to be able to support such a *collective creativity*. The recent literature on creative cities (starting, e.g., from Gertler 2004) has been analyzing why and how certain urban territories are able to reinvent themselves in very original ways. The literature on innovative milieus (see, e.g., Maillat 1995) is particularly interesting as far as this approach defines in reciprocal terms the creative process and the territory. Innovation being a systematic process linking science, technology, industry, finance, etc., geographical proximity may help to trigger the mechanism in specific locations with a rich endowment in such factors. Enrichment goes in both directions: the creative territory is reinforced by its success in developing innovation (endogenous development) and then attracts more activities and resources (exogenous development). Furthermore, the territory is defined in a very deep and complex way; it is not characterized by a simple network of factors, but takes into consideration the social structures that are at the origin of innovative behaviors (Uzunidis, 2010). In addition to this complexity, it is important to underline the endogeneity of *entrepreneurship* in such a representation: the individual entrepreneur builds up locally the needed cognitive and material resources, the social networks, and even, in the long run, the cultural attitudes that are necessary for the innovative activity.

The question of *geographical proximity* is essential for understanding spillover effects (Jaffe et al. 1993), because of the particular nature of knowledge which requires sometimes face-to-face interactions (Von Hippel 1994). Geographical variables include transportation costs, population density, levels of infrastructures, and local government. But the concept of territory includes also the idea of cultural heritage, the existence (or possibility) of shared visions, and other embedded factors that make a specific sort of innovation possible here and not elsewhere. In particular, the territory is characterized by *communities of practice* (in the sense of Etienne Wenger 1998) and other knowing communities that prepare the emergence and acceptability of some new ideas. The territory gives the opportunity of *situated cognition*. As shown by authors like Michel Callon, Ash Amin, and Patrick Cohendet, knowing communities are not simple “networks” of actors: they act as collective producers of knowledge, by processing many forms of translation and adaptation of ideas and finally propose (after internal negotiation) a new language

for thinking future innovations. Cohendet et al. (2010) apply this cognitive approach to “the anatomy of the creative city.” Such *mesoeconomic* spaces must be understood as complex systems. We need to understand the reciprocal relationship between micro-actors and their local environment in the creative process leading to innovation.

Already in Marshall’s work, we find the idea of systemic interaction between individual and collective creativity within industrial districts: as underlined by Loasby (1998), “Businessmen did not have the necessary knowledge to be optimizers, but they decided for themselves what new ideas to try, and what to keep. Each could also benefit from the experiments of others (...)” (Marshall 1920, p.210). In the Marshallian representation, “ordinary business is an arena for experiments”, like in the biological world, but there is “a crucial distinction between biological and social systems: the purposefulness of human actions” (Loasby 1998 p. 73). The evolutionary approach in economics cannot be exactly Darwinian. This is why we consider that creative territories are defined by the actors and their projects, more than by some deterministic mechanism. Therefore, we need to introduce here the *managerial* dimension of the *creative* approach of innovation.

The major ingredient of the innovation process is the desire and capability of an *entrepreneur*. The literature on entrepreneurship gives many interesting insights, in particular the *effectuation* approach proposed by Sarasvathy (2001). Indeed, the description of this specific way of designing and implementing a project casts a light on some core characteristics of the creative attitude: *pro-active* vision of the future, *serendipity* (discovery and use of unexpected solutions), understanding of the complexity of *causality* in social systems, and *procedural* rationality. We think the debate around innovation and project management within firms opened by this author is quite converging with issues of urban planning and other territorial development problems. Innovative clusters and smart cities are living experiences of collective creativity in complex multi-level, multi-actor systems. Such creative developments are not produced through classical top-down planning procedures. We precisely aim at interfacing the three following layers of creative mechanisms: the microlevel of firms’ strategies, the meso-level of territorial context, and the macro-level of public policies.

Creativity Between the Individual Level and the System

Current definitions of creativity involve the ability to *perceive the world in new ways*, to make connections between phenomena that were not related yet, and to accept the *uncertainty* of the application of any really new idea. Amabile (2008) proposed a model of creativity in organization where novelty is associated with applicability. Robert Sternberg and Todd Lubart gave a relatively similar (interdisciplinary) definition: creativity is “*the ability to produce work that is both novel* (i.e. *original, unexpected*) *and appropriate* (i.e. *useful, adaptive concerning task constraints*)” (Sternberg 2008, p. 3). Creativity is not limited to the fields of formal knowledge like science and technology, and it is not limited to the individual level. At societal level, for instance, it concerns new movements in art or new social programs.

Places for Collective Creativity

Creativity in a collective sense is ideally expressed in urban development, and the “toolkit for urban innovators” proposed by Landry (2000) describes various cases of cities concentrating many forms of “human cleverness” for the management of development issues. “Cities have one crucial resource - their people,” and increasingly, the imagination and motivation of local population has replaced classical factors like location, natural resources, or market access as “urban resources” to be taken into account (op. cit. p.xii). Charles Landry presents the creative cities as laboratories developing new solutions to the problems of growth. At this point, it is worthwhile underlining an important dimension of creativity: facing complex challenges, systems—and not only individuals—are forced to find original solutions. The wording “original” must be considered in its two meanings—(i) *novel* and (ii) efficient for the *specific* situation. The collective construction of original ideas is an illustration of the concept of serendipity, since no ready-to-use solutions exist and every metropolitan area has to invent its own future, starting from contingent resources and ideas—like in Sarasvathy’s philosophy of action called effectuation.

Observing the case of Montreal, Cohendet and Simon (2008) underline the role of *communities* in the collective creativity of the city, starting at the microeconomic level: “our view is that the creativity of these firms relies in the existence and interactions of the myriad of communities which are the active units of the many creative projects of the KI [Knowledge Intensive] firms, but which find their inspiration and creativity in the fertile soil of the creative city itself” (op.cit. p. 228). Organizations in this view are characterized by *distributed cognition*. The diversity of environments and technologies to deal with constitutes a system which is too complex for one actor to be fully understood. The role of communities is to develop social *cognitive repertoires* that are relevant for guiding people in their interpretation of the present world and for designing possible future worlds. Such knowing communities can develop without geographical roots (the development of virtual communities is a significant contemporary example), but many of them have links with a territory. Therefore, territories play a significant role in the efficiency of the distributed cognitive mechanisms. Nevertheless, the interfacing of all the communities present on a given territory is never spontaneous. Grandadam et al. (2013), presenting the dynamics of *situated creativity* in the case of the video cluster in Montreal, make the following analysis: the geographical externalities explaining the local relative advantage are not due to the proximity between institutions like firms and public organizations (the authors call them the *upperground*) or between individuals of the artistic scene (the *underground*), but to the existence of “places and spaces” (*middleground*) that allow the meeting and possibly the communication between all those communities.

Since, to a certain extent, “space does matter,” it is possible to think of possible instruments for innovation-driven regional policies (Muller et al. 2013) like developing *ideas labs*, *fab labs*, etc. in order to give a concrete place to the (fertile but more or less unexpected) encounter of people and ideas. This is a typical example of implementing a piece of “middleground” as an instrument of creativity policy. *Cluster policies* are of course a good classical example of governance aiming at the development of an “ecosystem of innovation” linking competitive and complementary actors. Here again, the innovation cluster (or science park, etc.) is located somewhere and constitutes a “place”

operating as a middleground. Such local systems have often started by themselves but local governments can boost their development.

A last example illustrating the process of cognitive interaction and knowledge translation leading to collective creativity is the role of knowledge-intensive business services (KIBS) in the development of territories (Miles 2005) and, within KIBS, the role of specific persons (*knowledge angels*) which have the ability to successfully work in varied environments and to import unexpected solutions from one community to another one (Muller et al. 2015). Innovation policy, especially at local/regional level, can indirectly help the cognitive structuring of territories by supporting those actors who play such catalytic role for the collective creativity. These microeconomic actors are sometimes quite better equipped than institutional policymakers for the design of relevant connections on the field, as explained below in “[The Role of Talented Individuals in Distributed Intelligence of Territorial Development.](#)”

Social Capital and Individual Action

As advocated in the introduction, when the creativity approach is taken into account in the analysis of innovative process (and for policy recommendations), it is no more possible to think only in terms of usual economic concepts like knowledge accumulation or human capital. The concept of *social capital* is at least as important because we have to consider the central role of knowing communities. Moulaert and Nussbaumer (2008) consider four types of capital at the basis of regional development: private (firms), ecological, social, and human. The “social region” is defined as an integrated approach of development where human and social dimensions of the existence are combined for giving rise—locally—to new possible visions of the society. The main issues are not restricted to the access to new knowledge and ideas: it is also a question of empowerment of local populations. In this representation, collective creativity expresses the possibility of an economic development that is socially and culturally embedded.

There is nevertheless a dilemma concerning the potential contribution of social capital to creativity and local development. The concept of social capital was introduced by Pierre Bourdieu. Robert Putnam made this concept very famous in the Anglo-Saxon world with his analysis of the American long-term decline of social capital. Putnam (1995) gives the following definition: *social capital* refers to *features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit*. In the same article, he mentions the *network capitalism* of East Asia and the “highly flexible, highly efficient” *industrial districts* that are based on networks of collaboration among workers and small entrepreneurs. In such a representation, the development of territories is associated with “tightknit communities” where people and firms create strong ties. To the opposite, Florida (2003) has a preference for a model of weak ties (quasi-anonymity) when he analyzes the role of the creative class in metropolitan areas—hence Florida’s policy recommendation of attracting creative people, more than nurturing local potential of creativity, in order to boost territorial development. “Where strong ties among people were once important, weak ties are now more effective (...) These older communities are being exchanged for more inclusive and socially diverse arrangements” (Florida 2003, p.6). Our argument here is that the dilemma concerning social capital can be partially overcome

through individual action, when specific persons apply their capabilities of interacting with different communities.

Collective creativity crucially depends on some individual actors who, like knowledge angels, are able to catalyze the collective construction of new mental representations. Such individuals have the capacity of translating or adapting ideas from one collective entity (firm, institutions, knowing communities...) to another. Such people are sometimes called *knowledge brokers*. The function they fulfill is more creative than the commercial analogy could suggest, since the piece of information or knowledge imported into a new community has sometimes no meaning at all in this context a priori. The export or translation requires very specific individual capabilities: bridging cultural distances, providing convincing arguments, assuming leadership, etc. A better name for such people is therefore *boundary spanner*. We use here the expression of Cohen and Levinthal (1990) in their attempt to understand the individual contribution to the firm's absorptive capacity. Knowledge acquisition through R&D or imitation must be completed by the specific role of those individuals "who stand at the interface of either the firm and the external environment or at the interface between subunits within the firm" (op; cit. p. 132).

In our international enquiry on knowledge angels (Muller et al. 2015), we observed different wordings in the description of the function those people fulfill within their own organization and between organizations. The Germans very often described their role as "knowledge brokers," but the French insisted more on the ideation process: "idea givers." The Spaniards liked particularly using the expression "facilitator," which is a clear reference to the notion of social capital. In French Canada, respondents often used the expression "business pushers," which belongs more to the repertoire of North American entrepreneurship culture. All those expressions illustrate in fact different facets of the boundary spanner function. The specific creativity of such individuals is to make available and understandable ideas that are potentially new and relevant for the destination entity. Entrepreneurship or intrapreneurship is their final aim, and the function fulfilled goes beyond managing knowledge: it involves the capability of expressing *visions*.

Creativity in this framework appears as split between two levels: the role of smart individual intermediaries is essential, but the elements of creation pre-exist in knowing communities. When transposing a concept from A to B, the boundary spanner seems to come with a radically new idea, although the idea was already "common knowledge" in the world of BA (with a different meaning). The act of creation lies in the translation; it does not fall from the heaven. Now, the capability of understanding both initial communities' languages is often an exceptional gift. Furthermore, a good deal of conviction is necessary, because cognitive imports are difficult, risky, and costly. This is the last point to underline: without a strong willingness to carry the project of cognitive transfer/creation nothing will happen. Our conclusion here is that creative activities need "new" ideas (inspired by world A) that can be recognized as "relevant" (in world B), plus a lot of motivation at the level of the actor of the cognitive transfer. Let us call the last element the "will" factor. It is difficult to imagine such a process without exceptional individuals who volunteer to do the job: they are a middleground on their own.

Policies Addressing Different Forms of Creativity

Before debating on innovation policies, we need to clarify our understanding of the domains of creativity that are the possible targets. The linear model of innovation in its purest form supposes a sequence of creative steps from the emergence of new scientific ideas to the production of technical artifacts and then to commercial innovation. We do not consider such a sequence as *the* relevant archetype of innovation, but it is worthwhile examining each successive step and observing the mechanisms at hand. These mechanisms are rather different.

Three Distinct Forms of Creativity

The actors playing in each domains (or *arenas* as analyzed by Joly 2007) follow specific rules, and therefore, the creative strategies cannot be described with the same vocabulary. Nevertheless, individuals or organizations can be present on several arenas at the same time and play several games in parallel. Therefore, the scenes are interlinked—although they should be analyzed separately. Economists will see here three different “markets” (for scientific ideas, technical artifacts, commercial innovations) with externalities between them. Nevertheless, the word “arena” is more relevant—in expressing strategic attitudes of actors, professional “postures,” or complex individual situations across arenas like *expertise*.

- On the arena of science, the nature of the creative activity is *basic research*. It can be curiosity-driven or finalized, but in every case, the cognitive aim is to produce models representing reality. The result, a formal representation respecting the rules of the discipline for its elaboration, is called a *discovery*. The latter is supposed to be public knowledge, freely available. Of course, for understanding it, people need the relevant absorptive capacities (professional scientists of the discipline are supposed to have them).
- On the arena of technology, the creative activity is *applied research*. The aim is no more to understand, but to build an artifact (product or process). If the artifact is really new and useful, it is called an *invention*. Here, the rule of the game is in principle the appropriation through the protection of the intellectual property (for instance patents), but other strategies are possible, including secrecy.
- In the society and on the markets, the creative activity is *development*, leading to *innovation*. In case of success, sales, profits, and jobs should follow. For the innovator, the big issue is the protection of its rent (extra profits) that should cover at least the costs and risks of the innovation. The protection through patents supposes a direct link between invention and innovation, which is not necessarily the case. Many other protection strategies can be developed. The creative activity of the innovator is entrepreneurship, not discovery or invention.

In the history of economic thought, Schumpeter was the first to underline the noticeable differences between the abovementioned domains of creativity. In a late contribution (Schumpeter 1947) where he summarizes his conception of “the creative response in economic history,” he very clearly explains how creative activities at individual level, in systemic relationship with the socioeconomic environment, lay at

the core of economic development. Different types of creativity must be distinguished, in particular technological and economic creativity: the inventor produces ideas, and the entrepreneur “gets things done.” As an example: “the fact that Greek science had probably produced all that is necessary in order to construct a steam engine did not help the Greeks or Romans to build a steam engine” (op.cit. p. 152). The functions fulfilled by the two types of creative people correspond to very different sociological and psychological realities. The innovator (entrepreneur) in particular has extremely various competencies: being able to see new possibilities (knowledge and visions), but also “being able to cope with the resistances and difficulties which action always meets with outside the ruts of established practice” (ibid).

As underlined by Antonelli (2015), Schumpeter’s approach of long-term economic development is the understanding of innovation as a creative reaction of entrepreneurs to systemic constraints and opportunities. Innovation is an emergent property of system dynamics. The system producing innovation includes creative individuals (entrepreneurs) as well as macroeconomic conditions under which these individuals are forced to move out of the routines. J.S. Metcalfe presents also Schumpeter’s vision of capitalism as “a vision of emergent novelty in the presence of order” (Metcalfe (2010), p.58, and portrays his concept of innovation as a “business experimentation” where individuals and teams are forced to imagine new solutions to current activity’s problems. “Creative capitalism is uncomfortable capitalism.” It is not a system to preserve the status quo but rather “a self transforming system in which transformation of economic knowing and transformation of economic activity run hand in hand” (op. cit. p. 60). To sum up, the macro-system puts individuals in an uncomfortable situation, which is an incentive to think out of the box, but the system can also help these entrepreneurs (market information, imitation/adaptation of competitors’ ideas, new technological solutions, new markets, etc.).

Economic policies offer possibilities to improve macroeconomic conditions and/or to bring individual support, incentives, information, etc. There are many possibilities of action, and in particular science policies, technological policies, and innovation policies. Furthermore, acting on one arena impacts the others. We will for instance consider to which extent research policies (aiming science or technology) are indirect innovation policies.

The Rationale of Innovation Policy

Any innovation policy is, at least implicitly, expressing one vision of the innovation process. The linear model of innovation has long been the inspiration of many top-down policies, while cluster policies intend to reinforce existing “ecosystems of innovation” on various territories in a mixed form of intervention (top-down monitoring of bottom-up initiatives). Nowadays, the tendency in all developed countries is to focus on more bottom-up mechanisms.

The classical *Colbertist* approach (organizing the linear chain from science to innovation through strong governmental intervention and the participation of national champion firms) is quite less fashionable: less efficient than it appeared in the period after WW2, and even no more possible in many cases (Mustar and Laredo 2002). Countries of strong interventionist tradition like France have progressively shifted to more decentralized policies in the recent decades (Héraud and Lachmann 2015),

including the development of innovation clusters—particularly through the selection and financing of *pôles de compétitivité* after a call for proposals across national territories. This procedure is a combination of hierarchical power and self-organizing initiatives: the money and the final choice are controlled by the national administration, but it is in fact relatively bottom-up insofar as the financing and the governance are multi-level (regional governments and local institutions are involved) and multi-actor (involving private actors). The implicit model of innovation in the new brands of policies is definitely not a knowledge-based linear process with a clear-cut division of (cognitive) labor, but a vision of innovative outcomes as the result of the networking of information sources, competences, formal knowledge, and local culture. The policy design here is a case of distributed intelligence, no more the organization model of public “*grands programmes*”.

For a better understanding and evaluation of the innovation policies, we must return to the *policy rationales*: what are the market failures or systemic failures that policies are supposed to cure? Is it mainly a problem of knowledge? And if so, what sort of knowledge? Colbertist projects express a massively top-down approach of innovative processes, where creativity in numerous fields is gathered and orchestrated (national research institutions, industrial R&D labs, etc.), but other centrally managed policy tools offer a larger role to decentralized decision. It is typically the case of the research tax credit (RTC).

As compared with direct governmental support, the RTC system can be considered as a relatively decentralized policy since the private sector decides on the allocation of funds (the firm will be partially reimbursed through the tax system, if expenses are accepted as relevant from a legal and technical viewpoint). It can be focused on certain specific types of R&D (new environmental solutions, ICT, defense-related technologies, etc.) or on certain types of beneficiaries like small and medium-sized enterprises (SMEs), but RTC is a priori considered as a neutral policy instrument leaving the decision of the specific R&D effort and of the corresponding targeted innovation to the decentralized actor, the firm.

The instrument is nevertheless centralized in its management, which leads to lower administration costs than those of direct subsidies. This is especially true in France, one of the countries exhibiting the most ambitious RTC program. In contrast, Germany has considered several times in the past decades this policy option but systematically rejected it. The comparison proves the importance of the structural, institutional, and even cultural context: lower density of fiscal administrations in Germany than in France; opposition to any measure for which the budgetary impact is not fully predictable, perception of the tax credit as unjustified windfall gain for companies, etc. In France, RTC policy is openly aimed at attracting foreign direct investment in high-tech sectors—or maintain those activities in the territory—but there is a debate about its efficiency (Lhuillery et al. 2013). We consider that the point is not only the impact of the policy on domestic R&D, but more fundamentally the issue of innovation (Héraud and Lachmann 2015). Increasing the effort of research in France does not necessarily lead to significantly more innovation and employment (except for research personnel). A positive correlation is statistically possible for SMEs who will develop and produce the innovative product in the same country, but quite less certain for large multi-national groups who organize a territorial division of labor across the world. In the case of Québec, studies (quoted by Mohnen 2013) showed that the return on

investment was proved significantly better for SMEs as compared to large firms. This is a lesson for territorial policy.

Our conclusion on this example is that *research* policy is not automatically an *innovation* policy. RTC addresses the *supply-side* of the cognitive issue of innovation by concentrating more research and researchers on the national territory. The *demand* for knowledge is another question; it depends on the entrepreneurial spirit and on all the variables that increase the relative advantage of the country/territory for the creation of new ventures. If entrepreneurial spirit is strongly limited by cultural or institutional constraints, no increase of the knowledge base will fundamentally change the level of innovation within the perimeter of the system. The articulation and proximity of the science and technology arenas to the innovation arena is a complex issue. Direct support to local ecosystems of innovation is probably more efficient, even if the cost of running the policy is higher.

Smart Specialization, Knowledge, and Territories

The linear thinking syndrome was responsible in the past for some policy failures at the European level. The Lisbon strategy at the turn of the millennium, aiming at an R&D expense level of 3 % of the GDP in average for the decade ahead, revealed to be a political gesture without great success. Furthermore, at the time the European Research Area initiative was launched by EC commissioner Philippe Busquin, some contradictions between the regional and cohesion policy on the one hand and the knowledge and innovation policy on the other hand were still unsolved (Héraud 2003). The EU policies for the period 2014–2020 seem to be *smarter*. With *Horizon 2020* and the *Smart Specialization Strategy* at regional level, new policy principles are implemented. *Place-based* economic transformation agenda are promoted. If the *knowledge-based* economy is still a central motto, the European recommendations are now “to build on each country/region’s strengths, competitive advantages and potential for excellence” as stated in the Regional Innovation Strategy for Smart Specialization (RIS3) document of the European Commission (2014). In fact, the smart specialization strategy is nothing completely new, it is rather a refinement and upgrading of the methodology developed for the structural funds programming. It is based on 15 years of experience in supporting innovation strategies at regional level.

Let us start with the official definition of the smart specialization strategy (European Commission 2014). It means national and regional innovation strategies setting priorities “in order to build competitive advantage by developing and matching research and innovation own strengths to business needs in order to address emerging opportunities in markets developments in a coherent manner, while avoiding duplication and fragmentation of efforts.” Such strategies must be developed through involving local authorities and stakeholders like universities, industries, and also social partners “in an entrepreneurial discovery process.” The founding fathers of the European smart specialization strategy (Foray et al. 2009) explain quite clearly that the *entrepreneurial process of discovery* is not only the learning process to discover the research and innovation domains in which a region can hope to excel but also the discovery process triggered by public policy for supporting greater engagement on the part of “locally situated entrepreneurs.” If the selection process can become a pure bureaucratic

exercise (the “experts” know), the original intention was to implement participation in the policy design (co-construction of knowledge about present capabilities and future opportunities of the territory, with existing or potential actors of the territory).

In the growth program *Europe 2020*, the innovation strategy is combined with other (supposedly reinforcing) priorities: education, employment, social inclusion, and sustainability (particularly in relation to energy and climate issues). Through the RIS instruments and the use of the European structural investment funds, all stakeholders must “unite under a shared vision” and to build “creative and social capital within the community.”

The novelty of this strategy, as compared to the policies of the 2000s, is to aim not only at regional scientific excellence or technological leadership but also at supporting practice-based (non-technological) innovation, for instance: social and service innovations, initiatives addressing social challenges, new business models, and administrative innovations (for instance in the area of public procurement). The RIS3 ex ante conditionality imposed on the EU member states and regions is to identify the *knowledge specializations* in terms of formal knowledge (which sciences and technologies fit the innovation potential?), but also in terms of assets and capabilities of various sorts. The policy is supposed to be tailored to the local context as a whole. This means acknowledgment of the fact that there are different pathways for regional innovation and development. We can see that smart specialization should not be a simple policy of avoiding overlaps and replication in development strategies—for saving public money in times of fiscal austerity—but involve a real collective cognitive effort on the territories for finding and exploiting the genuine local potential.

The creative attitude exists on the level of the policy design itself. Various ways of “thinking out of the box” can be mentioned:

- Choices should not be made at *sectoral* level (because dynamic synergies in related fields escape the logic of the sector).
- Governance structures and institutional actors are not the best *experts* (they generally replicate cognitive routines or convoy vested interests).
- Choices are not made forever (RIS3 must be adaptive, it is not about *static* comparative advantages).
- The definition of the *region* is not evident (functional regions should be targeted, instead of administrative regions, even if it raises difficulties for policy implementation).
- Knowledge transfer is not the diffusion of the same thing (*translation/adaptation* is always necessary and it is sometimes a source of creativity—not just a difficulty).
- Innovation is a process of *creative destruction* (and the positive and negative aspects will not impact all the territories in the same way; it is impossible to contain all benefits to a given perimeter or to exclude the destructive effects).
- Best practices and *success stories* can be dangerous models (because success is context-dependent, and also because we learn sometimes more from failures than from successes).
- *Non-cognitive skills* can be more important than cognitive skills in the process of innovation (personality vs knowledge).

The development of territories, specifically if they are not among the “leader regions,” is increasingly dependent on the invention of *creative policies*, in order to (exogenously) attract and (endogenously) develop *creative activities*. Creative people are not necessarily to be attracted into the territory, like in the Florida model; the best is often to train local people to be creative, to reveal potential creativeness, and also to network local “entrepreneurs” with external sources of creativity.

The Role of Talented Individuals in Distributed Intelligence of Territorial Development

Opposing the paradigmatic view of heterodox economics where perfect rationality is postulated, the behavioral theory of the firm (introduced in particular by Herbert Simon and James March) describes the cognitive limits that individuals encounter in the design and implementation of their plans. Bounded rationality models apply not only to the firm but also to any organization, including town councils or regional authorities, when they are confronted to innovative projects. In non-stationary environments, it is well known that no general optimal policy applies, but a sort of trade-off between two management strategies: *exploration* and *exploitation*. In complex and rapidly changing environments, it is necessary to exploit existing assets and knowledge, as well as to explore opportunities for future improvements. “Both exploration and exploitation are essential for organizations, but they compete for scarce resources” (March 1991, p. 71). The allocation of resources between the more rational activities (exploitation) and the more creative ones (exploration) involves many trade-offs: intertemporal, interinstitutional, and interpersonal. The exploitation attitude is about refining and implementing what is already known, whereas exploration is the pursuit of what might come to be known. The exploration activities consist of cognitive efforts to enlarge the range of new intuitions and ideas. Exploitation will then replicate the new approaches in diverse contexts as well as absorbing the successful novelties into the existing sets of routines.

In the already mentioned study of knowledge-based business services (KIBS), Muller et al. (2015) show the particular contribution of specific talented people to find good compromises between exploratory and operational tasks, thanks to the nature of the B to B activity and to the degrees of liberty they allow to the knowledge angels (KAs) within the firm’s hierarchy. KIBS and KA do not “waste” too much time in exploration because their regular job, operated in many different environments, is already in itself a task of “entrepreneurial discovery.” We consider that a relevant policy for the consolidation of territorial ecosystems of innovation is to rely on such boundary spanners. Instead of giving incentives and monitoring directly the firms, it seems wiser for public administrations to give them for example vouchers for business services to be used at the discretion of the beneficiary. Supporting KIBS creation and development could also be a good policy option.

The effectuation theory proposed by Sarasvathy (2001) can help us to get a deeper understanding of the specificity of the KA function. In the *causation* model of classical project management, knowledge is exploited in a problem-solving activity, whereas the effectuation approach starts from the present situation (assets, competencies, and available information—like known solutions) for imagining goals that are both desirable and compatible with the present endowments. If KA fulfilled the sole function of

problem-solving, they would just be knowledge brokers, but they are in fact more creative.

Destinations as well as paths are often unclear in economic decision-making. Because there are no clear pre-existent goals, “causal road maps are less useful than effectual exchanges of information between all stakeholders involved in the journey” (Sarasvathy 2001, p. 282). Through the interplay of human imagination and human aspirations, creative outcomes may appear: typically artifacts like products and processes, but also organizations and markets. Sarasvathy also considers a possible extension of her analyses to public policy formulation. She suggests to work in this direction on the basis of the Lindblom (1959) model of decision-making. We think it is indeed interesting to consider the general recommendation made by this author and to apply the idea to innovation policies. Lindblom (1959), p. 81, advocates the method of *successive limited comparisons*, which takes into account the current situation and tests some selections of goals and corresponding actions that are slightly different from the starting point. In such a repeated process, means and ends are not distinct, and the proof of a “good policy” is not the demonstration that it is the best way to achieve a given goal. It relies more on experiences and expert opinions: it is not necessary that all experts are convinced that the policy at hand is the most appropriate means to an agreed objective; they must just agree it is relevant. For the sake of creativity, Lindblom recommends to associate to the governance structure (e.g., administrators in a public agency) persons “whose professional values or interest create diversity of view (perhaps coming from different specialties, social classes, geographical areas) so that, even within a single agency, decision-making can be fragmented and parts of the agency can serve as watchdogs for other parts” (op. cit. p. 88).

The entrepreneurial discovery process of the smart specialization strategy can be an instrument of experimentation associating many actors to be found inside and outside the perimeter of the territory. The association of experts and actors from various horizons is not easy, but there are talented individuals and smaller-sized organizations like smart business services that already partially fulfilled this function. Their action on the field should be favored by the policymakers and their expertise involved in the governance structures. They are not only specialized knowledge brokers; they are part of the distributed intelligence architecture, working as a catalytic interface between the other actors of the innovation system.

Conclusion

The theory of economic development has been considerably transformed by the introduction of concepts and ways of reasoning from the economics of knowledge. Nevertheless, the logic of the innovation process and particularly the emergence and the role of entrepreneurs cannot be fully understood without introducing other elements. The interaction of talented individuals and creative communities plays an important role besides pure knowledge mechanisms like learning processes and R&D programs. The notion of knowledge must be extended to imagination and other meta-cognitive dimensions like culture, serendipity, and leadership. We hope to have given convincing evidence that innovation is not just a question of production and diffusion of knowledge.

The observation of creative territories reinforces the model of such complex systems of collective context-dependent creativity. Furthermore, the hypothesis of independent values and objectives is no longer relevant: goals and means are simultaneously conceived and experienced, in private strategies as well as in public policies (this is the sense of effectuation in entrepreneurship theory and project management). The change of axiomatic framework necessarily modifies the way to understand policy rationales and to design policies. Innovation cannot be imposed on territories; policies can only play with local sources of creativity. Furthermore, we advocate the idea that the concept of territory is not independent from its characterization as “creative.” In a creativity-based evolutionary approach of territories, the social and geographical entity is not only the fruit of its history and the set of its present characteristics; it is defined by the visions of entrepreneurial actors (the latter being resident or not). The territory exists as far as people have projects about it. Therefore, smart local policies are “entrepreneurial discovery processes” as proposed by the designers of the European S3 policy.

Finally, the role of creative individuals must not be overlooked. Individual creativity is always emerging from collective creativity (knowing communities, often linked to specific territories), but reciprocally collective creation proceeds through individual capabilities of synthesis, translation, adaptation, etc. This is typically a complex system, and innovation must be understood as an emergent property of such a system.

One important factor that individuals carry in the process is their willingness, their desire of action, the fulfillment of their visions. Therefore, our definition of creative activities is expressed in a conceptual triangle: novelty, relevance, and will. The creative territory is a space where these three aspects are, at least partially, embedded.

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