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Abstract

An extensive amount of studies have been devoted to the importance of the creative process. Creativity is critical to research and in particular to innovation, a key feature of economic competitiveness. Most of the previous studies have dealt with the creativity of individuals, the creativity of teams and the importance of the organisational context. This chapter, however, emphasises the role of the characteristics of the local and regional economic milieu where the creative process takes place and the local and non-local networks of such milieus. Both the local ‘buzz’ related to interaction and learning opportunities, and non-local networks associated with integration of different milieus, offer special but different advantages for creative activities. The milieu will play an important role in creativity by supplying both a large number of incompatible ideas and good conditions for bringing them together in order to gain new, profound insights. Local accessibility, i.e. clustering, of incompatible ideas and the interregional accessibility to incompatible ideas in other regions are a function of the network characteristics of the local milieu. The purpose of this chapter is to explore the spatial concentration of creativity and the role of clustering and networks in stimulating creative regional economic milieus. One of the arguments of the chapter highlights how clustering of creative agents and creative processes in specific locations generates creative advantages that stimulate creativity and the in-migration of creative agents. Furthermore, the chapter stresses the idea that a better connected economic milieu to other economic milieus via networks transmitting new ideas, information knowledge, etc., will generate higher creative potential of that economic milieu.

Keywords: creativity, creative process, clusters, artistic clusters, network theory, regional economics, local milieu, local and non-local interaction, innovation

JEL-codes:

O31 - Innovation and Invention: Processes and Incentives

R11 - Regional Economic Activity: Growth, Development, and Changes

1. Introduction

We, in particular in the last decade, have seen a rapidly increasing interest in creativity among researchers. A search using Google Scholar for the concept creativity for 1990 generates about 20,000 hits, while a similar search for 2008 generates more than three times as many hits. For the area of Business Administration, Finance and Economics the number of hits increases about four times during the same period. There are strong reasons to assume that the publications on the emergence, importance and behaviour of the creative class by Richard Florida have substantially contributed to this increased interest.¹ However, it is important to remember that creativity has always been an important human activity in all fields of human activity stretching from the generation of new knowledge, new inventions, innovations, new enterprises to the generation of new artistic expressions

Today, creativity is more than ever before looked upon as a crucial resource not only for the cultural sector, but also for contemporary economic development and indeed, personal growth (O'Connor, 2007). Hence, creativity does not only reside in the arts, the cultural industries and/or the media industries, but it has become a central and increasingly important input into all sectors where design and content form the basis for competitive advantage (Flew, 2002). Creativity is critical for research. The production of new knowledge implies that creative processes must take place somewhere in the research process. In particular, creativity is related to innovation, which increasingly is seen as the key to economic competitiveness. Researchers try to isolate the qualities that give rise to new thinking and new visions upon which innovation can build (Negus & Pickering, 2004). What creativity is supposed to contribute to innovation is an artistic quality, something deemed to be intuitive rather than calculative (Banaji, Burn & Buckingham, 2007). Thus, creativity has emerged in recent decades as a prime contemporary value and not least as a resource that has to be mobilised by the business community (Leadbeater, 1999; Rifkin, 2000; Howkins, 2001; Tepper, 2002). However, creativity has also come into focus in recent decades as a new role has been identified for the arts and the cultural industries as generators of economic values and as important to quality of life, the 'image' of cities and regions, tourism and ancillary service industries (Myerscough, 1988; Gibson, 1999; Throsby, 2000; Andersson & Andersson, 2006).

Koestler (1964) and Simon (1985) have stressed that exceptional creativity calls for an ability to bring together habitually incompatible ideas and combine them in a way that gives deep new insights. Törnqvist (1983), on the other hand, has considered the influence of place or context, i.e. milieu, on the individual act of creating something new. Törnqvist's perspective is important since creativity as well as innovation is a localised process (Karlsson & Johansson, 2006). Bringing these two perspectives together implies that the milieu shall play an important role in creativity by supplying both a large number of incompatible ideas and good conditions for bringing them together. The supply of incompatible ideas is among other things a function of the local accessibility, i.e., the clustering, of incompatible ideas, and the interregional accessibility to incompatible ideas in other regions, which both are a function of the network characteristics of the local milieu.

There is a long research tradition in regional economics and economic geography dealing with clustering going back to the nineteenth century and associated with names such as von

¹ According to Florida's ideas, the agglomeration of 'creative professions', i.e. the 'creative class', is driven by the quality of life, tolerance and creative feel of cities (Florida, 2002). However, even if his book is rich in terms of data, he does not present any hard econometric data to support his theories (cf. Peck, 2005; Montgomery, 2005).

Thünen, Marshall, Weber, Ohlin, Hoover, Cristaller, Palander, Lösch, Isard and Beckmann (Karlsson, 2008 a). Despite substantial research on clusters, there is still much confusion concerning the proper conceptualisation of a cluster, except that is generally conceived as a non-random spatial concentration of (economic) activities (Ellison & Glaeser, 1997). Typically, most of research on clusters has focused on industrial clusters and less interest has been paid to other types of clusters. However, whatever the type of cluster, we may in line with Krugman (1991 a) assume that the phenomena of clustering are evidence of the pervasive influence of one or several types of increasing returns. Typical of clusters is the existence of one or several forms of direct and/or indirect interaction between the agents in the cluster location. Increasing returns are obtained when such interaction generates positive externalities for the agents in the cluster. Also agents engaged in creative activities show clear tendencies to cluster. Thus, it is relevant to ask what types of positive externalities they get from clustering.

Concerning the network characteristics of a locality, we make a simple distinction between local and non-local networks. Here we focus on networks between agents. We define a network as consisting of economic agents connected by links, which together constitute the structure defining a specific network (Karlsson, Johansson & Stough, 2005). When all the agents in a network are located in the same locality, we talk about a local network and when at least one agent is located in another locality, we talk about a non-local network. Networks and network relations have five important characteristics (cf. Cappelin, 2003): i) networks can be open or closed, ii) the relationship (link) between two agents is characterised by a precise direction, which identifies either a mutual relationship or a relationship of control or dependence of an agent with respect to another agent, iii) each agent has a specific function, which depends not only on its relationship with other agents, but also on its position in the overall network, iv) each network is normally linked to other networks, so that many networks are interconnected with each other, and v) the relations existing in at a given moment in a specific network are normally affected by the relations that existed in the same network in previous periods, due among other things to the existence of cumulative learning (Nelson & Winter, 1982) and of general path dependence. To the extent that creativity depends upon the interaction opportunities of agents, the network characteristics of localities and regions might have a decisive impact on creative performance as well as the direction of the creative efforts. There are also strong indications not least in science that interaction opportunities are important for creativity. For example, Laudel (2001, 763) remarks that “One of the most important changes scientific research has undergone in the 20th century is the change from being something undertaken by single individuals into being a chiefly collective enterprise.” The reason behind this is on the one hand the increasing complexity of many research problems and on the other hand the intense and rapid dynamics of many research fields which require scientists to specialise, to take advantage of the division of labour and to collaborate.

The purpose of this chapter is to analyse the role of networks and place and the characteristics of creative regional economic milieus.

2. Creativity a fuzzy concept

Creativity is a fuzzy concept, which is difficult to define, measure, and confine. It has been conceptualized as: i) the personality traits of individuals that facilitate the generation of new ideas, ii) the process of generating new ideas, iii) outcomes of creative processes, and iv) milieus conducive to new ideas and behaviour (Rhodes, 1961; Im, 1999). Andersson (1985a), for example, defines creativity as the ability to combine *knowledge*, i.e. familiarity and in-

sights, and *competence*, i.e. the ability to use knowledge for one or several purposes, to create something new, which implies that change is at the centre of creativity.² However, it is beyond the scope of this paper to try to come up with some unifying and definite definition of the concept. Instead, we here use the rather clear definition suggested by Boden (2004, 1). She defines creativity as “the ability to come up with ideas that are new, surprising, and valuable”³, stressing a general ability that is not limited to the creation of cultural artefacts and expressions. Thus, creativity can be interpreted as the ability of individuals or groups of individuals to generate ideas, which are perceived by relevant specialists to be new and at least potentially useful for other creators, consumers and/or producers. The creative process is both a mental and a social process involving discovery of new ideas or concepts, or new associations between existing ideas or concepts, i.e. novelty by combination (Schumpeter, 1934). Thus, the creative ability of individuals and groups depends upon their absorptive capabilities, i.e. on their ability to find, evaluate and use information, ideas and concepts (Cohen & Levinthal, 1990).

Any discussion of creativity presupposes some degree of understanding of the creative processes at the micro level, i.e. within individuals or small teams of individuals working together. Unfortunately, the knowledge about creative processes at the micro level is rather limited. The human brain has, however, certain abilities, which are interesting (Andersson, 1985a). They include the ability to

- Use heuristic reasoning, i.e. to associate ideas, to formulate problems, to be perceptive, to discover, etc.
- Remember important facts and theories
- Detect deep structures in a system of overlaid and interdependent structures
- Detect and use ambiguity and manifoldness, i.e. to deal with seriously non-linear psychological processes
- Appreciate paradoxes and surprises
- Use and react upon experienced disequilibria
- Use fundamental uncertainties and structural instabilities.

According to some specialists, creativity consists of three components – domain-relevant skills, creative processes, and intrinsic task motivation – components, which all can be developed through informal and formal learning (Simonton, 2000; Robinson, 2000; Sternberg, 2007). There seems also to be some sort of consensus around the opinion that creativity is both a way of thinking “associated with intuition, inspiration, imagination, ingenuity and insight” and “novel and appropriate response to an open-ended task” (Byron, 2007).

It is possible to make a distinction between different types of creativity (cf., Florida, 2002): (i) scientific creativity, (ii) technological or innovative creativity, (iii) economic or entrepre-

² Amabile (1996) defines creativity as the development of new ideas that are potentially useful. i.e., that can be embodied in products, practices, services or procedures. It is important to observe here that creativity also develops ideas such as nuclear bombs and cluster bombs!

³ This definition can be compared with the following earlier definitions: “the process of bringing something new into birth” (May, 1959), “in business, originality isn’t enough. To be creative, an idea must also be appropriate – useful and actionable.” (Amabile, 1998), “is the ability to produce work that is both novel ... and appropriate” (Sternberg & Lubart, 1999), “a purposeful activity (or set of activities) that produces valuable products, services, processes, or ideas that are better or new” (DeGraff & Lawrence, 2002), and “the ability to understand, develop and express in a systematic fashion, novel orderly relationships” (Heilman, Nadeau & Beversdorf, 2003).

neurial creativity⁴, and (iv) artistic or cultural creativity. These different types of creativity are probably to a certain extent mutually dependent in the sense that they may stimulate and reinforce each other when located at the same urban region. However, it is well known that artists, such as painters, may develop a high level of creativity when forming artistic colonies also in peripheral rural regions.

To illustrate the creative process, Wallas (1926) introduced a phase model with six steps: (i) preparation, i.e., acquisition of the skills, knowledge and information that allow a person to create, (ii) incubation, (iii) intimation, (iv) illumination or insight – the ‘Eureka’ of Archimedes, (v) verification, and (vi) communication. However, despite the substantial research using laboratory studies as well as detailed examinations of historical accounts of major discoveries of men like Newton, Darwin and Einstein, the underlying mechanisms of illumination remains elusive (Schilling, 2005). Koestler (1964, 95) identified the capacity to “perceive ... a situation or an event in two habitually incompatible associative contexts” as the decisive phase of creativity. Thus, the capacities to select, re-shuffle, combine, or synthesise already existing facts, ideas, faculties, and skills in original ways may be understood as evidence of creativity at work.⁵ Perkins (1981) insists that skills like pattern recognition, creation of analogies and mental models, the ability to cross domains, exploration of alternatives, knowledge of schema for problem-solving, fluency of thought and so on, are all indicators of creativity as a set of learning dispositions or cognitive habits.

The use of the term creative process implies that we can talk about a start and an end, where of course the duration may vary very substantially. However, a process with a start and an end we can also characterize as a project – in this case a creative project. Thus, we should never look upon creative processes as a continuous process like much commodity production. This observation has important implications for the organization and location of creative activities.

Much of the earlier research on creativity has focused on creative individuals in the arts as well as in the industrial domain. This research has built upon the fundamental idea that creativity is connected with imaginative and uniquely gifted individuals. Thus, research on creativity has mainly analyzed individual cognitive characteristics and traits assumed to generate creative outcomes (Sternberg, 1985; Tardif & Sternberg, 1988; Glynn, 1996). In fact, the majority of studies on creativity have drawn tight boundaries around the individual as the locus of analysis (Montuori & Purser, 1996).

It is certainly well known in the industrial domain that many creative individuals, such as Thomas Edison, Gottlieb Daimler, John Dunlop, Alexander Graham Bell, George Eastman, and Guglielmo Marconi, all obtained their first patents working in their own basements or in a building in their back yards. However, even these highly creative individuals soon become members of larger creative teams. Today, creative activities in the industrial domain increasingly are organized with teams in research labs within large firms, specialised R&D firms and universities. However, individual inventors still get a substantial share of the patents awarded. Anyhow, the development during the last century indicates that it is the community and not the individual that matters for creativity (Csikszentmihalyi, 1999).

⁴ Sternberg & Lubart (1999) also look upon entrepreneurship as a form of creativity. As remarked by Baumol (1990) not all entrepreneurship is productive. Some of it is pure rent seeking and some of it is criminal.

⁵ This relates to the work by Schumpeter (1934) on innovation. He placed great emphasis on the fact that new ideas are rare, since most ideas are re-combinations of existing ones.

The general trend in the creativity research seems to be to release creativity from ‘artiness’, individual genius and idiosyncrasy, and to focus on creativity as economically valuable, team- or community-based, observable and learnable (McWilliam, 2007). This implies a broadening of the concept of creativity to include ways of thinking and doing that are observable and replicable processes and practices within daily economic and social life. The influence of various contextual factors including the social environment on individual creativity has been documented by, for example, Amabile (1988) and Amabile, et al., (1996). Woodman, Sawyer & Griffin (1993) stress that the group constitutes the social context within which creative behaviour occurs, and Hargadon & Bechky (2006) present evidences that many creative solutions are the product of collective creative processes, i.e. of social creativity (Cattani & Ferriani, 2008).

It is common to relate creativity to innovation but it is important to stress that it is essential to make a clear distinction between the two concepts. “All innovation begins with creative ideas ... We define innovation as the successful implementation of creative ideas within an organization. In this view, creativity by individuals and teams is a starting point for innovation; the first is a necessary but not sufficient condition for the second” (Amabile, et al., 1996).⁶ Thus, creativity is typically used to refer to the act of producing new ideas, approaches or actions, while innovation is the process of both generating *and applying* such creative ideas in some specific context.

3. Place, Creativity and Creative Processes

It seems to be a generally accepted fact that some places or milieus are more creative than others (Storper, 1997; Florida, 2002), even if their specialisation in terms of field of creativity differs. Why then are some milieus more creative than others? Are the underlying factors the same in all fields of creativity or different? How do creative milieus emerge, develop, mature and possibly decline? Are the life cycles the same for all fields of creativity or do they differ? Are there mutual positive interactions between different fields of creativity stimulating different fields of creativity to agglomerate, i.e. cluster, in the same milieus?

It is beyond the scope of this paper to answer these questions. The ambition here is to highlight the role of clusters and networks for creativity and in particular for the spatial concentration of creativity. However, to do this we have to go a bit deeper into the nature and characteristics of the creative processes. Despite a very substantial research on creativity and the creative processes, it seems fair to state that creative processes are uncertain and unpredictable and characteristics of these processes are partly unknown. As a result, there is substantial disagreement among scientists on what factors that stimulate or restrain creative processes.

Starting with the role of the milieu, researchers’ view on its importance is divided. Rank (1932) for example claims that exceptional creativity requires the creative mind to develop complete autonomy, i.e. that creative individuals and creative teams may need a degree of isolation. Koestler (1964) and Simon (1985), on the other hand, stress that exceptional creativity calls for an ability to bring together habitually incompatible ideas and combine them in a way that gives deep new insights. This implies that creative individuals and creative teams will be more creative the more exposed they are to a variety ideas and this cannot be achieved

⁶ "Often, in common parlance, the words creativity and innovation are used interchangeably. They should not be, because while creativity implies coming up with ideas, it is the "bringing ideas to life" . . . that makes innovation the distinct undertaking it is. “ (Davila, Epstein & Shelton, 2005)

in isolation. Simon (1985) stresses that the process of learning from diverse knowledge databases is a highly important source of invention and innovation and, thus, for creativity.⁷

In recent decades, we have witnessed a veritable explosion of new information, new ideas and new knowledge at the same time as the complexity of these items has increased (Quantas, 2002). Under these circumstances, it is becoming more and more difficult for creative individuals in an increasing number of fields to command all the resources needed to be creative. This makes it necessary to integrate creative activities in creative networks (Powell & Grodal, 2005) with frequent formal and informal interaction to stimulate creativity, to overcome unforeseen obstacles, to reduce uncertainty, and to build confidence (Christensen, Anthony & Roth, 2004). The effectiveness of creative networks depends upon their ability to search for and exchange information, ideas and resources, i.e. on the network's navigability (Watts, 1999). In this connection it is important to observe that the larger the network of people from which creative individuals and creative teams can learn, the greater the prospects for creativity and invention. However, it is only with nearby people that we can have frequent face-to-face interaction with and learn effectively from due to the tyranny of distance and to the fact that many ideas are not well spelled out and much knowledge is tacit.

The emergence and consolidation of creative networks depends on a number of factors, among which a catalyzing agent is one of the most important (Ekboir, 2002). Such an agent induces other economic agents to engage in the network and to invest time and resources in it. However, once a creative network is working, the importance of the catalyst may decrease and the importance of linking agents increase, because the incentives for other economic agents to contribute increase when they can take advantage of the interaction in the network and when the rules for interaction and governance become known by all participants.

What factors then stimulate creativity? Already Adam Smith (1776) dealt with this issue. According to him, the division of labour stimulates creativity and "the invention of all those machines by which labour is so much facilitated and abridged seems to have been originally owing to the division of labour. Men are much more likely to discover easier and readier methods of attaining an object when the whole attention of their minds is directed towards that single object than when it is dissipated among a great variety of things ... A great part of the machines made use of in those manufactures in which labour is most subdivided, were originally the inventions of common workmen, who, being each of them employed in some very simple operation, naturally turned their thoughts towards finding out easier and readier methods of performing it." Smith's analysis implies that creativity will be stimulated in milieus with a large market potential, since a large market potential stimulates the division of labour and specialization. However, even Smith (1776) admitted that there is a limit to which specialization stimulates creativity. "The man whose whole life is spent in performing a few simple operations, of which the effects are perhaps always the same. Or very nearly the same, has no occasion to exert his understanding or to exercise his invention." If divided labour does not have it within itself, the intelligence for creativity and invention must come from other sources.

⁷ It should be observed that there is a fundamental difference between invention and innovation that has been lost in much of the literature, where the terms have been used more or less synonymously without regard for the contrasting levels of risk and uncertainty or the very different kinds of work processes and creative processes, that are involved in these two activities. "Invention involves discoveries of new processes, products, or combinations that can lead to some practical application. Innovation involves the application of inventions, as a discovery or new product is refined and made suitable for marketing." (Suarez-Villa, 1996, 252)

However, Smith (1776) also offered another aspect of creativity when writing about "those who are called philosophers or men of speculation, whose trade is not to do anything, but to observe everything; and who, upon that account are often able of combining together the powers of the most distant and dissimilar objects." When Smith writes that a human being's trade is 'not to do anything', the implication is that (s)he is a theorist, and when he records that (s)he observes everything, the meaning is that (s)he must talk to many, i.e. Smith introduces a network perspective. Lastly the observation that (s)he is good at 'combining together' implies that (s)he is good at combining disparate and dissimilar knowledge. Marshall (1920, 225) described the process of how knowledge variety stimulated the emergence of new ideas: "[I]f one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus becomes the source of further new ideas." Schumpeter described this as "novelty by combination".

Combination and reorganisation of existing ideas and knowledge is a fundamental part of the creative process, so called 'bisociation' (Koestler, 1964). The scope for bisociation is greatest where there can be creative interaction in heterogeneous groups, in particular in the 'creative margin'. However, frictions may emerge, since different disciplines lack a common language and/or common concepts.

New knowledge combinations are, according to Desrochers (2000 & 2001), accomplished by (i) multidisciplinary teams working within a firm, (ii) employees adding to, or switching, their product line, (iii) individuals moving from one type of production to another, (iv) individuals observing a product/process in another setting and incorporating it into their main activity, or (v) individuals possessing different skills and working for different firms, collaborating with each other.

Another important question relates to why people are creative. This question is also discussed in Andersson (1985a), and he makes a distinction between the individual or intrinsic and the social or extrinsic motivation.⁸ It seems as if internal reinforcement mechanisms have greater importance for explaining the total creativity level of individuals than simple reward or coercion arguments. This possibly implies that it is difficult to stimulate the creative output of individuals, and thus that the creative output of regions is dependent upon the total number of creative persons. It is also important to observe that exaggerated demands for discipline and organization might strangle the creative potential. Concerning the social motivation for creativity it seems as if the right to take own initiatives, little of work supervision and employment and income security, if creativity fails, is important for generating creative working conditions.

There must obviously be rewards to creativity, since the creative process is a costly, uncertain process that includes the risk of failure, stress and other negative effects. Creative ideas challenge established norms and might bring disorder, which implies a risk for creative people. This implies that they tend to be met by resistance and scepticism, which is typical not least within science (Kuhn, 1962) but also within, e.g. the arts, music and poetry (Boden, 2004), where the orthodoxy works as a constraint on novelty and new means of individual expression. On the other hand, to change the established norms might be the intrinsic motivation for creative people. It is also probable that persons with intrinsic motivation are less worried about breaking 'the rules of the game'.

⁸ According to Amiable (1996), intrinsic motivation is more important for creativity than extrinsic motivation. However, extrinsic motivation might support intrinsic motivation.

Creative capabilities are important because the creative processes of economic agents are characterized by a frequent interaction in formal and informal creative networks. Creative capabilities cannot normally be bought or easily copied – they have to be learnt through sustained investments, experimentation, and employment of or interaction with the right specialists, and be supported by a strong commitment by the management in organisations and by the participants in the creative networks (Christensen, Anthony & Roth, 2004). Creative capabilities are embedded in individuals, in teams and in the strategies, routines and cultures of organizations (Argote & Darr, 2000). What is critical here is not that all employees in an organization are creative but that the creative individuals can exercise their creativity and influence the behaviour of other employees. However, the management of creative processes must be regarded as a managerial challenge, for, by definition, creativity always involves some degree of novelty and contingency (Mumford, 2000) that can neither be fully planned nor fully controlled.

Economic agents depend on their creative capabilities to be proactive as well as reactive in relation to changes in their technological, economic and cultural milieu. Creative capabilities are built by learning, i.e., by the absorption and creation of knowledge. Because the stock of information, ideas and knowledge is fast growing, complex, diverse and partly short-lived, learning requires strong absorption capabilities to search for useful information, ideas and knowledge and to transform it in a creative process to new ideas and knowledge. These absorptive capabilities depend upon endogenous as well as exogenous factors. The endogenous factors include the strategies, routines and cultures of individuals, groups and organizations, the supply of creative personnel, the investments in creative processes and the internal and external network structures of the economic agents. The exogenous factors include the general economic and cultural milieu and the institutional context where the economic agents are located as well as the general economic conditions.⁹

Creativity from an organizational point of view also involves collective sense-making and framing of issues and builds on existing social practices of problem-solving, agenda-setting and ‘creative interaction’ (Ford, 1996; Drazin, Glynn & Kazanjian, 1999). Thus, creative processes in organizations are partly governed by group norms, organizational structure and leadership (Woodman, Sawyer & Griffin, 1993; Mumford, 2000). Openness and dynamic contacts between individuals, teams and departments facilitates the acceptance of new perspectives and seems to be a particularly, relevant trait in organizational cultures able to stimulate creativity (Mumford, et al., 2002; Martins & Terblanche, 2003).

⁹ The capacity to combine core creative skills from both within and outside the organization is an organization’s core competency (Prahalad, 1993).

4. Local Networks and Creativity

As was stressed in the preceding section, the local milieu including its culture, knowledge base, etc., appears to act often as a critical success factor for creative processes. Apparently, the local milieu also offers various types of local networks, which tend to stimulate creative processes. The probability that creative processes will be successful can be increased through participation or involvement in local as well as broader inter-regional and international networks. In general, urban milieus offer many possibilities for economic agents for strategic network involvement, either material or virtual. Large and dense urban milieus appear to offer fruitful conditions for network behaviour, because of economies of density, suitable communication modes and associative cultures (including a scientific milieu). Such a milieu with an abundance of formal and informal contacts may offer a protective shell for creative activities.

Networks may, in general, relate to physical configurations (such as air, road, railway and telecommunication networks) or to virtual networks (such as industrial clubs and knowledge and information networks) (Karlsson & Manduchi, 2001). Such networks may have a local character, but may also extend towards global levels. Networks may be intentionally organised for a particular purpose but they can also be self-organised and self-governing. Networks are said to facilitate the relations of economic agents in a way that falls somewhere between the flexibility of the market and the rigidity of the hierarchy. Through networks, individual economic agents are engaged in reciprocal, preferential and mutually supportive actions.

All networks tend to create diversity in terms of information and knowledge and to stimulate the creative spirit. In general, local networks between economic agents may be seen as supporting mechanisms for creative processes; as such, networks are a blend of openness and protection. Information and knowledge provided via various networks is a *sine qua non* for successful creative processes. A variety of network configurations, such as supplier and customer networks, local networks of neighbouring firms, professional networks and knowledge networks all may contribute to more effective creative processes.

Network analysis views economic agents as interdependent and linked parts of a connected whole, rather than as independent units of observation (Uzzi, Amaral & Reed-Tsochas, 2007). It is obvious that also creativity can be better understood and analysed by applying the principles of network theory and network analysis, since much of the ideas, information and knowledge that are critical for creative processes are accessed via various professional, commercial and private networks. Collins (1998) in his study of creativity in science, arts, and philosophy shows that the creative breakthroughs of people like Pythagoras, Freud, Picasso, and Watson and Crick were a consequence of a particular type of personal network that stimulated exceptional personal creativity.¹⁰ In recent decades, scholars in organization science also have started to analyse the network aspects of individual creativity (Simonton, 1984; Brass, 1995; Perry-Smith & Shalley, 2003; Burt, 2004; Perry-Smith, 2006). Networks offer three unique advantages (Uzzi & Dunlap, 2005): private information, access to diverse skill sets, and power.

It is possible to understand the importance of networks for creativity by applying network theory. Networks provide horizontal links that cross institutional boundaries to put people

¹⁰ Collins only find three exceptions in the recorded history of man: Wang Chung (Taoist metaphysician), Bas-sui Tokusho (Zen spiritualist), and Ibn Khaldun (Arabic philosopher).

and organizations in direct contact with each other. Firstly, networks using modern information and communication technologies facilitate rapid information transfer over any distance but they also help create information. As people connected to the network receive information they synthesize it and new information emerges since information partly builds upon information. These networks also help in sharing and creating ideas. Both information and ideas are important inputs in creative processes.

Secondly, personal networks play a critical role in the transfer of tacit knowledge, which often is a critical input in creative processes. The transfer of tacit knowledge often requires frequent face-to-face interaction over longer periods, which implies that local personal networks have strong advantages when it comes to the transfer of tacit knowledge.

Thirdly, creative processes are characterized by the manipulation of information, ideas and knowledge but the characteristics of information, ideas and knowledge are very different from ordinary goods. One basic common characteristic of information, ideas and knowledge is that its production cost is independent of its scale of use, which implies increasing returns to the use of information, ideas and knowledge. This factor has traditionally conferred benefits to the early movers in the creative process.

One type of networks of special interest for creativity research is small-world networks, which is a type of networks in which i) the links among economic agents are highly clustered, in the sense that the connections of one economic agent with a high probability are also connected to each other, ii) the average number of intermediaries needed to connect any two economic agents is low, and iii) the average path length is relatively short. Thus, small-world networks offer a unique combination of high clustering and short path lengths, which offer an especially potent organising mechanism for increasing performance not least in terms of creativity. Milgram (1967) showed that small-world networks had a short path length despite a high level of clustering, i.e., even in a very large small world network actors are separated on average by only six degrees of separation or six intermediaries. Thus, it is natural to assume that small-world networks create unique performance benefits in activities such as creative processes. The reason is that many separate clusters enable the incubation of a diversity of specialised ideas while short paths allow ideas and resources to mix into new and novel combinations (Uzzi & Spiro, 2005; Fleming & Marx, 2006).

5. Clusters and Creativity

There are numerous historical examples of how creative people and creative activities tend to cluster. The examples stretch from the painters of the late 19th century clustering in Skagen in Denmark to creative software developers clustering in Silicon Valley. Even if there are examples of creative people clustering in small places, the majority of the historical examples seem to be examples of clustering in cities.

The tendency of creative activities to cluster or co-locate have been noted in the scientific literature (cf., Mommaas, 2004).¹¹ What advantages does clustering bring to creative activities?

¹¹ Much of the discussion dealing with clustering and creativity has dealt either with clustering of creative industries (Maskell & Lorenzen, 2004; Scott, 2006) or of the so-called creative class (Florida, 2002 & 2005). I avoid to use these concepts since I consider the definitions used in both cases to be very arbitrary. For example, industries that are characterized as non-creative have to rely on creativity in processes such as marketing or product development (cf., Siedel, Rosemann & Becker, 2008). Thus, I prefer to focus on creative activities instead,

Applying a traditional value chain discourse à la Porter (1998) the obvious answer is competitive advantage. However, in terms of creative activities it is probably better to talk about creative advantages. We can thus formulate the question as follows: what creative advantages does clustering bring to creative activities? Do these advantages differ for different types of creative activities? Do these advantages change over time given improvements in transport and communication infrastructures? With reference to analyses of value chains in commodity production one can ask whether creative clusters are “stand-alone” or if they are nodes in creative value chains, where creative impulses are transferred between different creative clusters. One interesting issue here is of course whether the importance of creative impulses varies between different creative activities. The relationships between creative clusters will be discussed in the next section where we discuss the role of inter-regional networks for creative activities.

We stressed in the introduction that creative processes involve both mental and social processes that if they are successful lead to the discovery of new ideas or concepts, or new associations between existing ideas or concepts. We can assume that the discovery of new ideas or concepts is very rare and that creative processes that are successful normally come up with a new association between existing ideas or concepts. The probability that such new associations shall emerge is all other things equal a function of the accessibility of existing ideas, etc., in a location as well as the degree of variety and diversity of these ideas (Lazzeretti, Boix & Capone, 2008). The accessibility of existing ideas increases with the size and density of locations, which implies that creative individuals as well as organised creative activities are attracted to larger and denser regions with higher idea accessibility but also with a larger variety and diversity of ideas. This implies that the productivity of creative activities is higher in larger and denser regions.

If we further assume that we can evaluate the creative output and make a distinction between small creative and large creative steps, i.e. between incremental and radical creativity, we might assume that the size and density of regions influence the probability for large creative steps. The reason is that radical creativity demands the combination of diverse ideas and that large and dense regions offer a much more diverse set of ideas than small regions. Partly these ideas are “as being in the air” (Marshall, 1890, 271) and the larger and denser the region the larger the number of ideas ‘in the air’. However, many ideas are not fully articulated and rather reside in the heads of people until they are released when the right circumstances are there. We may also assume that face-to-face interaction between people increases the probability that residing ideas will be released and the larger and denser the region the more opportunities for face-to-face interaction.

Given these basic considerations, we may now discuss more broadly the factors that tend to stimulate the clustering of creative people and creative activities in general and in large and dense regions in particular. Researchers have identified different properties of those locations that attract clusters of (modern?) artists, such as artistic freedom (Vaubel, 2005), ideological diversity (Simonton, 1976), and political fragmentation (Naroll, et al., 1971). Ley (2003) discusses the tendency of artists to cluster in large cities and explains the clustering by the need to come close to the art-related community, close to their market¹², and perhaps most important (!) ‘close to each other’. Large cities offer artists a suitable milieu in which to gen-

which can occur also in industries that are not defined as creative industries as well as involve people that are not defined as belonging to the creative class.

¹² Scherer (2001) claims, that the demand for artistic products in (large) cities is important for the location and clustering of composers.

erate networks, relationships, facilities and creative spillover effects within and across creative communities (Becker, 1982; Bain, 2003; While, 2003) but also opportunities to learn in arts colleges and through instructions from peers. Artists in a cluster may develop a common language, joint interpretative contexts and a shared knowledge base (Lawson & Lorenz, 1999). Bonds of trust and common goals are complemented by shared local knowledge, which is rooted in local social structures, institutions and cultures.

Co-location facilitates the establishment of common interpretative schemes (Grabher, 2002 a), especially through ‘hanging out’ in local ‘communities of practice’ (Wenger, 1998). This implies that one distinguishing feature of clusters of artists is that they provide unique opportunities for the transmission of sticky, non-articulated, tacit forms of knowledge between the artists located there. When this locally embedded knowledge is combined with codified knowledge from other regions new artistic expressions can be created, i.e. creativity is stimulated. In terms of radical creativity one can observe that different avant-garde movements have been closely related to large and dense cities and this is true still today in the developed western countries (Ley, 2003; Grosenick & Stange, 2005).

Norton (2004, 172), when discussing the role of Paris and New York as centres of artistic creativity and innovation, summarizes most of the above arguments when he argues that “these avant-garde art clusters provided localized knowledge networks in which artists, dealers, gallery owners, and critics could keep abreast of the latest artistic advance.” He mentions five factors that created positive feed-back cycles in these centres: i) the efficiency of communication, ii) the ready availability of new knowledge, iii) the cumulative building of a specialised knowledge base, iv) the education of an art-buying public, and v) the development of a public infrastructure of museums, schools, galleries, auction houses, and the like.

Thus, artists tend to cluster together to share ideas, offer mutual support and provide a sympathetic audience for one another (Kim, 2007). Furthermore, the rapid changes in artistic styles in contemporary art require artists who want to be in touch with current trends and the latest developments to be close to important art galleries (Kostelanetz, 2003; Grosenick & Stange, 2005). The results reported by Hellmanzik (2009) indicate that works that have been produced in artistic clusters are more valuable than paintings produced elsewhere. Thus, there exists a cluster premium due to favourable production and demand conditions in artistic clusters. It is this quest for superior rents that lures artists to cluster but also to pursue systematically and sometimes vigorously a search for potentially useful knowledge pools and impressions residing elsewhere by means of, e.g. study tours (cf. Scott, 1998; Maillat, 1998).

Obviously, learning opportunities is one critical factor in explaining the formation of creative clusters. A main argument in the contemporary literature on learning and creativity is that these are the result of interactive processes in which different artists come to collaborate directly and indirectly to create new artistic expressions. Thus, it is important to understand the learning processes that take place within a cluster of artists as well as the types of interaction that are involved.

Learning within artistic clusters can take place in many different ways (cf. Simon, 1991) but is often closely related to the ongoing activities extending the internal pool of knowledge and competence (cf. Fuchs, 2001; Tracey, Clark & Lawton Smith, 2002). An artistic cluster offers a common interpretative context based on artistic visions, values and memories, which exist in the form of artefacts, routines, and experiences. This helps to ensure that what each artist learns is in some way connected to what other artists know or learn. However, as knowledge

is in itself an important source for future learning and knowledge creation, small initial individual differences tend to increase over time even when individual experiences are shared. As a cluster grows and matures its knowledge stock will grow but in an uneven fashion and gradually becomes more coherent. The larger the cluster becomes, the fewer the experiences that are shared among all artists. This implies that what was presumably from the beginning a homogenous body of knowledge and competence becomes fragmented into a complex pattern of only partly overlapping fields of knowledge, competence and expertise, with limited connections and objectives no longer in full accordance with each other. Such developments create incubators for new types of artistic expressions based upon some sort of dedicated vision and targeted efforts. Thus, we here have a mechanism by which an artistic cluster may renew its artistic expressions.

Overall, the shared knowledge and idea basis enables artists in clusters to continuously combine and re-combine similar and non-similar knowledge and ideas to create new ideas and new artistic expressions. This stimulates artistic specialisation within the cluster and results in the development of localised capabilities (cf. Maskell & Malmberg, 1999 a & b), which are available to the artists in the cluster. Living within an artistic cluster has further advantages that are not available to artists located elsewhere. Making an analogy with the famous notion by Marshall (1927) of 'industrial atmosphere' as being something 'in the air', we could talk about a 'creative artistic atmosphere' that is limited to the artists living within and possibly visiting a particular artistic cluster. In a similar vein, Storper and Venables (2002), for example, recently have identified what they see as a particular important sub-set of cluster advantages, which they label 'buzz'.¹³ 'Buzz' represents the idea that clusters can be vibrant in the sense that there are lots of piquant and interesting processes going on simultaneously, generating lots of information, ideas and inspiration, which can stimulate the creativity among perceptive artists in different clusters. 'Buzz' refers to the information and communication ecology generated by face-to-face interaction by the co-presence and co-location in the cluster of artists and of other people interacting with the artistic community such as customers, critics, dealers, tourists, policy makers, etc. The 'buzz' consist of specific ideas, information and knowledge, which are continuously updated and revised. It also consists of intended and un-anticipated learning processes in organised as well as accidental meetings, the application of paradigm-specific interpretative schemes¹⁴, a mutual understanding of new knowledge and techniques, as well as shared cultural traditions and habits within the specific paradigm. All this stimulates the establishment of paradigm-specific conventions and other institutional arrangements. Artists continuously contribute to and benefit from the spread of ideas, information, techniques, gossip and news by just being there (Gertler, 1995).

Participation in the 'buzz' requires personal investments in links with other persons in the cluster, i.e. network formation and creation of communities of practice. All persons who are located in the cluster do not automatically receive ideas, information and knowledge. Instead, it is necessary for the artists to participate in various professional, economic and social spheres. In this context, artists are on the one hand deliberately scanning their regional milieu in search for ideas, information, and knowledge at the same time as they are surrounded by a concoction of rumours, impressions, recommendations, trade folklore and strategic information (cf. Grabher, 2002 b). It is almost unavoidable to receive some information, rumours and news about other artists in the cluster and their creations, behaviour and success. This occurs in negotiations with gallery owners, in phone calls with colleagues, when having lunch or

¹³ Other similar concepts used in the literature are 'local broadcasting' (Powell, 2002) and 'noise' (Grabher, 2002 b).

¹⁴ The paradigms change over time.

dinner together with colleagues, at art exhibitions, etc. Thus, part of the ‘buzz’ is spontaneous and fluid. Co-presence within the same professional and social context generates manifold opportunities for face-to-face meetings and communications. These meetings can be planned or occur spontaneously, i.e. non-designed, non-targeted and more or less accidental. However, their probability to occur is dependent upon the size and density of the artistic cluster.

The links in the different networks where the artists are involved link actors in the cluster in multiple ways (Uzzi, 1997). The longer the history of the cluster the more likely it is for the networks and connections between different networks to develop. Over time, these structures of professional and social relations stimulate fine-grained information transfer, joint problem-solving and creative sessions and the development of trust and reciprocity (Granovetter, 1985; Uzzi, 1997). Thus, different modes of communication operate in professional and social context of a cluster (e.g., chatting, gossiping, brainstorming, and in-depth discussions). Co-location and visibility generate potentials for efficient inter-personal translation and interpretation of news, information and knowledge between the actors in the cluster (Latour, 1986; Allen, 1997). Specific learning processes, path dependence and selection environments (Murdoch, 1995) establish paradigm coherence within clusters, in particular. Being located in the same place also enables artists to understand the local ‘buzz’ in a meaningful and useful way. This is because co-location within a cluster stimulates the development of a particular informal institutional structure, and similar language and interpretative schemes shared by those who participate (Lawson & Lorenz, 1995).

Under these circumstances, a high level of ‘ordinary’ creativity may develop under the prevailing artistic paradigm. However, we have no hints of what factors that may trigger ‘exceptional’ creativity, i.e. the emergence of new artistic paradigms. Under what circumstances are artistic clusters able to generate new artistic paradigms?

To understand the factors driving the clustering of artists we can use the famous scheme developed by Marshall (1890): i) a common labour pool, ii) a supply of intermediate inputs, and iii) information and knowledge spillovers. These supply-side factors generate a local proximity (Glaeser, et al., 1992), i.e. accessibility, which allows economic agents to benefit from otherwise unattainable tacit knowledge, and externalities of the trade located in a particular region, which can be internalised through learning. It is obvious that information and knowledge spillovers are the critical factor on the supply side for artists. Artists share ideas, information, and knowledge and generate a collective knowledge that is embedded in the locality. In particular, they are well informed about the characteristics of the creations of other artists in the cluster due to more or less continuous monitoring and comparing. Thus, individual artists can effectively compare their performance with that of other artists in the cluster. Overall, this creates rivalry and serves as an incentive for differentiation and variation of the artistic expressions.

The tacit character of much of the new knowledge implies that the potential for knowledge spillovers varies considerably over space. Tacit knowledge demands frequent face-to-face interaction for knowledge transfer and knowledge sharing to take place (Karlsson, Flensburg & Hörte, 2004). Since face-to-face interaction over long distances is both time and resource consuming, it is natural for economic agents, like artists, who are dependent on knowledge spillovers to cluster in a limited number of locations. Thus, one important reason why creative activities cluster preferably in large urban regions is that these regions offer physical proximity, which facilitates the integration of multi-disciplinary knowledge that is tacit and therefore ‘person embodied’ rather than ‘information embodied’ as well as allowing the rapid

decision-making needed to cope with uncertainty (Patel & Pavitt, 1991). Due to urbanisation economies, these regions also offer diversity, that is, economies of scope in information, skills, knowledge, competence, producer services and other inputs, which are crucial in creative, innovative and entrepreneurial processes (Karlsson, Stough & Johansson, 2009).

Individual artists are not dependent upon a common labour pool and the supply of intermediate inputs is certainly not critical but may make life easier for artists. However, what might be more critical is the supply of outlets for their creations in the form of, for example, art galleries, i.e. the demand side matters too. The supply side and the demand side aspects were synthesised by Krugman (1991 b) in his New Economic Geography Model, where he illustrated that economic agents will be located where demand is large and that demand will be large where many economic agents are located.

Leaving the factors that stimulate the clustering of creative individuals to the clustering of organised creative activities, such as general cultural productive activities, like the production of theatre performances, concerts, movies, etc, and R&D, it is obvious that Marshall's factors play a critical role for stimulating clustering. The presence of these specialised creative inputs in a geographically constrained area creates both static and dynamic localised advantages for creative activities. Of particular importance are the localised dynamics of collective learning and creativity (Keeble, & Wilkinson, 1999). Both cultural production and R&D has the form of projects. Projects are unique but organised endeavours, undertaken by heterogeneous teams of specialised economic agents who collaborate to fulfil complex, interdependent tasks for specific purposes (Lundin & Söderholm, 1998). In these projects, various creative economic agents are linked together with economic agents performing a series of specialised tasks in a complex web, which leads to the collective creation of a creative output.

'Cultural commodity production' often involves high levels of human input, self-organised or organised by a lead-partner as temporary networks of small companies and professional people (freelancers) working on a project basis (Scott, 2000), where teams, partnerships and alliances dissolve and are reorganised in an un-regular manner over time (Bilton, 2007). These networks provide dense flows of information, knowledge, goods and services and benefit economies of scale and in particular economies of scope in skills-sourcing and know-how. They involve complex division of labour and specialisation supported by the developments in information and communication technologies, which tend to tie professional people and small companies involved in cultural commodity production to places with a particular specialisation, i.e. clusters (cf. Pratt, 2004). Such clusters can normally only develop and survive for extended periods in larger urban regions, i.e. cultural commodity production is related strongly to the city (Scott 2004). Only large urban regions can provide those facilities, institutions, and embedded knowledge and practices, i.e. the urban eco-system, which is crucial for sustainable creative milieus. Thus, cities are "collectives of human activity and interest that continually create streams of public goods – ... – that sustains the workings of the creative field" (Scott, 2001, 13).¹⁵ The underlying reason is of course that 'creative production' often has a collective nature, is dependent upon the development and maintenance of creative teams with diverse skills and often needs to be coordinated within a relatively short and often finite time frame (Caves, 2000).

It is rare that researchers have tried to analyze how 'creative work' in projects comes about in the different contexts where they are embedded (Manning & Sydow, 2007). One interesting

¹⁵ Unlike Florida, Scott is concerned with cultural production rather than consumption.

observation that can be made here is that the more project cycles that are short-term and unforeseeable in terms of mission, the more important it becomes, that project partners are co-located (Sassen, 1995; Scott, 1997 & 1999; Hutton, 2000). This implies that project networks more and more gravitate towards local concentrations of creative talent, specialists, professionals and producer service firms when relations more and more are driven by availability and speed of delivery (Grabher, 2002 a) and an ambition to reduce geographical transaction costs.

At this point, it is important to stress, that it is not only creative activities within ‘cultural commodity production’ that have a tendency to cluster and that such clustering is not a new phenomena. It has for example been observed that inventors and particular great inventors in the U.S. in the first half of the 19th century had a strong tendency to cluster disproportionately in regions (such as New England and the Middle Atlantic) and in particular counties, where low-cost transportation, such as navigable inland waterways, were more accessible as well as patent agents and layers (Sokoloff, 1988; Kahn & Sokoloff, 1993 & 2004; Lamoreaux & Sokloff, 1996 & 1999 a & b).¹⁶

6. Non-local interaction and creativity

Above we have discussed the importance of clustering and local interaction for learning and creativity. However, there are researchers questioning the superiority of local versus non-local interaction (Malecki & Oinas, 1999; Oinas, 1999; Bathelt, 2001; Gertler, 2001; Vatne, 2001). There is according to these authors relatively little research on actual processes of learning and creativity to give enough evidence of the claims about localised learning and creativity based mainly on local interaction. As processes of learning and creativity are not well documented empirically, the mere clustering of creative persons such as artists is assumed to prove the existence of localised processes of learning and creativity. Since these clusters do not exist in isolation but are connected to other regions of which some contain similar clusters it might be the case that learning and creativity are the result of a combination of local and non-local interactions.

The channels used for non-local interaction have been referred to as ‘pipelines’ in the literature (Owen-Smith & Powell, 2002). The basic idea is that decisive, non-incremental knowledge flows are often generated through ‘network pipelines’. Creative people are embedded in social and professional networks, which are not geographically bounded and ideas, information and knowledge can be acquired through partnerships and cooperation of inter-regional and international reach. The resulting interaction is greatly impacted by the degree of trust that exists between the persons involved. When pipelines are established to new partners new trust has to be built in a conscious and systematic way – a process that takes time and involves costs (Harrison, 1992). The non-local networks are essential since ideas, information and knowledge tend to be fragmented and specialised and it is only through interaction in non-local networks that it is possible to sort out, interpret and evaluate these fragments and additions to the current stock of ideas, information and knowledge (cf. Törnqvist, 1983).

¹⁶ Khan & Sokoloff (1993) make the interesting observation that there is evidence that great inventors in the U.S during the early 19th century were both more likely to be born in counties with low-cost access to broad markets, and to migrate to, i.e. cluster in such counties. Thus, great inventors become highly concentrated in these clusters.

It seems natural to assume that ideas, information and knowledge spread through local ‘buzz’ interact synergetically with ideas, information and knowledge spread through ‘pipelines’ to stimulate learning and creativity in a cluster. The more the persons active in a cluster engage in the build-up of inter-regional and international ‘pipelines’, the more ideas, information and knowledge about for example new artistic trends are pumped into the local networks and the more dynamic the ‘buzz’ from which these persons benefit. Burt (1992) emphasises the importance of those actors in a cluster, which are able to make connections to otherwise remote networks, i.e. to bridge ‘structural holes’. Because of their potential to stimulate and intensify local interaction, the ‘pipelines’ support a cluster’s cohesion and strengthen its internal relations and interaction processes between cluster participants (Murdoch, 1995). Openness of cluster relations and active search for external ideas, information and knowledge may be critical to understand the rise of successful clusters (Scott, 1998; Maillat, 1998; Bresnahan, Gambardella & Saxenian, 2001).

The importance of non-local networks can be understood from another perspective. The need for non-local networks emerges partly from the fact that local networks can be too close, too exclusive and too rigid (Uzzi, 1996 & 1997). External network relations are important to avoid lock-ins in clusters (Kern, 1996). There is a significant difference between ‘introvert’ and ‘extrovert’ clusters (cf. Malecki, 2000) but even if a cluster over time achieves a successful balance between being too much inward- or too much outward-looking, it is nevertheless only able to handle a limited number of external linkages (cf. Grabher, 2001 & 2002 a). The reason is that the establishment and maintenance of external linkages requires substantial time and are costly.

Communication processes in non-local networks are contingent by nature and characterised by high uncertainty. Non-local networks encompass, for example, artists from different parts of the world, which are embedded in different social, institutional and cultural milieus. This implies that they operate in different selection milieus (cf. Owen-Smith & Powell, 2002), which will result in different artistic expressions. This is very important for these creative activities since new leading edge expressions are constantly created but the location of these leading edge creations are changing. Since the different artistic clusters are competing for attention, new leading-edge creations in one cluster are significant stimuli for the generation of new leading-edge creations in other clusters.

Thus, it can be hypothesised that both local ‘buzz’ and non-local networks offer special but different advantages for artists and other persons engaged in creative activities. Local ‘buzz’ is beneficial to learning and creative processes because it generates opportunities for a variety of spontaneous and unanticipated situations where artists interact and form interpretative and creative communities (cf., Nonaka, Toyama & Nagata, 2000). The advantages with non-local networks are instead associated with the integration of different selection milieus that open up different potentials and feed local interpretation and the use of ideas, information and knowledge residing elsewhere. Some clusters are able to be creative particularly because people in those clusters make connections with other clusters (cf. Malecki, 2000).

The use of existing non-local links and the establishment of new non-local links with other clusters and with individual artists in such clusters require planning, conscious efforts and specific investments. Thus, flows of ideas, information and knowledge through non-local links are not automatic and participation is not free but instead involves a complex and costly process. Cost-consideration will tend to make the interaction in non-local links targeted towards certain pre-defined and planned goals. Information flowing through global pipelines

has an intrinsic bias towards filtering information about failures and mainly contains information about successes.

Interaction through global pipelines involves a selection of clusters and of individual artists to interact with – interaction here also includes migration for shorter or longer periods to another cluster. Such selection is not easy since information about the set of potential clusters and individual artists usually is truncated and the information about these clusters and their individual artists incomplete (cf. Malmgren, 1961). Furthermore, artists have to develop a joint interpretative context and a common language in order to engage in fruitful interaction and cooperation. Artists that want to participate in non-local interaction must learn to understand their different institutional regimes, interpretative schemes, and artistic paradigms, which requires complex cognitive capabilities.

Since the interaction of artists in non-local networks can be interpreted as a conscious attempt to overcome identified weaknesses and shortcomings in the own cluster and to achieve certain creative goals, they are certainly prepared to make special efforts to bridge cultural, cognitive, and other distances. Non-local interaction between artists from different clusters implies a mixing of partly different ideas, information, knowledge and artistic paradigms. When the overlap in these respects is large, we may assume that the extra creativity generated is minimal. However, when the overlap is small, there is on the one hand the risk that the lack of a common language will prohibit effective interaction but on the other hand the chance that the meeting between two very different artistic paradigms might stimulate the emergence of new artistic paradigms.

Identifying the value and location of external artistic ideas, information and knowledge and building links to access the external sources is only part of the challenge when attempting to boost creative capability. An equally important task is to develop the ability to interpret, to understand, to evaluate, and to integrate the external stimuli in creative processes, i.e. to develop an absorptive capacity (cf. Cohen & Levinthal, 1990). It is important to observe that a cluster's absorptive capacity is larger than the sum of that of its individual artists and of other people interacting within the cluster. Instead, it is a function of the volume and the intensity of the local 'buzz' and non-local interaction. Internal gatekeepers and boundary-spanners become crucial for translating external ideas, information and knowledge into a form that can be understood by the individuals for whom it is particularly valuable. The concept of absorptive capacity emphasises both the role of diversity of expertise and its distribution within the cluster for creating new mental maps, which integrate the external stimuli in the local 'buzz'. The degree and distribution of expertise affects how external stimuli, which arrives through pipelines and is dispatched by the local gatekeepers will be interpreted and absorbed by the artists in the cluster. If the existing expertise is too narrow, a cluster will not be able fully to take advantage of its external stimuli. "So while common knowledge improves communication, communality should not be carried so far that diversity across individuals is substantially diminished". (Cohen & Levinthal, 1990, 134)

7. Creative Regional Economic Milieus

Social scientists for several decades have pointed out that the developed economies during the post-war period have gone through fundamental changes. Different authors have used dif-

ferent concepts to characterise what they have seen as the most basic aspect of these changes. Thus, concepts, such as the information society, the service society, the post-industrial society, the knowledge society, etc. have been introduced. Already, in the 1980s the Swedish economist Åke E. Andersson started to describe the dynamics of the long-term changes in the western societies and to analyse the underlying driving forces (Andersson, 1985 a & b, 1988 & 1989; Andersson & Mantsinen, 1980; Andersson, et al., 1984; Andersson & Strömquist, 1989; Matthiesen & Andersson, 1993). According to him, the major driving force in the modern economy is creative activities and processes, which generate new knowledge spurred by culture and communication. Development, handling and presentation of new knowledge and information employs a steadily increasing share of the labour force. These activities are assumed to have strong spillover effects on industrial activities in manufacturing as well as in service production.

In the picture painted by Andersson, the economic life is under steady change towards more dynamic product competition. The resource base in developed economies is no longer mainly natural resources, energy, etc. but education and assets based on creative activities. The development in these economies is based upon new complementary infrastructure. Traditional means of transportation are complemented and sometimes substituted by the communication networks created by modern information technology. Among the traditional means of transportation, road and air transport gradually get a more and more dominating role. Access to material and non-material networks is becoming more and more critical.

To be able to understand, predict and/or influence regional development in the creative society it is, according to Andersson (1985a), necessary to understand how the economic system can be divided into game or play and scene or arena. The economic and the political game with rapid and sudden changes is played on an arena where changes are slow. The arena consists of material infrastructure (transport systems, buildings, etc.), immaterial infrastructure (knowledge stocks, knowledge networks, etc.) and institutions (formal and informal behavioural rules, property rights, etc.).

A fundamental difference between the creative knowledge society and earlier societies is that its infrastructure in a profound way consists of many inter-connected layers. The material infrastructure not only consists of road, rail, air, and sea traffic networks. Rail, for example, serves local, regional, national as well as international transport demand. The rail traffic is complemented with successively more and more advanced information systems for traffic control as well as for planning and booking trips even in combination with other means of transport. The immaterial arena consists of knowledge and information assets. What is typical for the modern society is that knowledge and information flows are distributed over many different media and that electronic media increase their market share rapidly.

As regards institutions, the trends seem to go in different directions. On the one hand, there is an increasing stress on patents, copyrights, etc. to protect intellectual property rights. On the other hand, there are signs that intellectual property rights are becoming less and less interesting in a rapidly changing society, which is illustrated by the increased reliance on 'open innovation' (Chesbrough (2003)). What seems to matter more and more is the position of individuals, firms and regions in different networks, i.e. what access they have to relevant knowledge and essential information.

Already, Andersson, Anderstig & Hårsman (1990) demonstrated how industrial development and income growth in a region are positively influenced by a combination of universities and

other research institutions¹⁷, which grow synergetically with telecommunications and good accessibility to rapid transport systems in the form of air and road transport. The creative society comes through and creates growth and prosperity in a number of regions, which contain this kind of potentials. These regions tend to be centres of agglomeration and it is the diversity of knowledge, know-how, learning capabilities and resources found in these regions that makes them centres of creativity and innovation and which in turn, contributes to their competitiveness (Johansson, Karlsson & Stough, 2009).

In earlier phases, the military played the most important role internationally for stimulating creativity and innovation and the generation of high-tech clusters (Hall, 1990). Other sources, such as experiences, entertainment, health, environment, and food, in more recent phases have become more and more important in generating a demand for creativity and innovation. Overall, a huge interest has in recent decades been devoted to, in particular, high-tech clusters among scientists, politicians and planners, as well as in media (Karlsson, 2008 b). These clusters, which also have been described as creative, innovative, and knowledge-intensive, contain one or several industries that are R&D-intensive and have a high share of university-trained employees.

Fujita and Thisse (1996) suggest against this background that human activities can be divided into two categories: production and creation, where the former represents routine methods of production. Creation, on the other hand, stands for the generation of new ideas, new knowledge, new technologies, new products, etc. Andersson (1989) has analysed what characterises dynamic creative activities. Successful dynamic creative activities are large logistical networks of small, creative units. The creative units have a non-hierarchical structure and are often self-organised. This implies that economies of scale are combined with, and complemented by economies of scope. These characteristics have strong implications for the development of the system of functional regions¹⁸.

The difference between knowledge- and information-rich, and knowledge- and information-poor regions tends to grow. Regions with company R&D and research universities are centres for the development of fundamental research results, whether it occurs within the laboratories of universities or private companies. Such regions, which normally are large and dense, also offer deeper and more versatile knowledge, competence, and supply of specialists as well as rich opportunities for personal contacts. It is a greater probability for spin-off growth, if the regional milieu is information-rich (TV, radio, press; Internet, interregional and international information networks, etc.) compared to information-poor milieus. It is also vital to have activities within the region, which demands scientific results and can pay the price. With an intraregional demand, spin-off effects occur, which stimulate further growth. There are break-aways from existing institutions and activities, since progressive inventors start their own business and become entrepreneurs. This is in line with the incubator or nursery-city model, which argues that regions, which are highly diversified, and which contain a broad spectrum of different types of industries and firm sizes will function as superior incubators for the development of new firms and the growth of small ones (Chinitz, 1961; Duranton & Puga,

¹⁷ Karlsson and Andersson (2009) show that there is a strong persistence or path-dependence in the location of both industrial and university R&D. The location of industrial R&D seems to be quite sensitive to the location of university R&D and there are indications that the location of university R&D is sensitive to the location of industrial R&D.

¹⁸ A functional region is distinguished by its concentration of activities and of its infrastructure, which facilitates high factor mobility within its interaction borders. In particular, a functional region has an integrated labour market, in which commuting as well as job search is intensive (Johansson, 1998).

2001). One major reason is that in this kind of economic milieu there will be a variety of local business services available not least for supporting creativity in new and small firms.

For a creative region to grow and develop, it is important for the transport system to have high quality and high capacity (Matthiesen & Andersson, 1993). Such a transport system allows contacts with and imports of new knowledge and innovations from other creative regions in the rest of the world. It is much better for a region to be an import centre than an export centre, even if exports also contribute to growth and prosperity. The reason is that the majority of all those ideas, which generate new activities in a region, get inspiration from other regions. Irrespectively of how strong a region is in terms of R&D, it only produces a tiny share of all new knowledge in the world. Most of the ideas, which are taken up in a given activity, come from other creative regions. They are imported, they are used, they are developed, and they generate new production. The production of new goods or services places a firm among those firms, which are product competing and which have a capacity to pay high wages and salaries.

General import activities and knowledge importing organisations are concentrated in a limited number of urban regions in each country. Production, which is based on imports, is generally no high-risk activity. That something has been imported implies that it has been possible to produce somewhere else and to sell. In a second round, the new products in the import regions spread to other (export) regions and thereby their exports are renewed (Jacobs, 1969 & 1984).

There is a debate in the literature whether diversified or specialised economic milieus offer the best conditions for creativity and innovation. Already Vernon and Hoover (1959) and Vernon (1960) stressed the role of the diversity in the New York region for its economic development. Thus, diversity seems to be an important aspect of creative regions (Jacobs, 1961 & 1969). Other important aspects of creative regions are, according to Andersson (1985a):

- flexibility in terms of social conditions, economic activities but also in terms of land use planning,
- willingness to overcome political, language, cultural and physical barriers, and
- a socio-cultural milieu marked by great openness and an atmosphere of tolerance.

Not least, the last aspect enhances the attractiveness of creative regions for creative talent and makes them an inspiration for cultural producers, etc. A marked social and cultural variety and openness, therefore, represents a specific cultural capital of a creative region, which makes it highly attractive for the actors of the creative economy. At the local level, this cultural capital of a creative region might also be characterised as a specific sub-cultural capital of particular districts within the region, i.e. creative activities might be highly localised within a creative region. These thoughts support the thesis advocated by Florida (2002), that the economic growth of creative regions is driven by the locational choices of creative people – the holders of creative capital – who prefer places that are diverse, tolerant and open to new ideas.

Andersson (1985a) summarises the characteristics of creative milieus.¹⁹ Many different factors work together in a creative milieu. The creative process can be seen as a form of dynamic

¹⁹ The concept of creative milieu can be compared with the concept of “milieu of innovation” introduced by Castells (1989, 82). “By a milieu of innovation we understand a specific set of relationships of production ... based on a social organisation that by and large shares a work culture and instrumental goals aimed at generating new knowledge, new processes and new products.”

synergy. To initiate a creative process many factors must be able to influence each other in a mutual ongoing interaction. This concurrence and this interaction imply great demands on the regional milieu. It appears that the regional milieu must be of large scale but still culturally versatile, rich of deep original knowledge and competence and characterised by good communication possibilities internally and externally.

For the intraregional communication, physical nearness seems to be of great importance, since personal communication within groups of individuals sharing common interests seems to be a vital input to creativity (Jacobs, 1969; Lucas, 1988). To achieve considerable synergy effects there is a need for manifoldness and variation. The different activities in a creative region are often of small scale as individual activities. Industries do grow not by quantitative growth of the existing activities but through the emergence of new activities. The following seven factors seem to be fundamental conditions for creative processes according to Andersson (1985a):

- Benevolent or tolerant attitudes towards experiments
- Versatile composition of knowledge and competences
- Versatile and relatively unregulated financial basis for science, entrepreneurship and cultural life
- Good possibilities for spontaneous and informal personal contacts between different parts of the region and with other regions
- Many-sidedness rather than functional division of the social and physical milieu
- A feeling that the needs are larger than actual resources or possibilities
- A flexible social and economic organization, which sometimes go beyond the borders to structural instability²⁰

It seems, according to Andersson (1985a), as if structural instability is a necessary condition for creativity from both a micro and a macro perspective. During the major part of each research, design or development process, the activities are mainly routinised, i.e. they proceed within a structurally stable equilibrium process. However, in a parallel process an internal instability in the main process may develop. Inconsistencies at a logical plane may become more and more obvious concurrently with the attempts increasingly to generalize the basic ideas. Exceptions from basic principles may be discovered. Now the process might stagnate and end, if there is a lack of people with original, deep and varied knowledge and competence. However, if there are enough people with the right background and with possibilities of active communication between each other, the process can turn into a powerful bifurcation or a phase of structural instability with great uncertainty about the future development path and thus a great potential for creative acts.

Such a structural instability at the regional level can be perceived as a period of fundamental uncertainty about the future development. Trend extrapolations do not work. However, this uncertainty also brings an advantage as well as a risk. Due to the lack of stability within the system also smaller groups of people can influence the system and thus choose a new stable course, which may open up for several different stable courses. Of course, it is troublesome for the regional planning and policy that creativity demands structural instability, manifoldness and uncertainty. In addition, it may be difficult to combine creativity with short-term

²⁰ It has been stressed in the literature that the social and organisational context often affects the level of creativity (Rasulzada, 2007).

productivity. Furthermore, creativity at the regional level and social security can be assumed to be in opposition to each other.

8. Concluding Remarks

There is a very large interest in creativity among researchers in many disciplines, such as psychology, pedagogics, management, economics, and economic geography. The bulk of the research has focused on the creativity of individuals, but increasingly on the creativity of teams and on the importance of the organisational context. Less interest has been devoted to the role of the wider context in terms of the characteristics of the local and regional economic milieu where the creative processes take place and the connections of this economic milieu to other such milieus nationally and internationally. In this chapter, I argue that the clustering of creative agents and creative processes in specific locations generates creative advantages that stimulate creativity and the in-migration of creative agents. One further argument in this chapter is that the better connected an economic milieu to other economic milieus via networks transmitting new ideas, information knowledge, etc., the higher the creative potential of that economic milieu. It is my hope that this chapter will stimulate researchers in different fields to consider more carefully the role of clustering and networks in stimulating creativity.

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