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INDUSTRIAL DISTRICTS AND THE CITY: RELATIONSHIPS IN THE KNOWLEDGE AGE. EVIDENCE FROM THE ITALIAN CASE

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ABSTRACT

The spatial implications of fordist and district-based patterns of development have had a profound effect on the debate about the role of the city. While the city is reputed to be the crucial provider of externalities within the fordist model, its role seems more disputable when the district model prevails. This disregard is probably due to (a) the fact that the revival of the debate on industrial districts has placed strong emphasis on the agglomeration economies internal to the districts themselves, when not emphasising the burden of urban diseconomies; and (b) the countryside roots of most district pioneers. The quarrel was further fuelled with the advent of ICTs, and the feasibility of displacing productive phases at a global level. The paper argues that this is only the early part of the history. The advent of ICTs has had an important impact on the internal organisation of firms and on economic geography as a whole. It has also made knowledge and innovation the crucial drivers of the competitiveness of firms and local economic systems. The praxis of learning internal to firms has profoundly changed too. According to this view, the main hypothesis of the paper is that the city has become a crucial socio-spatial device for knowledge generation. The paper investigates this issue by introducing a new analytical category – 'Knowledge-creating services (KCS)'. With reference to the Italian case, the outcomes corroborate the above hypothesis and open an original perspective on the relationships between the city and IDs in the knowledge age: the city is shown to be not only the gateway for functionally connecting IDs with the global market but also a genuine 'Knowledge-creating District'.

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1 Introduction[2]

While industrial clusters of SMEs are objectively discernible entities, it is highly disputable that the neo-marshallian industrial districts (IDs) can be similarly defined. Their distinguishing features within the more general class of industrial clusters are (a) the fact that the firms are integrated within the same industry or phase (which can be objectively observable) and (b) the presence of a place-specific social capital (which is not, by contrast, objectively observable) thanks to which the ID enjoys a competitive advantage with respect to the big company and the generic industrial cluster. These peculiarities are summarised by Becattini's well-known definition, according to which an ID is "a socio-territorial entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district – and unlike in other environments, such as the *manufacturing town* – the community and the firms tend, as it were, to merge" (Becattini, 2004, p.19; our italics). Becattini himself argues that the presence of such a merging can be only inferred by having recourse to indicators such as: (a) the functioning of conventional prices within the ID, (b) entrepreneurs' self-limitation in avoiding extreme "Schumpeterian" actions against local competitors; (c) the recourse to joint actions to improve reciprocal competitiveness in the external market (Becattini, 2000) and, we add, (d) the practice of deliberately leaving a margin of indeterminacy in defining the terms of the reciprocal commitments in local transactions.

In a world where the apparently endless development and pervasiveness of market capitalism seem to impose increasing formalisation of any economic relationship, the ID phenomenon could prove that another route to development is possible, one which makes it possible to combine the richness of moral-based relationships and the requirements for impersonality of market competitiveness. Again according to Becattini's definition, the achievement of such a condition entails a socio-spatial divide, between an inner space – the ID "socio-territorial entity" – within which the recourse to the moral economy as well as market practices is possible and also socially encouraged, and an outer space – the "other environments" – which is ruled by the harsh imperatives of market, and which the ID has necessarily to relate to. This dual structure is not new at all, and actually relates to an anthropological archetype which is usually found in the presence of communitarian forms of social integration that are in contact with "other" communities: "You may charge a *foreigner* interest, but you may not charge your *brother* interest, that the LORD your God may bless you in all that you undertake *in the land that you are entering* to take possession of it" (Deuteronomy, 23:20, English Standard Version, 2001; our italics).

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Against this background, the theoretical frame underlying the notion of ID seems to be an updating of that archetypal structure to the industrial age, on the assumption that isles of community still exist within the market system. As known, these isles have been identified by the pioneers of the neo-marshallian approach with those parts of the North-Eastern and Central (NEC) Italian countryside where endogenous processes of handicraft and small enterprise development were taking place in the late sixties and seventies (Bagnasco, 1977, 2003; Brusco, 1989), often thanks to the initiative of sharecroppers, who had long experienced the contact with the market and the city (Cusinato, Cecchetto, 2003).

Figure 1 depicts the topological structure of that system, comprising a community-based ID (or system of IDs) which is tucked into a market environment, with which it relates. Whist the economic relationships internal to the ID are ruled according to a mix of moral and market rules, external relationships, be they with the generic world market or with the "manufacturing town", operate according to market rules. It follows that there is no structural difference between the city and the rest of the external space because both share the condition of being industry-based within a capitalistic system: if there is a difference, it is that the city is the pivotal and driving device of that system.

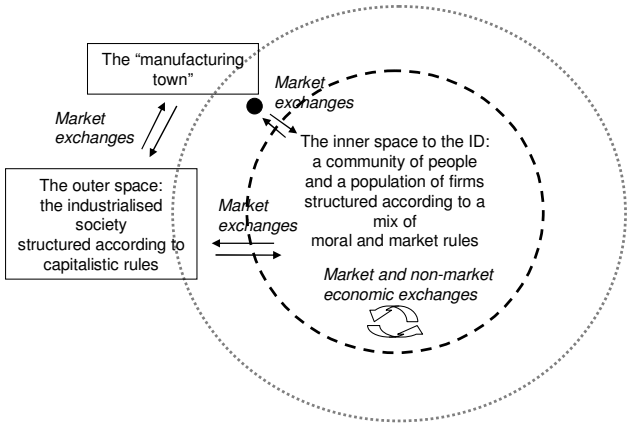

Figure 1 - The topological structure of the original neo-marshallian ID

Such a scheme entails competition between the newly-industrialised countryside and the industrial city, but, unlike the classical representation, according to which the former lies in a condition of dependency, this time the parties are reversed or at least balanced. Thanks to the common communitarian roots and the spatial proximity of the emerging local key players (entrepreneurs, workers, opinion leaders and politicians), the countryside now enjoys specific advantages in both the economic and the social domain, in contrast with the disadvantage it previously suffered because of the spatial dispersion of peasants (as Adam Smith noted).

Without questioning whether this representation is really consistent with the conditions occurring during the rise of the Third Italy, it seems expedient to examine if it fits with the present condition, which is characterised by the de-industrialisation of cities, the de-

materialisation of many crucial assets, the globalisation of markets, and the rise of what is increasingly labelled as the knowledge economy.
Responses will be achieved by first examining the peculiarities of the knowledge economy with respect to the fordist economy, as well as the role the city plays within this new techno-economic paradigm (Section 2). The story of the relationships between IDs and the city is subsequently revisited (Section 3) and a geography of the knowledge economy is sketched with reference to the Italian case (Section 4). Within this geography, the city clearly appears to be functionally and spatially complementary to the IDs, not only as the gateway to the global market, but also to knowledge-creating activities. In the final section, this complementarity is examined, bearing in mind that mismatches in knowledge-creating competences can severely hinder the establishment of synergies between these two pivotal realities of the present economic system.

2 The city in the knowledge economy

2.1 About knowledge

Knowledge can be broadly defined as the system of plausible beliefs the subjects have about reality while being aware that, precisely because it is a matter of belief, there is a certain degree of approximation between the mental images they form and the reality itself. The key epistemological issue therefore is (and has always been) how to assess that degree of approximation. In contemporary western thought, two main epistemologies compete with regard to this point, the ontological and the hermeneutical. The former is based on both the Cartesian belief that truth exists *per se* and the positivist belief that the subject can reasonably assess the convergence of his mental representations[3] to it through empirical testing.
The post-modern criticism has originated precisely from the confutation of this later belief. The criticism ultimately maintains that the device positivists have conceived for excreting any metaphysical residue from the scientific domain – i.e., empirical testing – is actually based itself on a metaphysical assumption: certain aspects that would be determinant in rejecting false assertions can indeed be systematically ignored in making empirical tests because of a fallacy in perceptive aptitudes (von Glasersfeld, 1980). From this point onward, truth becomes a conventional entity, and the cognitive focus shifts from searching for it to examining the mental processes by which subjects form their perceptual aptitudes.
The shift is particularly relevant as regards creativity because, while admitting that it stems from the combination of existing elements in a new and useful way, combination can occur at two different levels, depending on whether or not the reference set of elements includes the

[3] Purely to facilitate reading, the male is used to cover both genders.

cognitive code(s). Whilst in the ontological approach the combination concerns information drawn from reality according to the best approximation to the true code the subject supposes is at his disposal, in the hermeneutical approach creativity is conceived as the outcome of the exposure of the subject's own interpretative code to confrontation with other codes.

This entails, among other things, recourse to different sociologies of creativity. In the first case, the subject *creates ideas* by establishing a relationship with 'things', maybe in a solipsistic way, and society intervenes mainly by endowing him with a convenient cognitive code; by contrast, in the second case social relationships play a crucial role, by providing the subject with occasions for experiencing differences in cognitive codes. These diverse views are well rendered by Nonaka and Takeuchi (1995), who make a distinction between *Learning I*, "[which] is obtaining know-how in order to share specific problems *based upon existing premises*", and *Learning II*, "[which] is establishing *new premises* (i.e., paradigms, schemata, mental models, or perspectives) to override the existing ones" (p. 44; emphasis added). The next section is devoted to ascertaining how the *Learning II* paradigm has entered firms and industry at large, as a core strategic activity.

2.2 The rise of the knowledge economy

Since the seminal work of Drucker (1968), and in general the demise of Fordism, it has been admitted that the economy has left the industrial paradigm and entered a new one labelled the 'knowledge economy'. Many interpretations continue to be given of the genesis, significance and implications of this shift. The commonest one is that the event corresponds to the crossing of a certain threshold in the formation of GDP or total employment by the knowledge-based activities (OECD, 1996; Foray, 2000). This criterion is however a merely conventional one, because recourse to the systematic application of codified knowledge to industry dates back to the second industrial revolution. Labelling the crossing of that threshold as the entry into the knowledge economy is undoubtedly licit, but it might be that in doing so, some deeper aspects escape attention, and mainly that *the notion of knowledge to which the so-called knowledge-based activities make recourse might no longer be the same notion of knowledge to which the conventional approach makes reference when speaking about them.*

In response to this question, we advance the hypothesis that the advent of the knowledge economy consists in *the conscious internalisation of Learning II practices into firms and industry as a whole as a core strategic activity*. To understand how that event could have occurred, it is expedient to examine what has taken place within the communication circuits inside the firm with the advent of ICTs. Before then, communication necessarily required the intervention of the human factor, since the monitoring of automatic devices, based as they were on electro-mechanical technology, only worked in analogue mode, without any possibility of their being integrated into a complete monitoring system. The role of Humans

was to make communication possible at the firm level, by translating (in the double sense of interpreting and transferring) the signals that were emitted by the different local monitoring devices. However, this unavoidable human intervention meant that communication at whole was pervaded by ambiguity, since individual interpretative codes are idiosyncratic. It becomes clear why (a) most of the top management's care was devoted to establishing detailed protocols for minimising the ambiguity content within the communication circuits (Sennet, 2006), and (b) the typical firm assembled all productive phases within the same plant, the factory: if technical indivisibilities can explain the large dimension of plants, the proximity between technically divisible parts and phases of the productive process satisfied the need both to reduce the decay of information and prevent free-riding within the communication circuits.

The advent of ICTs has wholly upset this scheme. The fact that it is now possible to fully integrate the peripheral monitoring devices into a single "syntactic"[4] network thanks to the generalised recourse to digital language, has made the intervention of the human component in the codified communication circuits superfluous. It follows that *there has been an unprecedented disembedding of syntactic/'monological' communication circuits from the previously single circuit, within which this kind of communication was inextricably entwined with the human/'dialogical' communication*. This material separation has entailed crucial consequences inside firms and industry. Firstly, the closeness between the human factor and routine activities was no longer necessary. Secondly, routine activities have become potentially foot-loose, except when there are technical indivisibilities. The major consequence has however consisted in the chance the firm has had to adopt *Learning II* practices, thus displacing its focus from the mechanical production of goods to the handling of those conditions that are suitable for generating "vision[s] to create something new" (Audretsch and Thurik, 1998, p. 23). When *Learning II* is taken into consideration, the boundaries between firms and the socio-cultural domain also become vague and more permeable: rather, they become a new action-field for the firms themselves (Lash and Urry, 1994).

2.3 The city in the knowledge age

The disembedding of the monological from the dialogical communication circuits made possible by the advent of ICTs has revived the debate on the role of territories and the city in contemporary economies. According to the informational approach adopted by some scholars, it was foretold that face-to-face contacts would become irrelevant, and the city would lose its most distinctive agglomeration advantages, namely the facility to gather information within a dense and dynamic relational context (Boden and Molotoch 1994; Toffler, 1980; Pascal, 1987).

[4] The term is drawn from Nonaka and Takeuchi (1995).

Other scholars subsequently argued that important agglomeration economies are at work also within the informational paradigm, because of (a) the presence of significant indivisibilities and scale economies within the circuits of codified information, which gives rise to networks and requires important infrastructures on nodes; (b) informational spillover concentrates on such nodes; (c) these nodes themselves function as gateways between the various local places and the global network within which the universally codified knowledge forms and flows. By remarking too that this set of technological, informational, connecting and transcoding functions entails recourse to a variety of highly skilled and highly waged workers, it is not difficult to conclude that the nodes in the space of flows not only tend to locate in the city, but also give new substance and form to the city itself (Sassen,1991; Castells, 1996; Rullani, 2009).

However, this view of the pivotal role of the city within the globalised ICT-based economy renders only one side of its new condition since it does not adequately consider the consequences of the subsequent advent of the knowledge economy, as it has been described above. Once this event is considered, the key driver for facilitating the access of local systems into the global web and market is arising of socio-spatial structures that prove to be fit for enhancing aptitudes for knowledge-creation, that is for (a) recognising the heterogeneity in cognitive codes, (b) handling them in order to facilitate (c) the *generation* of new relations between things, agents and concepts, which is the very content of creativeness (Lane and Maxfield, 2005). With reference to the meaning Durkheim (1895) originally gave to this kind of generative structures, we name them 'knowledge-creating milieus' (KCM).

As regards the basic components and their relationships (spatial relationships included) for a KCM to work, we can do no more here[5] than merely to recall that: (a) it is made of two interrelated devices, one of which generates 'noise', and the other, which is an intelligent device, is inclined to view noise as the possible vector of underlying although unknown cognitive codes, the access to which would allow to gain original insights into reality; (b) two main ideal-types of KCM can be here identified, the dialogical milieu and the city. The first one is based on the personal involvement of a small number of strongly motivated participants which exchange opinions according to the practice of reciprocity, whereas the second one is a "milieu of milieus" (Rémy, 2000), which is characterised by an impersonal production of behavioural and cultural spillover within a large number of structurally interdependent actors.

Focusing on the city, four further features seem particularly worthy of note:

a) the buzz or noise which spontaneously stems from a sufficiently large, dense and dynamic social network is a public good (Storper and Venables, 2002), a trait which does not occur within a dialogical context, except for the restricted club of participants;

[5] For a detailed analysis, see Cusinato (2012).

b) this public good is destined to remain unexploited – and also to be viewed as a 'bad' – if there are no competences able to translate it into information, and mainly information about its generative code or codes;
c) translation entails recourse to a chain of highly specialised figures, the first and the last links of which are respectively the emerging figures of the cool-hunter and the 'post-modern' entrepreneur. Between them, a number of other figures intervene, giving rise to the so-called creative class: designers, engineers, psychologists, advertisers, publicists, and many others, who have in common the ability to deal with interpretative codes[6];
d) the cultural and professional aptitudes required for dealing with cognitive codes and the fact that these aptitudes improve with interaction among insiders, cause the formation of increasing barriers to the entry of competitors into an urban milieu (Camagni, 2007);
e) most of all, since the market is not the most suitable device for exchanging information and still less for dialoguing, it becomes necessary to have recourse to other devices, firstly reciprocation. It thus becomes possible to suggest that the internal relationships within an urban KCM are based on a mix of competition and reciprocity, i.e. on the same ingredient which is considered peculiar to IDs. As a consequence, the city in the knowledge age can be viewed as a special kind of district: a '*knowledge-creating district'*.

This way, the cultural contrast between the city and the neo-industrialised country would appear as a heritage from the industrial past, since both now resort to the same composite integrative device – a mix of competition and cooperation –, although differences occur on the functional ground, the city essentially being devoted to the *generation* of knowledge, and the ID to the *production* of material goods. The new situation is depicted in figure 2, where the internal relationships to the IDs and the city (not represented in the figure) as well as the relationships between these two kinds of socio-spatial devices occur according to a mix of market and moral rules, whereas the relationships with the external global market obey market rules.

It is also noteworthy that in this situation the city becomes the main gateway for IDs to the global market, because it offers functional services and competences to relate effectively with foreign, rapidly changeable, highly competitive and often highly sophisticated ambiences, the single ID cannot produce indoors (Rullani, 2009). The main challenge concerning the relationships between the IDs and the city in the knowledge economy thus becomes one of enhancing synergies between the two on the crucial terrain of *Learning II*[7], beside the more conventional although indispensable terrains on which the literature usually focuses (access to the global web of flows, to a sophisticated final market, to research institutions and knowledge-intensive services). Questions obviously arise about aptitudes and competences of both parts for interacting between them – and together, with the external world – on the

[6] In the following pages, we shall call the activities related to *Learning II* as "Knowledge-creating Services" (KCS). See Section 3.4.
[7] Suggestions in this sense can be read in the final chapters of Becattini (2009).

delicate terrain of *Learning II*: are the ID actors culturally prepared to deal with the 'noise' of the city? Symmetrically, are the urban KCS professionals competent in dialoguing with agents who may be distrustful of the uncertain outcomes and surely destabilising nature of *Learning II*? In the next two sections we shall describe in more detail the shift that has occurred in the relationships between the city and the industrialised countryside in Italy, consequent on the advent of the knowledge economy, and we shall also try to reply to the above questions in the concluding section.

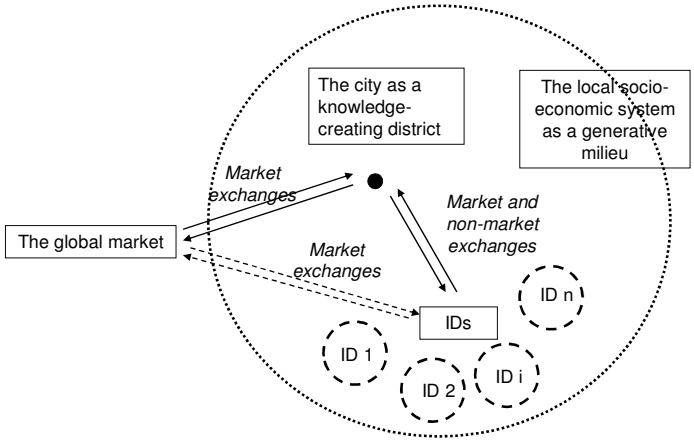

Figure 2 – The topological structure of IDs in the knowledge age

3 New relationships between the city and the 'countryside' in the knowledge age

3.1 Fordism and the industrial city

Fordism is a mass production system based on standardised goods, produced with reduced costs thanks to the use of scale economies deriving from the large dimensions of the plants. Work is scientifically organised through the rigid subdivision of tasks (manufacturing, planning, management and enterprise ownership) inside vertically integrated structures.

One of the peculiarities of the fordist paradigm is the asymmetry of power between the decision-making units (single agents, firms, regions and nations), which manifests itself also from a spatial standpoint, either between similar or very diverse decision-making units. Starting from this conviction, Perroux develops the idea that spatial agglomerations are a manifestation of power applied to geographical space (cf. Meadorn, 2001). According to Perroux (1995), indeed, the economic development concentrates upon a few growth poles that correspond to industrial agglomerations where driving firms or driving sectors locate. Poles generate agglomeration economies which trigger social and demographic polarisation processes, through Keynesian and Leontievian multipliers.

During the last big phase of post-war industrialisation in the Western countries, poles were predominantly localised in industrialised urban centres, characterised by high growth rates and intense technological, capital, labour and infrastructural concentrations (Friedmann, 1966). Unsurprisingly in Italy, at the end of the 1960s, notwithstanding the use of the North-South dichotomy to explain the drastic imbalances of the national economy, this uneven development started to be read according to the spatial metric of urban areas (Ruffolo, Barca, 1969). As a matter of fact, indeed, the urban gravitation process appears only around a limited number of areas – the industrial triangle of the cities of Milan, Turin and Genoa, and a few other industrial areas such as Livorno, Venice-Marghera and Florence. Avoiding regulating this trend could have led to the economic and social desertification of wide areas and, at the same time, would have implied important agglomeration diseconomies in the areas with major centripetal forces as Myrdal's studies on cumulative circular causation had demonstrated (Myrdal, 1957).

Industrial urban centres seem therefore to be a crucial pillar of the fordist economy. In one respect, they concentrate the necessary workforce for productive activity and represent the main final market, involving employees as consumers. Conversely, they allow for the control of deviance thanks to the rigidity of the productive organisation, which is reinforced by the rigidity of urban planning, and to the fact that the fordist factory rules not only economic relationships, but also social ones. Rigidity has been one of the factors which have contributed to the success of the fordist model and has been a factor on which its territorial outcome (the great industrial urban centres) has been grounded. At the same time it has been one of the most important structural features to have contributed to its decline.

3.2 The age of Industrial Districts: escape from the city

In the early 1970s, Fordism was thrown into crisis due to a series of events, both conjunctural and structural, which challenged two of its founding pillars: certainty and rigidity. The 1973 oil crisis occurred at a time when the mass goods market was saturated, the fixed exchange rate regime was given up and the rigidities imposed by that model of production had become a factor of friction, both in the productive and the socio-cultural domains. One of the territorial outcomes of the crisis of Fordism has been the process of dis-urbanisation, which took the form of an inversely correlated growth of dwellers and economic activities as opposed to urban dimension (Dematteis, 1997). In this period manufacturing activities, and mostly those that are highly land-consuming and labour-intensive, were delocalised from metropolitan areas (Piemonte, Liguria, Lombardia) to peripheral areas of the North-western and North-eastern regions (Garofoli, 1992).

The other phenomenon following the fall of Fordism was the exceptional endogenous development of small and medium sized enterprises, mainly specialised in traditional sectors

in the NEC (North-East-Centre) regions (from Umbria to Trentino), in territorial contexts characterized by small and middle sized towns located in the urbanised countryside (Becattini, 2001). These small centres, each of which was endowed with an industrial area, were also endowed with diversified urban functions, consolidated institutional elements, a variety of private service activities and dense road networks (Fuà, Zacchia, 1983). Thanks to a cultural climate reflecting the traditional values of family, devotion to work, saving propensity and compliance with authority, the industrialisation processes in these regions did not create the classic labour/capital and centre/periphery oppositions, but gave origin to a kind of morphological polycentrism.

The ID quickly became a metaphor of successful development, representing a local alternative to the internationalisation of the firm. Internationalisation and clusterisation do, indeed, represent two different ways through which economic systems have adjusted to the rise of the production costs due to the oil crisis and the rigidity of the labour market. With internationalisation, the most routine phases linked to the manufacturing activities have been displaced to developing or emerging countries, where firms draw heavily on the low cost of labour, a relaxed control of negative environmental externalities linked to the productive process and on a favourable fiscal regime. With the clustering of small and medium sized firms, cost reductions came from marshallian externalities and a curb on transaction costs. Proximity, face-to-face contacts, mutual trust, small household-owned workshops and network relationships allowed entrepreneurs of NEC regions to adopt a vertically disintegrated model of production without having to face its costs, which concern the price firms have to pay to buy goods and services on the market, since they could count on reciprocal trust (Williamson, 1985). Even if, in this first phase of industrialisation, the firms were not technological-innovation oriented, they could count on recurrent competitive devaluations made by central government, which erased the delays accumulated in productivity, compared with the other European countries.

To sum up, from the point of view of territorial outcomes, it is possible to state that the city, a pillar of the fordist model, was no longer central to IDs. Giorgio Fuà (1991) argued that sprawling industrialisation in the Third Italy was possible thanks to the lack of an urban structure involving big cities. Polycentrism and localisation economies coming from the clustering of SMEs seemed to be enough, at least till the 1980s, to make the ID model competitive on the international scene.

3.3 ICTs and globalisation: back to the city

The internationalisation of western firms was accelerated by the developments of ICTs, as well as new transport and logistic technologies. The new opportunities offered by the ICTs triggered a debate on the relevance of proximity and, consequently, the role of territories and

the city in contemporary economies. Some scholars, on the basis that face-to-face contacts might hypothetically become insignificant, stated that territory would implode in a homogeneous space, eroding the importance of proximity and agglomeration economies (Boden and Molotoch 1994; Toffler, 1980; Pascal, 1987). Mitchell (1995) speaks expressly about a progressive shift from the Weberian city to "Bits City", while Castells (1996) speaks of a "space of flows", a spatial organisation where agents, goods and information are in constant movement within a globalised space.

The reality is that all these contributions do not succeed in explaining why, notwithstanding their forecasts, polarisation and concentration processes, like territorial disparities, continued. As the most recent convergence studies show, at a sub-national level, territorial disparities are constant among the block of 15 EU countries, in rapid growth among new members (Paas and Schlittle, 2008), and increasing when shifting from the national and regional level to a sub-regional level (Straubhaar et al., 2002). Moreover, Mora (2008) shows that disparities emerge because of a growing sectorial specialisation and an increasing gap in human capital levels. Empirical evidence also shows that cities are not disappearing, but rather reaffirm their centrality in the globalised economy, where spatially dispersed activities are integrated at a planetary level (Hospers, 2003).

If, after the fall of Fordism, the ID seemed to be suitable to the new productive needs, economic globalisation requires however a further change of paradigm because SMEs clusters are no longer able to provide the conditions for facing global competition. Nowadays, relative prices have changed and thus competition increasingly requires the continual introduction of process and product innovations, which ultimately are knowledge-based activities. In this new condition, cities help by protecting against risk and uncertainty, allowing transaction costs to be minimised through cognitive inputs, the variety of the labour market and of suppliers (Camagni, 1993). The need for urbanisation economies – which concerns the concentration of different and not interrelated economic activities, the sharing of transport infrastructure and highly advanced services – induces firms to locate inside urban areas, generating geographical concentration of industries (real industrial urban sub-systems) quite similar to marshallian districts (Amin, Graham, 1999).

Thanks to urban agglomeration economies, a lot of cities reversed the process of manufacturing decline during the 1980s (Storper, 1996). On the one hand, the globalisation process permits the delocalisation of productive activities but, on the other hand, it requires concentration of leading and controlling activities of large multinational firms and global financial centres (Sassen, 1991). Indeed, if routine activities (which typically rest on syntactic communication) do not need peculiar localisation, knowledge-based activities (which rest on dialogical communication) show a peculiar localisation rationale, which seems to prefer urban contexts.

As regards the Italian case, the peculiarities of the process of tertiarising the economy have emerged since the 1980s. Many manufacturing firms began to outsource a lot of activities that were core activity-related, such as book-keeping, logistics, maintenance, legal activities, marketing, cleaning activities and staff training. As a result, service activities, previously carried out inside firms, became autonomous enterprises and, consequently, their employees, who were previously considered to work in the manufacturing sector, are now counted within the service sector (Gallino, 2003). Since, between the '80s and the new millennium a substantial share of the increase in service sector jobs[8] was due to this phenomenon, it is possible to state that a large part of the Italian tertiarisation process is deeply interrelated with the manufacturing sector, which remains the driving force of the national economy[9].

The outcomes of this process have been highly spatially concentrated (Calafati 2009). Private services – in addition to public ones – have polarised within the urban systems, that is to say a cluster of functionally integrated municipalities, organised around medium to big-sized towns. Choosing a central location allows them to take advantage of both a barycentric position and urban agglomeration economies. For instance, the analysis of the spatial distribution of employees in Italian provincial capitals (which are big or medium-sized cities) shows the polarisation of certain tertiary sectors, like 'real estate, renting and business activities, consulting sector' and 'financial intermediation': in 2001, their share in provincial capitals was, respectively, 57.8% and 60.9% out of total national employment in these sectors, while the provincial share was just 38.9% out of total national employment.

3.4 Knowledge-creating Services and the city

Scholars from different fields have provided different explanations of the features that make the city a suitable place for activities related to knowledge creation and innovation. According to Jacobs (1969), the *mixité* of economic activities and the socio-cultural heterogeneity of inhabitants are the most suitable conditions for the creation, transmission and re-shaping of knowledge. Cities are characterised by a continuous internal and external interaction which permits individuals and organisations uninterruptedly to process 'signals' and 'impulses', generating and spreading knowledge, enhancing the productivity and professionalism of employees and entrepreneurs. As a result, urban contexts can count on a ceaseless process of human capital enrichment that allows rapid technological change.

The neoclassical perspective suggests the importance of certain features that make the city particularly attractive for highly skilled workers (young people with a high level of education and income), such as consumer-oriented services, urban and climatic amenities, wage-

8 The real estate, renting and business activities consulting sector had 650,000 employees in 1981; the number rose to 1.2 million in 1991, and to 2.3 million in 2001.

9 In 1991, 2001 and 2007 manufacturing employees accounted, respectively, for 29.1%, 25.3% and 25.3% of the total employed workforce.

enhancing opportunities and quality of life (Glaeser 2005). Florida (2002), for his part, focuses on the importance of tolerant contexts with a high quality of life that attract creative classes to congregate. To intercept this type of worker, firms would need to elect the same localisation for their plants, triggering a process of cumulative causation.

But the story is perhaps much richer. Storper and Scott (2009) stress the relevance "of selective geographical matching of productive resources, skills and institutions of coordination", which would jointly be able to explain the basic source of urban dynamism. Applying these statements to the Italian case, interesting stylized facts emerge:

a) as previously described, the tertiarisation process which has occurred since the '80s is deeply interrelated with the manufacturing sector;
b) the spatial outcome of that tertiarisation process has been the concentration of services, and particularly knowledge-creating services, in urban areas;
c) a sort of division of labour between urban areas and IDs has also emerged. As in a modern version of the Weber theory on the localisation of industrial activities, cities furnish knowledge, creativity and innovation, which represent now basic raw materials and strategic assets for the ID-based manufacturing sector;
d) cities work as gate-keepers (Morrison, 2008), being the interface between the local and the global level. They allow IDs to build relational networks out of their local context, expanding their operative "boundaries" (IRSO, 2010). In this perspective, the interlinking of IDs and urban systems seems to be crucial if processes of endogenous development are to be sustained and global competitiveness faced (Rullani, 2009);
e) the possibility of establishing and improving such a link is closely related to the so-called *industrial commons* such as universities, the financial system, research and advanced services poles, high-tech know-how (Pisano and Shih, 2009);
f) urban marketing policies and targeted negotiations are essential to attract knowledge-based and most innovative activities, and have cumulative effects thanks to the mechanism of endogenous development (Calafati, 2009);
g) the focus on the city and urban policies has become a major element of the political agenda from the 1990s onwards (European Commission 1990; 1992; 1996; 2007). Cities and their actors are more and more often being considered as the main lever-points for regional and national growth, responsible for social cohesion, and an important device to cope with global competition through knowledge.

With reference to the view of the knowledge economy we have developed here above, it becomes worth examining the inter-link which exists (or could form) between the city and IDs, with reference to the crucial domain of *Learning II*, that is the capabilities of dealing with cognitive codes. By labelling as 'Knowledge-creating Services' (KCS) those economic services which are expressly devoted to, *Learning II*, we argue that they prefer (a) to cluster in the city, in order to take advantage of the generalised 'buzz' that forms, not only within their

somewhat closed circles, but in the wider urban arena, and specifically, (b) in cities that are placed, often even if not always, near IDs or within industrial milieus. The next section is devoted to exploring these hypotheses.

4 A geography of Knowledge-creating Services in Italy

Our approach to KCS differs from both the KIBS (Miles et al., 1995) and the Creative Industry (DCMS, 2001) approaches. It differs from the former because it does not take into consideration those services that, although they have a high technological content, mainly make applicative use of existing knowledge, such as "Data processing", "Database activities", "Maintenance and repair of offices, accounting and computing machinery". By contrast, KCS include "Media" as well as other public activities, such as "Universities and Research Centres", that are not recorded among KIBS. On the other hand, KCS differ from Creative Industry classification because they do not encompass the entire creative chain (from the inventive conception and design to the manufacturing production and retail) but only the primary components of this chain, which are inherently concerned with *Learning II*[10].

4.1 Methodological aspects

Before gaining an insight into the geography of KCS in Italy, let us define the spatial unit of analysis, the economic categories we will focus on, and the index we will make use of to describe them. As far as the spatial unit is concerned, the choice has fallen on Local Labour Systems (LLSs) (Istat, 1997). They are defined as clusters of contiguous municipalities which are aggregated on the basis of labour commuting flows. LLSs, nowadays, are the only spatial metric in Italy that conveys functional territorial relationships. This makes possible to account for the deep territorial changes which have occurred in this country since the '70s, the outcome of which has been the coalescence of neighbouring municipalities into urban systems, which, even if not overlapping in physical terms, are functionally interrelated (although not recognised as autonomous institutional entities).

Concerning the classification of economic activities, we propose an original classification, in accordance with the *Learning II* approach described in section 2. We have also decided to use the five-digit detail from Ateco (the Italian Economic Activities Classification), in order to be accurate in the identification of critical activities.

As shown in Table 1, three sub-groups have been distinguished among KCS:

[10] For details, see Compagnucci, Cusinato (2011).

1. *Core KCS*, whose normal activity, which is readable in the Ateco definition, consists in handling interpretative codes. Within this group, a further divide is made between *Private-Core KCS* and *Public-Core KCS*, depending on the respective services are tradable or not;
2. *Core-Related KCS*, which concern those activities that normally interact with interpretative codes, although this is not explicitly readable in the Ateco definition.

Table 1 – Classification of Knowledge-Creating Services

Ateco cod.	Private Core KCS	Ateco cod.	Core Related KCS
22110	Publishing of books	22150	Other publishing
22120	Publishing of newspapers	72100	Hardware consultancy
22130	Publishing of journals and periodicals	74141	Financial consultancy
22140	Publishing of sound recordings	74142	Labour consultancy
72200	Software consultancy and supply	74143	Agrarian consultancy
72601	Telematic, robotics, eidomatic activities	74144	Business and management consultancy activities
72602	Other computer related activities	74145	Public relations
73100	Research and experimental development on natural sciences and engineering	74146	Commercial information agency activities
73200	Research and experimental development on social sciences and humanities	74150	Management activities of holding companies
74111	Legal activities	74203	Integrated Engineering activities
74130	Market research and public opinion polling	74204	Aerial photogrammetry and cartography activities
74201	Architectural activities	74205	Minining research activities
74202	Engineering activities	74811	Photographic activities
74401	Advertising	92200	Radio and television activities
74845	Designers	92310	Artistic and literary creation and interpretation
92110	Motion picture and video production	92400	News agency activities
Ateco cod.	**Public Core KCS**		
92510	Library and archives activities	80303	Other higher education
80301	Higher education-3 years bachelor	85114	University hospitals
80302	Higher education-5 years bachelor	92520	Museums activities and preservation of historical sites and buildings

Source: Our elaboration of Istat classification of economic activities (Ateco 1991)

Data are drawn from the Italian *2001 Industrial Census*. Intersections between the three kinds of classification (KIBS, CI and KCS) are shown in Figure 3.

The last methodological aspect regards the choice of the localisation index, to map the geography of KCS. Even if in literature it is quite common to make use of the Localisation Quotient, which relates employees in a certain sector to total employment (Boix, Galletto, 2005; Istat, 1997, Lazzeretti, Capone, 2006), we shall make use of a Density Localisation Quotient (DLQ), which relates KCS employees to total dwellers of the LLS. This male possible to monitor two relevant aspects: firstly, the relative importance of each economic activity, not in respect to total employment (which can be a very low figure), but the demographic size of the LLS and, secondly, the presence of structural differences between the

labour markets of Northern and Southern Italy. The latter, indeed, suffers from high rates of unemployment and inactivity.

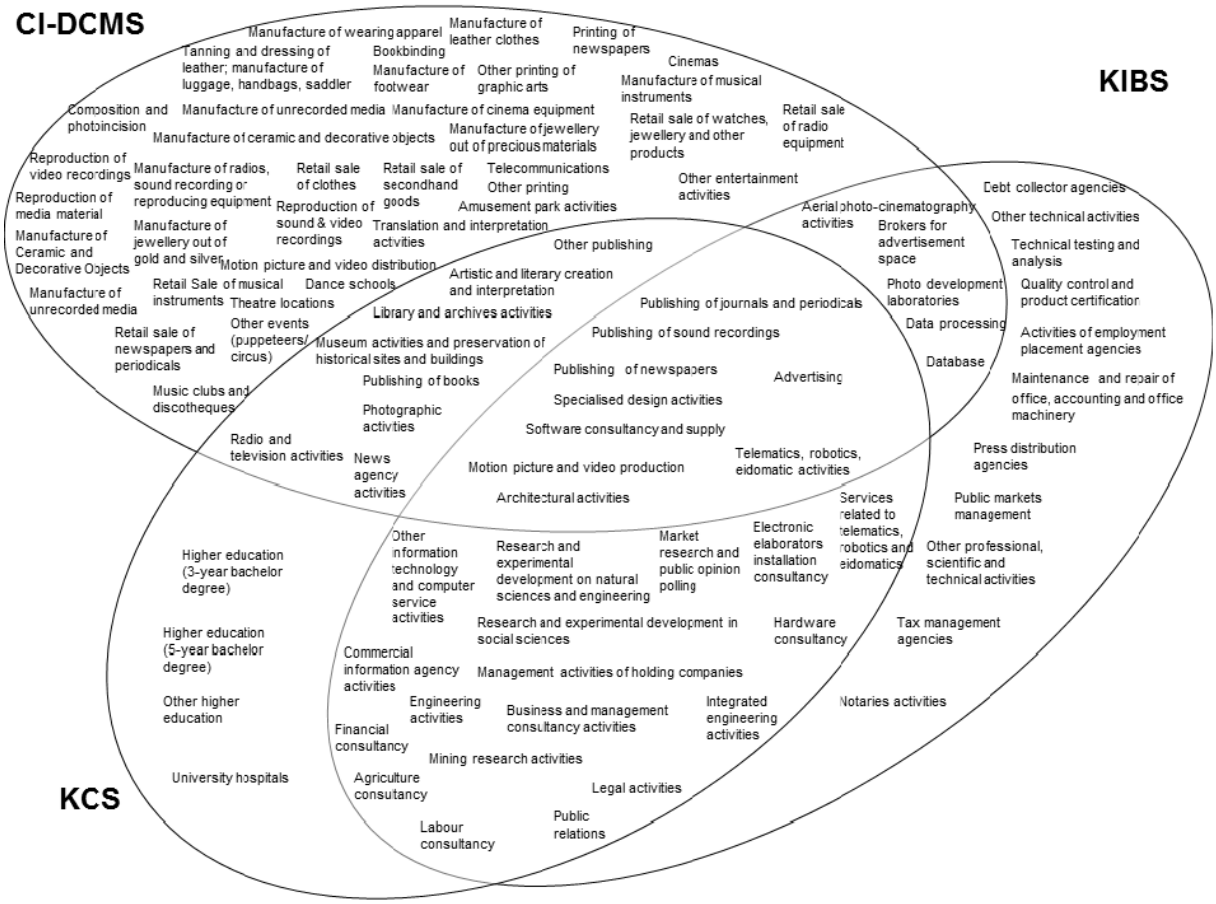

Figure 3 – The three main classifications of knowledge-based economic activities

The index is calculated as follows:

$$DLQ = \frac{\frac{E_{k,i}}{D_i}}{\frac{E_K}{D}}$$

where $E_{k,i}$ is the amount of KCS employees in the LLS i, D_i the amount of inhabitants of LLS i, E_k the amount of KCS employees in Italy, and D the amount of inhabitants in Italy.

4.2 Cities, manufacturing sector and KCS

The KCS sector employed more than 1.1 million people in 2001 (they were about 750,000 in 1991), equal to 5.7% of total Italian employment. Table 2 shows that more than half of them belong to Private-Core KCS. This is the most distinguishing subclass of KCS, which contributed more significantly to the increase of the total KCS sector between 1991 and 2001.

On the contrary, the Public-Core KCS sector with about 181,000 employees, is the smallest in job terms. The Core-Related KCS sector, finally, employed about 250,000 workers and, like Public-Core KCS, was less dynamic between 1991 and 2001.

Table 2 – Number of employees in KCS, KIBS and CI sectors, in 1991 and 2001

Years	Private Core KCS	Public Core KCS	Core Related-KCS	Total KCS	KIBS	CI-DCMS
1991	387.876	134.127	225.696	747.699	892.902	1.870.047
2001	671.830	181.379	251.677	1.104.886	1.623.934	1.854.539

Source: Our elaboration of Industry and Services Census, Istat 1991, 2001

As for the other classifications, total employment recorded for KIBS activities is higher than that of KCS (and the difference has widened between the two Censuses). CI employees, are almost the double compared to KCS employees (several manufacturing and retail activities are included), but their sector is also the most static on the temporal point of view.

The computation of the DLQ referred to KCS leads to the identification of 34 LLSs out of the total 686, with a considerable share of Private-Core KCS employees. Their further subdivision into three classes – namely, low ($1<DLQ\leq1.2$), medium ($1.2<DLQ\leq1.5$) and high ($DLQ>1.5$) – gives three groups of respectively 11, 10 and 13 LLS. A glance at the geography of Private-Core KCS (Chart 1) allows us to highlight some stylised facts. The first is that the evolutionary potential of KCS is localised particularly in Northern Italy[11], where 8 out of the 11 LLSs with DLQ >1.5 lie. As a consequence, and because of the importance of KCS in relation to local economic development trajectories, the existing disparities between Northern and Southern Italy will, probably, be exacerbated in the coming years.

The second stylised fact is that Private-Core KCS is an urban phenomenon: ~~out~~ of the 34 LLSs with DLQ>1, 31 contain a provincial or regional capital; the LLSs with DLQ>1.5 include the two largest Italian metropolitan areas (Milan and Rome), plus Turin, Bologna, Florence and Padua, each of which has more than 500,000 inhabitants. Of the remaining five LLSs, three include provincial capitals (Trento, Pisa and Parma); Mezzolombardo is integrated with Trento, and Ivrea, which is close to Turin, has a peculiar history depending on the presence of Olivetti (a computer science-based firm).

With regard to Public-Core KCS (Chart 2), we observe different patterns of localisation. These services are more homogeneously distributed throughout Italy, due to the fact that their localisation reflects more institutional than market factors.

[11] Of LLSs characterised by a substantial presence of Private-Core KCS, 21 are localised in Northern Italy, 8 in Central Italy and 5 in Southern Italy. Among the LLSs of Southern Italy (including Sicily and Sardinia) the only urban system with a medium value of DLQ, is Bari.

Chart 1 – LLSs with DLQ>1 in Private Core KCS[12]∗	*Chart 2 – LLSs with DLQ>1 in Public-Core KCS∗*
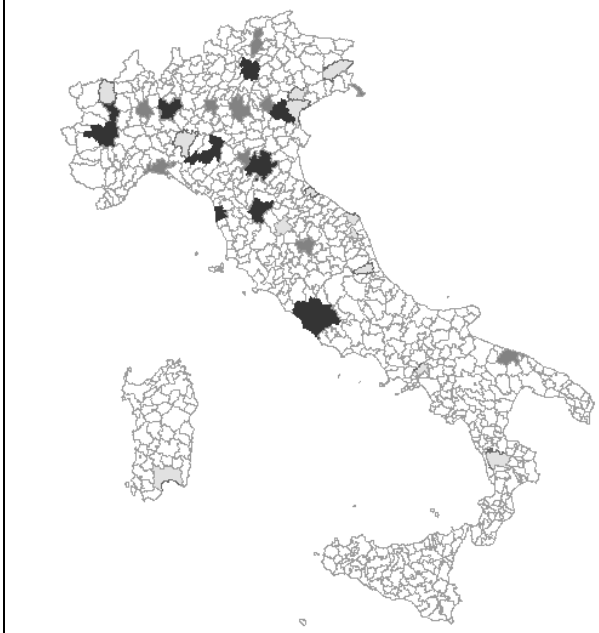	
Chart 3 – LLSs with DLQ>1 in Core-Related KCS∗	*Chart 4 – LLSs with DLQ>1 in total KCS∗*
	

It is for this reason that they mainly overlap with the LLSs which host provincial capitals, where most universities and university hospitals are also located. In this case too, LLSs

[12] The scale of grey denotes the DLQ degree. Light, medium and dark grey is respectively for low, medium and high density of KCS.

hosting cities are the most represented. Only 8 LLSs out of the 49 total specialised in Public-Core KCS are not provincial capitals.

Chart 5 – Intersection between LLSs specialised in Private-Core KCS and IDs[13]

As for the pattern of localisation of Core-Related KCS (Chart 3), it seems to be intermediate between Public-Core and Private-Core KCS – a little bit more sprawled than Private-Core KCS, but preferably located in Northern and Central Italy. Core-Related KCS are the least knowledge-intensive category among the three identified. Indeed, according to expectations, also their urban characterisation is less evident. Of the 53 LLSs with DLQ>1, 22 LLS do not include provincial capitals, but small-medium sized towns (in 15 cases they have fewer than 50,000 inhabitants). Finally, if we consider KCS as a whole (Chart 4), the urban feature emerges again. Just 2 LLSs out of 41 do not include provincial capitals, which is the greatest level of 'urbanity' among the considered typologies of KCS.

Chart 5 finally shows that there is a different and complementary functional specialisation between LLS specialised in KCS and IDs. The map shows the intersection between the 34 LLSs specialised in Private-Core KCS and the IDs as identified by Istat (Istat, 2006).

The number of spatial intersections amount to only 6 cases[14]. This seems to strengthen the hypothesis we made in paragraph 3.3, according to which KCS are strongly related to urban contexts which, in turn, are characterised by a structure of the manufacturing industry that is quite different with respect to IDs. The former, indeed, is more heterogeneous in terms of scale, making possible the localisation of large firms, while the latter is composed of small

[13] Grey is for LLSs taxonomised by Istat as Industrial Districts; white with black borders for LLSs with DLQ>1 referred to Private-Core KCS; grey with black borders for the intersection between the two previous categories.

[14] San Severino Marche, Vicenza, Brescia, Teramo, Modena, Urbino.

and medium-sized enterprises, specialised in the "made in Italy" sector (Becattini, 1998). As a consequence, we can state that the IDs are generally peripheral with respect to the major urban systems, and that they might 'depend on' them for the supply of KCS.

A last confirmation about the spatial concentration of KCS comes from Table 3. All the specifications of the Gini Index (not weighted, weighted for LLS population or area) show that KCS as a whole and their three subclasses are much more concentrated than population, total manufacturing and KIBS employees.

Table 3 – Gini Index of population and employment in KCS, KIBS and Manufacturing, 2001

Gini Index weighted on population		Gini Index weighted on area		Gini Index not weighted	
		Population	0,71620077	Population	0,66072349
Private Core KCS	0,83736765	Private Core KCS	0,89266936	Private Core KCS	0,85857788
Public Core KCS	0,82305058	Public Core KCS	0,92474896	Public Core KCS	0,93695779
Core-Related KCS	0,84243677	Core-Related KCS	0,88376907	Core-Related KCS	0,8429632
KCS	0,82874238	KCS	0,89213551	KCS	0,86241212
KIBS	0,81054145	KIBS	0,85036432	KIBS	0,81775958
Manufacturing	0,70238004	Manufacturing	0,74104941	Manufacturing	0,75376096
Total employment	0,73877999	Total employment	0,76408313	Total employment	0,72334867

Source: Our elaboration of Industry and Services Census, Istat, 2001

5 Conclusions

Learning I and *Learning II* are two cognitive modalities that are so closely intertwined as to be almost undistinguishable from each other in everyone's daily praxis. Although individuals think they are making predominantly if not exclusive recourse to *Learning I*, they are actually carrying on a ceaseless shuttle between the two modalities, thus continuously reshaping, maybe unconsciously, their own cognitive code. The belief that *Learning I* is the normal route to knowledge has however permeated modern civilisation: the separation between mind and nature and the need for 'clear and distinct' ideas in order to dominate both nature and society (and maybe the mind itself), have relegated *Learning II* to the so-called pre-analytical (Schumpeter) or metaphysical (Popper) domains, that is away from the properly scientific one. In turn, the mechanical rigidity inherent in the industrial paradigm, and chiefly Fordism, the need it had for an unambiguous command-and-control chain (Sennet, 2006), made *Learning I* the normative approach to knowledge and, à cascade, to innovation within firms.

The ICT revolution, with the disembedment of monological communication circuits from the intertwining with the dialogical circuits to which it has given rise, has made it possible to realise the higher generative potentialities of *Learning II* and, as a consequence, the key importance of dealing with information about cognitive codes rather than (or besides) information about the external world. The focus therefore shifts to the socio-spatial devices – milieus – that are reputed to enhance aptitudes for *Learning II*. The firm and the city have already been indicated as knowledge-creating milieus, and are under examination by number

of scholars. The question arises if the territory too can work and be governed (in the sense of governance) as a knowledge-creating milieu. As regards this concern, the above analysis suggests that the changing relationships between IDs and the city over time provide the appropriate frame (or merely a metaphor?) for supporting such a hypothesis. After a period – approximately from the late Sixties to the early Nineties of the past century – which was characterised (in Italy, at least) by the rise of IDs, and during which these socio-territorial formations were interpreted as an *alternative* pattern to development with respect to the fordist city, the time has perhaps arrived to question if this image is still consistent with the socioeconomic, cultural and spatial conditions consequent on the advent of ICTs and the rise of the knowledge paradigm.

On the prospect of the knowledge paradigm, the relationship between IDs and the city seems to provide the basic elements for a 'territorial' knowledge-creating milieu to emerge. On the one hand, the contemporary city works as a 'heterogenetic' device, in the sense it is not only the main place but the main generator of heterogeneity, heterodoxy and also noise. On the other hand, the ID is by its very nature an 'orthogenetic' device[15], the mission of which is to turn disorder (raw and dispersed materials, including information) into order (innovations and goods). The other necessary condition for the system effectively to work as a knowledge-creating milieu is the presence of a 'mechanism' allowing the disorder produced by the city, firstly, to be interpreted as a potential resource – a sort of informational raw material – and then possibly converted into genuinely new information through recourse to *Learning II*.

This requires that a congruence – a dynamic congruence – is set up (and governed) between the city's capacities to generate 'noise' and the ID's abilities to interpret it as a potential vector of innovation. If the city does not produce 'noise' in opportune quantity (not too much, respect to the capacities of processing it, and not too little, as is likely to happen in cases of extreme and undifferentiated urban sprawl), or does not catch, recode and transmit the 'noise' generated outside, the local milieu can decay for an excess or a lack of raw material (informational impulses) input. On the other side, if there is a lack of *Learning II* aptitudes within the ID, it is doomed to become isolated from the main source of information about cognitive codes and/or succumb because of an excess of noise. It seems therefore that the key concern should be that the local actors – policy makers, urban and ID entrepreneurs, representatives or pioneers of local KCS, educational and cultural institutions – meet to (a) ascertain if the basic elements are there for a territorial knowledge-creating milieu to become established and work and, if they are, (b) start a strategy for establishing a congruence between the generative capacities of the city and the interpretative and innovative capacities of the surrounding ID(s), and finally, (c) improve the performance of the milieu over time, by

[15] The distinction between heterogenetic and orthogenetic socio-spatial devices is drawn from Redfield and Singer (1954), who originally introduced it to distinguish between the traditional and the contemporary city.

acting both to enhance the capacities of the urban fabric for generating unexpected novelties, and those of the IDs for converting them into innovation opportunities.

These conclusions obviously detract nothing from other conventional strategies that are more directly connected to the *Learning I* approach, because of the necessary interaction between the two modalities of learning we have discussed above.

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