

Project: INNOVATION IN SMALL AND VERY SMALL
ENTERPRISES AND LOCAL DEVELOPMENT DYNAMICS

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**STATE OF ART IN INSTRUMENTS FOR LOCAL
DEVELOPMENT, SMEs AND VSEs**

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1. INTRODUCTION

Innovation in small firms and local development, with special attention to peripheral regions, is the topic of the bibliographic review presented in this report.

Theorists of development issues use a few theoretical approaches incorporating a base of spatial socio-economic constraints, from which a set of conditions for local endogenous development could be suggested. This is a recent question in Growth Theory or Industrial Economics that will become progressively more important, as global economies will call for similar social environments. The cohesion policy of European Union has contributed to an expansion of this debate.

Since the 1980's economists, historians and sociologists are concerned about generating structures able to permanently reproduce conditions for more advanced forms of development. In this review it can be observed that important advances were achieved in the description of processes for regional dynamism. Many of these descriptions refer to small enterprises as determinant actors in such processes, but only when the economic spaces generate an environmental context, inputs from agents have a multiplication effect.

Notwithstanding the theoretical framework created on the bases of these major steps, the E.U. still contains a significant number of peripheral spaces that are not able to sustain growth in economic activity. Generally related to the rural activities and dominated by small production systems, such spaces have not been integrated into wider industrial production systems and have therefore been excluded from social sources of power and domination (SYRETT, 1995).

An analytical framework to support policy makers with strategic choices in the use of instruments for local development was absent. In our opinion, a simultaneous and articulated analysis concerning firm size, innovative activities and social environments has to be built on, in order to better understand how and to what extent small firms have a capacity to trigger and sustain endogenous development in less favoured areas.

As a consequence, in our report we appeal to three different scientific areas: the economics of technological change, the economics of the firm and regional economics. From these three areas we have selected concepts to confront them and propose a new analytical framework specific for the goals of our study - to generate local development using innovative small firms.

2. OUR GENERAL THEME: EPISTEMOLOGY AND DEBATES

2.1. THEORETICAL QUESTIONS RELATED TO LOCAL DEVELOPMENT, INNOVATION AND SMEs

In our research project we have to define and measure potentialities of technological change in Small and Medium Size Enterprises (SMEs), and Very Small Enterprises (VSEs), and their contribution to local development and the competitiveness of rural areas in the EU. Agro-food industries play an important role in the industrial activities in these areas, which might occur, by the introduction of new technologies. They are competing with the multinationals and wealthy regions while their future is linked to the local economic dynamism and to local institutions. What are the analytical tools to help us understand the kind of technological learning that SMEs and VSEs could employ, while interacting with industrial partners and working in an environment of local institutions and governance?

The questions treated in this research project are related to three different economic domains:

- § economics of SMEs and VSEs, especially in the specialisation and learning aspects;
- § regional economics, where the (what is meant?) of the milieu (local environment) is interfering with industrial economics, in order to generate local development, and where? inequalities are strongly linked to the level of technological development;
- § and the economics of technological change.

Agro-food companies will be studied in the project, among them there is a high level of specialisation and a great diversity of industrial competencies. The food industries are classified among “low-tech” industries (OECD), but structurally they are a complex of different groups of enterprises: a great number of SMEs without formal R&D, and a few big enterprises spending about 5% of their turnover in R&D, and specialised suppliers.

These questions have to be addressed with a methodology appropriate to the new competition regime of the world economy. Globalisation is a phenomenon mainly marked by new market forces: enlarged frontiers after repeated international negotiations, new space-time relations, powerful systems of information employed for the selection and the diffusion of new technologies. Social relations inside the enterprise have been changed, evolving towards less hierarchy. It is difficult to judge to what extent SMEs and VSEs are more or less favoured in the new “global” environment.

The big multinationals are not the only main actors present on the world scene. Governments are also playing determinant roles, and have quite different capacities to discuss the rules and the way they are applied. But other actors are also able to act efficiently if they know the rules: small enterprises, local governments. They represent huge capacities of innovation and decision on the world markets. Of course, they have not generally the same strategic views on globalisation as the main actors. So that it could be misleading to make rapid deductions concerning their role at the world level, from apparent results: the jobs created by SMEs, conviviality coming along geographical proximity. But, they have probably specific capacities to adapt to industrial production systems, emerging from their involvement in local environments.

The true questions to address with inquiries in SMEs and VSEs are not related only to the nature of the small firm. Also the management of technological change through which this small firm can appropriate the profits of innovations and the needs of institutions dealing with the problems of local development in peripheral areas do arise. First, SMEs are working much more than big enterprises through market transactions, but their inter-firms relations take place within a space of transaction mixing a lot of non-merchant links with merchant links. Second, technological change by small and very small firms requires a combination of internal with external learning. This enables them to innovate and to appropriate innovation profit when inter-organisational innovations give them access to all needed resources; this happens if the space of transactions is organising an environment for the firm accordingly to the technological evolution in the industry. Thirdly, institutions like universities, innovation centres, local political authorities, have to cope with negative externalities in order to create conditions for good co-ordination between local industries and central economic regions.

Few economic studies are devoted to small firms. But during the last ten years some evidence emerged? about these firm capacities to create innovative activities. Such capacities are quite different between industries, in the same way as they differ for other categories of firms. What should be systematically analysed, is the geographical distribution of innovative small firms. Indeed, if we suppose a greater contribution to the economic growth from these firms, their concentration in peripheral areas should have a decisive result on the local development of these areas. Much more economic information is needed about SMEs and VSEs, to define the variables explaining the dynamics of local development. Our questions represent a step on the way to such a definition, trying to link the main elements of the local economy and the components of decision-making at the firm level. The assumptions raised for the micro-foundations of the economy must be coherent with the rationality of the agents

2.2. EPISTEMOLOGY AND DEBATES

The three epistemological areas have been strongly debated for at least twenty years. The theories proposed about the enterprise and about economics of technological change are renewing (challenge?) the paradigms of economics, being sometimes hardly subsumed by the standard theory. In the area of regional economy the influence of economic geography has enlarged the debate, introducing new concepts like the “territory”, “local development” and “milieu innovateur”. What use can be done with these concepts, being sure that they are enough debated, and that in some aspects of their definition they will not be devoted to the symmetry like the old notion of “pole de developpement”?

various theoretical approaches have contributed to the debates in these three areas, mainly the Neo-Institutional Economics, the Evolutionary Theory and Institutional Economics. Indeed, the role of institutions –and sometimes of governance- is largely evoked, without all the necessary references to pioneer works in this field. The debates are too much “localised”, lacking some generalisation around some fundamentals. The search for a “consistent theoretical corpus” (BRAMANTI, 1999) will probably be more fruitful, joining more deeply the efforts of Spatial Economy to others, even when coming from more expansionists than the Regulationist approach. In the present context we have not the capacities for some kind of generalisation, and the present situation of economic theory is a limitation for our work.

The theoretical limitations of these developments are described either as resulting from ill-definition of concepts, or a lack of organisation and hierarchy of the concepts.

MARKUSEN (1999) has formulated detailed observations about concepts associated with the analyses of industrial districts. She mainly complains about fuzzy conceptualisation of “networks”, “co-operative competition” and “social capital”. she is probably right in the sense that many scholars do not define the concepts they are referring to, and that there has been little discussion of most of the concepts employed.. But “firms’ interactions matter and network analysis has enriched economic regional studies”. These observations are quite relevant when they point out that empirical verification of behaviour is well done only with good methods, rigour and transparency (p. 879). The quality of theorising in Regional Studies may be a strong limitation for the validity of the results adduced from the evidence? (p.880).

A big problem has been the definition and opening of the black box of Innovation (ROSENBERG, 1983), and according to P. VELTZ (1999) it has still to be opened for better understand what are innovative “milieux”

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But a general overview on conceptualisation needs a bigger effort. E. GARNSEY and C. LONGHI (1999), for example, think that a system is not an “entity”, but rather a heuristic concept. So that we may use the concept of “territorial system of production and innovation” in a semantic and analytical way, without any direct evidence for testing it. We must try to make sure that we are using concepts in coherent ways.

3. CONCEPTS AND ECONOMIC ANALYSIS ON SMEs, INNOVATION AND LOCAL DEVELOPMENT

The questioning related to small and very small enterprises in peripheral regions is specific to marginal situations. It can not be compared to situations usually studied of regions competing in a global world . But the same methodology has to be applied in all situations, using an economic theory constructed to explain all behaviours, assistance, structures, equilibrium and disequilibrium.

In each of the three disciplinary areas we are referring to, a brief record of the works published is presented. In this bibliography we try to point out the theoretical views and the studies recently at the centre of debates. Of course they correspond to different approaches: it is important to make this review in order to define a set of methods and establish an appropriate and robust ground for our own study.

3.1. THEORY OF THE FIRM

There is no corpus dealing of economic theory dealing specifically with the small enterprise. But the theory of firm is much more oriented towards explanations and descriptions of big firms and their development - especially in the context of a globalisation of the economy - than to describing the organisation and behaviour of small and very small ones. Studies coping with the definition and the organisation of the firm cannot be developed into the foundations of the theoretical micro-economy. And, since most analyses tend to assume that the small firm is not an innovator, we shall have a special attention to scientific evidence about innovative activities in this Universe.

3.1.1. A MAJOR ISSUE: THE RISE OF ENTREPRENEURSHIP IN SMEs AND VSEs

Entrepreneurship has not received a clear definition in economic thought Yet, during the last fifteen years economic theory has been paying a new attention to the firm. The dominant general theory still teaches how decisions concerning supply come from a firm-point, only considered as a “black-box” since the technology is given and perfectly known. It ignores that economies are in a continuous process of adaptation, generating a lot of radical or incremental innovations. Several new representations have been built in during the eighties, taking into account innovations- not only the physical ones, but also the commercial, financial and organisational new technologies. These heterodox theories are recognising the fundamental fact, ignored by the orthodox thought, that “production takes place in organisations” (LYDALL, 1998). Unfortunately they are not coherent between them, so that we are now facing quite different new theories, accepting only two common features for the firm: first its organisational character, secondly its role as an institution (B. CORIAT, O. WEINSTEIN, 1995).

New fundamentals have provoked ruptures with the standard theory: the objectives of the firm perceived as a complex whole, the bounded rationality, the role of an X-efficiency due to organisational components and complementary to allocation efficiency, and an historical perspective on a complex and dynamic organisation.

Each new definition of the enterprise derives parts from different theoretical approaches. The Regulation Theory owns to both Marx and Schumpeter its bases, the

Evolutionary school is mainly indebted to Schumpeter and Simon, Aoki has obligation to Coase and Williamson, and the Agency Theory is mixing the assumptions from Smith and Coase. What mainly distinguish them are the objectives and the historical background of each firm-organisation concept.

Concerning SMEs, we cannot find foundations for their existence without assumptions relatively to these two dimensions. The formulation of these assumptions should result in the “persistent heterogeneity” of industrial structures, when we consider technology changing permanently and largely private. All firms cannot have comparable results in terms of efficiency. Small firms are different as organisations, as big firms are different from each other because they have their specific objectives and origins – historically and spatially. With such analytical backgrounds we may look for some framework to theoretically support the SME: it is emerging in the text proposed by P-A JULIEN (1995) about “Economic theory, entrepreneurship and new economic dynamism”.

Trying to give an explanation for the SMEs revival in the past twenty years, he describes a context of a change due to the rise of a new entrepreneurship. Increasing instability and uncertainty, he writes, are better challenged by small enterprises than by big ones. They are better able to organise resources to respond to the opportunities generated by market instability. And there always are entrepreneurs to take advantage of new conditions, disturbing their competitors: they produce and profit from instability. They are basically agents of disequilibrium and instability. These assumptions must be questioned, for they should explain also why the better capacity of big firms to face uncertainty did not protect them over the last twenty years against markets changes and instability. In the same way, it is not sure that we will find a higher flexibility in small than in big firms. But there are specificities of SMEs, quite clearly addressed by P-A JULIEN: their objectives, their osmosis with local environments. Both have some correlation, as linkages with environments must be helping these entrepreneurs to achieve? their strategic targets.

The objectives pursued by an SME may be described by three characteristics: the *personalisation*, permanence of the enterprise, creation of new supplies. Management of SMEs may be identified to an “itinerary” which plays the role of the strategy in big firms. It is a personal itinerary, where SMEs “objectives are often inseparable from the economic, political, social and psychological objectives of their owners, which alone may be sufficient to justify staying small”. The permanence of the firm is more important than growth and profit at all costs: “some entrepreneurs prefer to stay small rather to lose control of their firms”, having sometimes left jobs in large firms “to create a job on a more human scale”. Such objectives are completed by satisfactions pursued by the small entrepreneur as an innovator. His enterprise is first and foremost an adventure: success is tangible proof of victory over a somewhat hostile economy, failure becomes a personal failure. The adventure will succeed when the entrepreneur leads consumers to be dissatisfied with existing or competitive supplies, so as to make them accept its own new supply (P-A JULIEN, 1995).

This small enterprise can exist and develop in spite of market instability thanks to the territorial environments within which they usually evolve: “SMEs exist in osmosis with their environment or territorial surroundings”. This external context is quite essential for the SME’s activities: providing main resources, on information, reducing uncertainty, etc.

If we accept the assumption of different objectives for SMEs, the development of this category of firms should be analysed with efficiency criteria defined by these objectives, not relatively to profit or growth ratios. Concordant with the other assumption about the heterogeneity of efficiency, SMEs' efficiency has to be defined with criteria of permanency and social goals. That does not mean efficiency without an influence of competition through the market. SMEs are competing with all kinds of enterprises, small and big, having to meet consumers' preferences and to be able to adapt to economic changes better than the other enterprises. Indeed, such conditions for competition were probably faced during the last twenty years. It was an historical period of great transformation where the capacities of a Schumpeterian entrepreneur to "seize opportunities in an extremely turbulent environment, and to create change through systematic innovation" were not enough to explain the rise of SMEs (JULIEN, 1995).

Some other questions must be addressed about the context of social and economic change into which SMEs are developing today.

On one hand, there is the history of industrial capitalist development with a new step beginning since the 1970s, when "the age of high mass production and the period of American hegemony in the global industrial economy came to an end" (E. SCHOENBERGER, 1997). New challenges came from key markers: a dramatic proliferation of new competitors, a new competition regime based on deeply altered spatial and temporal practices (e.g just-in- time), a different style of social relations within and across firms. As explained by E. SCHOENBERGER to describe the cultural crisis, with which big firms were confronted, it was a "Schumpeterian process of creative destruction also implying the devaluation of the social and material assets that were constructed in and validated by the old social order". And "it is hard to tell the difference between competition within a social order and the competition between social orders". On another hand, the innovation process is now taking place through business institutions, or patterns of organisation most conducive to innovation and economic growth (LANGLOIS and ROBERTSON, 1995).

If such new social and economic conditions create more uncertainty, as quoted by P-A JULIEN, that does not mean we may observe to-day a new entrepreneurship. SMEs are a permanent component of industrial structures, at any time of the history. They cannot survive without making good entrepreneurial decisions. That is why it is always observed that "size distribution of firms in each industry will usually be highly skew" (LYDALL, 1988). But this is the result of more general thought about "entrepreneurship". In a general economic theory, we should have a quite central assumption concerning the role of entrepreneurs in economic development. All economists know that the main factor in the great change that occurred during the industrial revolutions was the flowering of free enterprise.

However, economic analysis has developed the need for the rationale of equilibrium: "the dominating neoclassical school of modern economics is based on assumptions of perfect competition, of perfect knowledge of existing technology and, at least in discussions of general equilibrium, of the absence of time lags and of the resulting influences of expectations and uncertainty. These assumptions lead inevitably to a static equilibrium analysis that excludes endogenous change. It is therefore, inconsistent with the existence of entrepreneurs" (LYDALL, 1998).

The functions of the entrepreneur correspond to the items contained in the assumptions avoided in the general theory: imperfect competition, imperfect knowledge of technology, and uncertainty. To meet success the entrepreneur has to be a marketer, an innovator and a decision-maker. "Success as a marketer requires good commercial knowledge, success as an innovator of physical and organisational arrangements requires a good knowledge of these technologies, and success as a decision-maker requires a good knowledge of many different kinds of information, commercial, technological, human relations, legal and others. All business decisions are likely to involve consideration of all three aspects: the commercial, the technological, and the degree of uncertainty. The entrepreneur is the person, or group of persons, who makes decisions on the basis of any or all of these considerations" (LYDALL, 1998).

With these definitions of entrepreneurship and the functions of the entrepreneur, we may question the perceptions of small and very small firms through their organisational capabilities to develop new technologies and new products. They are able to make good decisions to meet in a competition always renewed and changing. But what needs more explanation, is the influence of their specific objectives in terms of economic and social goals and of their osmosis with the surroundings on their processes of decision-making.

3.1.2. THE CONCEPTS

The concepts we need in our analysis are not precisely carved in all their aspects to fit the problems of small firms. Some are general and well discussed, allowing them to be employed easily: entrepreneurship, uncertainty, and flexibility. Others concern small enterprises and are less known, being less present in the research programs, or quite new in the scientific literature: organisational learning, strategic learning.

ENTREPRENEURSHIP is associated to the name of SCHUMPETER. He proposed to consider the economic role of the entrepreneur concerning the creation of new combinations of production, and the exercise of initiative, authority and planning? (SCHUMPETER, 1935). His views about the declining numbers of new entrepreneurs were based on the development of huge conglomerations, the correlated bureaucratisation of economic organisations killing the entrepreneurial spirit. But, it has been observed that the overall business concentration is stable since the second world war, and the theory of an increasing concentration was questionable "in the light of a careful reading of the evidence prior to 1935" (BAIN J.S. 1968). Because, as recalled previously, enterprise creation depends on the cultural context, through the ways the social order is influencing and changing the atmosphere around business, wealth, and people contributing to their development. Entrepreneurs are themselves produced by favourable economic and social conditions: "it is to some extent the power of a community, through the policies of its government, to influence the supply of entrepreneurship" (LYDALL, 1988).

A definition of the **SMALL AND MEDIUM ENTERPRISE (SME)** is generally associated to the size. The number of employees may be under 100 or 500, depending on the statistical categories. What is at stake, associated with the size, is the ownership influencing the objectives and the organisational structure. The same problem of definition occurs for the Very Small Enterprises (VSE), sometimes called "micro-enterprises", organisations with less than 10 employees, which are often (led?) by

craftsmen. Quite careful attention needs to be paid to these conceptual definitions, because of the implications for the discussion of the enterprise as an organisation.

The concept of SME is also related to institutional aspects calling for more deep debates. Legal forms are mainly the same as for all enterprises, but the social role of this enterprise is generally associated with local structures. If the “small entrepreneur” has political and social objectives and is able to build his activities in an osmotic way with the territorial surroundings (cf. JULIEN), it should be more clearly investigated on the rules accepted by the local community concerning the commitments of the enterprise and resources available for it in the territory.

The **SME’ s ENVIRONMENT** is another quite important concept, which is not yet well defined. It is important to go further in its discussion if SMEs have specific institutional roles. The definition of such an environment would include for example agencies involved in the defence of some historical specificity to the employment of qualified technicians. What seems clear is that SME may interact in a particular way with its local environment, whose interests are associated to the permanence of the enterprise, the interactions being strategic. But what are the conditions needed for this kind of interactivity (concerns, trust, etc.)? We may admit a concept of “local environment”, surroundings that have to be organised in the context of a wider regional territory, whose industrial structure has a geographical unity and is governed through local institutions. Such a distinction would be relevant for small enterprises employing local resources –human capital mainly-, and whose social concerns are “local” in a very narrow sense.

The concept of **STRATEGIC LEARNING** is used about organisations having capabilities to change in the long-term period. These capabilities are discussed by various authors (Richardson, Nelson & Winter, Teece) for a firm defined as a pool not of tangible resources but of intangible resources. The term “capability” refers to skills, experience and knowledge (RICHARDSON, 1972). It is related to the ability to perform tasks, and to improve this performance through knowledge. A core feature is that how the firm is organised depends also on the firm’s capabilities, “the skills of an organisation” being identified as “routines” by Nelson and Winter. “Skills, organisation and technology are intimately intertwined in a functioning routine, and it is difficult to say exactly where one aspect ends and another begins” (NELSON & WINTER, 1982). Organisational capabilities are the heart of the strategy decision-making in the small firm. It is clear that “routines refer to what actually an organisation does, while capabilities also include what it may do if its resources are reallocated” (LANGLOIS & ROBERTSON, 1995). Capabilities are mainly confronted with uncertainty, and specially for future needs of resources. Indeed it is not always possible to make plans with resources that the firm already possesses. And Langlois & Robertson developed the idea that “questions of firm strategy and firm boundaries are closely related”. Strategy implementation has to “determine how to make up any shortfall by either generating new resources internally or arranging to purchase them through the market”.

This strategic case will usually be solved in SMEs by the market solutions, but through which decision-making process? As assessed by M. S. Freel, “little is known about how technologically innovative small firms grow, learn or adapt to changes in their environments”. In his presentation of a conceptual framework of evolutionary strategic learning, he analyses how innovative small firms accumulate knowledge through

learning, acting as a process of uncertainty-reduction. Their experience does not work to get economies of scale, but increases the knowledge of true costs, and helps to make better decisions. The acquisition of knowledge involves the small entrepreneur in a capability of strategic learning different from that of the big corporation, a dynamic learning viewed “as an opportunity to access economies of scope rather than scale – wherein the breadth and intensity of activities undertaken by the small firm I ? (*doesn't make sense here*) contributes disproportionately to the learning-by-doing process” (FREEL, 1998). Routines of innovative small firms are different from that of their non-innovative counterparts: different forms of human capital on pre-start knowledge about costs, a greater reliance on external networks for advice and support. A consequence of the reduction of uncertainty through experience, is that the “level of uncertainty associated with innovation will require exposure to a broader and distinct set of experiences to meet the same end –logically creating opportunities to access economies of scope in the presence of several distinct knowledge bases”.

ORGANISED MARKETS define form of co-ordination intermediate to markets and the hierarchies. It entails quite important differences in the relations between agents from the case of market co-ordination. In pure market relations the only information exchanged is the price. Instead, “the most fundamental aspect of the organised market is the ongoing process of exchange between users and producers of qualitative information. The information exchanged involves a change in the knowledge base of both parties and we may therefore characterise it as a process of interactive learning, enhancing the innovative capability of the producer and the competence of the user” (LUNDVALL, 1999, p.474). Since information is costly and requires usually heavy activities in big firms, the “organised market” plays an important role in the environment of SMEs, providing them with an essential source of information. Various forms of organisation can be adopted for such co-ordination, described in a quite abundant literature.

3.1.3 THE ANALYSIS CONCERNING INNOVATIVE SMEs

Empirical analyses of SMEs are increasingly feeding the discussion between the different theoretical frameworks, but it is still only a beginning. Evidence is not well established about performance of small firms and their contribution to economic growth. As regards their innovative capacities, a whole set of concerns appeared during the last years: which measurements will give clear evidence of these capacities? If the costs of innovation are mainly in R&D, how can SMEs have good performances with low expenses in lab activities? The relationships between firm size and technological innovation were extensively studied. For a long time, it was thought there are increasing returns to expenses in R&D, the monopolistic corporation being the ideal environment for innovation- following the idea of J. Schumpeter. F.M. Scherer concluded after many years devoted to these relationships that “there is much about which I remain uncertain” (SCHERER, 1991).

We shall make observations about three kinds of empirical investigations: measurement of innovations in SMEs, the innovative processes in SMEs, the forms of learning process associated to innovation, and the SMEs' environment.

MEASUREMENT OF INNOVATIVE ACTIVITIES IN SMES

Measurement of innovative activities in SMEs became important during the 1990s, when their role in the creation of jobs appeared prominent at the same time as the emergence of innovations as a topic of broad public interest. Several scholars discussed the problem of technological change in industrial economics, notably in an international symposium organised in Berlin by ACS and AUDRETSCH with the best specialists (ACS & AUDRETSCH, 1991).

The first topic dealt with the measurement issues. Statistical inquiries usually produce data concerning two questionable proxies: R&D expenditures and numbers of inventions patented. No direct measure of innovation outputs exists. The second topic explored was the manner in which market structure, more precisely firm size, influences innovative activity, and conversely the extent to which technological change has an impact on the size distribution of firms. All scientific results in the discussion were empirically oriented, and related to several advanced industrial countries.

The debate pointed out mainly two conclusions. First, “there are considerable ambiguities and inconsistencies in the results in the plethora of empirical studies relating R&D and patents to firm size” (ACS and AUDRETSCH, 1991); second, it assesses the advantages of small firms. These were considered to be: the ability to dare ventures without bureaucratic blockages, to innovate by combination of a myriad of detailed inventions, and to face challenges with a staff which will be rewarded after solving technical problems.

New innovation output indicators have to be defined: the number of innovations is the main one. In KLEINKNECHT and REIJNEN (1993), several methods of collecting data are proposed, postal surveys for self-assessment by managers of their innovations or literature-based counting of innovations (in trade journals). Experiences with the first method (in Great Britain, Norway, Denmark, Germany and Netherlands) and with the second one (in United States, Netherlands, Ireland) helped to discuss the issues and related ways to work towards general inquiries. Though without a scientific consensus, the Community Innovation Survey (CIS) has been implemented by EUROSTAT to collect firm-level data on inputs to, and outputs of, the innovation process across a wide range of industries and across member-states and regions, between 1991 and 1993. Detailed results permit to observe:

- Great differences between industrial sectors, in terms of percentages of new products in the total sales;
- Many differences between sectors in size distribution of firms, sources of innovation and types of innovation made.

Yet, about a central issue, “identification of innovators is tricky. Innovation occurs in both large and small enterprises, but not always in the same way or through the same mechanisms. It would be misleading to summarise the enterprise-size debate as a straight comparison of whether SMEs are more innovative than large firms are. The reality is more complex, depending on the product, technology, sector and country (GABOLDE, 1997).

In spite of limits in its first version, the CIS is bringing confirmation of the actual composition of inputs engaged by the firms for the technological change. Their evaluation at the level of all industries shows a break-down of expenditures devoted in

EU to innovative activities: formal R&D in labs represents only 41% of the total, while product design costs account for 22%, and in trials, tooling up and training there are 27%. In such figures there is room for the technological developments and imitations looked for in small firms. Such “observations persuaded decision-makers that there was an increasing need to focus on SMEs. The macro-level empirical data seem to suggest that the decision-makers are right”. These firms being job creators and engines of economic growth. However, such statements do not help to produce more scientific evidence for the precise role that they play in the growth mechanisms. The perplexity is fuelled by the fact that these SMEs “form a very heterogeneous group of enterprises”.

INNOVATIVE PROCESSES IN SMES

It is quite clear that extreme heterogeneity relies on differences between strategies, differences between managers concerning confrontation with competition, knowledge of technology and ways to reduce uncertainty. A classification of innovative SMEs built upon different strategic components illustrates quite well such differences. The young organisations adopting a new technology and pursuing a clear growth strategy are defined as Schumpeterian Pioneers. Resource Based Innovators are the enterprises to offer a “total concept” consisting of both a product and a service component in order to differentiate themselves from their competitors. We have also the Porterian Innovators in a third category being world-wide technological leaders in their specific market segments (CLARYSSE et al., 1997, in GABOLDE, 1997).

Whatever the way they adopt to compete, SMEs and VSEs are more restricted in resources, especially information, than large companies. If they are innovators, they always use a variety of sources, but less R-D than big companies. Especially important is the fact that they are more active to organise and to catch information (PACITTO, TORJMAN, 1999). G. Vizcaíno (1998) offers us an image, both sectoral and dimensional, of the innovative industrial firms in Andalusia. From a wide perspective of technological innovation, which does not bound to the R&D formal activities, 414 Andalusian enterprises with innovative behaviour were identified. The results confirm that technological innovation, seen as a multidimensional phenomenon, is not restricted to big enterprises belonging to technological industries.

LEARNING PROCESSES IN SMES

Empirical studies often underline the role of the environment, defined as the local context into which enterprises develop their activities. A favourable regional environment, observed for a sample of 1000 SMEs in Britain, is explaining differences in innovation performances (D. KEEBLE, 1997). But these results are more due to collaborative activities between firms than to R&D organisations and their partnership. We may therefore accept an interpretation for these effects of the regional environment by increases in knowledge bases, got through organisational learning (M. S. FREEL, 1998). “Innovative firms can be seen to be engaged in a wider activity set”, able to see more issues thanks to collaboration into networks with other firms.

Organisational learning and institutional networking seem to work together in the behaviour of innovative SMEs and VSEs. Many observations have been made about the reluctance of such enterprises to co-operate locally (WIG, WOOD, 1997). That is why, several studies point out the need for networks for technological learning through

external sources. In the agro-food sector small enterprises employ more external sources than internal ones (R & D), in their innovative activities (NICOLAS & HY, 2000). There are interfaces helping them to combine sources of technical know-how, information and relations. They are probably organised with institutional local networks, whose help comes from their capacity to create cohesion or a favourable context for innovation: this cohesion may be represented as some sort of proximity, more cultural and social than geographical (C. BELOTTI, 1999). We are not far from the concept of innovative milieu (cf. *Infra*).

SMES ENVIRONMENT

The SMEs environment appears as a critical factor for the development of the enterprise, in all studies reported. For example, a negative effect of the SMEs' environment on innovative activities is observed in an empirical study from Kalantaridis (1999), regarding an agglomeration of manufacturing SMEs that failed to transform geographical proximity into an innovative milieu. The author focused upon the experience of Bedfordshire, a county that was characterised by close proximity to the London markets, the presence of R & D facilities, a considerable agglomeration of engineering SMEs and the existence of two complementary universities: factors often identified in the literature as conducive to innovative activity. "However, these locational advantages failed to act as the stimulus of a cluster of innovative SME's, the rates of innovative activity in the locality were well below those reported elsewhere in the UK." (KALANTARIDIS, 1999, p.74).

As the author suggests, potentially important impediments to product innovation, that could explain this situation, are related at once to internal and external learning:

- "...the relatively modest levels of research and training output of the local universities combined with only modest levels of higher education qualifications among adults, as well the limited development of networking practices among the majority of manufacturing SME's..."
 - "...the relatively limited degree of interaction among innovative SME's as well as between innovative SME's and local research organisations."
- (KALANTARIDIS, 1999).

In Ireland, in a marginal rural area extended to three counties, a group of 123 start-up was studied. The owners were asked their viewpoints of "entrepreneurs" on the institutional setting in which they operated their enterprises (P. McDONAGH & al, 1999). Quite often, these owners "had been born in the local area and came from families which were self-employed". They were acknowledging the great help received in establishing their businesses from public agencies (grants), but also underlining other important assistance: attitude of local bank managers, staff commitment, etc. Yet, the main idea coming out of the analysis is, - having quoted the essential supports for SMEs development-, the lack of an adequate local "enterprise culture", too few people coming forward with business ideas, or the ideas proposed being more often imitative than innovative. So that, the authors conclude to "imbalance between the amount of financial assistance available and the comparative level of local "soft" support, especially for marketing, long-term loan finance, training and technical change", suggesting the role of the environment in the development of an entrepreneurship.

3.2. ECONOMICS OF TECHNOLOGICAL CHANGE

In this area theoretical approaches have been developed mainly by the Evolutionary Theory and Regulationists, these latter dealing only with macro-economy. As we are more oriented towards analysis for the microeconomics of innovation, only the results coming into publications of Evolutionists will be referred to. It is possible only to mention the concepts more closely related to our theme, for there are many others which are more basic (product and process innovation, technological paradigm, technological trajectory, cumulativeness, radical and incremental innovation, etc.) and that we have not to discuss in our research.

3.2.1. A MAJOR ISSUE: WHICH INNOVATIVE APPROACHES FOR SMEs AND VSEs

In the Learning Economy all enterprises have to adapt their technology for the new standards of the distribution and logistic system in an intensifying competition, and even more to meet the requirements of consumers and public policy. All big enterprises are organised to learn and acquire the new knowledge, using it first for the dynamics of their innovative activities (NONAKA & TAKEUCHI, 1995). A different situation is observed for small and very small enterprises, whose organisation is not so developed for immaterial investments. Yet, we presume that all enterprises of small size are also able to make some kind of efforts to acquire the necessary knowledge to evolve with new technologies and to adapt their productions along the industrial and social evolution (omit or rewrite)

S. BRESCHI and F. MALERBA (1997) help an exposition of this major issue with the analysis of geographical distributions of innovators, into innovation systems, according the nature and the variation of technological regimes. All categories of enterprises are considered within one industry, but they may belong to different Sector Innovation Systems (SIS) in which they are interacting and competing in innovative and market activities with the same tools and the same knowledge flows. Such SIS result from historical, path-dependant processes, with high degrees of institutional and organisational specificity. But in an industrial context, they are embedded in a Technological Regime, defined by the level and type of opportunity and appropriability conditions for innovations, by the cumulativeness of technological knowledge and means of knowledge transmission. The examination of the Technological Regime of an industry allows some predictability about the kind of enterprises which may innovate. This is due to the possibilities of protecting innovations (appropriability), to the strength of a dominant design (opportunity), to the nature and the continuity in the learning processes (cumulativeness), to the tacitness of knowledge and the means of transmission used. And, inside an SIS all kinds of interaction between actors generally “tend to take place within the borders of certain geographical areas”. So that firms’ innovative activities take place in “knowledge spatial boundaries”, without discussing the boundaries of the firms themselves. The learning process has to be very precise, in order to relate its characteristics to the kind of industrial and geographical environment surrounding enterprises, having in mind that it is an environment in what is called today a “learning economy”. There are specific learning processes for each environment (LEBAS & ZUSCOVITCH, 1993), and for SMEs or VSEs an important assumption is that it heavily influences their learning capacities.

In the field of the theoretical economy, no attention has been paid to specific problems created by a less favourable environment for small enterprises. Our major issue will thus be applying such a methodology for technological learning to these cases, stressing what are the main characteristics of the knowledge in such a context, where it is difficult to identify some autonomy for economic policies – especially for the governance of an “innovation system”.

3.2.2. THE CONCEPTS

In the evolutionary theories, the methodological imperative is “dynamics first”, which means that innovators are evolving in a changing environment. The concepts created by these theories tend to give definitions for the processes through which technological change take place.

TECHNOLOGICAL REGIME explains variations of this environment in time and between economic sectors. NELSON and WINTER (1982) have developed their analysis to explain the intellectual structure orienting technological change in a field during a period. They defined it as a frontier of achievable capabilities, defined relative “to technicians’ beliefs about what is feasible or at least worth attempting”. It has also been defined as “the level and type opportunity and appropriability conditions, by the cumulativeness of technological knowledge, by the nature of knowledge, and the means of knowledge transmission and communication” (S. BRESCHI and F. MALERBA, 1997). Incentives to innovate are related to these conditions.

The **APPROPRIABILITY REGIME** determines the ease with which imitators can capture a part of the market created by an innovator (TEECE, 1986). In most industries innovators are confronted with a weak regime, losing a considerable amount of money to imitators. The effectiveness of the means of protection (secrecy, patents, and continuous innovations) varies greatly from one industry to another.

PATH DEPENDENCY: the endogenous generation of innovative opportunities is inevitably rich in positive feedbacks and is one origin of the New Growth Theories. But the various positive feedbacks in the economy have generated other theoretical analyses referring to different processes. The development of an industry is highly dependent of local resources, as well as the future competencies of an enterprise are dependant of its experiences. “Growth is a highly path dependant experience, and therefore history genuinely matters in understanding the rate and direction of development of specific industries” (LANDAU & ROSENBERG, 1992). A special attention has been paid to its role in the process of diffusion of innovations (ARTHUR, 1988, DAVID 1985). Multiple producers offer several alternative technologies and the adoption choices feedback upon the incentive of the next adopter through different alternatives: (a) sheer imitation effects and endogenous preferences, (b) network externalities, or (c) learning “induced” upon the producers or the chosen technology which then improve their quality and/or their price (DOSI, 1997).

In evolutionary models generated by the NELSON-WINTER theory, increasing returns to knowledge are more generally path dependent. “Path-dependency can arise at least at three levels. First, it may regard the pattern of technological learning of individual agents. Secondly, it may concern their behavioural rules. Thirdly, path-dependency may be a collective property of the time profile of aggregate rates of growth of output,

average productivities, factor intensities, product characteristics, etc.” (DOSI, 1997). One can also say that a firm’s initial choices of entry in an industry define its later decisions: “a set of routines will develop which will lead to a deepening of competencies in certain areas” (TEECE, 1988).

TACIT KNOWLEDGE explains one of the main form of resources creating opportunities for technical change. It derives from the basic concept “learning process”, which explains how learning has become the key factor of successful organisations. Firms don’t need only to have a given set of skills, but have to acquire new ones. Knowledge encompasses all forms of competencies and skills used and acquired through a learning process. And learning activity takes place in firms of all economic sectors, including so-called low-tech, traditional and services sectors. Emphasis on different forms of knowledge originated from the works of the scientist philosopher M. POLANY in 1967, who observed that “we know more that we can tell”. The first domain of tacit knowledge is skills, but may be extended to scientific knowledge, or to organisational capability (NELSON and WINTER, 1982). Quite accurate explications of the concept came with the distinction between “tacit” and “explicit” knowledge and their interactions: tacit knowledge is the knowledge, which cannot be easily transferred because it has not been stated in an explicit form. According to POLANY, the only way to transfer this kind of knowledge is through a specific kind of social interaction similar to the apprenticeship relationship. Organisational learning may be oriented towards combinations of codified (explicit) and tacit knowledge, through knowledge conversions integrated in the learning processes: “socialisation”, “externalisation”, “internalisation” and “combination” (NONAKA & TAKEUCHI, 1995). The content of knowledge transmitted by such processes varies (operational, conceptual), and permits collective learning.

INTERACTIVE LEARNING is one among various concepts of “learning” that have been created. “Learning by interacting” by B. LUNDVAL (1985, 1988), parallels the “learning by doing” and the “learning by using” developed by evolutionary theory. It focuses upon a “process of learning permanently, changing the amount and kind of information at the disposal of the actors”: the author describes the producer as “interested in monitoring the competence and learning potential of users”, while “the user, needs information about new products, and the information involves not only awareness but also quite specific information about how new use-value characteristics relate to his specific needs”. When technological opportunities and users’ needs are changing, uncertainty and appropriability problems require some stability in “user-producer relationships” and their organisation in networks.

INNOVATION NETWORK: The concept of Networking has been provoking quite a lot of contributions in different economic approaches. But economic networks are quite various, connecting actors in different ways for different purposes. The concept of innovation network, also named “network of innovators”, may be defined as “a basic institutional arrangement to cope with systemic innovation, an inter-penetrated form of market and organisation”. This concept emphasises “the importance of co-operative relationships among firms as a key linkage mechanism of network configuration” (IMAI & BABA, 1989). They have various activities: joint R&D agreements, technology exchange agreements, licensing and second source agreements, informal networks. Their importance is very high as external sources of technical information and expertise, and informal networks appear the most important (C. FREEMAN, 1991).

“Regional networks” are different, even if they also generate externalities. But, when considered as constitutive of a “milieu”, with activities of sub-contracting or production-sharing and supplier networks, regional networks may be assimilated to “networks of innovators”.

NETWORK EXTERNALITIES are advantages to “going along” with other adopters of a technology- to belong to a network of users (KATZ & SHAPIRO, 1985). They are involved through infrastructures built around technological systems: tangible infrastructures (roads, distribution and telecommunication systems, etc.), and knowledge infrastructures such as research labs, training systems etc. (K. SMITH, 1997). It may be considered that in peripheral areas (LFRs) as for under-developed countries, the lack of positive externalities is costly. “The quantity of scientific and technological capacity offered by the surrounding environment will result in variations in the cost of acquisition of the required relevant knowledge for otherwise equally endowed firms. The distance (both geographical and cultural) from these possible sources of knowledge will increase the entry cost” (PEREZ & SOETE, 1988).

This concept is also very important for the discussion of the **DYNAMICS OF TECHNOLOGICAL ADOPTION**. Indeed, the diffusion of technologies is not necessarily converging on the choice of the best one, if we consider both the formation of irreversibility on a network and the network externalities. With this concept of technological adoption, the cumulative effect of random events drives into a dominant position the technology that potential adopters expect to have the greater number of adopters (ARTHUR, 1988). New developments about competing technologies have defined more precise hypotheses about the behaviour of potential adopters, and interactions between agents. When instrumented by the utilisation of percolation models, the process of technological adoption might result in a mechanism where “the local structure of interaction tends to preserve the diversity of standards: the tighter the structure, the more diverse the selected standards in the long run” (P. COHENDET, 1999). Insofar as we may consider this “local structure” as the environment of the firms’ innovative activities, “technological adoption” is a companion concept for analysis of the “geographical distribution of innovators”.

INNOVATION SYSTEM is a set of institutions whose interactions determine the innovation performance of the firms (NELSON, 1993). An innovation system can be national, or supranational; it can be also regional inside a country. It can be supranational and regional within a country at the same time. One may distinguish between a supranational system at the European Union level, the national level, and the regional/local level (EDQUIST, 1997). But, at the same time innovation systems may be sectorally delimited. The approaches complement rather than exclude each other.

LEARNING ECONOMY is an economy where the ability to learn is crucial for the economic success of individuals, firms, regions, and national economies. Learning refers to building new competencies and establishing new skills and not just to “getting access to information (LUNDVALL & BORRÁS, 1997). Learning economy is not necessarily a high-tech economy. The learning potential (technological opportunities) may differ between sectors and technologies but in all sectors there will be niches where the potential for learning is high.

INNOVATION POLICY refers to elements of science, technology and industrial policy that explicitly aim at promoting the development, spread and efficient use of new products, services and processes in markets or inside private and public organisations (EUROPEAN COMMISSION RESEARCH, 1999). Policy problems cannot be properly addressed until policy makers take into account the many significant changes taking place in the production of knowledge, in the industry as well as in the traditional sites where science is practised (GIBBONS & al. 1994).

3.2.2. THE ANALYSIS

Many empirical studies have been more and more verifying theoretical analysis in the field of technological change. A state-of-art for all issues has been published by C.FREEMAN (1994). It has been observed also that there is a “promising interaction between empirical analyses, appreciative theories and formal modelling”, the bottleneck being “on the ability of the theory to digest observations and stylised facts” (G. DOSI, 1997). So that the aims are rather at high stakes: incorporate path-dependant learning, micro-heterogeneity, out-of-equilibrium interactions, how individual decisions aggregate into collective outcomes, etc. But these are theoretical issues, contrasting with others at the level of applications. Questions addressed are quite relevant for decisions-makers, particularly for policy decisions: at that level there is a lack of the necessary data to formulate more precisely the problems to be solved.

If some statistics are now produced and published by public agencies (national statistical bureaux, EC, OECD), the quantification effort is nevertheless limited to some variables and performance indicators: technological change remains identified generally to R&D expenditure in the five industries where it gives good appropriation results to innovators. The general situation we are facing is to identify and to discuss the appropriate variables that would (be?) more accurate for measurements needed.

EFFECTS OF SIZE ON INNOVATION CAPACITIES OF FIRMS

Several authors expressed in various ways the same observation about the absence of reliable empirical data in the field of innovation (KLEINKNECHT & BAIN, 1993). Attempts to quantify innovation processes are problematical, since there are drastic limitations both in data available for the innovation inputs and those for the outputs. Data on intangible investments (software, marketing and design) do not exist. Existing innovation statistics are quite poor about the “output” side of the activity. Good measurements would permit analysts to address such questions as:

do SMEs use their R&D input more efficiently than large firms, or the contrary?

Are there important inter-industry differences in the more or less efficient use of R&D resources?

Are there important international or interregional differences, i.e. do comparable industries in the various regions of Europe use their R&D at different degrees of efficiency? (KLEINKNECHT & BAIN, 1993).

The Effects of firms’ size on innovative performance has been discussed (see ACS and AUDRETSCH, SCHERER, KLEINKNETCH, STONEMAN, COHEN and KEPPLER). Measuring innovation activities through output indicators would help to compare performances of SMES : with Literature indicators, Postal surveys. This is a first aspect of the problem but not the only one, because outputs do not reflect characteristics of the

“learning process” in small enterprises. Around innovation there are various aspects of the economic life that are not clearly defined. *“Innovation constitutes an economic variable of particular complexity, being difficult to obtain qualitative and quantitative information with the same bases and similar methods used to measure other economic variables”* (BONFIM, 1999). We cannot hope to solve the problems in the same way with inquiries at the sector level, at regional, national and international levels. Such inquiries must first be organized considering how to define a “representative agent” to interview: objectives and “rationale” of the small firm being different, the notion of “representative firm” is not valid. Assumptions of the neo-classical theory consider innovation *“as a process where the outcome is determined exclusively by a combination of the effort made and chance, and that all firms have the same probability for success. Most innovation studies show that this is not a realistic assumption. Path dependency and the cumulative character of knowledge give different firms very different starting points”* (LUNDVALL, BORRAS, 1997).

Recent evolution of learning conditions in the global economy calls for new policies, especially oriented toward increasing *“learning capability of the weak learners –people and regions (the new deal). The question of geographical scale is crucial in the learning economy”*.

SOURCES OF LEARNING

Since a long time many authors have identified other sources of learning than R&D activities. What we needed was to get exhaustive data for these sources:

K. PAVITT (1984) for example identified the different sources used by the four main types of enterprises he had defined,

European statistics provide to-day the break-down of all sources of innovation in industrial activities: R&D represent only 40% of the total (GABOLDE, 2nd European Report on R&D, 1997).

The recent analyses have systematised inquiries about services and several specialised literatures have driven towards a shift of emphasis from the perception of services as production and consumption sectors towards services as functions. This interest reflects the new insights about the role of knowledge production and distribution in the economy, and more specifically, the provision of new knowledge-based services and the reshaping of old ones. Therefore knowledge-intensive services acquire a special relevance within the overall services sector as crucial instrument in the learning economy and in the innovation process” (EUROPEAN COMMISSION RESEARCH, 1999). These knowledge-intensive services are classified: hardware consultancy, data processing, database activities, R&D and engineering, technical consultancy and testing. “The role of knowledge-intensive services in national and regional innovation systems are closely tied to the products these services supply to the market. Specialised expert knowledge, research and development ability and problem-solving know-how are the real products of knowledge-intensive services” (STRAMBACK, 1997).

TACIT KNOWLEDGE

How to measure such a component of the technological learning?

Some studies have yet given some evidence of its pervasive importance in the development of the knowledge base of firms, through the utilisation of external sources

of information. W. FAULKNER & J. SENKER (1995) have analysed the role of tacit knowledge in the industry-public research relations. First they recalled that “the scientist acquires a wide range of skills and tacit knowledge during their apprenticeship, including how to assess data and information, also methods for manipulating and using tools etc.”. Their case studies supported views about complementary use of literature and personal contacts for transfer of scientific and technological information from the Public Research: “personal interaction is necessary to tease out some of the more tacit elements of the published material”.

INTERACTIVE LEARNING

It is largely recognised that co-operation between enterprises and innovative networks has expanded in the last couple of decades. Questions raised about the nature and the effects of innovative networks have led to observations about their structure and their impact at the organisational level. Learning by interacting has been identified as the main strength of Japanese firms in user-producer relationship through co-operative associations (Kyoroku Kai). Therefore this procedure is evolving in a policy in western countries: one of the more active European regions for innovation, Baden - Württemberg, has experienced Technology Consultancy Centers as organisational units for partnership between small enterprises and public institutions, whose result is mainly in stimulating interactions between enterprises (MORGAN, 1996).

European innovation policy has already played a role for stimulation of learning interaction, by the creation of networks supported through ESPRIT and EUREKA programs (EUROPEAN COMMISSION RESEARCH, 1999). In 1993, a review already identified twenty-three policy initiatives in Europe, most of them oriented towards SMEs.

INNOVATION SYSTEMS

The innovation systems were first thought in a national context, and the first verifications concerning them came from scholars who have studied the more powerful countries like USA and Japan: C. FREEMAN, R.R. NELSON, NIOSI, and others. National Innovation Systems have been extensively described for 14 countries of different sizes: the results of these observations are presented in the book edited by R.R. NELSON (1993). Such results have given evidence for the proposal of a typology of NSI, build mainly with statistics about technological activities and performances (AMABLE B., BARRE R. BOYER, R., 1997).

Regional Innovation systems begin also to receive some attention now: to what extent are they identified with their own institutions, and some autonomy in terms of innovation policy? Analysing very big inequalities between European regions, in terms of investments in R&D and innovative activities, it appears quite important to develop new technological and innovation policies at regional level (LANDABASO, 1997). Regional Innovation Systems have been studied for the EU (P. COOKE, 1999) in a TSER project, showing that Innovation Systems exist only in a minority of the 11 regions investigated. The study covers firms' behaviour, funding, decision autonomy, sources and frequency of innovations. “Regional integrated innovation policy is now

required, linking SMEs, not necessarily excluding large firms, but also including regional and relevant national and even international support organisations”.

The consistent results of these analyses allow use of the concepts worked in the Evolutionary Theory of technological Change. The most difficult task, now, is not in definitions of concepts, but applying them at different levels of the economy: the firm, the community? the region, national levels. The community? is the first level where actors are interacting and their individual decisions aggregate in collective outcomes: which outcomes?

3.3. REGIONAL ECONOMY AND ECONOMIC GEOGRAPHY

3.3.1. THE MAJOR ISSUE: THE ENVIRONMENTAL CONTEXT FOR FIRMS WITHIN THE EUROPEAN REGIONAL CONTEXT

As the EU faces radical transformations in its patterns of growth due to the enlargement and integration of eastern European countries, changes in the main rules of the world economic activities raise problems related to the spatial impacts of new political scenarios. There is much uncertainty related to them: job creation, environmental impositions and different capital flows are among other determinants to be considered. Whether or not the long lasting regional divergences will decrease as the EU moves through an enlarged union, is a major question. Many of the latest studies discuss the complexity of the problem calling the attention of the national governments for the necessity of careful and targeted regional policies (HART, M. AND HARDY, S., 1995)

The regional impact of the internal European market is in question. It becomes interesting to know whether or not the appreciable quantitative effect of the structural funds, that in 1992 the European Union had decided to double, will have a qualitative effect through more favourable economic positioning of the regions. We should bear in mind the economic and technological changes engendered not only by the dynamics of the completion of the internal market but also by the technologic industrial changes in the highly industrialised countries of the Union.

The less developed regions of the EU have benefited from European supports related to the cohesion funds. However the positive results from such instruments still can not be identified clearly and there has been a search to select the causes why, in spite of those efforts, the regions are increasingly? (NETO, P., 1999). In general such regions have handicaps to be surmounted: the locational disadvantages, structural adjustments and lack of consistent ? national development strategies. The choices made by investors not attracted by peripheral areas due to high risk in returns and lack of qualified human resources, create a *circlus viciosus* that explains the tendency of the gap. In general, the major issues point out the analyses that try to advise on how agents should act and behave inside this areas to perform qualitative improvements in the entrepreneurial environment, or discuss the level of responsibilities that should be attributed to the national policy and the public sector.

3.3.2. THE CONCEPTS

TERRITORY: CREVOISIER & MAILLAT (1989) have qualified as “territorial” a production system as a relational space for technologies, markets, capital, know-how

and representations. Other analytic approaches have caught up the idea of territory playing an essential role in economic development: “the localisation procedures *territorialising* the activities is an essential element in the creation of resources (LONGHI et QUÈRÈ, 1993). The territory is thus defined as a place for co-ordinating industrial activities, a link between external territorial economies and organisational and inter-organisational firm trajectories (VELTZ, 1993), and a political decision-making unit governing localisation, able to create and redistribute resources (STORPER, HARRISON, 1991). To give a more precise definition for this concept, P. VELTZ (1999) proposes a differentiation between the “local”, the “regional”, the “national” and a discontinuous “territorial network” that is stable.

ENDOGENOUS DEVELOPMENT: is a concept that characterises territories where a homogeneous social formation corresponds to a social consensus through cultural behaviours, a high social mobility, and a widespread labour ethic (GAROFOLI, 1992). Such specific context is appropriate to analyse processes of SMEs’ development (SYRETT, 1995). Can we conclude to a paradigm of endogenous development with the evidence of an endogenous industrialisation? (COURLET & GAROFOLI, 1995)

PERIPHERAL ECONOMY describes the case of peripheral rural areas, “*weakly integrated into wider capitalist and state structures and therefore excluded from social sources of power and domination*”(SYRETT, 1995). It relates to processes of political and economic integration necessary for local economic development strategies. See also CONTI, MURRAY or QUÈVIT.

THE INNOVATIVE MILIEU: *The set, or the complex network of mainly informal social relationships in a limited geographical area, often determining a specific external image and a specific internal representation and sense of belonging, which enhances the local innovative capability through synergetic and collective learning processes.*” (CAMAGNI, 1991)

INPUT - OUTPUT SYSTEM: *Specialised units that can be rewarded with increases in output, either as a result of the individual unit’s multiple external interconnections or as a result of the increased throughput of the system as a whole. Which means that external economies of scope have additive, overlapping effects with external economies of scale.* (STORPER AND HARRISON, 1991)

SPATIAL DIVISION OF LABOUR: is another general concept, largely developed with observations about the extension of big cities. “*The expansion of the spatial division of labour from the core to the periphery*”, is a result of transformations in the transport infrastructures, technological shifts in the production and distribution systems (ALBRECHTS, 1995, p.31).

This concept should be connected to ECONOMIES of AGGLOMERATION: it is associated with a dramatic rise in international trade, associated with widespread increases in export specialisation by the world’s advanced industrial economies, corresponding to a certain geographical reconcentration of production – what some have called the “*resurgence of regional economies*”. “*The geographical agglomeration of important parts of the production system are positively related in technologically dynamic industries*” (STORPER, 1993, 62).

REGIONAL COLLECTIVE LEARNING: *Is the creation and further development of a base of common or shared knowledge among individuals making up a productive system which allows them to co-ordinate their actions in the resolution of the technological and organisational problems they confront.* (LORENZ, 1996 in KEEBLE and WILKINSON, 1999)

LEARNING REGION: The learning region absorbs its concept from the learning economy. The economic activity of the learning region has the ability to build new competencies and establish new skills, something that is crucial for the economic success of individuals, firms, regions and national economies.

INDUSTRIAL DISTRICTS: There are two different types of Industrial Districts: the loosest type of network is the Marshallian industrial district, where high degrees of vertical and horizontal specialisation and an intense use of exchange induce the co-existence of small firms with single functions in the production chain. In this case transaction costs are minimal and tacit knowledge is low. The second type of Industrial Districts is different from the first one even if the levels of vertical and horizontal specialisation are high. The reason is that the dominant competitive characteristic of firms is not the price but the product differentiation, obliging to an elevated firm performance related to knowledge and distinctive competencies. BECATTINI and RULLANI (1995) stressed the importance of social/cultural contexts and local environment to the emergence of Industrial Districts as an example of local productive systems.

INDUSTRIAL MODEL: is considered to be a coherent set of principles in meso-economic analysis that are able to face uncertainty in the relations among the economic agents. Fordism and Post-fordism orders or approaches are considered as generating two distinct industrial models.

3.3.3.THE ANALYSES

Meanwhile regional science is supplying the experts with new tools. During the 1980's, empirical evidence on recent developments (of some regions like Emilia Romana, Toscana, Southern Germany, Southern California, Japan, and Silicon Valley), had shown growth patterns, based on production systems, whose characteristics were evidently distant from mass production and product standardisation and other concepts familiar to the Fordist approach. In most of the cases these examples accentuate the role of territorial agglomeration of production and the interconnections of social practices and institutions in the successful development of regions.

In general terms, a whole set of discussions emerged from research agendas concerned with the notion of geographical space, to conclude that its development is an endogenous procedure in which time dimension is an essential determinant. In the following pages we stress their main results, without details about empirical evidence which is provided in a huge number of studies.

THE TERRITORY AND THE INNOVATIVE ENVIRONMENT

The dynamics of a geographical space takes place when inside this space the agents perform relationships of different nature and a certain socio-economic behaviour characterises them. These relationships can be described as external to the market or internal to the hierarchy, and co-operative.

All these three kinds of transactions matter to the development of that space where not only the economic agents interact but where the social structure also induces a knowledge capacity - the territory. Indeed, globalisation and the fact that each different space is submitted to its market rules do not allow the analyses to exclude the importance of relations exterior to the market or internal to the hierarchy structure. That is why most of the studies discuss co-operation as the most adequate relational choice within the spaces.

The introduction of time as a major factor of the territorial dynamics permits us to transform the previous concepts of behaviour and relationship into "learning" and "interacting", giving origin to very consistent and original new approaches. How may learning be introduced in the territory? How, as a consequence, do structural changes happen in the territory? How does the territory constitute itself to accept a different set of organisational or technical procedures, the innovations?

In order to develop answers to these questions we have to perceive that the territory can not be reduced to its spatial dimension. It should be understood as an historical construction in which the institutions function as a regulatory element of individual and collective practices, the principal assets being therefore of a relational nature (KIRAT, 1993 in SIERRA, 1997). One of the main characteristics inherent to the territory is the proximity among socio-economic agents. Whether the agents benefit or not from this attribute depends on their technological and social capacity to interact.

Methodological Perspective	Nature of technological and territorial interactions analysis	Nature of proximity relations
Development polarisation	Original approach: unbalanced growth diffuses through technological externalities (Perroux [1964,199,1992], Davin [1964]).	Technical proximity: junction effects exercised by the motive enterprise. Relational proximity: importance of social connections in the economy.
	Reactualizations ?? (what is meant?): technological pole of development, deepness of technological reflection (?) (Arcangeli & Pegolo [1989], Bresson [1989], Ravix & Torre [1991]).	Physical proximity imposed by technological transference that demand tacit interactions.
Technological dynamic	Evolutionist approach (in the large sense): [1] Localised conception of technological innovation (Dosi [1988], Antonelli [1995], Savioti [1996]). [2] Dynamic of technological adoption and auto reinforcement spatial mechanisms (Arthur [1988], David & Foray [1995a]). [3] Innovation resulting from interactive learning (Lundvall [1988, 1992b]).	Physical proximity is required when exists an dialogical constraint on the tacit knowledge transfer. Geographic and cultural proximity facilitates interactive learning.
	Approach in terms of technological creation. Territory as the dimension of productive tissue and technology creation (Amendola & Gaffard [1988, 1994], Longh & Quéré [1993]).	The time dimension of resources creation implies time proximity between the innovation actors.
Territorial dynamic	National Systems of Innovation problematic: inscription of innovation processes in national social and economic institutions (Freeman [1988], Lundvall [1992a], Nelson [1993]).	Proximity of institutional and geographical order connects the agents among the same national territory and facilitates the interaction user producer.
	Endogenous development problematic: [1] Endogenous industrialisation: analyse of innovation's territorial component (Courlet [1989,1992], Garofoli [1992,1996]). [2] Innovative milieu, imbrication (?) of technological creation and territorial construction (Aydalot [1986a], Maillat & Perrin [1992]).	Endogenous development rests on spatial solidarity networks and socio – cultural implantation. Where from: importance of geographical and cultural proximity.
Industrial organisation	Industrial districts problematic: hybridisation of Marshall's concept for socio-economic studies (Becattini [1992], Belandt [1992]), evolutionists studies (Lecoq [1993], Loasby [1996]) or technological studies (Antonelli [1986], Storper [1992]) of territorial component of industrial organisation.	Geographical proximity allows district enterprises to develop innovations in common and to support on a strong social cohesion and community identity, drawing upon ? a strong cultural proximity. Districts constitute a localised labour division, resting on technical proximity among firms.
	Innovation networks problematic: studies of organisational dimension of territorialised resources creation process (Camagni [1991a], Maillat et al. [1995]).	Networks constitute themselves on a base of geographical proximity and technical proximity among firms and are reinforced by relational proximity (confidence, fidelity)

Source: Sierra, 1997.

There are discussions on the concepts of geographical and technological "proximity". While the first one indicates increases in the relation among economical activities and settles the idea of organisational and institutional proximity the second one suggests the importance of the interaction among agents, particularly the one that results from the

learning process. The complementarity between both concepts stimulates different forms for relations of proximity and can ease the enterprises to relate and institutions to integrate (SIERRA, 1997). At this point we start to touch the already described theoretical context related with technological change and innovation. We do not intend to involve in the same subject again, therefore our remarks will focus on two main ideas close to technological changes: the acceptance that technical specificity is a continuous learned procedure and the need to support this procedure as an endogenous result. Meanwhile intensive attention has been paid to the territorial dimension in the technological dynamics. BELLET (1992) discussed it presenting a review on the convergence of these two aspects.

Much earlier and developed by the GREMI, the concept of "innovative environment" had generated possibilities for interpretation of the phenomena of spatial dynamics exclusively based on innovative procedures and synergetic movements within the territories. We shall pay some detailed attention to the improvements in the analytical tools used by this group that since 1985, focused its main aim on the development of a common methodology and theoretical approach to the study of innovative behaviours within territories.

AYDALOT (1983,1984, 1985) first preoccupation was related to the inefficiency (incompatibility?) of both theses: the convergence and the divergence of growth pattern among territories. While the first one postulated the tendency of a similarity in the remuneration rates of the productive factors, the second defended the worsening of spatial hierarchies with cumulative negative consequences for the peripheral spaces. These two theses could not explain, however, a newly achieved economic dynamism in several European and American regions, reflecting an absence of analytical interpretation for spatial structural changes. This researcher was initiating the debate around the local environment of SMEs, defined "*milieu*" as a new model for regional development, considering that "*the space is something different from the simple addition of the components: there are common values and interaction that create synergetic advantages to be considered*".

Since then, several scholars have developed the definition, inside the general conception of a "*set of territorial relationships encompassing in a coherent way a production system, different economic and social actors, a specific culture and a representation system, and generating a dynamic collective learning process*" (GROSJEAN & CREVOISIER, 1998). More precisely CAMAGNI (1991) has proposed to understand the economic space as "*a relational space, the field of social interactions, interpersonal synergies and social collective actions that determine the innovative capability and the economic success of specific local areas*".

In a context of increased market competition and rapid innovation, firms and regions are faced with non-price competition factors, having clear advantages when able to systematically acquire new skills. A strong capability to learn and transform the organisational competencies (EUROPEAN COMMISSION RESEARCH, 1997) is demanded. The learning region favours pre-conditions for learning, in the forms of common regional culturally-based rules of behaviour and co-operation often in which collective agents may be of great help (KEEBLE, 1997).

So that the innovative results within the territorial space, could be considered as due to a collective *user* that reduces the degree of uncertainty for the firms by organising their functional and informational inter-dependence and informally performing functions like: search, signalling, selection, transcoding, transformer and control. This accent put on uncertainty is important for SMEs, usually because of their reluctance to co-operate in research activities for example.

Indeed much of the theoretical issues, using concepts as polarisation or spatial and functional labour division, could explain hierarchies among the spaces, but reasons for the recently observed alterations in the hierarchical order of the territories (Maillat, D., 1995) have not been researched.

The introduction of the concept of *Retournement* supplied useful explanations. First, an autonomous mechanism, detained by each territory (even peripheral) that could be able to change the hierarchical relation among spaces was presupposed. Then, it was possible to conclude that the consequent effects upon the development of such territories were not simples repercussions related to growth in nearly located rich regions but, results from specific dynamic procedures happening in these peripheries.

For the GREMI researchers, that had come closed to the theses of the industrial districts, the territorial development question became a central procedure in the composition of the global industrial system. The important issue being to know how the collective learning and the development of new know-how could emerge and reproduce in the territory.

There are two elements that theoretically define the role of the environment: the "collective learning" process, that enhances local creativity and capability to adapt behaviours due to environmental changes, and processes of reduction of dynamic uncertainty elements, intrinsic in technological development and innovative processes.

PRODUCTION SYSTEM AND NETWORKING

STORPER & HARRISON (1991) and other researchers advanced the notion of "production system" without interfering in generic terms with the major results obtained by the other research groups. We can assume that in spite of the different proposed frameworks related to environmental aspects, several approaches and consequent justifications, the major general conclusion expected is that networking is an efficient form to deal with environmental constraints.

In his approach Storper does not introduce the territorial dimension of production without a previous discussion on the types of "input-output systems", *functional cores* of the economic activity. SCOTT AND STORPER, 1990 (in STORPER & HARRISON, 1991) had explained how, similarly to the production units, the different input-output systems are generators of external economies of scale or scope, if groups of units of production are fragmented and specialised on a bases of social division of labour.

This permanent decomposition in the productive forms demands at the same time an intensification of the interrelationships among the input-output systems and exalts the need for production flexibility, inducing the advantages of working together -

networking or creating networks. In this case, spatial proximity matters not only in terms of reduction in physical distance, but rather in terms of easy information interchange, which can determine the efficiency of local production systems and their response capability to a changing external environment.

This organisational form has its own advantages, costs and risks. The main advantage is what DIRK KAMANN (in CAMAGNI, 1991) calls the “network surplus”: scale economies in R&D, commercialisation and production, complementary of know how and strategic synergies among firms. One risk concerns the possibility of easy opportunistic behaviours of some partners, which may profit from the co-operation alone. One major limitation regards the fact that the model is potentially highly profitable but also highly demanding in terms of organisational expertise and highly subject to costly failures.

Another contribute to the analyses was ANTONELLI (1995) explanations on the origin of co-operation. This is due to the existence of complementarity between different production units, whose relationships are not only based on competition. Facing an increase and more exacting demand, firms tend to be more specialised, inducing complementary and interdependency relations. Here, technological innovations emerge from the need for variety and differentiation, providing better levels of productivity to the firms.

In this logic sequence, co-ordination is not only allowed by the market system (based on prices), because this one doesn't transmit all the relevant information to keep active the cycle. The flow of information is only possible through ex-ante co-ordination among firms, leading us again to the concept of "networks".

Industries working in networks can be characterised by the existence of a variety of firms, linked by a high level of technical complementarities and compatibilities and highly integrated due to the externalities provided (CAMAGNI, 1995a and 1995b). These latter ones allow firms to have aggregate cost functions with increasing incomes, which can be interpreted as their benefits from belonging to the network.

SYSTEMS OF TERRITORIAL PRODUCTION

Due to a problem of diversity, it has not been easy to adapt the reality of the regional productive bases to the theoretical conceptualisation of territories. Independently from the fact that in general the productive territories do not correspond to the administrative divisions, other problems bring limits to the analyses. One of those limits was observed and worked up by GROSJEAN AND CREVOISIER (1998). It concerns the fact that most of the available case studies refer to only one of the several concepts related to systems of territorial production, when indeed the region is seldom homogenous. In most of the cases different subsystems coexist inside one same region.

This situation calls the attention to the importance of methodological forms to observe the functional relations defined within each territory in which autonomous sets are present. The articulation of both, territorial and functional aspects give origin to the concept of system of territorial production (STP).

We could summarise the diversity of situations pointing out some examples: technopoles, industrial districts, innovative environments, flexible specialisation, poles de croissance, regions of diffuse specialisation.

The coexistence among such different subsystems could be originating complementarities inside the territory. In this case, co-operations among firms are developed if the complementarities are organised through a common industrial strategy. What territorial strategy may result without a co-ordination of this territory? To understand the articulation between the subsets of a territorial system of production, we need a meso-economic framework. *Regional proximity improves co-ordination and induces to agglomeration economies. Specialised small firms benefit from better market opportunities and competitive advantages when compared to bigger, but isolated competitors*(BECATTINI, 1987 in ANTONELLI, 1995).

As Fordist solutions lose strength, local environment specificity becomes more relevant, as it concedes to the productive organisation essential inputs, like labour force, entrepreneurial capacity, infrastructures, social culture and industrial organisation. (BECATTINI and RULLANI, 1995). The author's idea is in order to value mostly the aspects related to the milieu where firms are located, leaving behind scale economies and mass production as determinants to competitive advantages. *(rewrite this sentence)* Industrial districts serve again as example. Here, labour force division among the several specialised small and medium enterprises happens, not due to the co-ordination of a big enterprise, but thanks to common entrepreneurial culture and a huge sense of interdependency. Because of being better adapted to the environment, this labour force division allows SME's, located in the industrial districts, to have competitive advantages when compared to big Fordist enterprises (BECATTINI and RULLANI, 1995).

GOVERNANCE AND POWER IN THE ORGANIZATIONS

There are two principal competing views of the nature of intra and inter- entrepreneurial relationships: the economic point of view and the sociological perspective.

The first is supported mainly by the transaction cost approach, a model whose goal is the pursuit of efficiency. Its basic presupposition is that market and its atomistic organisation consolidate all the relations into transactions ruled? by the rationality and the opportunism of agents (WILLIAMSON, 1975 AND 1985 in TAYLOR, 1995). In this model, if transactions involve uncertainty they tend to take place in hierarchically organised firms saving greater costs in marketing transactions but using, at the same time, higher levels of bureaucratic organisation. Once transactions are moving from markets into hierarchies, there is a specific knowledge that builds up - the *asset specificity*.

Notwithstanding the limitations of the transaction cost model, the same was used usefully to better understand the functioning of "production systems", identifying new industrial spaces, mainly. *Here flexible specialisation and flexible accumulation in the context of agglomeration and Marshallian industrial districts, have been identified as processes dismantling hierarchies and replacing them with localised market transactions* (TAYLOR, 1995).

STORPER AND HARRISON (1991), draw attention to the structure of the supply chains where the number of suppliers is different from the number of customers, to explain the asymmetry of power and develop a typology of governance structures. In this case, governance is defined as a context into which two major types of firms co-exist: the *core firms*, and the *ring*. The first kind of firms do have the power to determine the existence of the others and the second set, the *ring*, is constituted by firms that coexist under symmetrical conditions of dominance. These two elementary forces of the governance structures within the different types of input-output systems originate different conditions for governance and interrelationship between enterprises.

The second discussion on intra and inter- enterprise relationships integrates the context of structural *embeddedness* and is socially oriented in the sense that networks are seen as instruments to facilitate collective action within and outside the market contexts. The most important notions under this purpose is the recognition of an imperfect knowledge of economic actors and their acceptance of a shared collective understanding of the decision-making process, promoting the role of non-market institutions.

GRABHER, 1993 (in TAYLOR, 1995) emphasises four characteristics of the structural *embeddedness*:

- *reciprocity, involving indefinite sequential pattern of transactions*
- *interdependence, through reputation, friendship, mutual orientation and mutual adaptation,*
- *few long term legal obligations and the strength of weak ties*
- *asymmetric power relations, with the powerful framing decisions*

A crucial step in the process of understanding environments was given when industrial geography and organisation theory started to ??strength closed links???. As refereed by OINAS (1995) the organisation theory consists in a source of ideas useful to understand the nature of business organisations and their connections to their environmental contexts. The research traditions of this sociological discipline suggest three different approaches to discuss the contribution of organisations to regional development: resource dependence, new institutionalism and population ecology. Each of these approaches supplies important analytical tools.

The research that has been developed in terms of resource dependence favours the dependency as a determinant factor of power in the organisations, whereas such power is stimulated by the control over the resources (SCOTT, 1992 in TAYLOR, 1995), particularly those that are critical and scarce. *While arguing that organisations are externally constrained, the active choices are made in adapting to situations of external pressure. ... Besides being able to adapt themselves, organisations are also able to affect their environments (PFEFER AND SALANCIK, 1987 in TAYLOR, 1995).* The firm manager has then two decisive roles, on one side, determining how to adapt the organisation to meet the constraints and, on the other side, interfering to change the environment in which the organisation is integrated and shall respond (PFEFER AND SALANCIK, 1978 in TAYLOR, 1995).

The role of power or unequal power relationships within and between firms may influence patterns of geographical industrialisation and therefore speed development in the territories. TAYLOR (1995), refers to the fact that the empiricist tradition in the industrial geography simply separates small firms from large corporations creating a

dichotomy that neglects the appreciation of the full significance of business enterprises, their structures and the nature of networks within which they are situated. In this context the full understanding of the capital/capital relationship and the circuits of power that this relations trace are devalued in comparison with the capital/labour relationship and job creation that is generally an over evaluated argument. Also a criticism from the author is made of the restrictive character of the transaction cost model. Assuming transactions to either external markets or internal hierarchies, where the equilibrium is established whenever the efficiency is obtained through the minimisation of transaction costs, the model reduces the discussion of the dominance of power almost only to the neo-classical least cost location models.

To better understand networks of power, theoreticians should depart from the complexity of entrepreneurial tissue and distinguish all kind of productive organisations. Large firms from small firms, transnational corporations from national based corporations, foreign owned from domestic owned, craft from mass producers, high technology from low technology companies, head offices from branch plants. All those enterprises develop interrelationships, sometimes not necessarily contractual or transactional, at different functional levels with other organisations or agents in a *constellation* where place, time and strategic decision influence.

As we prepared ? this paper the discussion about governance and power in the organisations we had the intention to assign it to regional terms. Indeed the regional production is a very complex set of production systems and only occasionally the region corresponds to a unique production system. Governance and circuits of power are established across the region and generate different structures when combining the level of the existent social division of labour in production and the existing local interconnections in production. STORPER (1995), focused on the several forms that such interconnections could undertake:

- § extensive local and long-distance interconnections, non hierarchical;
- § large local firms dominated and long-distance interconnections, non hierarchical;
- § limited local connections and extensive, non-hierarchical long distance connections;
- § limited local connections and extensive long-distance connections dominated by a few agents;
- § extensive but hierarchical local connections and limited long distance linkages.

The level of adequacy of the described systems to reality could be argued, but even so a multiplicity of contexts is being described, from which a multiplicity of ways to respond to capital, technological or organisational inputs, skill upgrading or policy supports can derive. The systems, complex as they are, determine the results of inputs for change. Nevertheless, there is an urge to find a common view about the structure and development of "production systems" in order to be able to better define adequate policies for development strategies.

INDUSTRIAL MODELS AND STRUCTURAL CHANGE

LUNG (1995) presents a positive contribute to the discussion on spatial distribution (geography) of production, advancing the idea of industrial models as a concept that is still not definitively established. This concept is directly linked to the regulationist approaches from BOYER AND SAILLARD, 1995 (in LUNG, 1995) and is considered to handle problems related to a new economic order: the post-Fordism. With two main characteristics, the flexible specialisation (PIORE and SABEL, 1984 in LUNG, 1995) and the flexible accumulation (SCOTT, 1988 in LUNG, 1995), the theoretical view synthesised by Lung expects to create new tools to analyse the meso-economic space.

As uncertainty and stability are the constitutive bases of those models, both notions deal essentially with the management of the relations under a confidence level. Multiple reasons may justify iuncertainty that can derive mainly from different forms of labour relations (LEBORGNE and LIPIETZ in LUNG, 1995) or from changes in productive organisation created by the market. Examples are material or informational flows, market, and entrepreneurial relations.

The previous discussion brings up new, very important vectors into the analyses:

- § the model can not be defined independently from its specific spatial and historical context, and the stability pre-defines reactions (LLERENA in LUNG, 1995);
- § in the model and for each context, in contrast to uncertainty, stability helps the anticipations, therefore creating certain reactions to expected levels of performance;
- § in a transition period different industrial models coexist independently of the dominance of one of them;
- § The models have evolutionary tracks with national nuances (BOYER, 1991 in LUNG, 1995). So that the Fordist model can be associated with labour division and the post-Fordist model to territorial re-composition, which means that to each model corresponds a specific geography of production.

Regulationist justifications attribute to the Fordist model, the loss of identity of the territories. But, they explain how the new productive forms ("production systems" in the terminology of Storper and his group) in the post-Fordist era, may develop a new economic status for the local space. Once new flexible forms of productive organisation have been introduced, the closed articulation ?? to the market on one side and externalities and development networks of firms on the other, impose co-operation in conception and production procedures. Indeed, the increasingly strong rivalry and permanent competitive fluctuations impose new articulation?? forms between the local and global contexts in a way where production requires permanent adaptation to local specificities. To better understand the market expectations the firm relocates, at least one part of its conception and production procedures, putting an end to a regime in which the firm assortment of supplies are identical for the all geographic spaces (LUNG, 1995)

We have described a major logic that justifies a great part of the spatial dynamics in the post-Fordist industrial models. In the previous paragraph we have explained why the new principles of productive organisation require simultaneously stability and flexibility in the economic activity, also in terms of employment, orienting the territorial

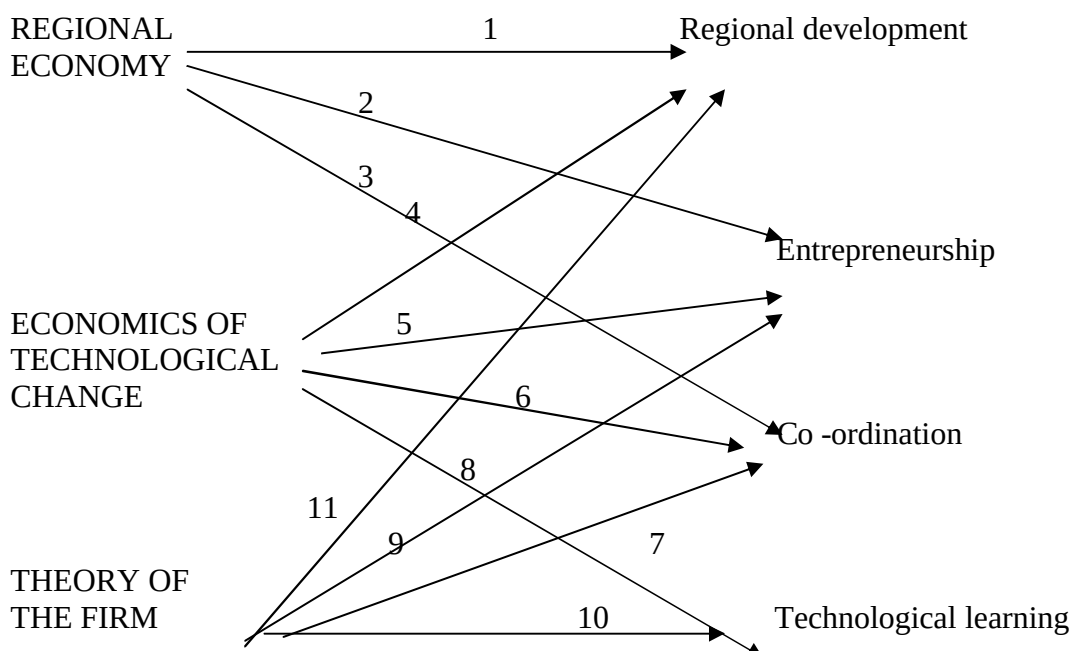
implantation of firms. Indeed, the need of firms for new competencies, more specific and systematically adaptable workers - absorbing the most recent innovations or dealing with fast informational flows - demands qualified human resources. The territories, sometimes the towns (also the medium size ones) are involved into productive organisational complexes.

In the era of flexibility, the world economy is seen as a mosaic of specialised production regions, marked by intense phenomena of reagglomeration of production. The introduction of techniques of flexible production, the globalisation of economic processes and the conditions of market competitiveness appear to be the origin of a profound reorganisation of forms of production and trade which, on the basis of mechanisms, reattribute to the local/regional systems functions and vitality which seemed to have disappeared in the era of the Fordist corporation and mass production (CONTI, 1995).

4. CONCLUSIONS

In spite of the extensive bibliographic review that has been made, several questions can still be raised for which answers could not be found. One of them supposes the space as a contribution to form the directions of a certain industrial model: in this case does space create the conditions for the incubation of new industrial models? The affirmative answer to this question would push us to a restrictive position in which the development would almost exclusively depend on political and strategic actions. Another pertinent question that could be raised is to know how long would models subsist, considering that they have traced deep roots within the territory? Independently of the proposed answers the main issue is the irreversibility of the territorial development process and therefore the long-term effects of policies in the regional dynamics.

We know that the whole set of concepts and methods that were presented is not fully operational. Several concepts have to be more precisely discussed. We use the example of innovative activities in R&D to generate new technologies and introduce specific problems of management – especially of innovation adequacy and uncertainty –, and interpretation of economic performance. "It is difficult both in practice and in principle to maintain a clear distinction between innovations in pure technology on one hand, and adoption or diffusion of already existing technologies on the other". Yet, it has been observed "a number of promising recent efforts to transmute theoretical concepts into operational research agendas and empirical projects" (G. WRIGHT, 1997). The adequate solutions being less accessible for SMEs and in Less Favoured Regions, we expect to make progress in the search for appropriate models, trying to give simple but realistic definitions for their behaviours. We have proposed to conduct our research project relative to SME's capacity to sustain an endogenous development with innovative activities in LFRs, through the analysis of four functions: local development, entrepreneurship, co-ordination, technological learning. Theoretical developments in the three economic areas here reviewed will contribute to the definition of these functions with accurate concepts. A first choice of these concepts appears in the following scheme, each one corresponding to a number identifying a concept present in a list under the next figure. The proposed concepts to analyse SMEs' capacities in the development of LFRs are:



List of the concepts corresponding to the numbers:

- 1 peripheral economy
- 2 proximity
- 3 innovative environment
- 4 learning region
- 5 tacit knowledge
- 6 collective learning
- 7 innovation appropriability
- 8 strategic learning
- 9 organisational learning
- 10 cumulative technological trajectory
- 11 governance and power

Peripheral environments and SMEs' dynamism

A strong emphasis has been put on the analyses of local development in the literature, particularly the role of innovation and its diffusion in the regional or local development. *However, few studies have focused on lagging regions and the problems they are faced with* (RITSILA, J, 1999). Specific gaps of “less favoured regions” are not systematically described

In the bibliographic research we found several comments that could be used to frame this important discussion, even if in general, the studied contexts refer to factors that can be detected in regions that do not suffer from handicaps attributed to their peripheral situations. Certain regions contain ??a set of local actors and institutions able to better perceive constraints and opportunities to integrate know-how skills, and other capacities able to help the environment to generate and diffuse new information or techniques. Others do not.

The especially difficult situation of peripheral spaces has been illustrated by QUÉVIT (1995), when describing the regional impact of the internal European market in traditional industrial regions and lagging regions. The author observes that from a regional point of view, the direct effects of the decreases of Non Trade Barriers to the recently integrated countries are positive, due to the decreases of production costs, whether ?? they concern traditional industrial regions or lagging ones.

However, many indirect effects, mainly related to size are responsible for a general pessimistic vision on development perspectives for the European peripheral spaces:

- most of the time they have difficulties in generating economies of scale in sectors where demand is stagnating or for low technology products;
- many SME's operating in such spaces find it difficult to pass the minimum efficiency level;
- few opportunities for this regions to generate technical economies of scale in the services sector, except for those which have good urban infrastructures;
- the incidence of peripheral geographical location regarding non-technical economies of scale: a handicap for the reduction of transport costs.

Considering that the economic space is a relational space as CAMAGNI (1991), pointed out, also the peripheries are *fields of social interactions, interpersonal synergies and social collective actions*. In isolated spaces, the lack of creativity and innovative attitudes is the result of a deficient collective learning. In such “**local territories**”, the social interactions work well only if their enterprises (SMEs)’ environment is as rich as in the core regions, contributing to technological and organisational learning. An issue to raise is to know how actors are able, in **peripheral regions**, to involve in collective and successful co-ordinated attitudes, mainly a **collective learning** allowing catching up in the **spatial division of labour**.

“Weak learners” (peripheral regions and firms) need a deep change in their environment in these territories:

- in a lagging “**local territory**”, the need is to eradicate lacks of several competencies: in economic and technological policy, in specialised training, in consultancy, in technological resources, etc. – in marketing and markets’ organisational **governance**, studies, data bases, information, institutions.
- In the SMEs located in a lagging “local territory”, the need for a more active environment will find out appropriate answers if changes in the “local territory” is achieved through better co-ordination with **regional territories**. All the capabilities of a **learning economy should be provided**: a set of various **innovative networks**, organisational supports for the learning of **tacit knowledge** in combination with codified knowledge, **an entrepreneurship culture**.

Proximity among agents is a tool for building up social capital, only in a learning economy. Learning in **Less Favoured Regions** will come out if it is openly declared the most important immaterial investment in the cohesion politics. The necessary **collective learning** is organised through a lot of conventions, in formal or informal forms, environmentally linked and therefore territorially differentiated. *They reproduce themselves through a cumulative process and merge from endogenous and different rationalities of the collective actors, sometimes linked to local bases (STORPER, 1995).*

Bibliography

ACS, Z.J., AUDRETSCH, D. B. (1991): Innovation and Technological Change, an International Comparison. The University of Michigan Press.

ACS, Z.J., AUDRETSCH, D.B. (1993): Analysing Innovation Output Indicators: the US Experience, in A. Kleinknecht, D. Bain (Eds), New Concepts in Innovation Output Measurements. S. Martin's Press, New York. P. 10-41.

ALBRECHTS, L. (1995): Shifts in Europe and Their Impact on the European Spatial Structure, in: S. Hardy, M. Hart, L. Albrechts and A. Katos (Eds), An Enlarged Europe. Regions in Competition? Regional Policy and Development, 6. Jessica Kingsley Publishers and Regional Studies Association. London. p.22 – 34.

AMABLE, B., BARRE, R., BOYER, R. (1997): Les Systèmes d'Innovation à l'ère de la Globalisation.

ANTONELLI, C. (1995): Économie des Réseaux: variété et complémentarité, in: A. Rallet, A. Torre (Eds), Économie Industrielle et Économie Spatiale. Economica. Paris. P. 253 - 272.

ARENA, R., ROMANI P. (1998): "Contribution à une approche Marshallienne de la petite entreprise". Revue d'Economie Industrielle, n° 86, p. 49-60.

ARTHUR W. B., (1988): Competing Technologies: an Overview, in G. Dosi et al. (Eds), Technical change and Economic Theory. Pinter Publishers, Londres. P. 590-607.

ARTHUR ANDERSON (1999): "Region Rhone-Alpes: Etude de positionnement du secteur agro-alimentaire". Réunion du Comité de Pilotage.

Assouline, G. et al (1996): "Réseaux et dynamiques locales". Biofutur, n° 157, p.17-26.

BAIN, J.S. (1967) : Industrial Organization. John Wiley and sons, New York. 678 p.

BECATTINI, G., RULLANI, E. (1995): Système local et marché global: le district industriel, in: A. Rallet, A. Torre (Eds), Économie Industrielle et Économie Spatiale. Economica. Paris. P. 173 - 192.

BELLET, M. (1992): "Technologie et territoire: l'organisation comme objet de recherche?". Revue Française d'Economie, n°1, p.85 - 137.

BELOTTI, C. (1999): " La modernisation technologique des petites entreprises en zone rurale. Réflexions autour d'études de cas suédois". Revue Internationale PME, vol. 12, n°s 1 - 2, p.127 – 150.

BERNARDY, M. (1999): "Reactive and Proactive Local Territory: Co-operation and Community in Grenoble". Regional Studies , vol.33, n°4, p. 343 – 352.

BERTRAND, N. (1999): "Des stratégies aux comportements spatiaux de l'entreprise: l'insertion locale des PME". *Revue Internationale PME*, vol. 12, n°s 1 - 2, p. 85 – 106.

BONFIM, J. (1999): "Como medir a inovação?". *Economia & Perspectivas*, n° 10, p. 145 – 161.

BRAMANTI, A. (1999): "From Space to Territory: Relational Development and Territorial Competitiveness". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 633 – 658.

BRESCHI S., MALERBA F. (1987): Sectoral Innovation Systems : Technological Regimes, Schumpeterian Dynamics and Spatial Boundaries, in Ch. Edquist (Ed), *Systems of Innovation*. Pinter. London & Washington. P. 130-156.

CAMAGNI, R. (1991): Introduction: from the local milieu to innovation through corporation networks, in: R. Camagni (Ed), *Innovation networks: spatial perspectives*. Belhaven Press. London and NewYork. P. 1 - 9.

CAMAGNI, R. (1995a): Espace et temps dans le concept de milieu innovateur, in: A. Rallet, A. Torre (Eds), *Économie Industrielle et Économie Spatiale*. Economica. Paris. P. 193 - 210.

CAMAGNI, R. (1995b): Global network and local milieu: towards a theory of economic space, in: S. conti, E. Malecki, P. Oinas (Eds), *The Industrial Enterprise and its environment: Spatial Perspectives*. Avebury. England. P. 195 - 213.

CAMAGNI, R., MAILLAT, D. (1999): "The Innovative Milieu Paradigm in Contemporary Spatial Economy". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 425 – 428.

CAPELLO, R. (1999): "Spatial Transfer of Knowledge in High Technology Milieux: Learning Versus Collective Learning Processes". *Regional Studies*, vol.33, n°4, p. 353 – 365.

COHENDET, P. (1998): Network, Interactions between Economic agents and Irreversibilities: the Case of the Choice among Competing Technologies, in: P. Cohendet et al (Eds), *The Economics of Networks*. Springer. Berlin. P. 93 – 121.

CONNOR, J., SCHIEK W. (1997): *Food Processing: an industrial powerhouse in transition*. John Wiley & Sons.

CONTI, S. (1991): Les Conditions Territoriales du Développement de la PME: La Leçon Théorique du Modèle Italien, in: C. Fourcade (Ed), *Petite Entreprise et Développement Local*. Editions ESKA. P. 155 – 177.

CONTI, S. (1995): Four paradigms of the enterprise system, in: S. conti, E. Malecki, P. Oinas (Eds), *The Industrial Enterprise and its environment: Spatial Perspectives*. Avebury. England. P. 59 - 97.

- COOKE, P. (1998): Regional Innovation Systems: Designing for the Future – REGIS.
- CORIAT, B., WEINSTEIN O. (1995): Les nouvelles Théories de l'Entreprise. Le Livre de Poche, Paris, 218 p.
- COURLET, C. (1999): "Territory and Development". Revue d'Economie Régionale et Urbaine, n° 3, p. 533 – 546.
- COURLET, C. and GAROFOLI, G. (1995): Districts industriels, systèmes productifs localisés et développement. Colloque ASRLF, Toulouse.
- CREVOISIER, O. and MAILLAT, O. (1989): Milieu , Organisation et système de production territorial: vers une nouvelle théorie du développement spatial. Doss. IRRER 24, IRRER, Neuchâtel.
- DAVID P. (1985) : "Clio and the Economics of QWERTY". American Economic Review, Proceedings, vol 75, pp 332-337.
- DAWAR, N., FROST, T. (1999): "Competing with giants: survival strategies for local companies in emerging markets". Harvard Business Review, p.119-129.
- DOSI, G. (1997): "Opportunities, Incentives and the Collective Patterns of Technological change". The Economic Journal, 107, p. 1530-1547.
- EDQUIST CH. (1997): Systems of Innovation Approaches: their Genesis and Anatomy, in Ch. Edquist (Ed) Systems of Innovation, Pinter, London & Washington. P. 1-35.
- ESPINA, A. (1996): Les Systèmes Productifs locaux et le changement structurel, in: OCDE (Ed), Réseaux d'entreprises et développement local. p. 91 – 100.
- EUROPEAN COMMISSION RESEARCH, (1997): The Globalising Learning Economy: Implications for Innovation policy. 175p.
- EUROPEAN COMMISSION RESEARCH, (1999): Key Action improving the socio-economic knowledge base.
- FAULKNER , SENKER, J. (1995): Knowledge frontiers. Clarendon Press, Oxford, 265p.
- FISCHER, M., JOHANSSON, B. (1993): Networks for Process Innovation by Firms: Conjectures from Observations in Three Countries, in: B. Johansson, C. Karlsson and L. Vestin (Eds), Patterns of a network economy. Springer – Verlag. P.261-305.
- FORD, D. (1980): The development of buyer/seller relationships in industrial markets, in: Ford, D. (Ed), Understanding Business Markets: Interaction, Relationships and Networks. Academic Press. London. P. 44 – 69.
- FREEL, M. (1998): "Evolution, innovation and learning: evidence from case studies". Entrepreneurship & Regional Development, 10, n° 2, p. 137 – 149.

- FREEMAN CH. (1991): Networks of innovators: a synthesis of research issues. *Research Policy*, n°20, p.499 - 514.
- FREEMAN CH. (1994): The Economics of Technical Change, Critical Survey. *Cambridge Journal of Economics*, 18, p. 463-514.
- GABOLDE, J (1997): Second European Report on S & T Indicators.
- GARNSEY, E., LONGHI, C. (1999): "Self-Organisation and Emergence of Innovative Milieus". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 513 – 532.
- GAROFOLI, G. (1992): Endogenous development and Southern Europe. Avebury, Aldershot.
- GIBBONS M., LIMOGES C., NOWOTNY H., SCHARTZMAN S., SCOTT P., TROW, M. (1994): *The New Production of Knowledge*. Sage Publications, London, 179 p.
- GIRAUD (1996): Les Systèmes Locaux de PME face a la mondialisation de léconomie, in: OCDE (Ed), *Réseaux d'entreprises et développement local*. p. 101 – 106.
- GORTON, M. (1999): "Spatial variations in markets served by UK-based small and medium-sized enterprises (SMEs)". *Entrepreneurship & Regional Development*, 11, n°1, p. 39 – 55.
- GRAAL (1998): "La Sphère Agroalimentaire Régionale – Diversité, Complexité, Qualité". Agreste, *La Statistique Agricole*, p. 1 – 8.
- GREFFE, X. (1999): "Le Chantier des milieux innovateurs: a new paradigm for territorial development". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 419 – 424.
- GROSJEAN, N., CREVOISIER, O. (1998): *Systemes de Production Territoriaux: vers une methode systematique d'identification et d'evaluation*. Université de Neuchâtel.
- HAKANSSON, H. (1987): Product Development in Networks, in: Ford, D. (Ed), *Understanding Business Markets: Interaction, Relationships and Networks*. Academic Press. London. P. 487 – 507.
- HAKANSSON, H., SNEHOTA, I. (1990): No business in a Island, in: Ford, D. (Ed), *Understanding Business Markets: Interaction, Relationships and Networks*. Academic Press. London. P. 526 – 540.
- HALL, R., WEE, M. (1995): The Regions in an Enlarged Europe, in: S. Hardy, M. Hart, L. Albrechts and A. Katos (Eds), *An Enlarged Europe. Regions in Competition? Regional Policy and Development*, 6. Jessica Kingsley Publishers and Regional Studies Association. London. P.8 – 21.
- HART, M., HARDY S. (1995): Economic Change in the Regions of Europe, in: S. Hardy, M. Hart, L. Albrechts and A. Katos (Eds), *An Enlarged Europe. Regions in*

Competition? Regional Policy and Development, 6. Jessica Kingsley Publishers and Regional Studies Association. London. p.3 – 309.

HUMPHRIES, C. (): La Territorialisation des Politiques Publiques: Rôle de la Gouvernance et du Financement Publics, in : OCDE (Ed), Réseaux d'entreprises et Développement Local – Compétition et coopération dans les systèmes productifs locaux.. p. 265 – 282.

HYVÖNEN, S., KOLA, J. (1998): New Policies, new opportunities, new threats: the Finnish food industry in the EU, in: T. Pitts (Ed), Competitiveness in the food industry. Blackie Academic & Professional. London. p. 253 – 267.

IMAÏ, K., BABA, Y. (1989): Systemic Innovation and Cross-Border Innovation: Transcending Markets and Hierarchies to Create a New Economic System. OECD on Science, Technology and Economic Growth. Paris.

IMP Group (1982): An Interaction Approach, in: Ford, D. (Ed), Understanding Business Markets: Interaction, Relationships and Networks. Academic Press. London. p.10 – 27.

JULIEN P. A. (1995): Economic Theory, Entrepreneurship and New Economic Dynamics, in Conti S. and al., The Industrial Enterprise and its Environment: Spatial Perspectives. Avebury, England.

KALANTARIDIS, C., PHEBY, J. (1999): "Processes of innovation among manufacturing SMEs: the experience of Bedfordshire". Entrepreneurship & Regional Development, 11, n°1, p. 57 – 78.

KATZ, M. and SHAPIRO, C. (1985): "Networks externalities, competition and compatibility". American Economic Review, vol. 75, p. 424 - 440.

KEEBLE, D. (1997): "Small Firms, Innovation and Regional Development in Britain in the 1990s". Regional Studies , vol.31, n°3, p. 281 – 293.

KEEBLE, D. et WILKINSON, F. (1999): "Collective Learning and Knowledge Development in the Evolution of Regional Clusters of High Technology SMEs in Europe". Regional Studies , vol.33, n°4, p. 295 – 303.

KEEBLE, D. et WILKINSON, F. (1999): Networking and Collective Learning in Regionally-Clustered High-Technology SMEs in Europe.

KIRAT, T. et LE BAS, C. (1995): Apprentissage technologique et interactivité dans les systèmes localisés de production et d'innovation, in: A. Rallet, A. Torre (Eds), Économie Industrielle et Économie Spatiale. Association de Science Régionale de Langue Française. Paris. p. 422 – 443.

KLEINKNETCH, A. et al. (1993): Collecting literature, based innovation output indicators: the experience in the Netherlands, in A. Kleinknetch and D. Bain, New concepts in innovation output measurements. St Martin's Press, New York, p. 42 – 84.

LANDABASO, M. (1997): "The Promotion of innovation in regional policy: proposals for a regional innovation strategy". *Entrepreneurship & Regional Development*, 9, n°1, p. 1 – 24.

LANDAU R. and ROSENBERG, N. (1992): Successful commercialisation in the chemical process industry, in N. Rosenberg, R. Landau and D. Mowery, *Technology and the wealth of Nations*. Stanford University Press, p. 73 - 119.

LANGLOIS R. N., ROBERTSON, P.L. (1995): *Firms, Markets and Economic Change*. Routledge, London & New York. 177 p.

LARANJA, M. (1999): "Por uma Política de apoio à evolução tecnológica da Economia Portuguesa". *Economia & Perspectivas*, n° 10, p. 125 – 143.

LAWSON, C. et LORENZ, E. (1999): "Collective Learning, Tacit Knowledge and Regional Innovative Capacity". *Regional Studies*, vol.33, n°4, p. 305 – 317.

LEBAS C., ZUSCOVITCH E. (1993): *Apprentissage Technologique et Organisation*. *Economie et Société*, série W, 5, pp. 153-195.

LONGHI, C. and QUÉRÉ, M. (1993): "Systèmes de production et d'innovation et dynamique des territoires". *Revue Economique*, n°4, p.713 - 724.

LUNDVALL, B. (1988): Innovation as an interaction process: from user-producer interaction to the National System of Innovation, in: G. Dosi et al. *Printer Publishers*.

LUNDVALL, B. (1999): Spatial Division of Labour and Interactive Learning". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 469 – 488.

LUNDVALL, B. et BORRÁS, S. (1997): "The globalising learning economy: implications for innovation policy". *European Commission*.

LUNG, Y. (1995): Modèles Industriels et Géographie de la Production, in: A. Ralllet, A. Torre (Eds), *Économie Industrielle et Économie Spatiale*. Economica. Paris. P. 85 - 110.

LYDALL H. (1998): *A Critique of Orthodox Economics, an Alternative Model*. San Martin's Press. New York, 190 p.

MCDONAGH, P. et all (1999): Supporting Entrepreneurship in Marginal Rural Areas: Experience from the West of Ireland, in: R. Byron, J. Hutson (Eds), *Local Enterprise on the North Atlantic Margin*. Ashgate. England & USA. P. 15 - 43.

MAILLAT, D. (1995): Millieux Innovateurs et Dunamic Territoriale, in: A. Ralllet, A. Torre (Eds), *Économie Industrielle et Économie Spatiale*. Economica. Paris. P. 211 - 231.

MAILLAT, D. (1996): Systèmes territoriaux de production et milieux innovateurs, in: OCDE, *Réseaux d'entreprises et développement local*. p. 75 – 90.

MAILLAT, D., KEBIR, L. (1999): "Learning Region et Systèmes Territoriaux de Production". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 429 – 448.

MARKUSEN A. (1999): Fuzzy Concepts, Scanty Evidence, Policy Distance : the Case for Rigor and Policy Relevance, in: *Critical regional Studies. Regional Studies*, Vol 33,9, pp. 869-884.

MORGAN, K. (1996): L'Apprentissage par l'interaction: Réseaux d'entreprise et services d'appui aux entreprises, in: OCDE (Ed), *Réseaux d'entreprises et développement local*. P. 59 – 74.

MURRAY, M., GREER, J., WALSH, J. (1995): Economic Restructuring within the European Periphery: The Experience of Ireland, in: S. Hardy, M. Hart, L. Albrechts and A. Katos (Eds), *An Enlarged Europe. Regions in Competition? Regional Policy and Development*, 6. Jessica Kingsley Publishers and Regional Studies Association. London. p.295 – 309.

NDJAMBOU, R. (1999): " PME exportatrices et information en zones rurales ou zones urbaines". *Revue Internationale PME*, vol. 12, n°s 1 - 2, p. 107 – 126.

NEIERTZ, N., ZEMBRI, P. (): L'aménagement du territoire

NELSON, R., (1993): *National Innovation Systems, a Comparative Analysis*. Oxford University Press, New York and London. 541 p.

NELSON R., WINTER G. (1982): *An Evolutionary Theory of Economic Change*. Harvard University Press, Cambridge MA, 437 p.

NETO, P. (1999): *A Integração Espacial: Economias de Rede e Inovação*. Instituto Piaget. Lisboa.

NICOLAS, F., HY, M. (2000): "Apprentissage technologique et innovation en agro-alimentaire". *Économie Rurale*, n° 257, p. 1 – 16.

NONAKA I., TAKEUCHI H. (1995): *The Knowledge-Creating Company*, Oxford University Press. New York & Oxford, 284 p.

OINAS, P. (1995): Organisations and environment: linking industrial geography and organisation theory, in: S. conti, E. Malecki, P. Oinas (Eds), *The Industrial Enterprise and its environment: Spatial Perspectives*. Avebury. England. P. 143 - 167.

ONDATEGUI, J. (1999): "Redes de Innovación y Desarrollo Regional en el Noroeste Peninsular". *Revista de Estudios Regionales*, n°55, p. 77 – 107.

PACITTO, J., TORDJMAN (1999): " L'innovation technologique dans la très petite entreprise industrielle française: ce que disent les statistiques". *Revue Internationale PME*, vol. 12, n° 3, p. 59 – 90.

PAVITT K. (1984): Sectoral Patterns of Innovation: toward a Taxonomy and a Theory. *Research Policy*, 13, pp. 343-375.

PEREZ, C. and SOETE, L. (1998): Catching up in technology: entry barriers and windows of opportunity, in: G. Dosi et al. Printer Publishers.

PERROW, C. (1993): Small Firms Networks, in: R. Swedberg (Ed), Exploring in Economic Sociology. Russel Sage Foundation. New York. p. 377 – 401.

PEYRACHE – GADEAU, V. (1999): “La contribution de Philippe Aydalot à L’édification de la Théorie des milieu innovateurs”. Revue d’Économie Régionale et Urbaine, n° 3, p. 429 – 448.

QUÉVIT, M. (1995): The Regional Impact of the Internal Market: A comparative Analysis of Traditional Industrial Regions and Lagging Regions, in: S. Hardy, M. Hart, L. Albrechts and A. Katos (Eds), An Enlarged Europe. Regions in Competition? Regional Policy and Development, 6. Jessica Kingsley Publishers and Regional Studies Association. London. P.55 – 69.

RICHARDSON G. B. (1972): The Organisation of industry. Economic Journal 82, pp.883-896.

RIGBY, D., WEBBER, M. (1997): The forms and determinants of technological change in US manufacturing”. Entrepreneurship & Regional Development, 9, n° 4, p. 273 – 297.

RITSILÄ, J. (1999): “Regional differences in environments for enterprises” Entrepreneurship & Regional Development, 11, n°3, p. 187 – 202.

ROSENBERG, N. (1982): Inside the Black Box: Technology and Economics. Cambridge University Press, Cambridge.

SARACENO, E. (1997): Evolution du sens de la diversité territoriale, in: INRA (Ed), La recherche agronomique européenne dans le monde du 21e siècle. Paris. P.198 – 205.

SCHERER, F. M. (1991): Changing perspectives on the firm size problem, in Z. J. Acs, D. B. Audrestsch, Innovation and Technological Change, an international comparison. The University of Michigan Press, Ann Arbor, p. 24 – 38.

SCHOENBERGER, E. (1997): The Cultural Crisis of the Firm. Blackwell Publishers, Cambridge. 258 p.

SCHUMPETER J. (1935): Théorie de l’Evolution Economique. Librairie Dalloz, Paris, 371 p.

SIERRA, C. (1997): “Proximité(s), Interactions Technologiques et Territoriales: une revue”. Revue d’Économie Industrielle, n° 82, p. 7 – 38.

SMALLBONE, D., CUMBERS, A. and SYRETT, S. (1997): “The Single Market and SMEs: A Comparison of its Effects in the Food and Clothing Sectors in the UK and Portugal”. Regional Studies , vol.33, n°1, p.51 – 62.

SMITH K., (1997): Public R&D Policy European integration and European Innovation Systems. Report. TSER project on Innovation Systems and European Integration.

STERNBERG, R. (1999): "Innovative Linkages and Proximity: Empirical Results from Recent Surveys of Small and Medium Sized Firms in German Regions". *Regional Studies*, vol. 33, n°6, p. 529 – 540.

STORPER, M. (1992): "The Limits to Globalisation: Technology Districts and International Trade". *Economic Geography*, n°68 (1), p. 60 – 93.

STORPER, M. (1995): La géographie des conventions: proximité territoriale, interdépendence hors marché et développement économique, in: A. Ralllet, A. Torre (Eds), *Économie Industrielle et Économie Spatiale*. Economica. Paris. P. 111 - 127.

STORPER, M., HARRISON, B. (1991): "Flexibility, hierarchy and regional development: the changing structure of industrial production systems and their forms of governance in the 1990s". *Research policy*, n°20, p.407 - 422.

STRAMBACH, S. (1997): *Knowledge-Intensive Services and Innovation in Germany*. University of Stuttgart.

SYRETT, S. (1995): Local Economic Development in Peripheral Rural Areas: The Case of Portugal, in: S. Hardy, M. Hart, L. Albrechts and A. Katos (Eds), *An Enlarged Europe. Regions in Competition? Regional Policy and Development*, 6. Jessica Kingsley Publishers and Regional Studies Association. London. P.281 – 294.

TAYLOR, M. (1995): The business enterprise, power and patterns of geographical industrialisation, in: S. conti, E. Malecki, P. Oinas (Eds), *The Industrial Enterprise and its environment: Spatial Perspectives*. Avebury. England. P. 99 - 122.

TEECE D., (1986): Profiting from Technological Innovation. *Research policy*, 15 (6), pp. 285-305.

TEECE D. (1988): Technological Change and the Nature of the Firm. In G. Dosi and al. *Technical Change and Economic theory*, Pinter publishers. London, 257-281.

THORELLI, H. (1986): Networks: between markets and hierarchies, in: Ford, D. (Ed), *Understanding Business Markets: Interaction, Relationships and Networks*. Academic Press. London.

TOLDA, J. (1998): "Aprendizagem produtiva e inovação tecnológica no Espaço Nacional e na Região Centro". Congress " V Encontro Nacional da APDR: Emprego e Desenvolvimento Regional", Associação Portuguesa de Desenvolvimento Regional.

TOUATI, P. (1999): "Le capital de risque régional français: vocation économique - vocation financière". *Revue Internationale PME*, vol. 12, n° 3, p. 91 – 106.

VIZCAÍNO, G. (1998): "Un estudio sectorial sobre la estructura dimensional de la empresa industrial innovadora en Andalucía". *Revista de Estudios Regionales*, n°51, p. 91 – 117.

VELTZ, P. (1993): "D'une géographie des coûts à une géographie de l'organisation: quelques thèses sur l'évolution des entreprises/territoires." *Revue Economique*, n°4, p.671 - 684.

VELTZ, P. (1999): "Innovative Territories: Which innovation?". *Revue d'Économie Régionale et Urbaine*, n° 3, p. 607 – 616.

WIG H., WOOD M. (1997): What comprises a regional system of innovation? *Regional Policy and Development*, 18, 66-98.

WRIGHT, G. (1997): "Towards a more historical approach to technological change". *The Economic Journal*, n°107, p.1560 - 1566.