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## The network model and regional policies for European cohesion and integration

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Riccardo Cappellin

## The Network Model and Regional Policies for European Cohesion and Integration

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### **1. Introduction**

According to the penultimate European Commission's progress report on social and economic cohesion (30.01.03), the aggregate index of regional disparities in Italy has weakly decreased in the period 1995-2000 and it is basically stable for all the EU-15 regions. On the contrary it has increased in other European countries. However, the aggregate disparity indicator is of little significance in order to explain or to anticipate the performance of individual regions, just as the aggregate overall grow rate of an economy is a poor predictor for the performance of the individual firms and even sectors, since in each year different firms growth and expand and others decline and close. Regional policies at the national and EU level can not be guided by aggregate indicators, while they should respond to the specific problems of the different regions (figure 1 and 2) and be based on the identification of the complex and also fast changing factors, which enhance or hinder growth in the specific regions.

Unfortunately, economists do not agree on the factors leading to economic growth neither at the national nor at the regional level. Thus, policy-makers pragmatically adopt various instruments, which seem to respond to specific problems. Clearly the number of policy instruments, which may be used, is more numerous than that of the theoretical approaches and it is continuously increasing. That lead to a seemingly confusion since the same policy instrument may be advocated for responding to different problems and on the base of different economic theories and policy approaches. Thus, the actual debate on regional policies may be described as the situation of "too many policy instruments in search of a theory".

The aim of this paper is to classify the various policy instruments into a limited set of theoretical theories and models and to clarify the different and often opposite hypothesis and methodological approaches which characterize these theories and models. As any ex-post evaluation, this effort is inevitably leading to an over-simplification. However, that may help in clarifying the issues at stake in what may appear as a rather techno-

cratic debate and in identifying the basic differences in the often opposite policy approaches which may be adopted.

The paper is articulated in three sections. It first confronts three distinct theoretical approaches, which have been defined as: neo-liberal, corporate and local development model. Then it presents a rather extensive data base of key economic indicators, which allow to appreciate the relevance of these different policy approaches, with specific reference to the case of the South-Italian regions (Mezzogiorno). Third, the paper focuses on the issue of knowledge creation and innovation, as the strategic factor of regional competitiveness and growth in the so called learning economy and it highlights the characteristics of an innovation oriented regional policy. Finally, the paper aims to frame this latter policy in a broader European perspective, aiming to promote the international integration of the various regional innovation systems.

## 2. The Neo-Liberal Approach to Regional Policy

A neo-liberal policy approach has often been advocated by economists at the European Central Bank, at the various Central Banks (e.g. Bank of Italy) and at the international economic institutions, as also often in the current policy debate on the media. According to that perspective, regional disparities are just a consequence of market imperfections and of regulations, which hinder competition between firms and flexibility in the labour market.

Salaries have to be decreased in the economic lagging regions and adapted to lower productivity levels. Lower production costs will make local products more price competitive. They also attract mobile external capitals. That will determine the increase of the capital/labour ratio, increase the productivity of labour and increase labour demand and employment.

According to this theoretical and policy approach, regional policies aiming to interregional cohesion have mainly a social dimension and short a term perspective and should work as accompanying measures, smoothening the social costs, of restructuring processes which are automatically driven by the free working of market forces, once regulations are removed.

The key economic policy instruments in a national policy promoting the development of economic lagging regions are:

- wage flexibility or regional differentiated wage negotiations,
- trade union flexibility or regional exceptions to law on labour rights and protections,
- emersion of the black economy through exceptions to national fiscal regulations,
- regional decrease of social security contributions,
- regionally targeted decrease of corporate tax.

The indications of neo-liberal approach are based on traditional neo-classical theory. They are intellectually provocative and have been demonstrated in the framework of an abstract macroeconomic model. However, they do not take into account the fact that a modern post-industrial economy, as also the world of large fordist companies of the 19<sup>th</sup> century, is based on actors, relationships and rules, which do not correspond to the rigid hypothesis of the pure competition model of the 18<sup>th</sup> century. Thus the policy recommendation of this approach are basically ineffective in promoting economic development in a modern industrial system.

Basically, the neoclassical approach is static and does not take into account the role of the rate of productivity growth and of the pace of innovation adoption in determining regional competitiveness. Thus, lower wages give a *una tantum* advantage similar to a devaluation, as neo-liberal policies do not have any clear effect on the rate of innovation adoption within companies.

The case study of the economic lagging regions in Italy demonstrates that an absolute decrease of labour costs would be ineffective in promoting the growth of these regions, as:

- the foreign demand of South-Italian exports is very low price elastic,
- the lack of competitiveness with respect to the other European regions is mainly determined by inadequate product innovation and product quality and not by costs,
- the wages in south-Italian are lower than in North Italy, as also the wages in Italy are lower than in the EU average and in the last few years European labour costs have benefited of a low exchange rate of euro with respect to the US dollar;
- lower wages would decrease consumption and the employment in service sectors in economic lagging regions,
- a decrease of wage would make them lower than the reserve wages of the labour force and that would lead to higher unemployment of local labour force,
- a decrease of local wages would then lead to an higher immigration from non EU countries,
- a decrease of local wage would lead to a greater emigration of local skilled workers toward the most developed regions, thus decreasing the return on the human capital investment in the economic lagging regions.

As indicated in table 1, the share of unemployment of South-Italian regions and also of the black economy is smaller than that of population, while the share of employed workers is greater. The basic economic weakness of the South-Italian regions is the scarcity of the number of industrial firms. That is coupled with their limited size and especially with their very low export orientation. The actual labour costs are already much lower than in the other Italian regions. On the other hand, it can hardly be advocated that economic lagging regions are penalized by too stringent labour regulations, as these latter are in the South-Italian regions the same as in other regions, where the unemployment rate is much lower. Moreover, the bargaining power of trade unions, as revealed by hours lost of strikes, is much lower and the number of deaths due do labour accident is unusually high when compared to the industrial employment. That is an indication that national regulation on labour security are already slack and not rigorously enforced in the South-Italian regions.

Table 1: Key statistical indicators of regional disparities in the neo-liberal model for Italy and the Mezzogiorno

Neo-liberal model : key statistical indicators of regional disparities	Measure Year	Mezzogiorno	Italy	Mezzog. / Italy
Population a.v. <sup>1)</sup>	2000	20,850,151	57,844,017	36.0
Total value added a.v.	1999	453,693,172	1,882,369,712	24.1
Unemployed workers a.v.	2000	1,576,194	2,494,934	63.2
Employed workers a.v.	2000	5,918,421	21,079,776	28.1
Employed in the black economy a.v.	2000	253,000	536,000	47.2
Industrial firms a.v.	2000	195,668	757,367	25.8
Industrial value added a.v.	1999	92,248,130	531,549,398	17.4
Manufacturing exports a.v.	2000	51,929,373	486,576,369	10.7
Yearly compensation of blue collar workers a.v.	1998	31,636	33,345	94.9
Cost of labour per employee with respect to the North-Central Italy %	1999	81.2	100.0	81.2
Productivity with respect to the North Central Italy %	1999	79.0	100.0	79.0
Hours lost for labour conflicts a.v.	1999	466,485	6,363,534	7.3
Deaths due to labour accidents a.v.	1999	317	1,150	27.6
Employed workers in Industry a.v.	2000	784	4,927	15.9

<sup>1)</sup> absolute value

A second and partially different approach in regional policies, as been advocated by the business leaders, large multinational firms and the national associations of industry (e.g. Confindustria). The principles of this approach, which may thus be defined the corporate approach to regional policy, are rather simple and to some respect more solid than that of the neo-liberal approach. In fact, this approach is based on the comparative costs and advantages of alternative locations and it basically advocates that the existence of external diseconomies in the economic lagging regions, due to the greater distance from the markets, the lower productivity of labour, the lack of basic infrastructures and services, should be compensated by public financial and fiscal subsidies. This approach mainly aims to attract external investments in the economic lagging regions. In that perspective, this approach is to a large extent a continuation of the traditional exogenous development approach, which in Italy has characterized the so called “extraordinary intervention in the Mezzogiorno” from the 60s to the 80s, although it is much more theoretically simple and less rich of cultural, social, political and economic implication.

The key policy instruments used in the Italian regions and which may be related to the corporate approach are:

- planning contracts with large industrial groups (“contratti di programma”),
- various job creation initiatives and area contracts within special local areas (“contratti d’area”),
- financial contributions to investment (Law n. 488),
- decrease of labour contributions (“fiscalizzazione oneri sociali”),
- greater wage flexibility and regionally differentiated contractual wages (“gabbie salariali”),
- time extension of the aid to workers temporary suspended or dismissed (“cassa integrazione straordinaria”),
- trade union flexibility (exemption from the “statuto dei lavoratori”),
- job creation in public financed socially useful activities (“lavori socialmente utili”),
- financial aid to the creation of new firms by young persons (“imprenditorialità giovanile”),
- decrease of corporate tax,
- tax allowances.

However, a policy of attraction of external investments (regional marketing) is not a substitute for a well designed industrial policy. The corporate approach is based on a simple comparative cost evaluation and it has failed to explicitly address the structural weakness of the South-Italian industrial firms and to evolve into a clear and modern strategy for the industrial development of these regions. In particular, the corporate approach not only lacks the consideration of the macroeconomic, intersectoral and systemic relations and issues, which are important in the process of economic development, but it even does not make explicit reference to the modern management theories and models. For example it makes no reference to the need to diffuse quality control methods in the south-Italian industry, to the need to promote technological progress as a key competitiveness factor, to increase inadequate R&D investments, to accelerate the time to market and product innovation, to promote the process of internationalization of south-Italian firms.

In particular, statistical indicators for the south-Italian regions demonstrate (table 2) that the south-Italian economy has been capable to attract only a very small share of foreign investments. The number of large firms is very small with respect to national economy. Clearly high-tech firms are much more rare. The productivity of labour is lower. The regional economy is isolated from the international economy as indicated by the low value not only of export but also of imports. The firms in the south-Italian regions are isolated or single plant firms. They neither belong to a group nor have been capable to create a group. The economy is characterized by very small firms, made by 1-2 employees. On the positive side, the rate of firm creation has recently increased and it is greater than the national average.

Table 2: Key indicators of regional disparities in the corporate model for Italy and the Mezzogiorno

<b>Corporate model : key statistical indicators of regional disparities</b>	<b>Measure Year</b>	<b>Mezzogiorno</b>	<b>Italy</b>	<b>Mezzog. / Italy</b>
Population a.v.	2000	20,850,151	57,844,017	36.0
Total value added a.v.	1999	453,693,172	1,882,369,712	24.1
<hr/>				
Manufacturing plants created or acquired by foreign firms %	1986-1989	9.3	100.0	9.3
Manufacturing plants created or acquired by foreign firms %	1990-1993	13.8	100.0	13.8
Employed workers in firms with more than 200 employees a.v.	1996	233,918	2,960,618	7.9
High-tech firms a.v.	2001	18,461	81,486	22.7
<hr/>				
Value added per employee in non agricultural activities (Italy = 100)		87.6	100.0	- 12.4
Export to the European Union a.v.	2000	29,955,677	273,267,382	11.0
Imports from the European Union a.v.	2000	21,507,449	279,074,452	7.7
R&D intra-muros expenses by firms a.v.	1999	452,252	5,684,034	8.0
Employees having attended training courses a.v.	2000	181,235	1,064,619	17.0
<hr/>				
Firms controlled by other firms a.v.	1999	14,785	121,755	12.1
Firms controlling other firms a.v.	1999	2,447	21,224	11.5
<hr/>				
Employed workers in firms with 1-2 employees a.v.	1996	976,503	3,306,414	29.5
Firms registered since less than 2 years a.v.	1997	230,167	666,552	34.5
Firms registered from 10 to 20 years a.v.	1997	438,370	1,376,199	31.9

The corporate approach while emphasizing the capability to attract foreign or external investments does not explicitly acknowledge that the low export capability of the south-Italian industry is the main factor of the gap in industrial development of South-Italian, as the development of once rural regions in North and Central Italy has been driven during the last 50 years by the exports to EU countries and the international markets.

The emphasis on financial and fiscal subsidies, characterizing the corporate approach, is leading and it is instrumental to the aim to maintain the political power concentrated within the national ministries and it has been an argument traditionally used to oppose

the devolution of powers to regional and local governments in the field of industrial policies. Moreover, a regional policy based on financial and fiscal State subsidies is determining recurrent conflicts with the European institutions and is incompatible with the EU competition policy. Clearly, a regional policy based on financial and fiscal State subsidies is distorting the price and incentive system and leading to the creation of un-competitive industrial plants.

### **3. The Model of Local Development and the Model of Territorial Networks**

According to the endogenous development approach, the most important development factors or resources are almost geographically immobile, such as: physical infrastructures, specialized labour force, local economic sectoral structure and localization economies, technical and organizational know-how, entrepreneurship capabilities, urbanization economies, local social and institutional structures, local consensus and identity, etc. (Cappellin 1998). Thus, the productivity of mobile (exogenous) resources, such as: capital, unspecialized labour and codified information, depends on the quantity and quality of local (endogenous) immobile resources and the strategic objective of regional development policies is to insure the quantitative and qualitative growth, the full employment and the efficient use of local immobile resources.

In synthesis, the process of economic development consists of the gradual reconversion of local resources and productions, both within the firms and through the creation of new firms and the closure of existing firms. That reconversion allows to shift local resources to more sophisticated and higher-margin productions, which allow to increase the per capita income.

The international literature has elaborated various tightly related concepts, which may be grouped into the so called local development model. Among them, well known concepts, are those of industrial districts and local production systems. Although there is not a single definition of industrial district in the very large number of empirical and theoretical, Italian and foreign studies devoted to the analysis of this modern form of territorial organization of the firms, a wide consensus seems to exist on the following characteristics of an industrial district (Brusco; Paba 1997, Steiner 1998):

- a high specialization in a specific product,
- a population of small and medium size firms,
- production processes decomposed in different phases with low optimal technical sizes,
- a presence of external economies for the individual firms, but internal in the local territory,
- the development of subcontracting agreements and of cooperative behaviors between the firms,
- a high mobility from employee to self-employment status and high birth and death rates of the firms,
- the development of a common production and organizational know-how embodied in the skills of the local labour force.



Clearly, the local development approach underlines the need to promote the relationships of co-operation and of technological integration between the various firms and local actors.

More recent studies have focused on the concepts of clusters and networks. The model of territorial networks is tightly related to the local development model. However, it implies a greater formalization of those relationships between the firms, which were mainly informal and based on reciprocal personal knowledge and trust in the traditional industrial districts (Cappellin 1998). That requires the use of more binding or formal agreements between the local firms, as it is characteristic of the just in time and the total quality processes. In particular, this approach implies a greater sectoral diversification of the local economy and a tight integration among the various sectors.

The approach of territorial networks has allowed to identify various forms of integration in a local economy, leading to the creation of various specific links and networks, where different types of flows circulate (Cappellin; Orsenigo 2000):

1. technological integration and information flows,
2. integration of the local labour market and labour flows,
3. production integration between the firms and product flows,
4. integration between the service sectors and the manufacturing firms and service flows,
5. financial integration of the firms and capital flows,
6. territorial integration at the local level and transport flows,
7. social and cultural integration and social links,
8. relationships of institutional integration and institutional links,
9. territorial integration at the interregional and international level and all above indicated flows and links.

According to the network approach, regional economic development does not only depend on the endowment of local resources and capabilities, but also on the regional openness toward the international economy or on the intensity of the integration with the other regional production systems, in terms of exports, productive investments, financial investments and firms acquisitions, transfers of organizational capabilities, transfers of technological know-how and tourist flows.

Often networks are perceived as an organization form, based on intentional co-operation, intermediate between the market, which is based on the concept of competition, and the hierarchy, which is based on the concept of authority. However, the concept of network is broader than that of co-operation/alliances. In fact, two firms may belong to the same network even when they do not explicitly co-operate, but they are tightly integrated, such as in the vertical supply chain of a given product. Moreover, contracts between firms in a network may be rather stable, although they may not explicitly be long term contract. In particular, the stability of the networks is insured by the existence of adequate hard and soft infrastructures, which represent a public good and are not only created by the individual actors themselves but also by the public authorities.

Thus, networks may have different characteristics and they may be distinguished in the following three types:

- ecology networks, often indicated as agglomeration economies or as complex adaptive systems and characterized by strong interaction. Ecology networks are made by relationships of objectively observable stable interdependence or integration. They are also based on behavioral adaptation, strong specialization, complementarity and idiosyncratic relationships and lead to various forms of traded and untraded interdependencies or spill over effects,
- community networks, often indicated as social capital and based on the sense of identity and common belonging, an homogenous culture, the sharing of common values. Community networks are characterized by the existence of trust relationships and of common institutions and specialized intermediate social organizations,
- strategy networks, often defined as joint ventures or cooperative agreements between firms and other organizations, based on negotiations, formal and explicit agreements and reciprocal commitments. Strategy networks often imply the sharing of specific resources which are invested in order to achieve common goals and future but uncertain benefits.

A local production systems of firms may also be defined as a complex adaptive system made by a large number of components, which interact in non linear ways and adapt or learn (Holland 2002). Thus it is possible to describe this system with a model, which focuses on key relationships and can only contain a limited amount of detail. In fact, the wide literature and the extensive empirical studies on the evolution of local production systems in various countries and periods allow to identify some regularities or mechanisms, which describe the evolution of this specific type of a complex adaptive system.

In particular, according to the approach of regional endogenous development, the process of economic development may be represented as in figure 1 and it is the result of the tight interaction between six key blocks of variables:

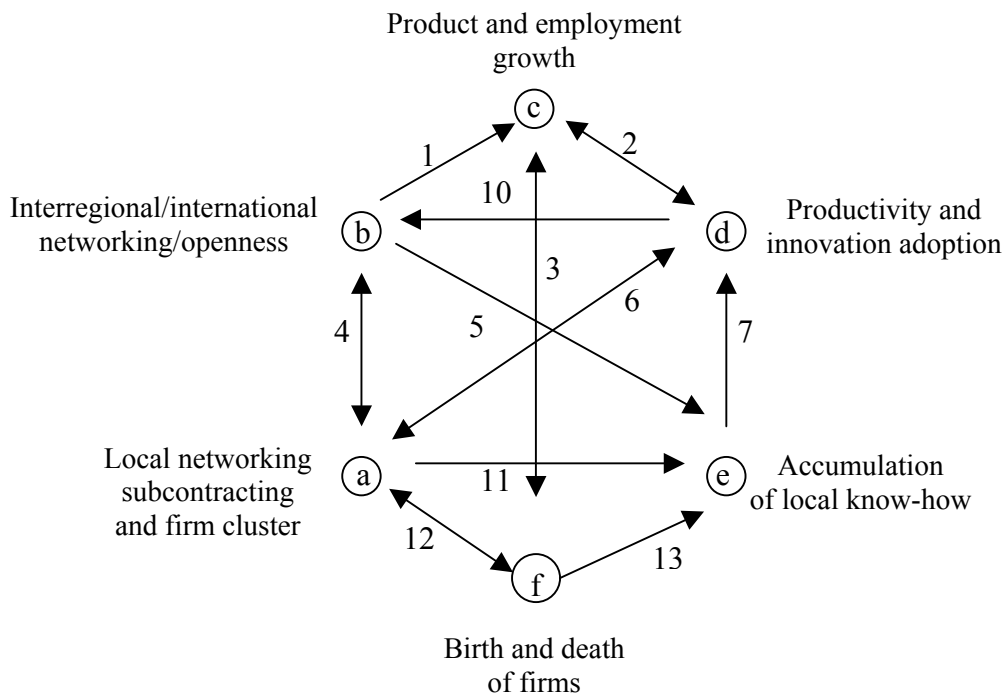
- a. the process of local networking,
- b. the process of interregional and international networking,
- c. the growth of the regional product and employment,
- d. the dynamics of productivity or the adoption of innovation,
- e. the accumulation of the local technological and organizational know-how and
- f. the process of birth, growth and closure of local firms.

The dynamic relationships between the above six variables allow the identification of various cumulative processes, which may have a virtuous character, as indicated in figure 1.

In particular, the adoption of process innovation and the growth of productivity leads to a decrease of employment (2) and of labour costs and to an increase in profits, which has a positive impact on investment and especially in the creation of new firms (3). That allows an increase of employment (3) and the reconversion of production capabilities, which were made temporarily unemployed. The maintenance of a low level of unemployment promotes a high social consensus (12) and it lowers the resistance to the adoption of innovation by the workers (6), thus promoting the increase of productivity. Moreover, the creation of new firms promotes the diversification and a greater integra-

tion of the local production networks (12): that decreases the obstacles to innovation within firms (6).

Figure 1: The development process in the model of territorial networks



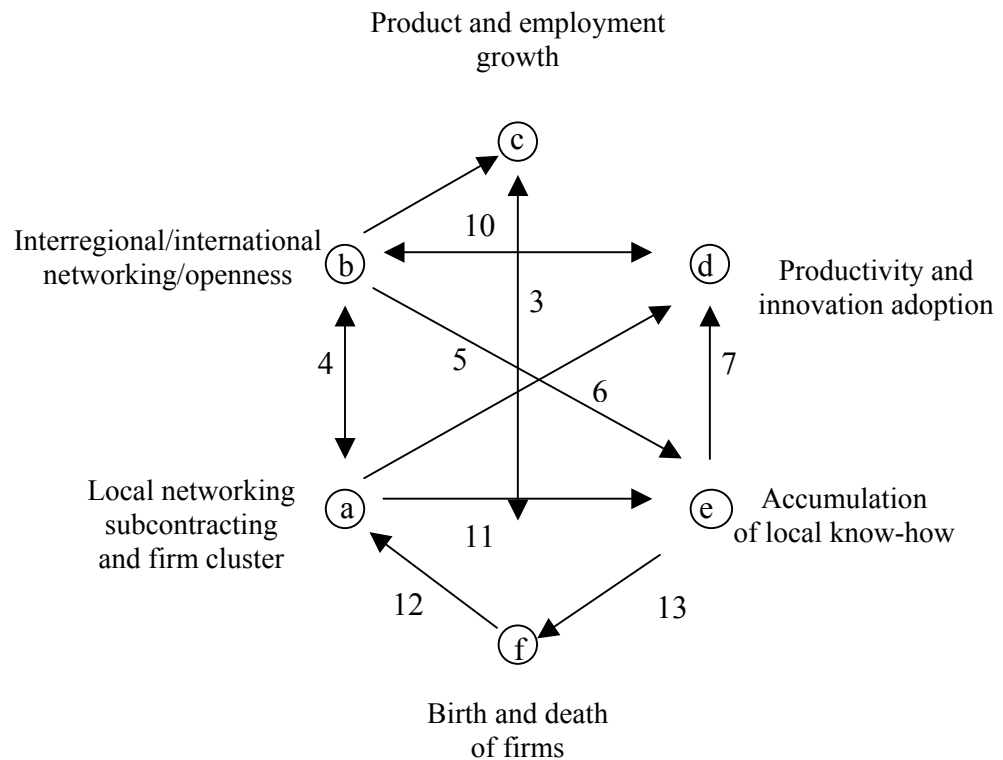
Secondly, the development of the local economy stimulates the demand of local services by the population and of specialized subcontractors by the firms and thus leads to the creation of new firms (3). The higher number of firms in the local economy implies a greater competition and co-operation (12) among them, a greater diversification of the organizational and technological know-how and the development of the entrepreneurial capabilities (11). That stimulates the adoption of product innovation (7), an increased quality of local productions, the competitiveness on the external markets and the growth of exports (10), which represent the most dynamic component of the demand of local productions (1).

Thirdly, the tight integration between the local firms within the networks of subcontracting and the increased complementarity of the local firms increase the efficiency of the local production system and facilitate the innovation process (6) and thus the competitiveness of local productions (10). On the other hand, the increased international openness stimulates the co-operation between the local firms (4), in order to jointly face the challenges of the international competition.

Fourthly, the development of local networking and especially of the subcontracting networks facilitates the creation of new firms (12), which, as indicated above, promotes the diversity of the technological and organizational know-how and the entrepreneurial capabilities (11). That facilitates the innovation process (7) and this latter stimulates the networking and co-operation between the local firms (6), as it promotes the outsourcing and the creation of subcontracting agreements.

The relationships of these six block of variables may also be used in order to interpret the case of the failure of the traditional exogenous approach in the development of Mezzogiorno regions (e.g. the “extraordinary intervention of Mezzogiorno”) during the ‘60s and ‘80s (figure 2). In this case the increasing openness of the economic lagging regions has determined an increasing dependence from central public intervention (Latella 1999).

Figure 2: The effects of traditional regional policies in economic lagging regions



In fact, the external financial flows sustain the revenue level and the local demand (1). That determines the development of local production systems made by service and industrial firms mainly oriented to the local demand rather than to the national or international market (3).

Moreover, the dependence from the public resources determines a distortion in the sound economic evaluation of the investment projects and in the incentive system (5). In particular, the abundant flows of financial resources transferred to the firms discourage the stimulus to increase the productivity and to introduce innovation (10).

Moreover, the dependence on public resources of the central intervention spreads at the local level an assistance mentality and of patronage practices (5) and that hinders the development of local networking between local firms and institutions (4) and determines a lower cohesion in the local community. On the other hand, the hierarchical relations with central authorities hinder the development of horizontal relations with other regions and determine an attitude of closure and an effect of international isolation (4).

The low capabilities to cooperate between the local actors and the frequent internal local conflicts and political instability on the local governments lead to a lengthening of

decision-making processes, decrease the process of networking and interactive learning (11) and the capability to promote institutional learning and change and the pace of innovation adoption (6).

The centralized structure of national and European regional policies and the lack of fiscal powers of local governments hinder the sense of responsibility of the local institutions and the development of their internal policy capabilities (5).

The low rate of innovation adoption and the low productivity and higher costs decrease the competitive capabilities (10). The export flows are very low and that increases the dependence from external resources (5). This latter lead to the imitation of external life styles and to the loss of local tradition and identity.

The increase of the employment in the public sector decrease the labour mobility and flexibility (5). The prevailing of a bureaucratic and conservative culture hinders the development of innovation and of entrepreneurial capabilities (5). On the other hand, the location of large external firms determines the crisis of handicraft activities and of traditional labour crafts (5), which could have become the base for future export capabilities. The revenues transfers from abroad through the public sector determine negative effects on the labour ethic and on the saving capabilities (5).

The inadequate development of local competencies compresses the local entrepreneurial capabilities and the creation of new firms (13). The insufficient birth rate of new firms and the inability of existing firms to emerge from the black economy hinders the growth of employment and productions (3). Moreover, the limited number of industrial firms existing in the local economy hinders the development of local networks, leads to an inevitable isolation and make more difficult the development of forms of cooperation with other local firms or organizations (12).

The lack of production diversification of the local economy and the difficulties in cooperation between the local firms hinder the development of interactive learning processes, the development of the local know-how, of competencies and of technological and organizational capabilities within the firms (11). The lack of specialized competencies and the decay of the local education services hinders the adoption of innovation and the increase of productivity (7).

#### **4. Regional Disparities Indicators and Policy Guidelines for the Italian Mezzogiorno**

According to the local development approach the key indicator of the weakness of the south-Italian regions is the low level of industrial employment (table 3). Moreover, industrial firms are scattered within the regional territory, often outside of well designed industrial areas, and are isolated one from the other. Thus, they are not in position to exploit agglomeration economies, such as the firms in the industrial districts of other regions. Further weakness are the low endowment of economic infrastructures, the low institutional autonomy, indicated by the very low fiscal revenues, and the weak administrative capabilities. Another negative factor is the poor planning of the regional territory, as indicated by the scarce diffusion of basic planning procedures, leading to a progressive decline of the environmental quality.

Other negative indicators focus on the lack of external openness and international networking of the south-Italian regions. Transport flows at the national, non local, level are very low. The diffusion of information is scarce, as indicated by the readership of newspapers. Exports and import flows are low and indicate a situation of isolation with

respect to international markets. Also international tourist flows are very low, with respect to other Italian regions. Finally, the investment in R&D are much lower as also the participation to the international networks of technology is almost absent.

These historical weakness of the south-Italian regions have substantially decreased in the last decade, when the traditional exogenous development policies have gradually been substituted by a new regional policy approach focusing on the development of the endogenous potential. In particular, various positive factors seem to indicate that also the Mezzogiorno economy could usefully adopt a modern network approach to regional policy, as the south-Italian regions indicate:

- an higher birth rates of firms with respect to other Italian regions,
- an increase of their share in national exports (as demonstrated by the exports of furniture of large company Natuzzi and by the very modern Fiat plant in Melfi),
- the creation of some large hubs in intercontinental maritime container flows (as the port of Gioia Tauro in Calabria is the largest container port in the Mediterranean sea),
- the emergence of various clusters with a strong industrial specialization, similarly to the “industrial districts” in the central-eastern regions of Italy,
- the development of co-operation between local actors and the creation of many territorial pacts for local employment,
- the political change in municipal, provincial and regional institutions and their increasing credibility,
- the improvement in the management and planning capabilities of regional administrations.

In fact, recent statistical indicators point out a greater rate of firm creation and a positive balance between firm registration and closure. Moreover, the typical medium high-tech sectors characterizing the Italian light manufacturing sectors (e.g. “made in Italy” productions) are increasingly diffused also in the Mezzogiorno regions. Manufacturing exports, while being very low, have consistently increased faster than the national average in the last decade. Agricultural exports of Mezzogiorno represent a large part of the Italian national export, thus indicating a great increase in the competitiveness of agricultural productions. In particular, the Mezzogiorno regions indicate the capability to perform an original role in the national economy as gateways in its relationships with the North Africa and the Middle East countries. The gap of Mezzogiorno regions in the participation to modern ICT is now very low with respect to the other regions. Finally, the quality of the labour force is not a problem any more since the level of students registered in the secondary schools is even higher than the national average.

Differently from the neo-liberal and the corporate approach, the network approach underlines that international competitiveness is mainly determined by labour productivity, firms organization and technology. Innovation and especially product innovation is the key factor, in order to promote the sectoral diversification of the economic lagging regions.

Table 3: Key indicators of regional disparities in the local development and the network models

<b>Network model: key statistical indicators of regional disparities</b>	<b>Measure Year</b>	<b>Mezzogiorno</b>	<b>Italia</b>	<b>Mezzog. / Italy</b>
Population a.v. <sup>1)</sup>	2000	20,850,151	57,844,017	36.0
Total value added a.v.	1999	453,693,172	1,882,369,712	24.1
Employed in industry a.v.	2000	784	4,927	15.9
Employed in industry – selfemployed a.v.	2000	179	860	20.8
Irregular labour units in industry a.v.	2001	253	536	47.2
<b>Internal networking</b>				
Employed in industry a.v.	1991	733,703	5,270,598	13.9
Employed in industry within industrialized areas a.v.	1991	250,964	4,561,418	5.5
Industrial employment in industrial areas / total industrial employment %		34.20	86.50	- 52.3
Industrial districts a.v.	1991	9	199,0	4.5
Employed in industry in industrial districts a.v.	1991	31,381	2,229,750	1.4
Industrial employment in industrial districts / Total industrial employment %		4.30	42.30	- 38.0
Industrial employment in non industrial areas a.v.	1991	482,739	709,180	68.1
Tax revenues / current revenues %	2000	33.10	40.80	-7.8
Tax and non tax revenues / current revenues %	2000	49.60	62.50	-12.9
Endowment of economic infrastructures %	2001	59.30	100.00	59.3
Share of provinces having elaborated or adopted a territorial plan %	2001	19.44	44.66	-25.2
Urban plans adopted by municipalities in the period 1995 - 2000 a.v.	2001	217,0	2,027	10.7
Number of municipalities a.v.	2001	2,556	8,104	31.5
Differentiated garbage collection a.v.	1998	138,0	3,007	4.6

<b>External networking</b>				
National transport of goods - loaded tons a.v.	1997	205,074	1,130,936	18.1
Newspapers sold a.v.	1998	416,315	2,183,957	19.1
Exports a.v.	2000	55,343,432	497,989,601	11.1
Exports - Manufacturing a.v.	2000	51,929,373	486,576,369	10.7
Imports a.v.	2000	66,694,735	493,307,990	13.5
Italian tourists (days) a.v.	1999	30,684,411	128,237,924	23.9
Foreign tourists (days) a.v.	1999	13,575,835	90,235,528	15.0
R&D intra-muros expenditure, Total a.v.	1999	1,869,235	11,524,031	16.2
Technological balance of payments - revenues a.v.	2000	54	5895	0.9
Technological balance of payments - expenses a.v.	2000	129	7362	1.8
<b>Factor of strengths</b>				
Firms in industry a.v.	2000	195,668	757,367	25.8
New firms registered in industry a.v.	2000	9,779	33,724	29.0
Cancellation of firms in industry a.v.	2000	9,829	37,504	26.2
Employed in the made in Italy sectors a.v.	1951	163,037	1,172,813	13.9
Employed in the made in Italy sectors a.v.	1991	194,753	1,314,636	14.8
Employed in the made in Italy sectors a.v.	1996	169,682	1,139,426	14.9
Growth of manufacturing exports %	1991-1999	233.40	204.30	29.1
Agricultural exports a.v.	2000	2,262,908	6,951,533	32.6
Imports from North Africa a.v.	2000	14,008,170	27,028,927	51.8
Imports from Middle East a.v.	2000	9,565,575	18,017,569	53.1
Exports to North Africa a.v.	2000	2,580,148	11,995,821	21.5
Penetration in % households – mobile phone (*CN) %	2001	77.00	78.80	-1.8
Penetration in % households - internet (*CN) %	2001	17.70	25.50	-7.8
Students registered in secondary schools a.v.	1999-2000	1.068.056	2.360.808	45.2

1) absolute value



The specific role of regional policy is not to struggle with labour organizations for reducing wage levels, but first of all to look for policies aiming to increase the long term productivity growth. Labour flexibility is a necessary condition in the innovation process. However, labour flexibility by itself does not generate technological and organizational innovations, which requires entrepreneurial and managerial capabilities and sound industrial strategies and policies. On the contrary, flexibility alone without innovation and investments is going only to endanger that social consensus between the local actors, needed in a regional economy aiming to a rapid and pervasive transformation.

Clearly, wage levels should be proportional to productivity levels. In fact, high wage levels may be a negative factor for firms, which are already in a crisis. However, low wages have never been a factor of success and of long term growth for modern corporations, neither the reason for the recovery of firms, which need to undergo through a deep restructuring process.

According to the network approach, regional policy should not aim to compensate the local costs and external diseconomies with financial subsidies, but to remove these latter and promote the specific local factors of strengths. The network approach aims to enhance the specific characteristics of the Mezzogiorno economy, its differences with respect to other European regions and to exploit its regional comparative advantages in international competition. It also aims to strengthen the social and cultural identity as a factor of economic development and international visibility and competitiveness. It emphasizes the role of the urban network and the various cities in the process of economic restructuring as also that of international linkages and of the role of Mezzogiorno in the network relationships between the European Union and the various Mediterranean countries.

As indicated above the endogeneous model of development may be distinguished into two different and related approaches. The local development approach highlights the importance of various regional policy instruments, which have increasingly adopted in the South-Italian regions, such as:

- territorial pacts for local employment,
- provision of technical assistance (real services) to small firms by public technology centers,
- creation of regional financial corporations (“finanziarie regionali”),
- creation of industrial location offices in municipal governments (“sportello unico”),
- decentralization of national administration,
- contract for education and labour for young workers (“contratti di formazione e lavoro”),
- time determined labour contracts (“lavoro a termine”),
- job creation in new socially useful activities (“lavori socialmente utili”).

On the other hand, the network approach underlines other instruments, such as:

- national and regional innovation policies,
- creation of science parks,
- creation of technology incubators,
- promotion of regional exports,
- improvement of transportation and communication infrastructures,

- creation of modern logistic services,
- urban renewal in large metropolitan areas and regional territorial planning,
- institutional agreements and planning contracts between public institutions,
- promotion of fiscal regional autonomy and devolution of power to local governments,
- transnational and national interregional co-operation programs.

In conclusion, the approach of the endogenous regional development underlines that regional policies can intervene on the six key variables of the regional development process, which have been indicated in figure 1 and 2, through various specific policy instruments:

- *I - productivity and innovation*: promotion of investments, adoption of process innovation, product innovation and organizational innovation within firms, investment in R&D, etc.,
- *K - growth of local know-how*: vocational education, continuous education, technical and managerial education, territorial knowledge management, creation of centers of technical assistance, co-operation between local firms in innovation projects, etc.,
- *F - birth and death of firms*: promotion of entrepreneurship, firms incubators, venture capital, managerial assistance, etc.,
- *N - local networking*: empowerment of local institutions, improvement of administrative capabilities, creation of intermediate institutions and industrial association, infrastructure investments, urban and environmental quality, transport infrastructures, etc.,
- *O - external openness*: promotion of exports, of internationalization of local firms, of interregional subcontracting, attraction of external investments, international transport and communication infrastructures, programs of interregional co-operation, etc.,
- *L - employment growth*: employment in public sectors, policies on the labour supply, promotion of woman labour participation, disclosure of firms in the black economy, unemployment subsidies, etc.

## 5. The Transformation of a Local Production System into a Learning Region

The empirical evidence contradicts a traditional paradigm, according to which an increasing economic integration of the economic lagging regions within the most developed areas would be the cause of a cumulative process of increasing regional disparities. On the contrary, the changes occurred in the technologies and in the forms of the relationships between the firms seem to demonstrate, that a greater economic integration at the European level has been a factor, which has enhanced a higher development of various economic lagging regions.

In fact, the isolation of an individual region with respect to the contiguous areas hinders to achieve that critical threshold, which allows to become visible in the framework of an increasing global competition. Thus, each area should develop co-operative strategies at least with the most contiguous regions.

The experience of the economic development of the European Union in the last decades demonstrates that the development of each local production system depends not only on the endogenous resources and capabilities, but also on the openness toward the global economy and on the capability to develop relationships with other regional production systems in terms of exports, tourist flows, productive investments or financial acquisitions, transfers of technological know-how and access to external organisational and entrepreneurship capabilities.

The competitiveness of firms is determined by the quality of the product and processes, the shortening of decision making time, the time to market in product development, the time lags in production cycles and the adoption not only of technological innovation but also of organizational innovations in the production processes. Key factors are the enhancement of the competencies and professional skills of the labour force, the intermediate cadres and the managers and entrepreneurs. The factor which insure the survival or growth of firms is not the material investments, the financial capital and the value of material assets, but rather the know-how and the core competencies of the firms.

Innovation – both technological and organizational – is a fundamental ingredient of economic growth, both directly and indirectly – via exports and trade and that it has a crucial role in enhancing the positive potentials of the process of international integration.

The quality and level of the know-how is a major factor in promoting the competitiveness and the development of a region. In particular, according to a network approach, the advancement of knowledge is promoted by the cultural diversity, by the synergy between local and external sources of knowledge and by measures increasing the connectivity between the various local production systems. In fact, the receptivity to innovation depends on the circulation of information and on the capability to integrate the explicit external knowledge with the often implicit local production know-how.

The concept of the knowledge economy indicates a new phase of economic development in which scientific knowledge and human resources represent the strategic factors. Moreover, the concept of the learning society underlines the link between the processes of learning, the innovation process and the competitiveness of the firms and the national or local economies.

The concept of knowledge economy is different and wider than that of the new economy based on ICT (Information and Communication Technology). Internet facilitates the transfer of information and the capability to learn and it, therefore, enhances the development of the knowledge economy. However, the development of the knowledge economy and therefore of the demand of information is a key factor, which stimulates the diffusion of Internet and of the so called new economy.

The international literature has elaborated various tightly related concepts in order to interpret the process of local development, such as: the industrial districts, the milieu innovateur, the clusters, the regional innovation systems (RIS), the approach of the proximity dynamics, the institutional thickness and the approach of territorial networks (Becattini 1991, Putnam 1993, Brusco; Paba 1997, Braczyk; Cooke; Heidenreich 1998, Steiner 1998, Porter 1998, Rallet; Torre 1998, Maillat; Kebir 1999, Cappellin 2000a).

Regional development theories have recently focused on the process of learning and of knowledge accumulation in regional networks (Lundvall; Johnson 1994, Cooke; Morgan 1999, Maskell; Malberg 1999, Cappellin 2000, 2003, Holland 2002). On the other hand, mechanisms and potentials of learning in individuals have been studied from different disciplines and can benefit from a quite long tradition and consolidated

knowledge, though various and not always converging. Some contributions have focused on the social aspect of learning, where social learning is defined as the process by which the individual, according to social stimuli and internal stimuli connected with the social environment, acquires information from the social context and processes them to produce social behaviours.

The creation of new knowledge implies an intense process of interaction (Nonaka; Konno 1998) which is characterized by transfers both of tacit knowledge and of explicit knowledge and which requires face to face contacts and a physical proximity, like also contacts through the ICT on long distance.

Defining a region as a learning region means to contend that the actors of the system are committed to an interactive learning process, which allows the development of knowledge, know-how and other capabilities required for creating innovation and keeping the regional competitiveness (Maillat; Kebir 1999).

The objective of a learning region is that of integrating the tacit or implicit traditional knowledge, which is bound to the local context, with the codified knowledge available at the world level, in order to stimulate the regional endogenous potential. In particular, a learning region may represent the final outcome of the evolution of an industrial district, which undergoes an ongoing evolution thanks to the active role of the processes of learning, adaptation and innovation.

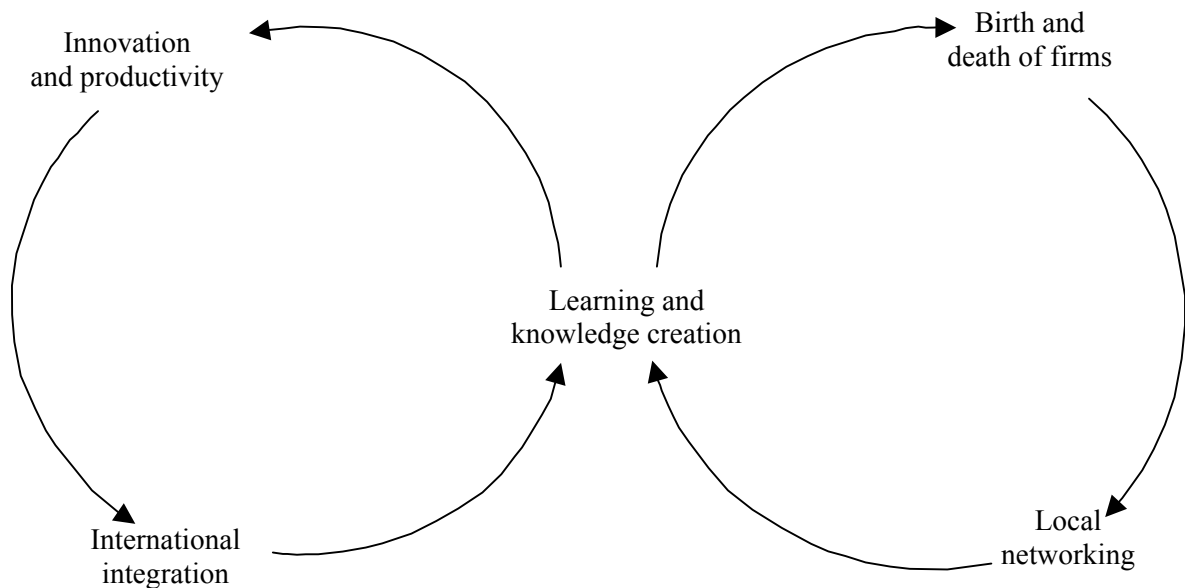
The key variables of the economic development process in a learning region, are those which characterize the process of knowledge creation and innovation. In fact, the processes of interactive learning and of process of knowledge creation play a crucial role in the development process, as they enhance on the one hand the innovation within the existing firms and on the other hand the creation of new innovative firms.

Innovation and productivity increase in the existing firms, lead to a greater international competitiveness and thus an increasing openness and integration in the international economy. The creation of new innovative firms increase the sectoral diversification of the local economy and enrich it of new technical competencies and production capabilities and lead to the formation of networking between the firms at the local level. Both the increasing international integration and the increasing networking at the local level stimulate the process of interactive learning and of knowledge creation, thus leading to positive cumulative process of development, as indicated in figure 3.

Learning and innovation are intrinsically a collective and interactive process that involves access to, interactions among, integration of heterogeneous agents, technical skills and fragments of knowledge, competencies and capabilities. Innovation has a fundamental systemic, organizational and often spatial nature and it involves, in various forms and degrees, collaboration and cooperation with a multitude of differentiated actors. That leads the innovation process to change from a linear model to a chain-linked model (Mansell; When 1998).

The knowledge networks are based on vertical customer-supplier relationships, which are a crucial tool for the development of incremental product innovations, and also on horizontal relationships, that could promote the development of the innovation process through the offer of information on technological opportunity and the process of imitation and of adaptation of success innovations adopted by other firms and organizations (Maillat; Kebir 1999).

Figure 3: Learning and knowledge creation, indicators and drivers of economic development process



Regional innovation policies in less developed regions, should focus on the case of small and medium size firms and on the medium and low technology industrial sectors, which may represent the crucial specialization in the industrialization process of these regions.

Innovation affects the capabilities of small and medium size firms to survive and to grow in the actual process of liberalization and openness to international markets. In particular, innovation in small and medium size firms (SMEs) can be broadly defined as extending beyond research and development activities and also beyond the adoption of new technologies, in order to include more incremental developments, such as the adaptation of product and services to meet the changing needs of customers and markets and the adoption of new organizational methods both internally and in the relations with other firms in a sectoral or regional framework.

## 6. The Aims and the Metrics of Territorial Knowledge Management (TKM)

The “European Innovation Scoreboard” has selected various indicators of innovative performance. Table 4 allows an analysis of the individual indicators of innovative performance in an international sample of economic lagging regions and of industrial restructuring regions and it compares it with average levels in the European Union, the new Member States and in the Candidate Countries. The gap of the economic lagging regions with respect to the EU average is the largest in term of business R&D and in particular of high-tech patent application. That is certainly related to the high gap in term of employment in medium and high-tech manufacturing and of employment in high-tech services. On the other hand, the gap is lower in term of public R&D and of tertiary education.

Table 4: The innovative performance of new Member States and the Candidate Countries, Economic Lagging Regions and Industrial Restructuring Regions

	Popula- tion with tertiary educa- tion	Public R&D / GDP	Employ- ment in high-tech services	Employ- ment in medium/ high-tech manufac- turing	Business R&D / GDP	High- tech patents / popula- tion	GDP per capita
<b>Economic lagging regions</b>	16.8	0.41	1.96	3.8	0.33	2.37	
Burgenland	14.5	0	2	4.31	0	0	14,105
Brandenburg	33.4	0.89	2.32	4.58	0.60	9.3	15,412
Peloponnisos	12.7	0.10	1.27	1.35	0.09	0	8,230
Andalucia	18.8	0.46	1.48	2.41	0.22	0.3	9,508
Limousin	17	0.21	3.18	4.38	0.53	1.4	17,485
Campania	8.8	0.54	2.05	4.46	0.29	0.5	10,525
Norte	7.3	0.30	0.74	3.39	0.10	0.3	8,738
Northern Ireland	22.2	0.39	2.65	5.54	0.45	2.4	15,963
<b>Other Italian regions</b>							
Puglia	9.36	0.30	2.19	3.99	0.15	0.5	10,971
Basilicata	6.59	0.36	0	9	0.08	3.3	11,826
Calabria	10.21	0.26	2.54	1.21	0	0	9,983
Sicilia	9.47	0.48	2.12	2.3	0.03	4.9	10,798
Sardegna	8.27	0.58	1.83	2.26	0.09	1.2	12,407
<b>Industrial recon- version regions</b>	17.9	0.44	2.34	7	0.44	5.49	
Steiermark	12.29	0	1.99	7.05	0	5	18,237
Region Wallonne	22.47	0	3.14	4.85	1.15	6.9	17,329
Saarland	17.85	0.63	2.34	8.76	0.33	6.5	21,533
Kendriki Makedonia	17.9	0.43	1.38	2.14	0.09	0	10,576
Aragon	24.66	0.31	1.15	10.54	0.39	0	14,424
Nord-Pas-de-Calais	16.39	0.31	2.4	6.59	0.36	3.7	17,299
Umbria	9.59	0.57	2.99	6.65	0.11	1.2	16,284
North East England	22.35	0.37	3.34	9.45	0.62	2.7	16,451
<b>European Union</b>	21.2	0.67	3.6	7.6	1.28	12.4	
<b>Candidate Coun- tries</b>	17.5	0.41	2.6	5.4	0.32	0.5	

Sources: European Innovation Scoreboard 2002 and Science, Technology and Innovation: key figures 2002

The gap of the EU economic lagging regions in term of employment in medium and high-tech manufacturing and of employment in high-tech services is also significant when compared to the new Member States and the Candidate Countries (CC) and to a sample of industrial restructuring regions, which indicate higher average level in both indicators. On the other hand, the levels of the other indicators of innovative performance are very similar in the economic lagging regions, in the CC and also in the industrial reconversion regions, and they are all significantly lower than the EU average.

In the EU industrial restructuring regions, the level of tertiary education is lower with respect to the EU average and also (only with some exceptions) to the average results for the CC.

Also employment in high-tech services, public R&D, business R&D is lower in the industrial restructuring regions than in the EU average and comparable to the levels in the CC.

On the other hand, EU industrial restructuring regions indicate in most cases levels of employment in medium and high-tech manufacturing higher than the CC and in some cases higher even than the EU average.

The collection of statistical indicators of innovative performance requires a specific theoretical framework, which allows to clarify the key relationships in the process of knowledge creation and of innovation adoption.

According to an evolutionary perspective technology is knowledge. Therefore, it is linked to the understanding, elaboration and assimilation of information, and it has a cognitive dimension. On the other hand, a modern industrial economy may be described as a complex adaptive system (Holland 2002), which is similar to a cybernetic circuit, performing various calculations, or to a network of biological cells, which live integrated among themselves in a symbiosis relationship. In particular, the basis for cooperation and survival in the knowledge economy is differentiation and similarity between the knowledge nodes. In fact, a knowledge economy thrives on diversity of knowledge, as such diversity should enhance complementarity and cooperation.

As in the models of neural networks, the creation of knowledge is the result of an adaptive learning or searching process, which leads to new synaptic connections of various nodes. Knowledge sciences show that improvements of a man's knowledge base are only possible, when outside stimuli reach the individual's cognitive system and these stimuli are integrated and processed within the cognitive system.

The approach of territorial knowledge management allows to identify the key dimensions of a modern innovation oriented regional policy. While the neo-liberal approach to economic policies basically aims to the increase the competition between firms and flexibility in the labour market, the aims of the network approach to regional policy may be summarized with the following six "I":

- *investments* and promotion of a forward looking perspective,
- *integration* at the local level of firms,
- *international integration* in terms of production, investment and technology,
- *interaction* between different technologies, competencies and actors,
- *intelligence*, creativity and receptivity to new technologies,
- *innovation* and entrepreneurship capabilities within firms and of local institutions.

In fact, regional development requires greater investments not only in fixed structures but also in intangible assets, such as R&D and education. That requires an enlargement of the temporal perspective both of the institutions and also by the private firms and the adoption of medium and long terms strategies and qualitative targets. Clearly the return of investments in R&D, such as those in physical infrastructures, can not be evaluated on a yearly perspective, but as a prerequisite for application technologies which may be developed in the next decades.

The development of knowledge requires a strong integration and the creation of network at the local level between the firms and also with the institutions, the citizens and the various local actors, which have different and complementary competences. While cooperation has often been interpreted as alliance between firms with similar characteristics, a network perspective emphasize the need of creating cooperation schemes between firms which are different and complementary and aim not to defend themselves but rather to achieve a joint project and to create new productions.

The development of the knowledge economy requires an increasing international openness, as that enhances the access to external knowledge and new technologies. It also allows a greater diversity of competencies available as the access to local markets and the specialization of local firms.

The process of knowledge creation requires learning processes which do not occur at the individual level but have a strong interactive dimension. In particular, innovation requires interdisciplinary collaboration or the interaction of different technologies and the interaction of basic with applied research, of tacit with codified or diffused with private, of specialized with combinatorial or integrative knowledge and of propositional with prescriptive. That also requires the existence of institutions, organizations, social capital, networks or soft infrastructures which may facilitate the creation of these forms of interactions.

There is the need to free the intelligence and to promote individual and collective creativity. The innovation process depends not only on the accessibility to complementary knowledge, but also to openness or to the absorptive capabilities, which determine the speed of change and the time to market. These latter are mainly related to level of education, the investment in human resources, in continuous or lifelong training, as they allow a greater flexibility and receptivity to what is new. Creativity depends on the capability to connect existing building blocks in new ways, to accept external stimulus. That also requires the acceptance of the differences and of the positive aspects of the conflicts, as innovation always generates conflicts (creative destruction). There is the need to promote the lateral thinking, the autonomy and freedom of researchers and inventors and to reserve to them stable resources to prosecute their search of innovation. These policies should also aim to avoid the brain drain and to attract competent and creative people from other countries and regions.

Finally, development policies should promote the innovation or the capability to implement technological ideas in the firm's organisation and to generate income and promote revenue creation. That implies the capability to integrate the cognitive processes with the production processes and organise local resources and increase their productivity. Innovation does not only have a technological dimension but also an organizational and institutional dimension and it is important also in the tertiary sectors and in the public administration. Next to the innovative start-up in the science based sectors are also incremental innovation which develop within the complex networks of many small firms and of tight client-supplier production cooperations, leading in the medium term to completely new products and to radical changes in the technologies.



## 7. The European Dimension of Innovation Policies

Clusters are often considered as the main drivers of regional development. Clusters are formed by groups of innovative enterprises, academic and research institutions, local development agencies and/or other supporting organizations. Clustering is networking at large, with constituent parts developing strong, interdependent links. Interaction flow patterns vary, representing knowledge transfer, financial transactions or simply, increased personal contacts. Clusters of industrial and service activities, networks of small and medium size enterprises, supported by a rich endowment of social capital and intermediate institutions, have a diffused role in all European regions and that seems a characteristic of Europe with respect to other world areas.

However, local clusters are also increasingly integrated in the regional, national, European and global economy. Thus, local networks are gradually extending at the interregional/international level. Moreover, concepts and methods which have been elaborated on the economic and social integration at the local level and on analyzing the concentration of innovative activities in specific local clusters and networks, could be applied in an interregional/international framework.

Innovation generates winners and losers at the same time and depends on learning processes and knowledge creation and accumulation. Learning brings about enormous opportunities for growth but also severe threats of exclusion and marginalization, especially for the economic lagging regions in the EU and Central and Eastern Europe (CEE) regions and countries. In fact, there is the need of examining the problems and possible policy actions arising from the perceived need for tighter integration and cohesion within EU countries, as seen from the perspective of a learning economy, taking into account the persistent disparities of the economic lagging regions (particularly Objective 1 regions) as well as the enlargement of the European Union.

An important problem in regional policies is the transition of the less developed regions, such as the actual Objective 1 regions and the regions of the CEE countries, to the model of the knowledge economy and how to avoid their exclusion with respect to the most developed regions, which operate at the frontiers of technologies. The question of how international knowledge networks can contribute to economic development and how policy can support such networks is of great importance. Knowledge and innovation networks have developed within Western Europe and they should be encouraged to develop in the economic lagging regions of the actual 15 EU members and in the new accessed countries with a view to maximizing the full potential of Europe's knowledge and learning capacity as a whole.

European regional policies should identify the role of international openness and receptivity and promote the integration of the less developed regions into the international knowledge and innovation networks from the perspective of the transition of these regions to the model of the learning economy. There is the need to analyze the mechanisms which operate at the interregional/international level and lead to higher forms of integration of industrial and service firms, not only in a commercial or financial perspective, but also in that of the knowledge and innovation networks. In particular, interregional/international knowledge and innovation networks should allow the circulation not only of information or codified knowledge, as in the collaboration between R&D institutions, but also of tacit knowledge, know-how and competencies.

There is the need to promote the transfer of information, knowledge and competencies between firms at the interregional/international level, as a factor leading to higher competitiveness and growth, in all countries but especially in economic lagging regions (particularly Objective 1 regions) and in Central and Eastern Europe countries. That

implies to decrease the organizational and institutional distance between the various regions at the interregional/international level, since tacit knowledge and innovation capabilities often are embodied in human capital and individual organizations and institutions.

European regional and R&D policies should identify specific institutions and procedures or soft infrastructures which could favour European cohesion or a greater integration of the less developed regions within a European Research and Knowledge Area. Regional and innovation policies should develop strategies for an intensification of interactive learning processes and co-operation not only with specific regions but also at the interregional and international level. They should promote the creation of new hard and soft infrastructures or institutions, both at local and European levels, which can enhance the way in which knowledge and innovation networks existing in the most developed countries of the EU, may be extended to the economic lagging regions (particularly Objective 1) in South Europe and the countries in Central and Eastern Europe.

Policies should tackle the obstacles which usually hinder the diffusion of technology spill over outside a specific local economy, and the policies should care for soft infrastructures and institutions which can remove those obstacles. In fact, the question of whether knowledge creation and diffusion leads to economic convergence or divergence to a large degree depends on the development of institutions that create and transfer knowledge.

An appropriate institutional framework at the European level may have a key role in determining the rate and direction of technological learning. Thus, it is important to promote an environment conducive to research and innovation, through the introduction of accompanying legal, financial and fiscal conditions that would prove necessary. Supranational institutions may become an important actor in setting policies, which do not merely support particular innovative activities, but create a framework by which knowledge dynamic processes are harnessed. Transregional infrastructures could allow a greater share of information through more frequent face-to-face contacts, common culture and greater opportunities for collaboration. These policy indications may contribute to the European R&D policy and to the European regional policy in economic lagging regions.

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