

**Joint Congress of the European Regional Science Association (47th Congress)  
and ASRDLF (Association de Science Régionale de Langue Française, 44th Congress)  
PARIS - August 29th - September 2nd, 2007**

**Special Session**

**The governance of knowledge networks**

**REGIONAL GOVERNANCE**

**IN THE KNOWLEDGE ECONOMY:**

**policy strategies and policy-making models**

**Riccardo Cappellin**

University of Rome "Tor Vergata"

[cappellin@economia.uniroma2.it](mailto:cappellin@economia.uniroma2.it)

## ABSTRACT

The paper analyzes the role of institutions in the process of development and of knowledge creation. A different and evolving institutional framework plays a key role in the process of innovation within the various clusters and regional innovation systems. Institutions and other forms of “social capital” play the role of immaterial infrastructures which organize the knowledge flows between SMEs within the clusters. The multiplication of players and layers of negotiation – international, national, and local – demands a different model of government, called “multilevel governance”, based on organisational structures of interaction and partnership and different from the traditional rigid neo-liberal agenda and the hierarchical planning approach.

The papers highlights the differences between these three policy models in four key fields of a modern knowledge economy, such as of the process of innovation, the process of international integration, the evolution of labor markets and the need for higher consumer protection and satisfaction.

A policy of the knowledge economy based on the “governance” or “dynamic coordination” approach implies the use of different policy instruments with respect to those usually adopted in traditional innovation policies, such as: public R&D, public subsidies to private R&D, public demand of innovative products and services, protection of IPR in order to insure a monopoly power to innovators. New policy instruments are those which aim to steer the knowledge networks. The papers concludes that the multi-level governance of a modern knowledge economy is different in various respects from the current innovation policies in industrial economies.

### Key words:

Multilevel governance, knowledge economy, regional innovation policies, innovation networks, European institutions, SMEs.

A different and evolving institutional framework plays a key role in the process of innovation within the various clusters and regional innovation systems. Institutions and other forms of “social capital” play the role of immaterial infrastructures which organize the knowledge flows between SMEs within the clusters. The multiplication of players and layers of negotiation – international, national, and local – demands a different model of government, called “multilevel governance”, based on organisational structures of interaction and partnership and different from the traditional rigid neo-liberal agenda and the hierarchical planning approach.

This paper focuses on the study of the relationships between the concepts of knowledge and governance, as a key factor in the transition to a modern knowledge economy. I first analyses the aims of economic policies on the base of the factors of the process of knowledge creation.

Then, it analyses the role of institutions in the process of development and of knowledge creation. That leads to define multi-level governance as a policy making model, which differs from the traditional and rigid neo-liberal agenda and also from the classic top-down planning approach.

The discussion of these issues leads to identify mayor differences between the current innovation policies in industrial economies and the model of multi-level governance in a modern knowledge economy.

Finally, the paper highlights the role of institutions and of the governance model in three new fields of a modern knowledge economy, such as the process of international integration, the evolution of labor markets and the mechanisms needed for higher consumer protection.

The paper concludes by indicating the relevance of the network model as a theoretical framework of the governance approach in order to identify different strategies and policy tools with respect to those usually considered in traditional innovation policies.

## **1. The definitions of the knowledge economy and the learning process**

The concept of knowledge economy is related but it also differs from that of information society and other widely diffused concepts, such as: high-tech industries, information and communication technologies, new economy and new technologies.

It underlines the tight relationship between the learning processes, the innovation and the competitiveness of the economy and it is usually employed to design a new phase in which the knowledge and the human resources represent the strategic factors.

The knowledge economy is a larger concept than just an increased commitment to R&D. It covers every aspect of the contemporary economy where knowledge is at the heart of value added — from high-tech manufacturing and ICTs through knowledge intensive services to the overtly creative industries such as the media and architecture.

In a knowledge economy the competitiveness of the firms is determined by the quality of the products and processes, the decrease of the times in decision making, the production and delivery times of new products, the adoption of technological and organizational innovation in production processes within the firms as also in the external institutional framework..

The notion “knowledge-based economy” draws attention to the fact that since the post-war period the production process has increasingly relied on knowledge-based activities. The proportion of labour that handles tangible goods has become smaller than the proportion engaged in the production, distribution and processing of knowledge. The expansion of the “knowledge-intensive” sector vis-à-vis other routine and physical production processes seems to be one of the major trends in economic development in this period.

Furthermore, the concept to knowledge economy is tightly related to that of knowledge intensive based services and of intellectual capital and intangible assets. In fact, it has been asserted that people, rather than such traditional factors of production as capital, will become the main source of value and economic growth in this new type of capitalism, and that in future, more and more productive activities will make use of employees’ intellect and creative capabilities<sup>1</sup>.

Thus, it is crucial to develop the competencies and professional skills of the labour force, the intermediate and top managers. In particular, the factors which determine the survival and success of firms are increasingly less the fixed investment and the financial resources and more the know-how, the intangible resources and the distinctive competencies.

The concept of the learning economy represents an evolution of that of the knowledge economy. The learning approach emphasizes a dynamic approach to innovation rather than the more static approach adopted in the knowledge-based economy that emphasizes access to

---

<sup>1</sup> Florida, R. (1995), Towards the learning region. *Futures*, 27(5):527–36.

a stock of specialised knowledge. It makes clear that what really matters for economic performance is the ability to learn and not the stock of knowledge.

Lundvall and Johnson (1994)<sup>2</sup> argue that it is better to talk about ‘a learning economy’ than a “knowledge-based economy”, since the high pace of change means that specialised knowledge becomes much more of a short-lived resource, and that it is rather the capability to learn and adapt to new conditions that increasingly determines the performance of individuals, firms, regions and countries.

The learning approach emphasizes a dynamic approach to innovation rather than the more static approach adopted in the knowledge-based economy that emphasizes access to a stock of specialised knowledge. It makes it clear that what really matters for economic performance is the ability to learn (and forget) and not the stock of knowledge.

Thus, in a learning economy, innovation is understood as an interactive learning process, which is socially and territorially embedded and culturally and institutionally contextualized<sup>3</sup> (Lundvall, 1992). Learning theorists argue that the process of innovation is highly interactive and is dependent upon social and cultural institutions and conventions<sup>4</sup>.

Since economic systems are complex and evolving, the main problem is that of organization or coordination, i.e., how to guarantee that the various involved actors will adopt a coherent behaviour, so that they can jointly attain the desired aggregate result without dissipating resources.

In the network paradigm, information flows through an interactive process and new knowledge is created through the combination of existing information and knowledge within a learning processes following specific paths<sup>5</sup>.

Learning is based on various mixed modes of integrating different combinations, and proceeds according to an evolutionary and adaptive process, both dynamically (in time) and spatially (through regional diversification and integration). Thus, the network paradigm underlines that learning processes are different in various regions and periods and they can never perfectly reflect the same abstract model.

Innovation is the result of decisions of the various interacting agents based not on the principle of substantive rationality, but rather on that of procedural rationality. They behave on the base of available incomplete knowledge and aim to “satisfactory” results through continuous adjustments and not through explicit maximization. Thus no complete sequence of decisions can be preordained. On the contrary, each new decision modifies the general scenario and the subsequent decision must take account new information about the new modified scenario and that lead to new strategic hypothesis.

---

<sup>2</sup> Lundvall, B.A. and Johnson, B. (1994), The learning economy. *Journal of Industry Studies* 1 (2), 23-42.

<sup>3</sup> Lundvall, B.A. (1992), (ed.) *National systems of innovations: towards a theory of innovation and interactive learning*. London, Pinter Publishers.

<sup>4</sup> Morgan, K. (1997), The learning region: institutions, innovation and regional renewal, *Regional Studies*, 31-5: 491-504.

<sup>5</sup> Cappellin, R. (2003), Networks and Technological Change in Regional Clusters in Bröcker, J., Dohse, D. and Soltwedel, R. eds., *Innovation Clusters and Interregional Competition*, Springer Verlag, Heidelberg.

Hence, to achieve coordination, organizations need to learn rapidly. The objective is not the identification of the best, but immediately unfeasible solution, but rather to shorten the time of changes and to adopt even marginal innovation sooner than the competitors. To that aim, a good design of the organizational procedures involving the interaction of the various actors is crucial.

The study of the impact of the Knowledge Economy on the structure of the territory as also the analysis of the facilitating role of the territorial structure on the transition toward the KE in the various regions highlights the importance to focus the analysis on the human resources, rather than on physical infrastructures or on specific technology component.

**Table 1: The knowledge economy is made by human beings**

<b>Dimensions</b>	<b>Roles</b>	<b>Actions</b>
<b>a) supply</b>	<b>factors of production:</b>	the increase of productivity, the adoption of new technologies and the role of life-long learning
	human beings as workers to be trained in new productions	
<b>b) demand</b>	<b>market:</b>	the disparities between the adoption of new product and services in central areas and the late diffusion in external markets
	human beings as inhabitants and users of new goods and services	
<b>c) governance</b>	<b>institutions:</b>	the governance of the innovation system and the adoption of new tools in innovation policy by local institutions
	human beings as citizens, voters and decision makers on innovation strategies	

The role of people in the knowledge economy is usually recognized only by focusing on the supply side, as tacit knowledge, competencies, collective knowledge and interactive learning processes are social processes. Thus, new knowledge leads to an increase of production capacity or of total factor productivity. This approach is leading to advocate greater investment in education and in life long learning.

However, the knowledge economy is also characterized by the development of new product and services and especially by emerging new needs and living habits. Thus people are important in the knowledge economy as consumer, characterized by higher education levels, greater free time and having different attitudes toward work, leisure, health, security, culture, preference for an urban living, etc.. That represent also a crucial opportunity for the

development of new sectors and the diversification of the economy facing the challenge of global competition by countries, producing traditional goods at lower costs.

Finally, a knowledge economy is characterized by the request of greater freedom and democracy and that is leading to investigate the role of people as citizens active involved in policy making. On the one hand internet allows a greater access to information and facilitates the participation of citizens in policy decisions. On the other hand, also the transition toward the knowledge economy is characterized by the emergence of more complex problems, which ask for an empowerment of people or a greater decentralization and the adoption of new approaches (such as “governance”) in policy making.

## **2. The role of institutions in the process of economic development**

Mokyr (2002)<sup>6</sup> has argued that the industrial revolutions need to be explained by the development, but mostly by the diffusion and use of new knowledge. Thus, it can be considered a coincidence, in a way, that England around 1780 was the first country where sustained economic growth based on the use of newly developed knowledge could be observed. England was by no means the most technologically advanced country, and indeed it used knowledge developed in countries such as France extensively. Mokyr points to the institutions of English society that lowered the costs of communication about new knowledge. The result was that knowledge was much more readily exchanged among savants, among fabricants, and between these two groups. Thus, new knowledge was more easily created, but most importantly existing knowledge was put to good use faster, even if the knowledge would be of a tacit nature (cf. Cowan et al., 2000<sup>7</sup>).

Communication then, in Mokyr’s argument, will both broaden and tighten the knowledge base of propositional knowledge, and stimulate the development of techniques (“prescriptive knowledge) “that find an immediate application in society and stimulate economic activity. Central in Mokyr’s analysis is his concept of the “access costs” people face when in need of “useful knowledge”.

Economic growth should be understood as an evolutionary process and the endogenous approach seems rather satisfactory for understanding the forces behind the "immediate sources of growth" and the processes that are within the "black box". For interpreting and explaining economic growth the nature and dynamics of the organization of production, the role and change of institutions, and technology and technological advancement should be specified.

Institutions have a key role in the process of innovation. Development processes do not take place in a vacuum but rather have profound institutional and cultural roots (North 1981, 1986 and 1990). "The central issue of economic history and of economic development is to account for the evolution of political and economic institutions that create an economic environment that induces increasing productivity," (North, 1991, p. 98).

---

<sup>6</sup> Mokyr, J., 2002. The Gifts of Athena – Historical Origins of the Knowledge Economy. Princeton UP, Princeton, NJ.

<sup>7</sup> Cowan, R., David, P., Foray, D., 2000. The explicit economics of knowledge codification and tacitness. Industrial and Corporate Change 9, 211–253.

Economic development, then, is stimulated in those territories with highly evolved, complex and flexible institutional systems. That is why training and research institutions, entrepreneurial associations, unions and local governments can more efficiently use available resources and improve competitiveness when firms are integrated into territories characterized by thick relational networks.

Barriers, which hinder self-sustained growth processes, frequently appear due to deficiencies in- and poor performance of the institutional network. Institutions define and limit the set of choices of individuals. They include any form of constraint – formal and informal – they can be create or they may simply evolve over time.

A crucial distinction is between institution and organisation (both provide a structure to human interaction): but institutions represent the rule and organisation the player. Institutions, together with the standard constraints of economic theory, determine the opportunities in a society. Organisations are created to take advantage of those opportunities and, as the organisations evolve, they alter the institutions

A nation can be maintained only if, between the state and the individual, there is interposed a whole series of secondary groups, as the so called “intermediate institutions”, which are near enough to the individuals to attract them strongly in their sphere of action and drag them, in this way, into the general torrent of social life.

New institutional theory argues that the strategic significance of institutions in development processes lies in the economies that its functioning provides. The behavior of institutions can lead to:

- generate external and internal economies of scale,
- reduce transaction and production costs,
- increase trust among economic and social actors,
- favor economies of scope,
- improve entrepreneurial capacity,
- increase learning and relational mechanisms,
- reinforce networks and cooperation among the actors.

Thus, a wide range of institutions is required in the process of innovation. The diffusion of knowledge and innovation creation in a specific network or sectoral/regional/national innovation system depends on the “institutional thickness” of the innovation system to be considered.

Regional governments are required for attracting external investments, to coordinate large strategic projects and to promote the birth of new firms and entrepreneurial capabilities. Local governments are required for an effective territorial the planning and for the creation of efficient transport and logistics infrastructures. Local credit institutions are required for the financing of innovative projects by existing firms and to enhance the creation of new firms. Local education institutions, such as vocation training and university institutions are required for the identification of labour skills required by the new technologies and for maintaining the traditional productive skills in a given territory. Labour agencies, trade unions represent specialized institutions required for an effective management of the local labour markets and to facilitate the interaction between the supply and the demand of labour, the wage negotiation procedures and the management of the “welfare” system. Chamber of commerce and industry associations are major partners in promoting a regional innovation system and in the

identification of strengths and weakness and of strategic lines of competitiveness and development. Finally, local and regional authorities may also be a source of financial and technical support for company development and innovation. They may provide specialized infrastructures, information systems or training programmes for particular industries. They may encourage constructive interactions between firms and discourage opportunistic behavior by supporting institutions that promote their collective interest<sup>8</sup>.

### 3. The role of institutions in knowledge interactions

Due to their interactive nature, learning processes involve groups of individuals and calls for the development of links, networks and social and cultural institutions and conventions among different actors. The passage from the individual learning to the interaction among individuals implies the co-ordination of the interaction process.

According to cognitive theories, the creation of new connections or the reinforcement of existing connections implies the compatibility with other actors, the success in the adaptation and the development of appropriate routines and institutions (Hayek 1937). According to Marshall the order makes room for creativity, organization aids knowledge, as stable pattern may be used as heuristics. Institutions consent to saving the limited cognitive capacity of individuals and organizations and facilitating the process of reciprocal integration (Rizzello, 2003 and Loasby, 2003).

The stock of knowledge grows through learning processes, which are interactive, and influenced by the institutional set up, regarding their content, rate, and direction. Also the process of innovation is highly interactive, in contrast to traditional linear models, and is dependent upon social and cultural institutions and conventions (Morgan, 1997, p. 493<sup>9</sup>).

A central fact about the modern process of innovation is that it is based on the division of labour. Division of labour produces efficiency gains from specialization and professionalization, but it also requires a framework to connect together the component contributions of different agents.

The exchange of knowledge cannot be effectively insured and coordinated by the conventional market. The role of institutions is that to create new routines or baseline, which insures the adaptability of connections between actors. Therefore the creation of institutions enhancing the connectivity of knowledge should be a central concern of policy.

In particular, whereas, in principle, explicit and codified knowledge may be traded on markets, tacit knowledge is untradable and requires non-market allocation. Knowledge is challenged within network by formal and informal institutions, for instance, within the firm, in the context of inter-firm networks or forms of co-operation between private agents and public institutions.

Because of the specific character of technological knowledge, its asymmetric and tacit character transactions between organizations and individuals have to be mediated by non-

---

<sup>8</sup> Cappellin, R. (1998), The transformation of local production systems: international networking and territorial competitiveness, in M. Steiner, ed., *From agglomeration economies to innovative clusters*, London: Pion.

<sup>9</sup> Morgan, K., 1997. The learning region: institutions innovation and regional renewal. In: Asheim, B., Dunford, M. (Eds.), *Regional Studies* Special Issue: Regional Futures 31 (5), 491-504.



market methods, primarily through networks and other forms of arrangement, and procedures which build trust and work to limit the damaging consequences of asymmetric information. So we need the support of clusters by policy, reducing transaction costs (Williamson 2000).

As a consequence of the importance of know-how, it is the network or organised market governance structure (see Powell, 1990)<sup>10</sup> that is perceived to best support trust facilitated interactive innovation (Lundvall and Johnson, 1994; Morgan, 1995, 1997; Cooke and Morgan, 1993<sup>11</sup>).

Thus, institutions have a key role in the process of innovation and in the generation and working of “knowledge and learning networks”.

Institutional arrangements are important for the generation of knowledge and learning networks as they allow (Maskell and Malmber 1999, Navaretti et al. 1998, Lawson and Lorenz 1999):

- to reduce the uncertainty about the experiential knowledge of others (of other companies, research institutes etc.),
- to increase incentives for medium-(long)-term investments into diffusion channels – e.g. common codes, products, fora – between the different participants in a network,
- to develop and adapt research, production, distribution, and after-sales strategies to increase the absorptive capacity of new information by the other participants,
- to raise the specificity of development, processing and diffusing knowledge within the network to strengthen incentives for the participants to concentrate their investments in the network and protect new knowledge against competing networks.

The processes of new knowledge formation, that is, learning processes, are social and interactive and dependent on the institutional set-up of the economy. Rules (procedures, organizational forms, norms, routines) constitute the foundation of organizational behavior. In a way it is paradoxical that the focus on economic change goes hand in hand with a growing interest in institutions.

Antonelli (2005) identifies a variety of governance modes, ranging from coordinated transactions and constructed interactions to quasi-hierarchies, however, has progressively emerged according to the characteristics of knowledge and the costs of using markets and organizations<sup>12</sup>. They are based upon three basic mechanisms: quasihierarchies, coordinated transactions and constructed interactions (Stiglitz, 2000)<sup>13</sup>.

Nooteboom (2000) distinguishes between integration within an organization, under ‘hierarchy’, which entails labour contracts, norms and values, advantage, bonding and habituation, obligational contracting, which entails trust on the basis of the legal

---

<sup>10</sup> Powell, W.W., 1990. Neither market nor hierarchy: network forms of organisation. *Research in Organisational Behaviour* 12, 295-336.

<sup>11</sup> Cooke, P., Morgan, K., 1993. The network paradigm: new departures in corporate and regional development. *Environment and Planning D: Society and Space* 11, 543-564.

<sup>12</sup> Antonelli, C., 2005, The business governance of localized knowledge: an information economics approach for the economics of knowledge, Dipartimento di Economia “S. Cagnetti De Martiis”, Working Paper No. 02.

<sup>13</sup> Stiglitz, J., (2000) The contributions of the economics of information to twentieth century economics, *Quarterly Journal of Economics*, 115, pp. 1441-1478.

infrastructure, and relational contracting, where trust may be based on norms/values, advantage, bonding, and routinization<sup>14</sup>.

The cognitive processes have a spatial dimension, as all the main components of the process of knowledge creation have a localized nature (Cappellin and Orsenigo 2006)<sup>15</sup>. There is considerable social leakage in the transmission of knowledge. There are also considerable spill-over effects which result in secondary benefits of proximity to the source of knowledge production, such as the development of high technology clusters, the attraction and retention of skilled workers, the attraction of investment, and the spinning off of new firms, jobs, and industries.

Learning can be considered as a social process of ongoing development embedded in a specific regional socio-cultural context. As the creation of new knowledge implies an intense process of interaction, the concept of sectoral/geographical clusters deserves special attention. Within clusters, “social capital” and trust relations between local actors can be seen as a conceptualization of the glue that facilitates transactions, cooperation and learning in an uncertain world.

Institutions include any form of constraint: formal and informal. They can be created or they may simply evolve over time. A wide range of institutions is required in the process of innovation. The diffusion of knowledge and the process of innovation creation in a specific network or sectoral/regional/national innovation system depend on the “institutional thickness” of the innovation system to be considered.

The spatial patterns of innovation and the related geographical dimension of economic and social development have witnessed a renewed and increasing interest in the literature [<sup>16</sup>, <sup>17</sup>], but attention is to be focused on the ability to build social capital, including interactive learning, local externalities, and networks among institutions [<sup>18</sup>]. This focus on relational assets is part of the “institutional turn” in regional development studies as a result of the relative failure of classical approaches, which sought to privilege either “state-led” or “market-driven” processes regardless of time, space, and milieu.

Clusters and networks are learning organizations and among the non-market devices by which firms seek to coordinate their activities with other firms and other knowledge-generating institutions. Thus, clusters are subtle and differentiated institutions for co-operation and interactive learning and connectivity of technology producing institutions should be a central concern of policy.

Clusters and networks can then be regarded as economic clubs acting to internalize the problems of effective knowledge transmission. To this degree, they are a substitute both for formal markets and organizational integration. Thus, clusters and networks as a specific expression of innovation processes can be regarded as a form of Coase institution (Coase

---

<sup>14</sup> Nooteboom, B., 2000, Learning by Interaction: Absorptive Capacity, Cognitive Distance and Governance, *Journal of Management and Governance*, pp. 69-92, Vol: 4, Issue: 1.

<sup>15</sup> Cappellin, R. and Orsenigo, L. (2006), Regional learning networks in medium tech sectors and European integration, paper presented at the ERSA Congress, Volos - Greece, August 2006 (<http://www.economia.uniroma2.it/dei/ikinet/>).

<sup>16</sup> P. Cooke, K. Morgan, *The Associational Economy*, Oxford Univ. Press, Oxford, 1998.

<sup>17</sup> M. Storper, *The Regional World—Territorial World in a Global Economy*, Guilford Press, New York, 1998.

<sup>18</sup> G.M.P. Swann, M.J. Prevezzer, D.K. Stout, *The Dynamics of Industrial Clustering*, Oxford Univ. Press, Oxford, 1998.

1992) that tries to integrate the positive external effects of innovation, technological knowledge and development activities (Coleman 1988, Keeble et al. 1999, Lagendijk and Cornford 2000).

Besides formal institutions, trust and routines often are decisive prerequisites for successful emergence and sustainability of innovation and learning networks. This refers to the basic concept of social capital (Putnam 1993, Woolcock 1998, Grootaert 1998, Krishna 2000).

The concepts of trust and social capital are increasingly being applied in attempts to understand the underlying institutional features of clusters and network. Social capital is the more inclusive concept which, according to one popular definition (Putnam 1995): “refers to features of social organization, such as trust, norms and networks, that can improve the efficiency of society by facilitating co-ordinated actions. Social capital can be seen as a conceptualization of the glue that facilitates transactions, cooperation and learning in an uncertain world.

The generation and transmission of new forms of tacit knowledge is facilitated and may even be conditioned by a certain level of social capital. Thus, this latter represents an asset, which may become increasingly important in the emerging context of the learning economy.

In a globalized world of freely moving capital and increasingly freely moving people, only “social capital” remains tied to specific locations. In fact, the “learning economy” is characterized by the hypermobility of the information and knowledge and the local character of the social capital.

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.

#### **4. “Governance” as a distinct policy model**

The design and implementation of innovation policy requires to tackle the problem of the architecture of the institutional framework and to solve those policy issues, which occur in the relationships between the center and the periphery, the public and the private sector, the firms, the workers and the various external stakeholders, the world of production and that of financial intermediaries, the public technology transfer centers and the private consulting companies and last but not least the integration of an economic and technological perspective with a social and institutional perspective.

The debate in Europe on industrial and innovation policies allows to identify various alternative approaches in public policy-making:

- a) the centralist model of planning (“government”),
- b) the free market model,
- c) the public-private partnership model of “multi-level governance”.

The ‘multilevel governance’ model allows a flexible combination of bottom-up initiatives and top-down coordination and financing. Thus, it is possible to distinguish within it two different types, which can be indicated as “governance model 1” (public-private strategic partnership) and “governance model 2” (local networking and cooperation). The first type is characterized by a crucial role assigned to national public authorities in promoting and steering the

innovation networks made by different firms and actors. On the other hand, the latter type is characterized by a stronger autonomy of the different economic and social stakeholders.

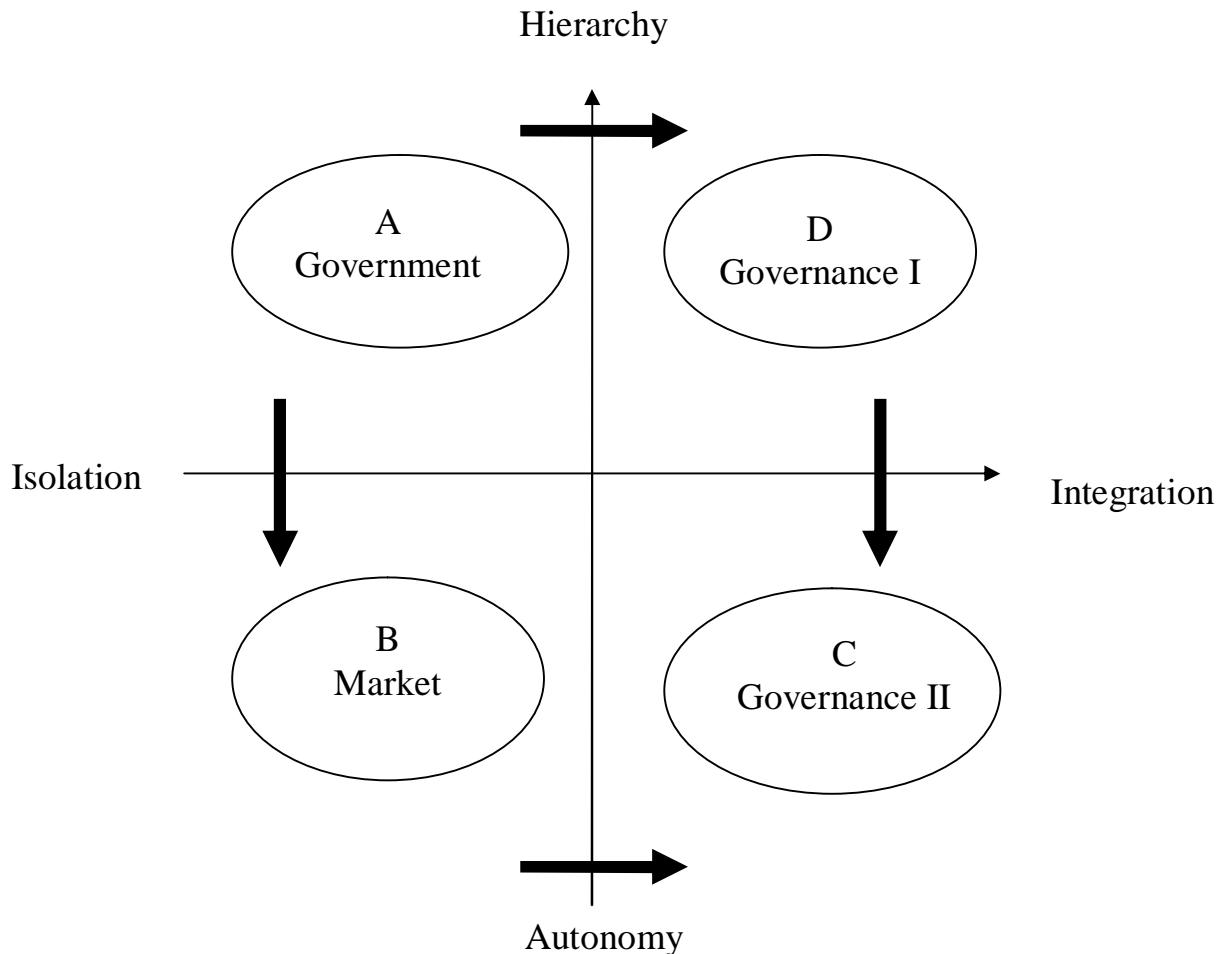


Figure 3: Four policy-making models

In figure 3, these four models of policy-making are described according to their respective position within two major dimensions: ‘hierarchy vs. autonomy’ and ‘isolation vs. integration’<sup>19</sup>. The first dimension measures the power of the central authorities vs. the freedom of the various firms and individuals. The second dimension measures the level of explicit economic interdependence, the sharing of common values and the sense of belonging vs. the absolute isolation of each individual either in front of the law defined and enforced by the State or in front of the market price as in a perfect competitive market, as all individuals are equal in front of the law and all firms are equal in the model of perfect competition.

When both these two dimensions are considered, recent evolution in technology and the changes in industrial organization seems to indicate the need to a greater autonomy of the various firms and actors. Moreover, the increasing interdependence of the actors and the firms

<sup>19</sup> Cappellin, R. (2004), The Matrix INT (Instruments and Needs of Technology) and the evaluation of innovation policies, in Wink, R. (ed.), *Academia-Business Links: European policy strategies and lessons learnt*, Palgrave – Mac Millan, pp. 168-194.

as also the increasing complexity of the factors determining the innovation processes and the need to integrate complementary technologies seem to indicate the need for a greater integration of the individual firms and actors.

The multiplication of players and layers of negotiation – international, national, and local – demands for different models of government, called governance, based on organisational structures of interaction and partnership, that more and more characterise local societies.

The expression governance is used with respect to decision making systems, where the decisions are not taken according to the traditional hierarchical processes by a public authority (“government”), but rather through open forms of collaboration between a plurality of public and non public actors, which may differ between the various specific areas of policy and between the various levels of government. Governance is made by complex policy networks. The decision making processes may include forms of horizontal and vertical negotiation, where the exercise of a hierarchical control is only one of the components and most often not the major one<sup>20</sup>.

Governance is the challenge of steering and positioning complex organizations. These can be committees, research groups, firms, networks, communities, regions and international agencies. Ultimately, it is a matter of leadership, responsibility and vision when it comes, as it does daily, with technology and society. A requirement is for policy groups to become highly adaptive organizations. It requires becoming effective signal processors, organizations that incorporate learning in their strategy.

Governance cannot be considered a purely local process, but a multilevel process that develops through territorial and functional networks, transversal policy networks, the proliferation of technical bodies, distributive coalitions and organised economic groups at international, national, and local level.

A “multi-level governance” system is represented by networks of public and private actors. “Multi-level governance” defines a new mode of regulation and coordination based on heterarchic negotiations around interfirm networks and public private partnership. It is based on negotiations or strategic alliances between multiple stakeholders in order to secure agreed objectives which are mutually beneficial.

It is a modality of co-ordination of the economic and social dynamics based on the involvement and participation of a plurality of actor, that are neither all governmental or public.

Multi-level governance represents a coordination mechanism, which involves the organization of autonomous but interdependent activities, institutional orders at economic, political and social levels and is essential to assure cohesion, mutual comprehension and harmony between different agents in the social system. Thus governance is the means by which order is accomplished in a relation in which potential conflict threatens to undo or upset opportunities to realise mutual gains.

---

<sup>20</sup> Cappellin, R. (1997), Federalism and the network paradigm : guidelines for a new approach in national regional policy, in M. Danson, ed., Regional Governance and Economic Development. London: Pion.

Both the recent evolution of technologies and the process of increasing international integration of national economies seem to underline the usefulness of the model of 'multilevel governance'. In fact, most programs designed and implemented at the European level have focused on stimulating the process of institutional building and aimed at the creation of 'national or regional systems of innovation' by promoting the creation of inter-firm networks in innovation.

Governance is an heterogeneous set of methodologies and practices able to create multi-level models of collective actions that allow to face new problems. It is a variegated set of collective actions models and organisational modes for the exercise of a government based on the interdependency among organisations, the network interactions, the definition of rules of the game negotiated and shared, a significant degree of autonomy of the networks on the State.

At the international level, governance represents a mutation of international politics, no longer monopoly of the governments' activity, but field of "...informal mechanisms, non governmental with whom individuals and organisations act, satisfying their needs and pursuing their goals". Also at the international level, governance is the sum of the different modes individuals and institutions, public and private, manage their common affairs with in a continuous process of co-operation and composition among various and conflicting interests.

At the local level, the concept of governance has been used as a heuristic tool to explain the current transformation of the local space. The emergence of a real urban governance as a new mode of governing the cities. In this context, governance refers to "...the capacity to integrate, and to form the local interests, the organisations, social groups, and, then again, in terms of capacity to represent them outside, to develop strategies more or less unified in relationship with the market, the State, the other cities and other level of government.

Also at the local level, the governance have two different approaches: one normative - the so-called "strategic planning" - and another mixed - the "neo-regionalism". The first aims at developing planning means to organise and co-ordinate actions of the local stakeholders and to reduce conflicts, in order to create conditions for the local policies success. The second one considers a public strategy of decentralisation and entrepreneurial management of the local institutions as the core of Administrative Governance.

In particular, "multilevel governance" seems most opportune in order to identify, accommodate and integrate between themselves the multi-facets relationships between innovation and territorial structure, the various stakeholders involved in decision making and to promote the design of accompanying territorial policies and planning.

Connectivity between the various institutions should be a central concern of policy. Governance of knowledge and innovation networks according to the "Territorial Knowledge Management" approach<sup>21</sup> implies a continuous public investment in the development of technical standards, social norms, and organizational, financial and institutional solutions, which may facilitate the adoption of innovation.

The model of multi-level governance of policy making is different both from the traditional and rigid neo-liberal agenda and from the obsolete top-down planning approach.

---

<sup>21</sup> Cappellin, R., 2004. Territorial knowledge management: towards a metrics of the cognitive dimension of agglomeration economies, International Journal of Technology Management, Vol. 26, Nos. 2/3/4, 303-325.

It is now widely recognized that the interventionist top-down model (“government”) in the innovation policies is neither possible nor desirable, since innovation for its very nature can not be reduced to command and it has a pro-active character and it is open to new discoveries.

The governance model also differs from the free market model, which advocates more competition and flexibility, while the governance model focus on the need of a greater integration and a faster innovation, which are related to the existence of intermediary functions, a greater stability, a long term perspective and the supply of adequate public investments.

Moreover, Research, Technology, Development and Innovation Policy (RTDI) is a field of concurrent legislation between various levels of government, and tighter vertical cooperation should complement an increasing specialization according to the subsidiarity principle.

The model of governance is based on the principle of negotiation and cooperation, while the government model is based on the principle of power or authority and the free market model is based on the principle of competition and conflict.

Hierarchical authority (planning) as also private initiative and competition (free market model) may prove to be illusionary shortcuts. They may accelerate the early decision making phase. However, they most often finally determine long lasting conflicts in the implementation phase, between the various interests affected by large projects.

In particular, it is important to underline the difference between the traditional “government” model, based on economic planning, state intervention, and public owned firms and the “governance” model based on negotiation, coordination mechanisms and “intermediate institutions”.

It is now widely recognized that the interventionist top-down model (“government”) in the innovation policies is neither possible nor desirable, since innovation for its very nature can not be reduced to command and it has a pro-active character and it is open to new discoveries. Innovation depends on the autonomy and active collaboration of researchers and entrepreneurs, rather than on passive obedience. Incentives and negotiations, rather than orders seem to be the main instruments in order to promote and manage innovation.

In a network model, the policy-maker can not adopt typical hierarchical methods, such as traditional planning (“government”), but it should be capable to guide or to steer (“governance”) the network of the various economic, social and institutional actors, in order to promote the flows and to orient the relationships between these latter, for promoting self-sustained economic development processes.

Whether the “government” model is not appropriate to the modern innovation policies, it is also clear that the neo-liberal free market model based only on the regulation of prices and competition is inadequate to manage the issue of innovation. In particular, the governance model differs from the market model as it insures a greater integration, the existence of intermediary functions, a greater stability, a long term perspective and the supply of adequate public investments. While the neo-liberal agenda is based on the prescription of more competition and flexibility, the governance model indicates related but different aims, such as greater integration and innovation.

In fact, the innovation processes are tightly connected with the division of labour, the specialization and integration of various production phases and labour competencies. While the market model focuses on atomistic decisions, this increasing labour division requires a framework, which allows connecting the contributions of different firms and actors. Institutions and economic policies have a crucial role in the development of systemic interactions between the industrial firms, the financial system and the training of human resources and scientific institutions and in the development of forms of production integration, leading to local and also global supply or value added chains. In particular, a social and institutional framework is required by the processes through which tacit knowledge is transformed into codified knowledge and is incorporated into a complex innovation.

Moreover, knowledge circulates within networks through formal and informal institutions. While explicit or codified knowledge may be exchanged on technology markets, tacit knowledge has an asymmetric character and it is non tradable, while it requires allocation mechanisms which are different from the markets. Only specific organizations and institutions and not traditional markets are capable to insure the access to information and those connections which allow the exchange and the tight interaction of knowledge, competencies and technology transfers. These organizations may be made by large multinational companies, joint projects for new productions, norms and technical standards between the participants to a network, local networks or clusters of firms, forms of public-private partnership or large “network of excellence” between research institutions.

While the market model emphasizes the concept of flexibility, the speed of information flows and of decision making processes is tightly related to the stability of the organizational forms and it depends on the existence of a well developed institutional system (“social capital”) and from immaterial structures and infrastructures which facilitate the relationships between the various actors participating in the innovation process and reduce the transaction costs. In fact, the instability and the risks associated with the market mechanisms lead the various actors of a given innovation system to search a shelter in more structured organizations and in a framework of shared values, leading to collaborations and avoiding negative forms of competition.

While the market model is based on the value of competition and conflict, institutions reinforce the identity and reciprocal thrust and allow limiting the disadvantage of the asymmetric circulation of information. That allows to reduce uncertainty and the risks related to the unforeseeable results of innovations and it is crucial in order to increase the incentives to invest for medium and long term projects or to support long term investments in education, which may increase the receptivity to innovation by the various actors.

Finally, the transition to the model of the knowledge economy requires the creation of new hard and soft infrastructures, both at the local and at the European level, which may facilitate the enlargement of the knowledge and innovation network in order to include also the economic lagging regions, sectors and firms. However, the creation of these institutions can not be insured by the market forces and it requires appropriate public investments, as networks can be considered as a form of capital (“social capital”), which requires collective economic resources for its creation and maintenance, otherwise it would lead to a progressive decay.



Governance approach is characterized by the gradual search of a consensus between different stakeholders on the selected issues agreed to be decided. That inevitably leads to more complex solutions than those indicated by top down decisions or by the belief on the “rational” results of market competition. Moreover, the governance approach is evolutionary, as the results of negotiations between the different needs of different “stakeholders” leads to incremental changes and to the gradual search of sub-optimal solutions and the base of previous experience.

In particular, the governance of an innovation network, especially in a regional and urban framework, requires the search of a flexible balance between the “community” model, which aims to promote identity or minimize transaction costs, vs the “network” model, which aims to promote diversity or to exploit the network economies or diversity and complementarity. That trade-off is indicated by the following contradictory characteristics and processes:

- a) homogeneity between the various actors within the network versus diversity and specialization of the complementary competencies and characteristics of the individual actors,
- b) thickness of the network or tight integration between the various actors versus leadership and relative isolation of the nodes characterized by outstanding excellence,
- c) hierarchical coordination between the various nodes versus preservation of the autonomy of the various actors, characterized by distinctive competencies and roles, to avoid forms of collusion and insure flexibility,
- d) explicit top down cooperation between the various actors versus complex negotiation procedures, which aims to mediate recurrent conflicts of interests between the actors.

Thus, the basic trade-offs between appropriation and dissemination, concentration and distribution, incentives to produce and incentives to use, variety and complementarity indicate that the problem of governance of knowledge transactions in quasi-markets yet remain to be solved (Antonelli 2005).

## **5. A typology of instruments in regional industrial policy**

The four policy making models may be used in order to classify a wide set of policy instruments used in industrial and innovation policies at the international level (table 2)<sup>22</sup>.

The first class of instruments (‘government’ model) considers the case, when the national government intervenes directly in order to promote ‘national champions’ or to protect ‘strategic industries’. A crucial role in this case is played by national ministries and agencies created by the national government, although these latter may be regionally decentralized. Thus, also the cases of large science parks and research institutions and of technology transfer (TT) centers totally publicly financed are considered in this class. These types of innovation

---

<sup>22</sup> Cappellin, R. (2004), The Matrix INT (Instruments and Needs of Technology) and the evaluation of innovation policies, in Wink,R.(ed.), Academia-Business Links: European policy strategies and lessons learnt, Palgrave – Mac Millan, pp. 168-194.

policies instruments seem to be the most diffused at the international level and they can still play an important role in many both less developed and also developed regions and countries.

<b>Table 2: Policy-making approaches and instruments of innovation policies</b>	
<p><b>A) “Government” model</b></p> <ol style="list-style-type: none"> <li>1. Public owned industries</li> <li>2. Subsidies to strategic private industries</li> <li>3. National agencies of sectoral industrial plans</li> <li>4. Public funding of R&amp;D</li> <li>5. Regional offices of national agencies or departments</li> <li>6. Public demand and fiscal incentives</li> <li>7. Large public R&amp;D institutions</li> <li>8. Science Parks</li> <li>9. TT service centres (fully public financed)</li> </ol>	<p><b>C) “Governance” model 1: public-private strategic partnership</b></p> <ol style="list-style-type: none"> <li>1. Strategic planning contracts with large firms</li> <li>2. Territorial pacts with local actors</li> <li>3. Regional technological parks and centres</li> <li>4. TT centres and programmes (partially nationally publicly financed)</li> <li>5. University – industry liaison offices</li> <li>6. Professional continuous education centres</li> <li>7. National programs for R&amp;D and innovation networks</li> <li>8. National networks of TT service centres</li> <li>9. National financial trusts for financing innovative firms</li> <li>10. International networks of TT centres</li> </ol>
<p><b>B) “Market” model</b></p> <ol style="list-style-type: none"> <li>1. Privatisation of public industries</li> <li>2. Market deregulation</li> <li>3. Liberalization and MNE attraction</li> <li>4. IPR regulation and national patent offices</li> <li>5. Private professional services</li> <li>6. Private technology brokers</li> <li>7. Private venture capital</li> <li>8. Private research companies</li> <li>9. Technological education centres</li> <li>10. Public information and benchmarking centres</li> </ol>	<p><b>D) “Governance” model 2: local networking and cooperation</b></p> <ol style="list-style-type: none"> <li>1. Cooperative research projects between SMEs (CRAFT)</li> <li>2. Autonomous - non governmental research institutions or foundations</li> <li>3. Business Innovation Centres (BIC) and Innovation Relay Centres (IRC)</li> <li>4. TT centres of industry associations and chambers of commerce</li> <li>5. Local incubators of innovative firms</li> <li>6. Regional/local development agencies</li> <li>7. Local stakeholders coordination tables</li> <li>8. RIS - regional innovation system</li> <li>9. Territorial knowledge management (TKM)</li> <li>10. Regional innovative start-up funds</li> </ol>

A second and opposite class of instruments (‘market’ model) considers the case, when the crucial role to promote innovation is left to market forces. Certainly, general measures in industrial policy, such as privatization, liberalization and market competition regulation, as well as specific regulations of intellectual property rights (IPR), may have an indirect but

powerful impact on innovation performance of regional and national economies. According to this approach, private TT intermediaries, such as professional services, technology brokers, venture capitalists (VC) and specialized new research start-ups play a crucial role. However, even within this model public authorities are still important, especially in facilitating the circulation of information and in enhancing a higher level of formal education of the labor force.

The third class ('governance' model 2) encompasses those policy instruments, which are based on the concept of public-private partnership, when the leader role is played by public authorities. This is the case of national planning contracts with large private or public firms or of territorial pacts for employment bringing together many local actors. Specific instruments, such as university-industry liaison offices, TT co-financed by private industries, technology parks focusing on specific sectors and clusters, shall lead to a tight integration between public and private institutions. Moreover, the concept of cooperation is the key element in programs aiming to create networks at the national and international level between the various actors and intermediaries active in a regional or national innovation system.

Finally, the fourth class ('governance' model 1) encompasses those policy instruments, which are often supported by public resources, but have been created by a bottom-up initiative of private actors, groups and citizens. A crucial role in this case is played by the cooperation between firms and especially between SME, by the incubators of new firms and by independent foundations or research institutions. Local stakeholders are grouped together around an industry association or chamber of commerce. 'Business Innovation Centers' and 'Regional Development Agencies' can be very helpful instruments in promoting local cooperation.

Within this approach some innovative instruments, such as 'Regional Innovation Systems (RIS)', which have been widely experienced in European countries, also have to be classified. Another, similar methodology is the 'Territorial Knowledge Management (TKM)', which aims to facilitate the relationship between local firms within territorial networks (Cappellin 2003a). Barriers of SME to financial markets shall be overcome with the help of start-up funds (seed capital and VC) by regional organizations.

The various instruments in innovation policies have a different capability to respond to the problems and needs. Thus, policy-makers have to identify those policy instruments, which may be more effective, and to improve the internal organization of public institutions by comparing the policy instruments locally available with international benchmarks.

Different institutions, policy strategies and policy tools are required for the management of:

- different phases in the product/technology life cycle (e.g. innovation/development/maturity) and different sectors and types of technology (e.g. mechanical, information, biotech)
- different types of knowledge, such as codified/tacit, individual/collective, local/international, propositional/prescriptive, intellectual capital assets/learning processes
- different components of the knowledge management process (e.g. market orientation, accessibility, receptivity, identity, creativity, entrepreneurship)

The transition to the Knowledge Economy has an impact both on the organization of the individual firms and on the competition processes within the individual markets or sectors. These impacts have been those which have mainly attracted the attention of economists.

However, the Knowledge Economy has also an impact both on the structure of the territory<sup>23</sup> and on the institutional framework.

These four different dimensions of the impact of the Knowledge Economy can be analyzed in an European or national or regional framework and they lead to different forms of “governance” models.

<b>Table 3: Four domains of the knowledge economy and multi-level governance</b>				
<b>Geographical Levels / Four Dimensions</b>	<b>Firms</b>	<b>Sector/technology</b>	<b>Territory</b>	<b>Institutions</b>
<b>European</b>	European alliances and M&A	R&D networks in old and new sectors	Globalization and regional cohesion	Competition policy
<b>National</b>	Restructuring of large firms	Sectoral innovation platforms and national champions	National Innovation System	National strategies, programs, laws and public finance
<b>Regional</b>	SMEs growth and innovation	Vertical and horizontal transfers of know-how and technologies	Regional Innovation System	Regional projects, intermediate institutions and public-private partnerships

In the perspective of the individual firms, the development of the knowledge economy represents an incentive to adopt specific forms of governance of the relationships between the various firms, such as the creation of alliances and mergers and acquisitions at the European level, the national public interventions aimed to sustain the restructuring process of individual firms facing the challenge of new technologies and the policies aimed, especially at the local level, to sustain the growth and innovation in small firms.

In a sector or technological perspective, the development of the knowledge economy represents an incentive to promote R&D networks within new and old sectors at the European level, to create of national champions and innovation platforms aiming to increase the synergy between the various firms belonging to the same sector and to promote technological vertical and horizontal spill-over in specific local clusters.

The territorial perspective to the development of the knowledge economy leads to focus on new issues such the competition and divide between the various countries and the large regions in the world economy, the need to integrate the various sectors and actors within

<sup>23</sup> Cappellin, R. (2007), Learning, Spatial Changes, and Regional and Urban Policies: The Territorial Dimension of the Knowledge Economy, *American Behavioral Scientist*, Volume 50, Number 7, pp. 897-921

complex national systems of innovations and similarly to adopt an intersectoral approach in the policies aiming to increase the competitiveness of the various regional innovation systems.

Finally, considering an institutional perspective, the challenge of the emerging knowledge economy leads to design new institutions capable to govern the relationships between the various actors at the European level, such as an European competition policy and authority. At the national level, new institutions are represented by national strategies, programs and laws, which mobilize complementary flows of public finance. At the regional level, governance is characterized by the design of specific regional projects, the creation of new “intermediate” institutions between the State and the individual actors and flexible forms of public-private partnership.

## **6. A new perspective to innovation policies and three new fields of knowledge policies**

The aim of the transition to the Knowledge Economy and the adoption of a multilevel governance approach seem to imply a change in the policy aims, instruments and decision making forms with respect to traditional industrial and innovation policies:

- a) adopt a learning – heuristic approach (bottom up: system, horizontal, dynamic, evolution) versus an innovation - strategic approach (top down: structural, vertical, static, harmonization) in knowledge creation and diffusion ,
- b) focus not only on codified knowledge/information and technology diffusion: output indicators, but also on the development of know-how (tacit knowledge), on enhancing the interactive learning processes, and embedded capabilities (skills, competencies): input indicators,
- c) adopt two additional framework: not only a firm or a sectoral/technology perspective but also a territorial/regional and an institutional perspective. They aim to create a “National/Regional Innovation System” and to promote institutional building and learning through the creation of new procedures, intermediate institutions and also new forms of relations between public institutions.
- d) focus non only on the supply side or the increase of the production capabilities, but also on the demand side or on the satisfaction of the new needs of society (well-being, welfare, identity, social cohesion, living environment, sustainability, etc.) and on the political/institutional procedures (“how to do” rather than “what to do”, institutions building rather than strategy design, the problems of conflict management, consensus, values, identities, ethical issues),
- e) have a larger scope than innovation/technological policies as they do not concentrate only on R&D financing and on financial support to research institutions and high tech sectors , while they adopt a wider policy agenda and an integrated approach aiming to integrate other economic policy domains (labor market, education, industrial, regional, trade policies, etc.)
- f) promote not only diffusion and imitation of the top end/leaders in order to decrease the existing divides, according to a “linear approach” to technology transfers, but also development and inclusion of the bottom end actors/followers, according to a “systemic

approach”, considering also intermediate technologies, SMEs and the enhancement of medium or low qualified workers, while focusing on the role of key nodes and links in the knowledge networks,

- g) adopt a territorial knowledge management approach, focusing on enhancing the six levers: problem orientation, accessibility, receptivity, identity, creativity and entrepreneurship

Knowledge policies in Europe should not only focus on the coordination of national programs aiming to promote innovation, but also to new emerging issues in policy-making such as the relationships between the knowledge economy and the globalization process, the changes in the labor market and problems of consumer satisfaction.

First of all, in a traditional industrial economy international integration is mainly lead by the pressure of competition in the international market or by the attempt to resist to the threats of the market globalization through various forms of national protection, such as the public subsidies to “national champions”.

On the contrary, in a modern knowledge economy, the circulation of knowledge and information and the capability to sustain the global competition is facilitated by the existence of soft institutions, such as innovation networks or by hard institutions, such as international research programs, promoted by the European Union.

International economic integration is a multidimensional concept, as it implies<sup>24</sup>:

- a) market integration, which facilitates the integration of the flows of products/services and it is determined by custom tariffs, different currency, transport and ICT infrastructures and other barriers having monetary costs,
- b) institutional/organizational integration, which facilitates the international integration of the flows of investments, flows of labor force, flows of technological knowledge, social links, cultural links, institutional links as all these flows require an harmonization of the organizational and institutional framework.

Various institutional mechanisms explain the profound differences between the working of the international economic relations in the European context and what is occurring between the countries of other world areas, where international relations are only governed by the rules of the market mechanism.

All these regulations and institutions allow a gradual shift from the perspective of the international market to that of an internal market. The forms of the process of networking and integration at the international scale in the European Union tend to become gradually similar to the forms of networking and integration, which exist within an internal market at a national or regional level. In fact, the crucial difference between interregional and international market relations is due to the existence of a “State”, as within the same country or within a federation or political union of various countries, relations are subject to the rules of law and are managed by a complex set of powerful institutions, such as a central bank, antitrust and

---

<sup>24</sup> Cappellin, R. , (2004) Il ruolo della distanza istituzionale nel processo di integrazione internazionale: l’approccio dei network, in A: Quadrio Curzio, ed., La globalizzazione e i rapporti Nord-Est-Sud, Bologna, Il Mulino.

other regulatory authorities, industry associations, trade unions, consumer associations and various other councils, committees, foundations and associations.

<b>Table 5: The process of international integration and the knowledge economy</b>			
	<b>Knowledge economy: Innovation competition</b>		
<b>International market integration</b>	National innovation systems	European innovation networks, European integration	<b>International institutional integration</b>
	Free trade, protectionism, national champions	Financial integration, mergers & acquisitions, competition rules	
	<b>Industrial economy: Cost competition</b>		

Thus, we may distinguish:

- the globalization process, which is only made by market integration and it is determining high social inequality in many third world countries,
- the process of European integration, which is made not only by market integration, but also by institutional/organizational integration and it has not had any negative impact on the inequality between the European regions.

Economists usually underline that the process of international integration stimulates an higher economic growth. However, the level of social inequality has increased due to the effect of the pure market integration and it can be gradually reduced only through a greater international institutional integration. Clearly, the institutions which may regulate and promote a process of transnational integration should arise from an historic and evolutionary process, which is specific of each area, as the “institutional thickness” has a precise evolutionary character and the building of an institutional framework is the result of a long and gradual process of institutional learning.

Second, knowledge policies are related to labor market policies. Labor relations in a traditional industrial economy may be regulated through free market mechanisms, such the right of free firing, lower wages and free immigration from low income countries. On the contrary, in a modern knowledge economy, labor competencies develop in the framework of

“communities of practice”, where learning is an interacting process. Modern knowledge management aims to redesign the internal organization of the firms to promote a more direct involvement and commitment (“empowerment”) of the labor force and to facilitate the access to tacit knowledge through a process of socialization of work practices. Labor mobility explicitly contrasts with the improvement of labor competencies, as the firms need to retain skilled persons and the transmission of competencies to young workers requires long term contract of training rather than unregulated flexibility. Moreover, mature workers would oppose to invest in the collective learning process and to devote their personal effort to learn new specific techniques, unless an higher long term security is granted by the firms, as an higher specialization would make these workers less employable by firms operating in different production fields.

<b>Table 6: The governance of the labor market in a knowledge economy</b>			
	<b>Knowledge economy: Better capabilities</b>		
<b>Free market</b>	individual mobility, efficiency wages, stock options	Collective learning, knowledge management, training contracts	<b>Governance</b>
	free firing rights, lower wages, free immigration	collective contracts, quota system, welfare system	
	<b>Industrial economy: Lower costs</b>		

A third field of knowledge policy is indicated by the aim to higher consumer satisfaction. The protection of consumer in a industrial economy may be achieved through the traditional market receipts, such as more competition, deregulation and international competition. On the contrary, in a modern knowledge economy, the demand is often not the result of the simple aggregation of individual demands but rather related to the actions aimed to respond to new emerging collective needs. Quality standards are jointly defined by the community of users and producers. The user and the consumer highly interact in the development of the new product and services.

Clearly , in order to participate to a spectacle of “La Scala” it is required to pay a price, just as in the consumption of a private good. However, the rules applying to new goods and



services seem to differ in various respects from those of traditional material goods. First, the “willingness to pay” of the consumer also depends on its knowledge of music and that requires a long learning process.

<b>Table 7: Consumer satisfaction and the knowledge economy</b>			
	<b>Knowledge economy: Higher quality</b>		
<b>Free market</b>	more information, market segmentation, product differentiation	local culture/preferences and collective needs, quality standards, producer-user cooperation	<b>Governance</b>
	competition, deregulation, international competition	cooperative production, public production, price regulation	
	<b>Industrial economy: Lower costs</b>		

Moreover, the people participating to the program are not only passive consumers, but also direct participants in the delivery of the service, as the rather exclusive environment of “La Scala” is a key factor, why persons want to attend to an event.

Often, the role of the actors in the production of the “superior” goods and services, characterising a knowledge economy, is switching from a passive to an active role, as “amateurs” may become “professionals” or the same persons belonging to a specific community of experts may in some cases be the user and in some other cases become the producer of the same or of related products. For example, artists or sport experts some time create their own instruments initially for personal use and these latter can later be produced to be sold to others. Certainly they were pupils before becoming teachers.

Clearly, the introduction in the market of a new specific good or service is not the result of individual action, but rather the result of an implicit coordination between all partners belonging to the specific community considered. The creation of new goods and services requires the capability to aggregate emerging and diffused needs of a community or association of users characterized by a specific culture and appreciating that product or service.

Finally, in the case of “club goods” the payment of the price is not the only instrument to exclude a potential consumer, as the knowledge of the rules governing that club and a deep knowledge of the specific field of activity, are conditions not only in order to appreciate the product, but also in order to be personally appreciated and to be allowed to enter in the club.

In some cases the consumption of goods and services is only instrumental in order to participate to a given community, as the real aim of the consumer is the possibility to socialize with other actors, characterized by a similar knowledge or culture. In this perspective the definition of “community goods” seems more appropriate than that of “club goods”.

Thus, knowledge plays various roles in the consumption of the new goods and services characterizing a modern knowledge economy. Consumption is not related to the monetary exchange between the consumer and the user considered in isolation, but rather to the complex and changing distribution of individual roles within that specific community, which is interested to the use and production of a specific good or service. That apply not only to cultural products, leisure and sports activities, but also to programs related to education and training or social cohesion or health or local living environment quality or natural resources protection or natural hazards protection. Moreover, these new perspectives may highlight the changes in the demand of traditional material goods, as they are increasingly combined with complementary services.

The possible conclusion is that in a modern society new emerging needs can not be satisfied by individual producers, but they require a collective, although not always national state, provision. Public expenditure and taxes seems to be inevitably lead to increase: a scenario that may not appeal to neo-liberal economists but which seems to be demonstrated by the fact that even conservative governments never succeeded in decreasing the ratio of public expenditure on GDP, but for limited periods.

## **7. The policy indications of the network approach**

The internationalization of markets and of production processes indicates that innovation and new knowledge are the key factors of competitiveness for European firms and regions, leading to economic and employment growth and also to international division of labour, agglomeration and exclusion phenomena.

In the model of the open innovation, innovation is the result of the interaction of different actors and of the combination of different competences and, as Adam Smith wrote, the most important form of division of labour is the division of knowledge. In fact, innovation is not the result of the individual inventor or entrepreneur, but rather the result of a processes of collective learning, which requires the interaction of many different private and public, regional and international actors.

A modern knowledge economy needs a cohesive view on the innovation system as a whole. A trustful and flexible co-operation between the different actors of innovation is especially possible at the regional level, due to the close spatial relationship, that facilitates the generation of innovative projects. However, clusters do not align with state-, county or other administrative borders, as network of complementary actors in the same production field may include various regions.

The European economy is characterized by the existence of clusters of small and medium size firms working in intermediate technology sectors, where tight vertical and horizontal linkages integrate the various firms and the level of trust and formal cooperation is high. However, a greater focus on innovation is needed and an explicit joint innovation strategy is still lacking. In particular, a structural weakness of most European economies is the comparatively low-level of formal networking between the research institutions and the industry sector, since cooperation mainly takes place on an informal basis through personal contacts and hiring of graduates.

In particular, the sudden crisis or also the sudden recovery of individual industrial firms indicates the importance of the time dimension as a key competitive factor of the European industry. Innovation policies should timely react to unexpected changes, such as the sudden closure of some large firms requiring the fast reconversion of human and financial resources into new productions.

Thus, the governance of innovation and knowledge networks should focus on the flexibility of the individual firms and on transaction and adjustment costs, which affect the speed of adopting new projects<sup>25</sup>. Innovation policies should promote innovation networks, which lead to reach critical thresholds, decrease the time to market and also insure the continuity of the innovation effort.

A complex interaction is needed between regional and national or European innovation policies since various new sectors (aerospace, environment, energy, finance, mayor international infrastructures, etc.) requires an higher national or European coordination. On the other hand, the network approach has promoted the discovery of the spatial dimension of innovation policies and has lead to adopt policy schemes, which focus on the regional clusters and are highly similar in the various countries, while having different names, such as national networks of clusters, poles de competitivè, competence centres, centres of expertise.

A policy of the knowledge economy based on the “governance” or “dynamic coordination” approach implies the use of different policy instruments with respect to those usually adopted in traditional innovation policies, such as:

- public R&D
- public subsidied to private R&D
- public demand of innovative products and services
- IPR in order to insure a monopoly power to innovators

New policy instruments are those which aim to steer the knowledge networks and to:

- create new nodes in the knowledge networks, such as the enhancement of innovative spin-offs from firms, the recognition of universities as a new actor in innovation networks, the promotion of diversity and attraction of new actors,
- create missing links by defining new procedures in the relationships between the local actors.
- promote international links in order to avoid regional closure and lock-in effects,

---

<sup>25</sup> Cappellin, R. (2003), Territorial knowledge management: towards a metrics of the cognitive dimension of agglomeration economies, *International Journal of Technology Management*, Vol. X, n. X.

- invest in human resources, education and life long learning, in order to increase receptivity to new knowledge,
- promote alignment and identity building by defining joint long term projects and a joint strategy.
- accommodate the switching costs or adjustment costs implied by major changes in order to increase the flexibility of sectoral clusters and SMEs and accelerate the time of changes.
- design and adopt new regulations, which may defend weak and dispersed interests and determine the conditions in order to aggregate scattered needs and demand and to create new markets for innovative products and services.

### **Acknowledgement**

This work has been made possible by the funding of the VIth EU Framework Programme, within the context of two projects: “*IKINET - International Knowledge and Innovation Networks for European Integration, Cohesion and Enlargement*”, VI EU Framework Programme, Call identifier FP6-2002-Citizens-2, <http://www.economia.uniroma2.it/dei/ikinet/> and *EURODITE: “Regional Trajectories to the Knowledge Economy: a Dynamic Model”*, VIth EU Framework Programme, Call identifier: FP6-2003-Citizens-3: <http://www.eurodite.bham.ac.uk/papers.asp>