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Intermediate institutions for interactive learning processes in a "governance" perspective: the case study of aeronautic industry in Campania region

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1. Introduction: The role of institutions in the interactive process of learning

A flourishing literature has studied the economic growth as an evolutionary process. To many scholars the endogenous approach looks rather satisfactory in order to understand the forces behind the "immediate sources of growth" and the processes that are inside the "black box". However, in order to interpret and explain localised economic growth, there is still a need of specifying phenomena, such as the nature and dynamics of the productive organisation, the functions and changes of institutions, and the technology and technological advancement.

This study, based on the empirical analysis conducted on the Aeronautical Cluster of the Campania Region in the framework of the IKINET programme, tends to emphasize the role of intermediate institution in the diffusion of innovation and, in broader sense, of knowledge creation among the stakeholders. The interviews to fifteen enterprises and twenty non industrial organizations aim at providing evidence of the interactive learning processes evolving through a governance approach in the aeronautic industrial cluster in the Campania region. The methodology, based on a mix survey/case study approach, has investigated the role of the social institutions connected to the knowledge production. The selected sample of enterprises represents 25% of the whole regional sector, with a balanced mix between large firms and SMEs.

Among the intermediate institutions, public and private research centres, service and financial organisations, and social organisations have been analysed and their interactions evaluated through the filter of different governance approaches. Preliminary to that, we have defined a theoretical structure in order to provide the necessary background to the criteria for interpreting the empirical analysis and to robust the findings, by replying to the “why”, “what”, “who”, and “how” questions.

2. Why? Technological innovation could determine localised economic growth

The question of why to analyse the role of the social institutions in a geographically localised knowledge production finds its roots in the increasing importance of spatial issues in technological innovation and/or the human capital development, as also pointed out by the endogenous growth theory. The hypothesis that forms of local governance of economy are the key to explain successes of local economies is not new, and in this paper its broad literature will not anymore analysed but used as a postulate.

According Romer, endogenous growth can be produced by an increasing variety of specialised capital goods or by an increasing knowledge base associated with these capital goods and associate externalities effects of information spillovers (Romer, 1986) or, if we take into account Lucas, by private investments in human capital, the benefits of which also spill over to the surrounding environment.

By defining technology “…as the complete set of production, organisation, information, and communications blueprints which are available to all firms, and which mediate the relationship between the input factors employed and the outputs produced”[1], we introduce another emerging keyword in the economic literature: the knowledge used in the production process. Moreover, new (or recombined or rediscovered) knowledge introduced into the economy is called innovation. So, it is possible to figure out that more knowledge we accumulate, also through geographically localised investments in human resources, and more economy growth we could expect. Obviously, it’s very difficult to identify the source of such growth, because the effects of innovation can be external to a

process that is not completely linear. However, that relationship appears sufficiently robust to inspire regional policies.

In the case study of the Campania aeronautic industry cluster, the spatial reference is strictly dependent on the openness of international aeronautic sectoral R&D and the market opportunities for clustering. A learning system completely dependent by exogenous factors – i.e. large firms, external clients, and international promoters - could not have interest to sustain a local interactive dimension, as it prioritises the international dimension. In Campania, moreover, there is not a noticeable tradition of interactions between the business and industry community and the world of research. The existence of limited interaction between enterprises and knowledge institutions could be partly responsible for the low degree of technology transfer from research institutions to industry. As the vast majority of enterprises do not have own resources to develop new knowledge on the base of in-house research, knowledge diffusion may occur in the local economy only when the firms have an easier access to the knowledge developed inside the region, and not outside. In that perspective, the participation of the intermediate institutions can have significance in terms of regional economies governance and institution building.

3. What? The knowledge dimension

If the knowledge is the central factor, we should have an idea of the knowledge we have been considering and of the way it develops. The knowledge creation and diffusion is a complex phenomenon connected to time and space variables. Its spatial nature depends on the proximity, but at the same time provides "brakes", such as congestion effects, to a-spatial endogenous growth that, without diminishing returns to either capital or human capital accumulation, could be explosive. Its temporal nature, as introduced by seminal work of Hayek (1937), eliminates the concept of "absolute" in its economic value, attributing different judgements of value to the same knowledge in different timeframes.

The time factor has stimulated relevant reflections in the social sciences, linking the cognitive science to the evolutionary approach: knowledge can be achieved even before its translation into an explicit form and it is a product which is not completely "known" by its creator. In other words, some basic elements can escape the agent because they are not known in a conscious way.

The unconscious aspect of the knowledge, the so-called *tacit dimension*, consists mainly of behavioural rules, such as the moral or the tradition. The same concept returns in the Michael Polanyi's *inarticulate knowledge*, a set of tacit rules that "… decide our belonging to a specific culture and sustain our intellectual, artistic, civil and religious activity"[2]. Another similar expression could be found in the theory of the "common sense" developed by the Scottish Illuminists, and then resumed and enriched with an evolutionistic approach by Charles Sanders Peirce[3]. The tacit dimension becomes a co-ordinating and connecting element between different individuals in harmony with the "objectivity" of the local culture. The individual knowledge advances interacting with other individuals' knowledge, in other words with the development of the society. Therefore we can't isolate the knowledge, but only to analyse its interactions, that is, the *learning*. We can't define the knowledge as a fact, but we need to place it in an ex-ante mental structure. In that context, the role of the evaluation becomes strictly related to space and time, because "the objects are what people think they are"[4]. Accepting such line of reasoning, the applicability of quantitative methods should be restricted to the analysis of historical sciences, but not of social sciences.

The passage from the individual learning to the interaction among individuals deals with the co-ordination of the interaction, and appears as the most problematic aspect. Taking into account that data aren't the external reality but the evaluation of the reality, the first requirement for a co-

ordination, and then for an ex-ante equilibrium, is that the plurality of involved individuals have a common initial basis of evaluation. In addition, the larger is the number of interacting individuals, the easier is to find divergences in the evaluation. The social equilibrium, moreover, can have significance if only we reject its generality, in other words, that it can't imply as condition the compatibility and the satisfaction of all individual plans.

For example, institutionalists do not pretend to wholly explain individual behaviour by the institutional or cultural environment, although they admit that societies are constituted by institutions formed and changed by individuals. As a result, institutional theory does not make reference either to the assumption of the individual rationality, or to a single, general model, but it is focused on *habits*[5] and *rules* as necessary for the human action. Institutionalists, therefore, do not seek to build a general and a-historical model of the individual agent but, focusing on specific features of specific institutions, they manage to encapsulate some significant stability in socio-economic systems. They are not merely data-gatherers, because no understanding is possible without a theory. "Theory does not arise by induction from data; all empirical analyses presuppose a prior conceptual framework and an explicit or implicit theory" (Hodgson, 1998).

In the case study of Campania region, the co-ordination role in the innovation process ought to be analysed, through the prism of the tacit dimension, with particular attention to the behaviour of the public stakeholders in promoting knowledge development. A particular relevance has to analyse if innovation in the enterprises is user-driven innovation, where the interaction of suppliers, customers, etc., has top priority, and verifying if the learning process looks out customers as an essential source of knowledge.

4. Who? The role of the institutions

Institutions are rules amalgamated by an exclusive abstract model, which highlights specific sets of social facts. The planning and combinatory aspects become marginal for the institutions: the development of the knowledge is contextual to the development of the behavioural rules. According to an institutionalist approach, we consider institutions as the rule and the organisation as the player. As rules, institutions define and limit the set of choices of individuals, including any form of constraint – formal and informal – that can be created or may simply evolve over time. If institutions determine the opportunities in a society, organisations are created to take advantage of those opportunities and, as the organisations evolve, they alter the institutions.

Using a broader cognitive approach, also institutions can be separated, similarly to the distinction between codified and tacit knowledge, between spontaneous orders and organisations. However, the organisations can plan their objectives only if placed in a spontaneous order. As a result, studying the role of the institutions in the interactive learning process means to contextualise the organisations to a specific cultural, social, economic and political context and not simulating abstract behaviours.

Institutions play a fundamental role in the process of transforming individual knowledge in explicit knowledge as also in behavioural rules. Although based on a different approach, North evaluates that 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). It is not surprising, then, if economic development receives the better stimulus in those territories with highly evolved, complex and flexible institutional systems, or that training and research institutions, entrepreneurial associations, unions and local governments can use available resources more

efficiently and improve competitiveness when local communities are characterized by thick relational networks, and then by a convergence of behavioural rules.

Nevertheless, current theories risk to fail interpreting the complexity of knowledge, when they reduce the problem to a better co-ordination or to increase the number of variables as a quantitative modification. On the contrary, the increase in the complexity asks for analysing new types of relations and interactions. A more complex society can't be analysed with the same tool of simpler societies. Subsequently, barriers hindering self-sustained growth processes are often attributed to deficiencies and poor performance of the institutional network, without clarifying role and responsibilities of the organisations in a specific spontaneous cluster, which by definition can't be appraised or planned.

In a favourable spontaneous cluster, interactive organisational behaviours can lead to:

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

But what is a favourable spontaneous cluster? And which role the institutions should play inside it?

According Durkhaim, a nation can be maintained only if, between the state and the individual, there are interposed a whole series of secondary groups adequately close to the individuals to strongly attract them in their sphere of action and, in this way, into the general torrent of social life. That particular type of institution is represented by the so-called intermediate institution, such as regional and local governments, local credit organisations, local education institutions, labour agencies, trade unions, chambers of commerce, and industry associations.

A wide range of institutions, which may be defined as "institutional thickness", would support a specific network or sectoral/regional/national innovation system. Regional governments can attract external investments, coordinate large strategic projects and promote the birth of new firms and entrepreneurial capabilities. Local governments are required for an effective territorial planning and for the creation of efficient transport and logistics infrastructure. Local credit institutions have the responsibility to finance innovative projects of existing firms and to enhance the creation of new firms. Local education institutions, such as vocation training and university institutions, should both identify the labour skills required by the new technologies and maintain 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. Chambers of commerce and industry associations are major partners in promoting regional innovation systems and in identifying local strengths and weakness and in support strategic approaches to competitiveness and development.

As asserted by a vast body of literature, differences in the innovation performance can be attributed to a combination of resources, mainly intangibles, developed by firms and the local institutions, rather than to industrial structures as considered in Porter's analysis of the dynamics of competitive forces within market structures[6]. Amongst these intangible resources, *networking* has arisen as a significant characteristic in success stories of innovation processes. In economics, such concept has had a heterogeneous evolution of modalities, shapes, and meanings, and it is usually examined through two main perspectives.

The first perspective takes into account the *network* as an analytical tool for representing and investigating intra- or inter-organisational relations. It describes, therefore, a vast archipelago of social interactions in local communities, lobbies, groups, and institutions, through methodological apparatus aiming at identifying relational structures between actors, such as the *social network analysis.*

The second perspective distinguish the *network* as a synthetic term identifying a heterogeneous group of organisational forms and modalities of economic activities, which manage a complex web of interdependencies between individuals, organisations, ethnic groups, and local communities. Under such signification, the *network* represents a modality of organisation.

There are three basic ways of *networking*. The first is the *external units' network*, with a firm leader that establishes a set of ties and relationships with external companies and/or institutions. The second is the *internal units' network*, where the internal organisation of the firm is designed according modules and procedures corresponding to those developed in the external units' network. Finally, there is the *interpersonal network*, which stands for a critical aspect of the network organisation, influencing its implementation.

Many authors in different disciplines (Maskell and Malmber 1999, Navaretti et al. 1998, Lawson and Lorenz 1999) stress the importance of institutional arrangements for the generation of knowledge and learning networks, which are not all available in the markets, in order to:

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

Moeover, 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 behaviours by supporting organisations that promote the collective interest.

In our case study, the Campania aeronautic cluster has been investigated in terms its active and/or potential attitude towards a co-ordinated approach, that is, the networking. Then, each institution has been analysed in terms of roles, tools and strategies for the interactive learning processes.

5. How? The process of knowledge creation and the governance approach

The last element of our theoretical structure is represented by "how" individuals interact amongst them and with institutions, developing new knowledge and producing innovation. We aim at recognising how public and private intermediate institutions can generate interaction amongst them, with the firms, the political assets, workers and various external stakeholders, the world of production and financial intermediaries, the public technology transfer centres and the private consulting companies and, last but not least, they integrate specific economic and technological knowledge in a social and institutional perspective.

5.1. The process of knowledge creation

In contrast to the traditional linear models, modern theorists argue that the process of innovation is highly interactive and is dependent upon social and cultural institutions and conventions (Morgan, 1997, p. 493[7]). The competitiveness of a region, therefore, can be directly influenced by local actors' ability to generate, access, understand and transform knowledge and information by means of an interactive learning (Maillat & Kebir 1999). This interactive nature involves groups of individuals both outside and inside the personal businesses (social networks) and calls for the development of links, networks and co-operative actions among different actors even outside the existing institution. Spontaneous orders and organizations channel knowledge within networks. In principle, explicit and codified knowledge, such as patents, R&D investments, qualifications, and papers, may be traded on markets. Besides codified knowledge there is a large part of knowledge which is not being captured or understood. This part of knowledge is largely unrecognized by traditional development policy and analysis, however it often gives the competitive edge to regions and individual firms through creating innovative practices which are difficult to transfer in absence of face-to-face contacts (Nonaka and Takeuchi, 1995). Many studies (Nonaka and Takeuchi, 1995; Foray and Lundvall, 1996) have tried to capture and codify tacit knowledge, and thus enabling its transfer. On the contrary, as previously explained, the tacit dimension, such as competencies and skills, is strictly tied to the individual in not always conscious forms and, therefore, can't be transferred effectively through conventional markets and requires non-market allocation: for instance, within the firm, in the context of inter-firm networks or forms of co-operation between private agents and public institutions. Rules (tradition, ethical rules, procedures, organizational structures, standards, and routines) constitute the foundation of organizational behavior and clearly justify institutions as a focal point, which can have a key role in the process of innovation and in the generation of "knowledge and learning networks".

Another important factor characterizing the process of knowledge creation is its local dimension. 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.

If we consider the "Territorial Knowledge Management" approach[8], knowledge and innovation networks implies a continuous investment in the development of technical standards, social norms, and organizational, financial and institutional solutions, which may facilitate the adoption of innovation. In order to steer and position complex organizations, the governance dimension should be investigate. 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. Policy groups should become highly adaptive organizations, becoming effective signal processors, organizations that incorporate learning in their strategy[9].

5.2. The "governance dimension"

In this perspective and taking into account the current European debate on industrial and innovation policies, the multiplication of players and layers of negotiation – international, national, and local – demands for different models of government, called "governance". They are 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. 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.

A common element is that the dispersion of governance across multiple jurisdictions is both more efficient than and normatively superior to central state monopoly. Important as well is the claim that governance must operate at multiple scales in order to capture variations in the territorial reach of policy externalities. Because externalities arising from the provision of public goods vary immensely—from planet-wide in the case of global warming to local in the case of most city services—so should the scale of governance. To internalize externalities, governance must be multi-level. Obviously, there are several other perceived benefits, i.e. more decentralized jurisdictions can better reflect heterogeneity of preferences among citizens ; multiple jurisdictions can facilitate credible policy commitments (Majone 1998; McCubbins and Page 1987) and allow for jurisdictional competition (Frey and Eichenberger 1999; Weingast 1995, 2000), facilitating innovation and experimentation (Gray 1973).

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.

In general, we define governance as a heterogeneous set of methodologies and practices able to create multi-level models of collective decision making based on inter-action and flexibility.

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 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.

According to Holligsworth and Boyer (1997), we can have five archetypes of governance, based on the leading institution name. Being an abstraction, each model does not exclude the others and the all institutional set up could take part to the governance process with more or less weight. The archetypes are the market, the industrial organisation, the State, the community, and the association. According these types of social organization, we can distinguish between competition (market), hierarchy (industrial organisation), coercion (State), solidarity (community), and negotiation

(association). The motivations of the stakeholders to interact with the others determine the distinction among different models.

For the need of our analysis, we only interpret the different models in terms of opportunities for interactive learning. The guiding principle of the *market model*, based on the rationality of the stakeholders aiming at increasing their individual utility, is the atomistic competition that inspires the co-ordination: in a constellation, a stakeholder could be interested to develop knowledge inside his local context, providing information, consultancy, or other services in order to realise economic profit through a better competitivity of the other local firms.

The *organisational model* is based on stakeholders that, according to prefixed rights and responsibilities, have systems of relation defined by regulation. The co-ordination of the activity is hierarchical and the learning process is realised through a vertical integration, that is through the fusion of many firms of the cluster.

Also the *State model* is based on the co-ordination of the stakeholders through a hierarchical control. In terms of learning, the model hypothesises a co-operation among private firms and public institutions, which offer information, consultancy and other services through specialised administrative bodies or other public organisations. They can be local initiatives and institutions, administrative unit at regional level, but also universities, other academic institutions and research & development centres, funded by the State.

In the *community model* the guiding principle of the co-ordination between stakeholders is represented by the informal solidarity, autonomous and sometimes spontaneous among the member of a social unit, such as a family, a "clan", a local administration or a "community". The individual motivation is represented by the appreciation of the other community members or by the desire of belonging to a group.

We can imagine a co-operation among SMEs for a joint research programme in order to increase the local level of competition. At the centre of the *association model* there are organisations established to promote interests functionally defined. In this case the guiding principle is the negotiation of interests inside/between groups. This is the case of organisations with the main scope of representing their members' interests towards the State or other lobbies, and able also to provide selective goods, such as services.

These models are abstract and only their combination can provide the basic reference. Moreover, every single model can be considered under both a pure endogenous and a multilevel perspective. In the second one, the analysis of the exogenous ties can introduce various distortions in the abstract models. Therefore, the governance approach allows a broad range of theoretical possibilities and lets to the empirical analysis the identification of specific structures of governance, and then the analysis of their functioning and their dynamics of development.

In our case study, that means to separate structure (institutions) by function (the interactive learning). Moreover, it has significance, in terms of results and consequences, to define which institutional type detains primary role in guaranteeing knowledge development. In concrete terms, the analysis aims at defining the institutional leadership, the attitude of the stakeholders, the existence of a "strategy", the degree of institutional legitimating, the spatial dimension, and the presence of exogenous factors.

6. The case study of the aeronautic sector in Campania Region

The analysis of 15 industrial firms and 20 non industrial organizations aimed at providing evidence of the evolution an interactive learning process based on a governance approach in the aeronautic industrial sector in Campania Region. The selected sample of enterprises represents 25% of

the whole regional sector, with a balanced mix between large firms and SMEs. The selection of 20 non industrial organizations has asked for the ex-ante identification of a potential regional network, also through informal interviews with some key-actors of the regional innovation system in Campania.

The examined organizations can be grouped in four categories:

- *Public Institutions*, such as regional agencies for the industrial development, centres of technological transfer created or partially financed by the public, technological parks, and other local public agencies;
- *Research Institutions*, such as university departments, public and private research centres and organisation for advanced training;
- *Services organizations*, such as Chambers of commerce, industrial and professional associations, suppliers of engineering, software and management services;
- *Financial Institutions*, such as international banks, local "Casse di Risparmio" focused on the credit to local SMEs, other public or semi-public promoters, in particular Bank Foundations.

Information and data related to the 20 selected organizations have been collected both on desk, through a sectoral study, both on field, through interviews with key-actors and questionnaires submitted to privileged interlocutors. After having introduced the relevance of the aeronautic industrial sector in Campania, the case study tests and validates the issues emerged from the "why", "what", "who", and "how" theoretical considerations. In particular, the analysis investigates the governance dimension of the interaction among the different stakeholders, by the following elements:

- institutional leadership,
- attitude of the stakeholders,
- existence of a "strategy",
- degree of institutional legitimating,
- spatial dimension, and
- presence of exogenous factors.

The analysis of these filters aims at defining the Campania aeronautics position within the five "governance" models, not forgetting elements such as the existence of the tacit dimension, the existence of an active and/or potential attitude towards a co-ordinated approach, and roles, tools and strategies of the intermediate institutions to create an equilibrium in the interactive learning processes

6.1.Relevance of the aeronautical industrial sector in the Campania region

The Campania region is living an unstable equilibrium between the risk to become weaker, due to the transfer of resources towards more competitive areas, and the opportunity of a faster development, due to a sustained growth in some of its areas.

The population of the region is about 10% of the total population of Italy, and the growth of the GDP from 1996 and 2001 has an annual average of 2,6%, which is greater than 2,1% annual growth rate of Italy. Such good result is due to the growth of the construction industry and of the exports of automotive and aeronautical products, while within the manufacturing sector the agro-food and the clothing sector are the most dynamics.

The Campania region represents 25% of the economy of South Italy, while it represents only 6% of the national economy. These two percentages summarize the following regional problem: the region has a leadership in South Italy, but it plays a minor role at national level.

Its industrial structure depends in part by the previous national policies for developing the Italian "Mezzogiorno". On the one hand, South Italy is characterized by a quite high number of large public companies, which operate in traditional industrial sectors, usually under the public control, such

as the iron and steel industry, the shipbuilding industry, the aerospace industry, and the railway industry. On the other hand, it is characterized by a large number of SMEs, which mainly operate in the traditional sectors, such as the clothing industry and the agro-food industry. They are often working in the informal sector, and most of them appear impermeable to the diffusion of new technologies, and try to preserve their small size.

The aeronautical industrial sector in the Campania region, whose history goes back to the beginning of the XX century, is one of the few high-tech industrial clusters existing in European Union Objective 1 regions. It is composed by approximately sixty specialized firms and research centres. It has more than 10.000 employees and a turnover of more 500 million a year.

The various initiatives organised and/or sponsored by the local public administration support the idea of the relevance of the sector for the regional economy. To enforce its relevance to the political asset, we can recall the agreements signed by the Regional administration with both public aerospace research centres in order to locate them in Campania and the Boeing company in order to localize production of some high-tech components of the new Boeing 7E7; or the regional coordination for the creation of an Aerospace Pole in Campania (with the participation of universities, public research centres, large companies, SMEs, industrial associations, etc.) and the establishment of a programming committee for the aerospace network (made by universities and public research centres and large companies).

These observations open the question on the possible dichotomy between the development of a high-tech sector (like the aeronautical one) and the regional economy in a lagging region like Campania.

6.2. How knowledge develops and diffuses: from the institutional leadership to the market forces

In the aeronautical sector, firms must certify the quality of their products in order to have access to the market, that is, to have knowledge of the standards to which to conform their products and how to participate to international tenders. Firms, moreover, must have advanced competences of informatics, in order to make use of product and process innovations.

The institutions interviewed pointed out the difficulties of the SMEs in the sector to acquire the necessary competences in order to have a dynamic role in the market and the power to manage the knowledge, which passes in the majority of cases, through enterprises of greater dimensions and/or leaders, if not through for the large “prime” at the apex of the characteristic hierarchical structure of the aeronautic sector. This seems to indicated an exogenous leadership, and local institutions mainly concentrated in the attraction of external resources, by investing in promotional activities, such as territorial marketing and networking, both inter-firms and intra-institutions.

Such attitude is linked to the idea of a aeronautical sector productive development in Campania conditioned by the ineffective access to specific production-related services, which on the contrary characterise European and Italian both mature areas and new realities. In fact, a firm can’t neither competing nor growing and developing if it can’t access to organisations of technical assistance and specialized consultancy, to efficient financial facilities to R&D structures, to institutes for the quality certification, to centres of technology diffusion, to enterprises and societies of design, implementation, maintenance, and commercialization etc… or if it will not be sustained by efficient public services – i.e. electricity, transports, telecommunications, etc...

In the Campania region, the rising and strengthening of a thicker structure of SMEs has developed new demands and requested diversified interventions, which assume the existence of organisations and the operationality of articulated and complex tools. To the emerging of that demand

the knowledge has acquired a relevant role. But too often, SMEs encounter difficulties to answer the new needs, because they don't have a complete perception of the problem and/or because they don't know how to solve it and at which cost. They prefer, consequently, to outsource and/or to maintain a dependent relationship with the firm leaders and/or with the "prime".

Besides, even if all companies in the aerospace sector belong to some network and are more or less involved in different programs of collaboration with large companies, the extent of cooperation is quite low. In particular, the most elementary forms of collaboration among SMEs – such as purchase groups etc - are lacking. Attempts of aggregation failed in the past, due to the explicit hostility of national large customers, which consider the aggregations of SMEs as a threat to their privileged relationship with their larger international customers. So, the analyzed sector is at a critical point, for which it is necessary that all actors involved put together their efforts in order to steer and to direct the development process, by both identifying participative mechanisms at local level and strengthening those exogenous elements which are able to promote local development. Obviously, part of the criticisms can be solved at local and national level and some of them can be solved only partially. This observation opens the question of policy at the international level which can be determinate only with a more exhaustive integration into transnational networks.

In the '70 Campania region approach to regional development and regional policy aimed at correcting economic disparities by means of machines (an insufficient industrial equipment compared to other regions) and infrastructural (delays in communication and transport infrastructure and also delays in basic infrastructure). In the '90, there has been a change in the strategic vision of the regional development, based on the valorisation and creation of specific resource only available at local level and able to compete at international level.

For this reason, the Campania region has tried to develop "reactive" measures of economic and regional politics centred on the strategic behaviour of the actors, on the creation of innovative development milieus, and on the implementation of major projects involving economic promotion and innovation, the creation of specific resources, and competence in the field of academic and professional training, local marketing, etc. In this context, the so-called "immaterial infrastructures" play a fundamental role. In the eye of policy-makers, they appear to be able to reinforce a region's competitive advantage and its capability to attract investment.

The main purpose of this policy is to encourage the spread of knowledge (education, training, and stages), technologies, and innovation; to increase social capital and stimulate entrepreneurship; and to give specific support to company networks by providing services such as research and development, finance, accounting, commercial services, marketing, personnel selection, foreign trade, etc.

From what we have said above, it would seem that in Campania, ever since the late '90, the regional government has been striving to develop a regional institutional framework capable of strengthening human resources, and thereby to promote the spread out and integration of knowledge in the regional industry as the main source of innovation and competitive advantage. In the specific case of the aeronautic sector, this policy seems to have provided an adequate answer to the demands of those companies, whose need of anticipating and incorporating the increasingly fast technological changes of the global market has made human capital a crucial factor, and training and lifelong education as the driving force behind innovation and regional competitiveness.

The institutional leadership of the regional government was strengthen by the decentralisation process promoted in Italy by the National Government, which retain only the coordination and harmonization of the intervention strategies (i.e. the definition of pluri-annual objectives of national

expenditure for research and high formation in meaningful percentage of GDP or the creation of tools to support the research, production and innovation activities, see DL 297/99).

The decentralisation, together with the subsidiarity principle, promoted in the regions to a renewed development of public institutions, research centres and traditional organizations of services as the Chambers of Commerce, the Industrial Associations and the Financial Institutions. The multiplication of public or private organisations supporting local firms implicated to start thinking in terms of co-ordination and interaction, at local level, among private and public organisations.

The co-ordination has been solved by several organisation, reflecting the international, national, and local context. Nevertheless among the consequences that they have behaved, there has been the development of new systems of relationships, whose organization modalities are not still defined and consolidated precisely. Then, in recent years, to make up this situation, it was looked for to found decentralized interface nets, open toward the outside and, above all, toward Europe, that were able to effect a first diagnostic evaluation of the SME's demands and abilities with the purpose to direct them toward sources of specialized support.

In Campania region, the interviews point out that many actors involved in the development of the aeronautical sector have matured a deep awareness of the necessity of a "proactive" economic politics, in order to increase the competitiveness "not-from-costs" and to stimulate the strategic competitive position of the local productive system through a greater quality of products and services.

In answer to the changes of the market and the complexity of the innovation context, besides, the "imposed" objective was to contribute not only to increase the competitive ability of the firms by strategies and programs of technological innovation but also by the formation of new skills required by the technological evolution, promoting the use of regional knowledge, competences, know how and technologies. Therefore, in the last five years, there has been a spontaneous proliferation of initiatives addressed to find a convergence among the operators demands, merging specific local needs with the opportunities offered by intermediate institutions able to assume a catalyst role for the cluster development.

In such context, the Campania region activity has particular relevance, trying to gather together local competences and excellences in the R&D, reorganizing their expectations to favour a more applicative orientation. As a starting point, the regional government individuated and defined, together the MIUR (Ministry of Education, University and Research), a "regional strategy for the innovation". The documents defined also specific instruments for promoting research and innovation in the most strategic sectors, such as the aeronautical sector. In the Regional Operational Program 2000-2006 (POR), main interventions concerned both the promotion of the innovation demand by the local productive system, and the organization of an articulated technological offer on the territory, through the structures of the regional research system networking. Particularly, on the side of the innovation demand promotion, the strategy has foreseen for the SMEs an intervention of "animation" by granting the acquisition of services finalized to the R&D project definition (as the search of technological partners) or to the realization of an industrial research project (art. 11-law 598/94). As regards to the reorganization of the research stock, the strategy has established Regional Centres of Competence, which represent a "demonstrator" project to put together regional research organisations, services organisations, social institutions, public bodies, and large firms in the Campania, but also an organizational and managerial model to valorise the research activities in terms of technological transfer and new entrepreneurship.

The strategy of the sector has been, then, completed by the promotion of the connections among research, local development and new occupational "basins", and, coherently with aims of the European Council in Lisbon, by incentives for the birth and the development of innovative enterprises.

The advanced state of realization of the strategy has allowed, later on, a rescheduling, as an extension of the intervention lines pointed out and crossed, on the necessity to promote mixed public-private initiatives and investments in the applied research in the high technological sectors.

Particularly, the Campania Region has undertaken, as further priority, the specific objective " to favour the enterprises internationalization and the promotion of the trans-border and trans-national economic integration ." To such intention, together with the Ministry of the Productive Activities, the ICE (National Institute for the External trade), SACE (Institute for the Assured Services of the External Trade), SIMEST (Italian Society for the Enterprises in the foreign countries) and the regional Chambers of Commerce, has stipulated, in May 2001, an operational convention for the constitution of SPRINT, a regional organism of innovative services finalized to the support of the enterprises internationalization, whereas companies, institutions and representative corporate bodies can find nowadays a single interlocutor which to advance proposals and to signal dysfunctions and problems.

As regards, particularly, the aeronautics, the phase of realization of such strategies has favoured (over that the promotion and the support to the enterprises through activity of animation, scouting and incubation) continuous processes of contamination and integration among the stakeholders, public and private, involved in the development of the sector. In this context, of notable interest results the testimony constituted by the CARN - Campania Aereospace Research Network, born in 2002 under the auspices of the Campania Region, whose activities, see the share of other privileged interlocutors within the development of the sector as the University (Department of Aeronautical Planning, Faculty of Engineering, University of the Studies in Naples “Federico II”) and Research Centres (CIRA – Italian Centre of Aerospace Researches, and the IMCB-Institute for the composite and biomedical materials of the National Research Council) as well as of some majors among the enterprises as Alenia, Avio, Piaggio. The principal objectives of the CARN are:

• Information interchange and dissemination;

• Systems of training by programs of specialised formation, financed by the regional funds and specific incentives of the Region, that answer to the demands of the network members;

• Development of pre-competitive research.

In the research collaboration activity, the members of the network share a same interpretation of the needs and answer to its maintaining own identity. This happens through the realization of specific shared projects, at middle-long term, that allow the realization of strategic industrial innovations, and, at meantime, they furnish enough resources to the expansion, by the base research to the applied one, of the most promising themes, assuring, finally, the transition of technology in products and industrial services. The network offers, besides, both the opportunity to form a critical mass (human and financial resources, infrastructures) with the purpose to furnish remarkable technological innovations, both the possibility of growth in the scientific competitiveness thanks to the sharing of costs and job and the management optimized of the resources of the same net.

Another of the principal tools to develop the actions strengthening the ties between research and enterprises (so that to reach conditions of “break-up” with the preceding models of local economic development) it is considered “technological district.” With this expression we intend a geographical concentration of people, firms and public and private institutions that collaborate and compete in a specific industrial sector, characterized by an elevated technological content. These new models of agglomeration born and develop under the push of four well recognizable factors: the engagement of the public institutions, the intervention of innovative firms, the share of the private investors and the presence of talents.

In this optics, the Campania Region, in agreement with the MIUR, has promoted in 2003 the birth and the growth of a technological district on the Engineering of the Polymeric and Composite Materials-IMAST, consortium among enterprises and research centres, which attend the University Federico II, the National Research Council, the ENEA and CIRA, technological and industrial partners, and, for the first time, financial structures as S.Paolo IMI-Banco di Napoli, Fondazione Banco di Napoli and the Meliorbanca. In the operational centre have been equipped 2500 mqs of research structures and 1300 mqs of laboratories, shared by the public and private partners. In IMAST work over one hundred researchers, there are installed research centres of different firms and there are studied, projected and realized innovative materials for the sectors of: aerospace, naval, automotive, biomedical, polymeric electronics, building. The consortium has the mission to realize a research, training and technological innovation system in which are integrated the objectives of knowledge development and growth of the know-how to apply to the products and industrial processes above all for the companies partners. The initiatives of the Technological District, that has the role of national leading, have the general objective of the territory growth and are focused on three macro-lines:

- To reach the international excellence in the research, becoming leader in the engineering of the materials and in its industrial application, through the cooperation Academy-Firm;
- To attract and to form the talents, becoming a pole of attraction for the best international talents in the field;
- To promote new technological entrepreneurship, creating new enterprises that "food" the technological development of the region and spread the innovation created in the industry.

Therefore, it clearly emerges that Universities and Research Centres, as privileged places of knowledge production and development, have a dominant position in the process of public-private sharing related to the aeronautical sector. In fact, if in the case of the Research Centres the pursues objectives are coherent with the national strategies and with the demands of the enterprises, the interaction between didactics and research, at the bottom of the universities mission, assures a constant tie among production, transmission, diffusion and use of knowledge and information.

The opening to the international dimension of both, besides, qualifies subsequently their function of interface, able to report the world of the enterprises with the different competences and experiences present at micro (local), macro (national) and trans-national level. In general terms, the relationships with the enterprises of the aeronautical cluster are, in fact, consolidated and, in the most greater part of the cases, formalized through contracts and conventions and/or the joined share to initiatives and events. They concerns both training of specific skills required by the firms, both the research and technical advices or services. The participation at network and consortia contributes to valorise the research relationships already implemented, and to create new opportunities that can allow the synergism realisation on the side of the research demand, over that, obviously, on the side of research activity offer. It also establishes, additionally to the accords of collaboration stipulated with other institutions and national and international organizations, a sort of integration between the short nets and the long ones that already characterized the system.

To this intention, exemplificative appears the case of the Department of Aeronautical Planning (DPA)- University Federico II of Naples, that has been one of the promoting subjects of the CARN and the IMAST. The DPA, having a solid tradition of excellence of its graduates, based on a narrow and profitable tie with the industry and the scientific aeronautics community, participates, through the Italian section, presided by Finmeccanica, to the Advisory Council for the Research on the aeronautics in Europe (ACARE). ACARE is composed from 39 members coming from the European Union

member states, Eurocontrol, European Commission, representatives of the European aeronautical industry and its customers. It has the mission to define and to affect the strategic Agenda of European research in the aeronautical sector. In March 2005 ACARE-Italy has produced a programmatic document "the Italian Vision on the research and the technological development of the aeronautical sector", introduced to ACARE-Europe, in which it is defined a strategy for the activities of technological research and development (R&D) of the Italian aeronautical sector, considering its relapses on the efficiency and quality of the aerial transport system and, also, the social importance, the economic value and the contribution to the comfort and the safety of the country. The document, in agreement with the strategy fixed by "European Aeronautics-A Vision for 2020", has the goal to maximize the efficiency of the national system of R&D, positioning it coherently with the lines of the European research in the sector, and, at meantime, safeguarding and promoting the specific development of the country.

As regards the services organizations with particular reference to the Chamber of Commerce, the Industrial Associations and other societies involved, it is to underline, above all, the importance that derives from their nature of intermediate institutions, deep-seated on the territory. In the process of definition and realization of knowledge management strategies and in the sector development, they represent and/or connect different interests. Therefore they have the possibility to mediate among different subjects, as the enterprises (companies and SMEs) on the one hand, and the public institutions, the university and the research centres on the other. In the relationships system among the different stakeholders, such organizations are, therefore, in a dimension able "to exalt" the horizontal and vertical articulation of the responsibilities and of the decisional centres, assuming, overall, the role of "system integrator", with the mission to activate and to strengthen the synergism and the cooperation processes among the actors.

In this direction, there are a lot of tools and activities realized by the different organizations, often within common and connected initiatives also with the other actors of the system. In general, they concern the promotion of sector studies, workshop and meetings among enterprises (particularly among the local SMEs and the homologous ones of the aeronautical pole of Tolosa), and other initiatives articulated mainly in three principal issues:

1. training finalized to the intersection between demand and offer of the professional figures in the considered sector;
2. the services production according to a model of "knowledge and internet organization" based on organization criterions for processes of knowledge management, co-makership (involving "suppliers" and customers) and learning organization;
3. the institution of "permanent observatories", constituted with the objective to pursue every opportune action to promote the development of the aeronautical sector.

As regards the first issue, the activity of Industrial Union of the Province in Naples (U.I.) is particularly relevant to estimate the relationship system relapse on the local development. This organism has promoted for a long time the link among firms and University, carrying out it, since 1990, through conventions with the Athenaeums. Particularly, the first level of integration has been that related to the availability of the entrepreneurs in partnership with the U.I to develop training courses for undergraduates in their firms. From 2003, the U.I. has started a connection of own website with SOFTEL, a structure responsible for the promotion of the University apprenticeships, so founding by informatics a "Counter University Apprenticeships".

The second level of integration has been activated for some degrees of particular importance for the economy of Campania region and Piemonte region by the Project "Campus Nord South", producing the first graduates in three innovative curricula in Aerospace Engineering, Electronic

Engineering and Science of the Materials/Packaging, required by the local firms in Turin, Alexandria and Naples. The third level of the possible synergism has been activated, in experimental way, by the program “Campus One” that, in the training courses founded, has resorted to entrepreneurial testimonies, integrated between them; a further level of the didactic integration Union-Athenaeums is represented by the university Master and by the education and superior technical formation (I.F.T.S) that Union promotes through agreements among firms in partnership, schools, professional institutes and university, answering to POR (regional operative programme) and using regional funds. Further testimony of a certain relief in formative context is constituted by the CONSAER -Consortium for the development of the Aeronautical Firms. Born in 2000 under the auspices of “Sviluppo Italia s.p.a.”, a national agency for the south –Italy economic and entrepreneurial development of the Ministry of Treasury, the Consortium is sustained by partners as ATITECH s.p.a (Alitalia group), Avio, Officine Aereonavali Venezia (Finmeccanica group coordinated by Alenia), etc. CONSAER essentially deals with activity of formation and training in technical managerial context, serving as interface among demand of specialized personnel by the enterprises and offer by training societies.

Also for the services related to second issue (production of services according to a model of “knowledge and internet organization”) the offer is manifold and different, from the tools proposed by TECHNAPOLI - a Scientific and Technological Park (PST) of the metropolitan area of Naples and Caserta- in research activity, technological transfer and training, to the others ones realized by CESVITEC- Centre for the promotion and the technological development of the SMEs in South of Italy- a Chamber of Commerce Special Agency , active in Naples since 1972 in the field of connection research-firm, innovations diffusion, support to the technological transfer, valorisation of the research products and services. Among these last ones, it appears of particular utility the product “Symbiosis”, a service realized by the" Program of agreements among SMEs in South of Italy" promoted by the Chamber of Commerce in Naples and co-finances by the funds of the Chambers of Commerce Italian Union. “Symbiosis” has the objective to develop the fundamental information interchange among large and small enterprises on the respective demands, ability and competences, so facilitating the collaboration relationships, as, for instance, the traditional subcontracting opportunities or more advanced forms of cooperation and partnership, and the knowledge diffusion.

As regards the institution of “permanent observatories”, the Engineers Association in Naples is particularly active to support the aeronautical sector through the activities of the Committees of Technological Innovation Research and of Aerospace and Telecommunications. In this domain there is also the Aerospace Observatory, founded by the local Industrial Association in March 2005, with the objective to promote the enterprises aggregation in the sector by constituting consortia at local, national and international level. To this intention, on August 26 2005 it has been signed an agreement protocol among the Campania Region, the Chamber of Commerce, the AIAD (National Industries Association for the Aerospace and the Defence), the Engineers Association Aerospace Committee and the Confederate Labour Unions, that have constituted with the Industrial Association of Naples a permanent “Table “ on the Aerospace.

Among the interlocutors considered by the investigation, aren’t missed the financial institutions, characterized, nevertheless, by a scarce interaction with the others actors, above all with the industrial management, whereas the relationships are almost exclusively established on the base of individual social capital, developed over various years. Overall, according to the entrepreneurs, some of the greater obstacle to affirm trust relationships between enterprises and financial institutions appears the practice of higher rates of interest, diversified among the north and the south of the country, operated by the banks. According to these last ones, on the contrary, the greater obstacle is the lack of interest by the entrepreneurs to involve the banking system in the project financing of their

firms. Currently, nevertheless, there is a turnabout: S. Paolo- Imi Banco di Napoli, one of the greater bank localised in Naples, and the principal banking groups have levelled the rates and, according to the norms BASEL 2, they are equipped with a series of financial products for the enterprises. These "products" are finalized to the innovation, internationalisation and aggregation development and are based on an intense interchange with the firms and on the supply of additional services.

The above analysis of case studies seems to confirm that specific conditions and factors have given rise to "interactive learning processes" and "a participatory environment". But what is the actual scope of these "interactive learning processes"? Are the mechanisms of governance developed in the process examined above capable of determining "a satisfactory evolution of the participatory environment"? To answer these questions we have undertaken a more in-depth analysis, from a multilevel governance perspective, of the relations between the main actors involved in the development of the sector.

6.3. Multi-level governance vis-a-vis local governance

A satisfactory evolution of the "participatory environment" and a multilevel governance process require some pre-conditions as for the public authorities are concerned: first of all they should be endowed with competencies about negotiation processes and management; secondly, they should pursue results and networks building, not just the defence of their prerogatives.

Moreover, a continuous active participation by the other shareholders (like the private sector and the other local intermediate institutions) implies a full involvement during all the phases of analysis, co-decision, evaluation and control of a project or plan lifecycle. This means that these subjects must have an adequate access to information, to advisory boards and to negotiation with the relevant public bodies. The case studies show how far these conditions are met in different organizations.

Particularly in our analysis we firstly focus on the topology of information and knowledge networks established in the local area, assessing their structural characteristics, as to unveil their texture and inner properties; then we analyse to what extent actors' linkages are based on strong or weak ties. The next step of the analysis is to investigate whether and how they are fragmented or polarised. In fact, the partition of networks in either few or many communities (i.e. subgroups, partitions, core periphery structure, etc…) is an important issue because it may affect the extent to which knowledge and information circulate within the local system. Finally, in such context, we conclude analysing if the participation of public authorities, on one side, and intermediate institutions, on the other side, makes possible to guarantee margins of efficiency to the operational contexts within which stakeholders act and, at meantime, to rationalise and plan the reproduction processes of economic, social, and political relations on a wider scale (national and international).

About the network structural properties, our empirical findings suggest that in the analysis of networks the conceptual distinction between the mutual density, that counts only reciprocated contacts, the non-directional density, wherein all contacts matter even if they are not reciprocated, and the value density, based on valued relations, which takes into account not only the number of linkage but also the quality strength of each relation, is very relevant. In fact, comparing the above densities within the network we firstly observe that the mutual density is rather low. In general terms, it regards only the linkages of some specific non industrial organization like public authorities, the principal research centres and universities with the large and medium enterprises. In this case the relations are formal, institutionalised on research and training projects and characterised by a knowledge sharing.

Conversely, when also not-reciprocated contacts are taken into account, there is a substantial increase in the network density but in this case the relations are informal, concerning, above all, the

SMEs, based on an individual social capital and on information's exchanges. These findings are interesting because provide a preliminary evidence supporting the argument that knowledge is shared by a relatively smaller number of actors with respect to information, confirming the degree of reciprocity. Another key element to qualify the features of the network is, in fact, the strength of the ties and, therefore, the value density. According to our results, we observe a dominance of weak ties in the information exchanges and a prevalence of strong ties in knowledge network, whereas reciprocity entails high stability and trustworthiness and it is commonly associated with strong ties while in information exchanges the degree of reciprocity is always lower.

The above results also suggest that we are analysing a networks where relational capability is much higher for some actors than for others but also that knowledge and information are not appropriated and controlled by one single actor. This means that the network is far from a typical configuration where a central "leader" actor controls all the flows, and the relatively high degree of heterogeneity of the stakeholders proves that there are different abilities to participate to formal and informal exchanges, in particular those concerning knowledge and interactive learning. Nevertheless it further indicates that exists a differential access to informational resources in the local system, suggesting the existence of a core of actors dominating the network.

In our case studies, therefore, we find that the hard core - sharing a great amount of local knowledge- is populated above all by large and medium enterprises, public and private research centres and some universities while, more in general, we have monitored the weakness, and sometimes the inexistence of SMEs and the intermediate institution role in influencing and stimulating the multilevel governance process within the network. In terms of impact – even noticing the exception of some isolated cases in the actions of regional authorities and some private organization – the difficulties found to realize common plans underline the need to focus on individual and collective mentality's change and to consolidate structures and institutions able to support this change.

In this perspective the network expansion becomes very important, since, in most cases, it is blocked at a regional and local level; and so are the density properties and the diversification of the relations. Particularly, to promote the growth of the cooperation ability in the territory and to consolidate in effective way the territorial system of innovation is necessary to undermine some invisible barriers, such as the scarce mutual knowledge diffusion in the local context, the problems of communication and language between the different actors; the difference of the systems of values and discrepancies of competence and technology among large companies and SMEs and between firms and others non industrial organization.

It is necessary, besides, to activate in the governance of the network such mechanisms that allow obviating to the almost total absence of financial partner and to a scarce convergence of the policy options, an insufficient cohesion in the strategic lines of the different organisms at local and national level.

In fact, despite the manifold initiatives and the tools realized by different organizations, it notices still a certain fragmentation of decision-making centres, dispersion of authority, reduction of responsibility. This implies an insufficient level of coordination among the actors and, above all, the absence in the governance process of a public subject as a strong catalyst, capable to promote, to mediate ant to represent the collective affairs.

As regards the first factor, it is important to note that, if we regard economic systems as complex and evolving, their main functioning problem is coordination, i.e., how to guarantee that the various agents involved will maintain a coordinated behavior so as to attain the desired aggregate result, and attain this result without dissipating resources. In the network paradigm, information travels through an interactive and relational process, and knowledge is accumulated through continuously

evolving learning processes. Thus, the network paradigm can never perfectly reflect an abstract model. It works in mixed modes integrating different combinations, and goes through evolutionary and adaptive processes, both dynamically (in time) and spatially (through regional diversification and integration). As a consequence, in the aeronautic sector in Campania, as in other sectors, the decisional sequences of agents are not based on the principle of substantive rationality, but on that of procedural rationality leading to "satisfactory" decisions reached by progressive adjustments. In other words, the behavior of agents is the result of a decisional sequence based on available knowledge (which is always incomplete) to reach "satisfactory" results. Thus, the decisions taken are satisfying, not maximizing. Moreover, since these decisions are reached by progressive adjustments, 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 of new information about the new modified scenario, and of new strategic hypothesis. Hence, to achieve coordination, organizations need to learn rapidly. By learning, we do not mean the accumulation of information, but the processing of knowledge in view of redefining objectives, problems, and strategies. In the case of the Campania aeronautic sector, as we observed above, this only occurs in a small number of the case studies analyzed here. Most of the sector actually shows a lack in "consistency of the interactive learning process". Furthermore, to enact effective governance, all subjects need to participate in organizational learning processes by spreading the knowledge in their possession. This need arises, on the one hand, because knowledge is no longer concentrated in the hands of a few privileged subjects, but is dispersed among a multitude of economic agents and social actors; on the other, because not all knowledge items can be produced, categorized, and circulated as commodities within a market system. Such an approach can only be adopted for knowledge items classifiable as "know-what" or "know-why" - i.e., abstract or technical knowledge - whereas "know how" and "know who" - practical knowledge - is unspoken and incorporated in interpersonal relations; hence, it can only spread over communication and relational networks based on social cohesion and participation.

As to the presence in the governance process of a "catalyzing" public entity capable of acting as a mediator and representing collective interests in the network, our empirical investigation indicates that the Campania region could be regarded as such an entity, both for its purely institutional role, and for the activities and resources it has deployed in support of the Campania aeronautic sector. However, the data we have collected in the field indicate that the Campania region often failed to interact with other actors and its leading role in policy enacting was hence undermined. Although it had the institutional power and functions, the Campania region was unable to fully achieve vertical coordination with other national and local institutional subjects, and horizontal coordination with all the other socio-economic actors in the network. The reason is probably that the Campania region has been unable to stimulate interaction processes leading to the rise of a governance capable of coordinating different actors. In other words, its action has not allowed all the actors to benefit from their interactive participation. When this occurs, a participative network can become a merely formal procedure or, even worse, a bureaucratic scheme which actually interferes with decision-making. One of the possible reasons for the failure of participants to benefit from the network may be an unbalanced distribution of advantages deriving from the participative and cooperative process, whereby some subjects were cut off from these advantages. A lack of agreement on the rules regulating distribution could have fueled such a situation. A further reason could be a failure to recognize the link between the improvement of an actor's individual situation and the selfsame actor's participation in the network.

Another necessary condition to keep a participative network from losing its effectiveness is to eliminate asymmetries in the circulation of information, a problem we have sometimes observed in the

network under study. Such asymmetries result in distorted decisions and undermine consensus, hence discouraging participation. This is what happens, for example, when governance structures do not allow full access to information to all actors, intentionally, or due to deficiencies in their communication strategies. Furthermore, it is necessary to guarantee that agreements entered into will be observed, and clearly define what the objectives are and how long it will take to reach them. Decisional rules have to be agreed upon, and the clauses of the agreement must be respected. Each subject's function and participation in benefits must be defined. Otherwise, the subjects' involvement will be emptied of meaning and opportunistic behavior will be encouraged.

Definitely, the key idea expressed is that a governance process to be effective has to be perceived not as an exogenous imposition, but as a reflection of an endogenous process of mutually shared behaviours. So that, to result fully functional to its economic development policy's objectives, it has to promote from the bottom diffusion mechanisms and incentives system in order to induce actors to bear maintenance costs for the implementation of the opportunities' sets mainly shaped by strategies. The cost is represented by the sacrifice of the economic agents and other actors to converge and sustain cooperative behaviours, either giving up or mitigating opportunistic behaviours. This undoubtedly seems to generate a trade-off between actual individual performances and social future performances. So we stand for the essential integration of the themes related to governance mechanisms in the development's drivers. The themes' horizontal mainstreaming in the different development sectorial policies have to be matched their mainstreaming on planning and implementation different levels (local, regional, national, international) in an integrate way. As a matter of fact, interdependence ties all the spaces- from the local to the global one in one system. So it is necessary to act simultaneously on the interconnections of all these space regions. It comes from here the importance of the interaction among the international Community, the National Governments and the local authorities in a multilevel governance. One of the policies standard to support efficiently from the bottom the governance implementation process refers to take steps as: tools and interventions to generate a change in the cognitive sphere of the actors; tools to favour information's diffusion and knowledge related to efficient practice's transferral; tools to promote cooperation; educational tools to improve both capacity building and managerial competences. The composite combination of these immaterial resources represents the policy production factors and therefore the maintenance costs of the efficient implementation of the governance process. A further policy indication deriving from our study- cases is that even if they would configure as exemplifying of the best practice in a national contest, they represent the well known problems of a governance model exportability, reinforced from the fact that, generally, the condition for success is tied to a leadership conditioned by the context situations, provided of specific experiences and strongly motivated (history role).

In the end, for an efficient governance implementation the actors' socio-economic game identifies two elements that have to act simultaneously: institutionalised connection and actions' complementarities. Institutionalised interactions refer to strategic coordination of individual actions in different game's domains, through these interactions are produced externalities deriving from actions complementarities.

In conclusion, on the base of these considerations, it is necessary a consolidation of the actual context, strengthening the long-term evolution of the politics and the strategic approaches of the different stakeholders and reciprocally recognizing as source of competitive advantage. In this way could be possible to increase the strength of the nets and to produce new knowledge for the cooperative innovation among local and regional systems, stimulating, at meantime, the transnational partnership between agencies of innovation and transfer.

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