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A GAP ANALYSIS OF REGIONAL INNOVATION SYSTEMS (RIS) WITH MEDIUM-LOW INNOVATIVE CAPABILITIES: THE CASE OF CAMPANIA REGION (ITALY)

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ABSTRACT

The aim of this paper is to investigate the implementation of a Regional Innovation System (RIS) in the Campania Region, an Italian Region characterized by a medium-low innovation capability. The paper focuses on a comparative analysis using the data of the Regional Innovation Scoreboard 2009 and the data about services provided by the most innovative Italian Regions. The paper states that low performances of Campania Region Innovation System (CRIS) are due to the lack of actors that act as Catalysts between researchers, which play the role of Explorers of knowledge, and entrepreneurs, which play the role of Exploiters. Furthermore, the paper suggests that it is necessary a strong action of the Regional policy maker (the Governor) to build an effective environment where such Catalysts can effectively develop. To this aim the local Regional government should establish an Agency for Innovation, which acts as a Governor to promote the birth and the growth of new actors and of new competencies needed to complete the CRIS.

1. Introduction

Knowledge, learning and innovation are the most important factors for competitiveness in the global knowledge-based economy. (Lundvall, 1992; OECD, 2000). Research and innovation are prerequisites for sustainable competitiveness of both nations and regions. In recent years, it has been recognized that innovations are usually the result of ongoing and prolonged collaboration and interaction between enterprises and a variety of different actors. These actors include enterprises, customers, producers, consultants, research institutes and universities, etc. Also institutions, interpreted as normative structures, play an important role in promoting stable and efficient interaction and collaboration.

It has been suggested that the accumulation of technological processes occurs mainly on a local or regional level and that technological and knowledge spillovers tend to be geographically concentrated (Brenner, Grief, 2006). Geographical proximity (physical, economic, social) is important not just because of reduction of physical distance and associated transport and location costs, but also because it facilitates information exchange, lowers uncertainty, increases the frequency of interpersonal contacts, facilitates trust, diffusion of common values and beliefs, and promotes learning. Many studies have interpreted innovation processes in industrial districts as the result of different learning processes and stressed that the innovative capability of industrial districts is one of the most important factors of their competitive advantage (Aydalot and Keeble, 1988; Baptista, 2000; Enright, 1998; Krugman, 1991).

The emergence of successful clusters of firms in many regions around the world raised the attention of policymakers in Regional Innovation Systems (RIS) (Doloreux, Parto, 2004). The RIS is considered the most appropriate policy level for developing innovative entrepreneurship. The great interest raised by the RIS is due to the opportunity to focus public

resources in the development of local enterprises, especially Micro and Small Enterprises (MSEs), and of their business environment. The main idea is to promote interactions between different local actors that have good reasons to interact, such as small and large firms, manufacturing and service companies, industries and universities, private and public agencies. These interactions should foster local learning processes as well as regulatory and governance activities.

However, according to Doloreux and Parto (2004) the "diverse variety of regional innovation system types creates a significant degree of 'definition confusion' and empirical validation issues, making it difficult for researchers and policy makers to envisage what a regional innovation system is, or should be. The approach thus suffers from the absence of a unified conceptual framework from which a universal, albeit very broad, model may emerge to guide research and policy". They argue that, in order to "engineer" the RIS it is necessary to specify what the institutions are and how they interact in different systems, at different scales, or at different levels. RIS have different characteristics in different regions depending on their industrial specialization (Andersson; Karlsson, 2004).

Innovation systems in high-technology regions are most likely different from the innovation systems in regions specialized in traditional industries. Moreover, RIS can also be very different between Regions with similar industrial structures, according to different industrial policies and regulations (Tiwari; Buse, 2007). A relevant literature has been developed about RISs operating in high- technological environments (Cook; Memedovic 2003;), but few studies investigated RIS in medium-low innovative Regions. Campania Region is ranked as medium-low innovative Region, second to last on five, in the European Regional Innovation Scoreboard, a performance tool comparing innovation performances across NUTS 2 (Nomenclature of Territorial Units for Statistics) Regions (Pro Inno Europe 2009).

The aim of this paper is to investigate the implementation of a Regional Innovation System (RIS) in a region characterized by a medium-low business environment and to answer to the following research questions: i) what are the barriers to the effective implementation of a RIS in a region characterized by a medium-low level of innovativeness as Campania Region (Italy)? ii) Which policies have to be implemented and which actors have to be involved to increase the effectiveness of RISs in this kind of Regions?

The Region under investigation in this paper is Campania Region – Southern Italy. Campania Region is the largest region for population and GPD of South of Italy (5.812 millions in 2009, ISTAT). It is characterized by a high density of manufacturing firms, but the capability to export is low (2,6% in 2009, ICE) (Tab.1). On the other hand, there is a large number of researchers (5.796 in 2009, MIUR), but the capacity for innovation is medium-low, as highlighted by Regional Innovation Scoreboard 2009 (Pro Inno Europe). It is clear that there is an issue at the system level that prevent the circulation of knowledge and technical solutions between the research world and the industrial one. Our aim is to analyze this issue.

Indicator	Value	Source
Population	5.824 millions	Istat, 2010
Density	428 ab/kmq	Istat, 2010
Total Workforce	1,650 millions	Istat, 2009
Industrial Firms	35,938	Istat Asia, 2007
Employees in Industrial firms	208,907	Istat Asia, 2007
Exporting Firms	7054	Rapporto ICE 2009-2010
% of exporting firms on Italy	4,3%	Rapporto ICE 2008-2009
Value of export	7880 millions	Rapporto ICE 2009-2010
% of export on Italy	2,6%	Rapporto ICE 2008-2009
Universities	7	MIUR, 2009
Researchers (2009)	5796	MIUR, 2009
% of Researchers on Italy	9,52%	MIUR, 2009

Table 1: Main characteristics of Campania Region (Southern Italy)

2. Barriers to the implementation of RIS

A Regional Innovation System could be considered as a complex learning system of interactive actions, influenced by dynamic processes within networks including different actors (Iandoli et al, 2010). A very general view of complex learning systems is provided by Schwandt and Marquardt (2000), which give us interesting insights about components of a RIS. Based on Parsons' functional social model, Schwandt (1997) define organizational learning as "a system of actions, actors, symbols and processes that enables an organization to transform information into valued knowledge which in turn increases its long-run adaptive capacity" (p. 8). According to Schwandt model (1997) four categories of actors take part in a complex regional learning system:

a) *The producers of knowledge*, namely the set of universities, research centres, public and private laboratories and their combinations (eg Regional Competencies Centres), large companies operating in technological sectors. This set of players is the subsystem of the *Explorers*, made by subjects that explore the boundaries of knowledge producing new ideas, new methods, new techniques made available to MSEs.

b) *The producers of market value,* namely the set of firms, especially small and medium enterprises. These actors define the subsystem of the *Exploiters*, i.e. firms which are able to transform knowledge into value for the market.
c*) The mediators of innovation*, such as Liaison Offices of the Universities, Science Parks and Technology Incubators, Trade Associations, Chambers of Commerce, Industrial Districts, Industrial Associations. All these actors act as *Catalysts* or facilitators in the complex process of transfer, adaptation and utilization of knowledge.
d) The fourth actor is a *Regional Innovation Agency*, playing the role of *Governor* of the system.
Relationships among these actors are not smooth. The deployment of effective collective learning action among the four actors faces relevant barriers, widely analyzed in relevant literature (Ylinenpää 1998; Acs and Audretsch 1988; Mohnen, and Rosa 1999; Tödtling and Trippl 2005; Tiwari and Buse 2007.): *Financial bottlenecks,* such as hindered access to external finance, high innovation costs, high economic risks; *Bureaucratic hurdles,* such as long administrative procedures;, restrictive laws and regulations; *Cultural barriers*, such as limited internal know-how to manage the innovation process effectively and efficiently; difficult access to qualified human resources; lack of a collective approach toward innovation.; *Lack of professional and technical services,* such as proper logistic services and research laboratories, support to protect intellectual property rights; *Fragmentation of intermediaries of innovation and technology transfer processes.*; *Lack of synergies* among competencies and services needed*; Missing market know-how* to meet customer's needs and to enter foreign markets.
Particularly, according to Isaksen (2001), Regions within medium-low innovation environments are characterized by: low levels of clustering and weak endowment with relevant institutions, that is "organizational thinness"; lack of interaction and networks "fragmentation"; situations of "lock in".
Todtling and Trippl (2005) emphasize the "organizational barrier" as the main barrier for peripheral Regions, with a minor influence of "fragmentation" and "lock in" barriers.
It is important to note that there is no exclusive correspondence between these types of barriers and types of Regions. In many cases Regions in reality face a mix of these deficiencies.
The organizational thinness of peripheral Regions means lack of dynamic clusters and of support organizations, or, according to the Learning System above depicted, lack of actors playing the role of Catalysts. Tödtling (1992) suggests that the lack of clusters and the organizational thinness explain most of low performances in innovation activities of these areas. Old industrial Regions represent another typology of problematic areas where learning and innovation have been insufficient, despite of signs of renewal in recent years (Tödtling and Trippl, 2005). In contrast to peripheral Regions, where the lack of clusters appears to be a relevant barrier, old industrial Regions face the opposite problem of too strong clustering as they are overspecialized in mature industries experiencing decline. Metropolitan Regions are regarded as centers of innovation, benefiting from knowledge externalities and agglomeration economies. However, not all metropolitan Regions are innovative. Some of them lack of dynamic clusters of innovative firms, despite the fact that individual technology companies, R&D activities and research organizations may exist. However, the problem of fragmentation, the lack of networks and interactive learning seems to represent an important innovation barrier in such regions.
Campania Region, located in less-developed Southern Italy present the double characteristics of peripheral Regions and old industrial Regions.

3. Campania Region SWOT analysis.

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.
Campania Region represents almost 25% of the economy of South of Italy, while it represents only 6% of the national economy. These two percentages summarize the following regional problem: the Region has a leadership in the South of Italy, but it plays a minor role at national level. The South of Italy is characterized by a quite large number of 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. Campania Region is characterized by a large number of MSEs, operating in the traditional sectors, such as the clothing industry and the agro-food industry. They do not have an adequate organizational and financial structure and most of them appear impermeable to the diffusion of new technologies, and try to preserve their small size. Table 1 shows that in Campania Region there is a high density of manufacturing firms, but the capability to export is low. On the other hand, there is a large number of researchers, but the capacity for innovation is low, as highlighted by the Regional Innovation Scoreboard 2009, which ranks the Campania Region as medium-low innovator. It is clear that there is a problem at the system level preventing the circulation of knowledge and technical solutions between the research world and the industrial one. The Regional Innovation System is locked. Many players have no incentive to build collaborative networks extended in space and time. The prevailing models of cooperation are characterized by few players, weak ties and occasional aggregations on opportunistic basis to take advantage of specific opportunities, such as the availability of financial resources from European Programs.
It is essential to identify the opportunities of Campania Region through the valorisation of strong points and the containment of weak points on the basis of the scenario in which Campania Region is involved. The acknowledgment of internal strengths and weaknesses, as well as external opportunities and threats of the Region (Akca, 2006), takes place on the basis of a Swot- analysis (strengths, weaknesses, opportunities and threats). See table 2.

STRENGTHS	**WEAKNESSES**
➢ Availability of natural and cultural resources. ➢ Articulated presence of major university centres. ➢ Diffusion of entrepreneurial activities in some districts and areas. ➢ Strategic geographical position, reinforced by the development of intermodal hubs. ➢ Workforce characterized by growing presence of large young segment. ➢ Availability of work force with a degree. ➢ Development of regional high quality products for local and national markets. ➢ Easier access to higher education across decentralization and distance learning. ➢ High density of manufacturing firms.	➢ Weak cooperation among universities, research centers and private sector. ➢ Weak connections between educational system and the needs of the labor market. ➢ Lack of MSEs capability to develop collaboration with others in order to promote innovation. ➢ Lack of circulation of technical and scientific knowledge from researchers to MSEs. ➢ Many players have no incentive to build collaborative networks. ➢ Shortage of private initiative. ➢ Graduates leave the Region. ➢ Qualified work force lacking in strategic areas. ➢ High rate of unemployment.

OPPORTUNITIES	THREATS
➢ Establishment of conditions to facilitate access to innovation. ➢ Spin-off establishment, patenting and licensing are strategic elements to transfer scientific research results and to produce regional economic benefits. ➢ Services and technology transfer projects to support enterprises and research groups selecting the information and guidance channel to capture innovation real needs.	➢ Lack of a network between explorers, exploiters and catalysts. ➢ Relatively low educational level obstruct additional opportunities needed to satisfy labor market needs. ➢ Lack of collective approach toward innovation. ➢ Lack of professional technology brokers. ➢ Relatively low level of clustering amongst scientific environments.

Table 2: Campania Region SWOT- Analysis

CRIS has evident structural limits regarding innovativeness and the enabling factors that support the innovative process. It is necessary to raise levels of awareness throughout MSEs that innovation is a basic requirement for the future competitiveness of firms in an environment that is evolving as a globalised market. Campania Region seems to be particularly pulled down by the absence of MSEs innovating in-house and of MSEs collaborating with others. The priority for Campania Region seems to be the definition of strategic actions that allow the transformation of intangible assets into innovative outputs. Moreover, it is fundamental elaborating innovative financial instruments that remove the obstacles that still exist in order to develop innovative activities.
Furthermore, the matching of supply and demand of qualified knowledge will intensely impact on Campania Region innovative performance.

4. The Campania Regional Innovation System: a comparative analysis

The European Regional Innovation Scoreboard provides a comparative assessment of innovation performance across the NUTS 2 (Nomenclature of Units for Territorial Statistics) Regions of the European Union and Norway.
The data in the "Regional Innovation Scoreboard 2009" report, carried out by Pro Inno Europe, let us to compare Campania Region and other Italian Regions, and Campania and other European "Convergence Regions". The term "Convergence Regions" steams from the European Union's Regional Policy. This term defines Regions that are beneficial of Structural Funds and Cohesion Funds in order to reduce regional disparities and support regional development.
The comparative analysis proposed in this paper compares the values of the 17 indicators of the Scoreboard of Campania Region with the average values of North, Central and South of Italy, and with the average values of Convergence Regions in Spain, middle Germany, Greece and Slovenia.
The 17 indicators are grouped in three different classes, named dimensions. The benchmark analysis here performed is strictly based on the Regional Innovation Scoreboard 2009, taking into account data of 2004 and of 2006 (source RIS_2009_Annex_4 PRO INNO Europe).

4. 1 Descriptive analysis.

Based on indicators of innovative performance related to the years 2004 and 2006 it has been possible to analyze the trend of growth of the innovative performances of Campania in

comparison to the other Regions in Italy and with respect to the other European "Convergence Regions".
Figure 1 reports the trend of a global performance indicator (obtained by grouping the indicators for which it was possible to compare the year 2004 and the year 2006) from 2004 to 2006 for Campania Region and other Italian Regions. Starting from Figure 1 we can notice that the innovation performance generally decreases in 2006 in all the Italian Regions. The better performing Region is the North of Italy that represents an "Innovation leader" in comparison to the other regions of Italy. Campania Region is the worst performer both in 2004 and in 2006.
The same comparison can be done between Campania ad the other European Convergence Regions (Figure 2). Also in this case it is possible to notice that Campania is the worst performer in 2004 and in 2006. The other European Convergence Regions behave very differently: Germania Convergence Regions have the same performance in 2004 and in 2006. The Slovenia's ones show the same behaviour of Italy passing from 2004 to 2006, while Spain and Greece increase their innovativeness in 2006.

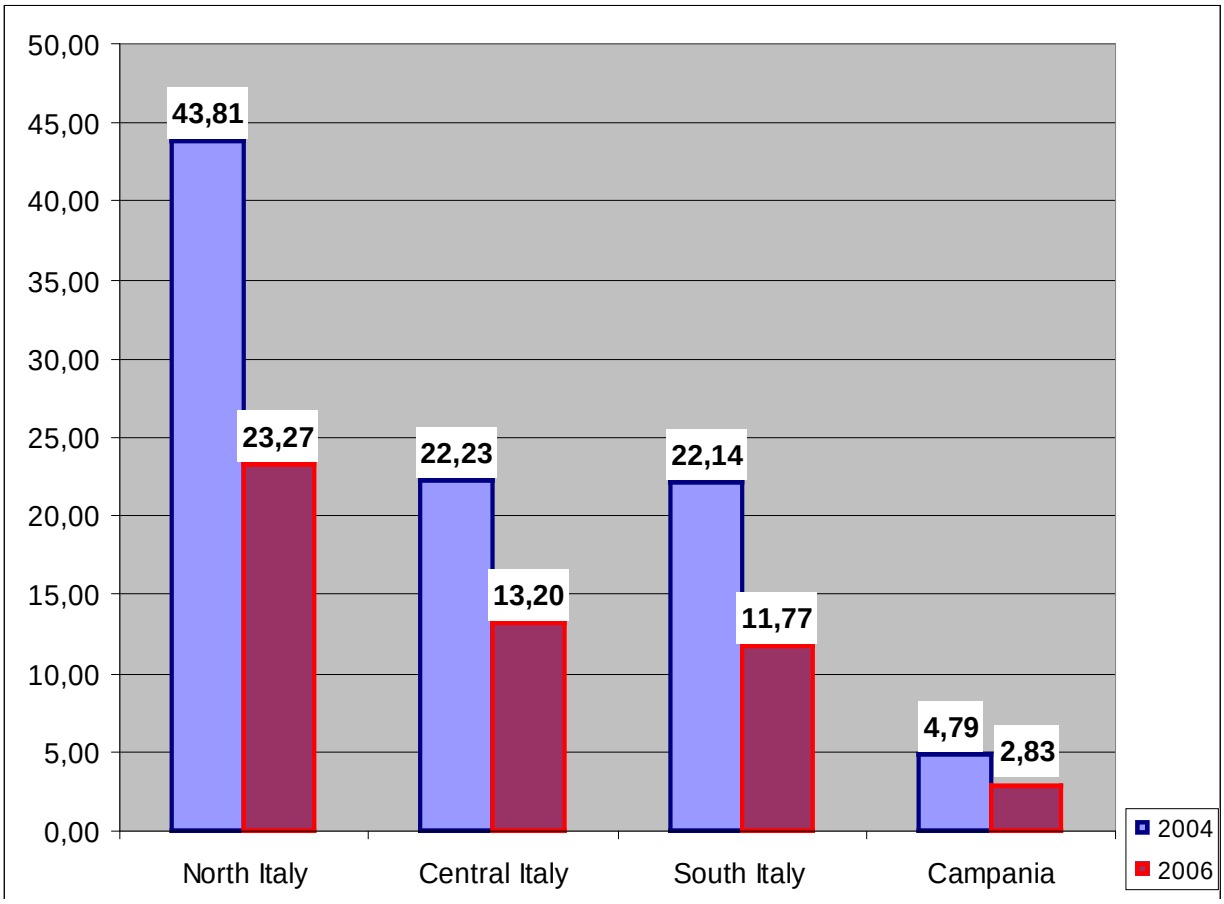

Figure 1: the innovation performance in Italy in 2004 and 2006

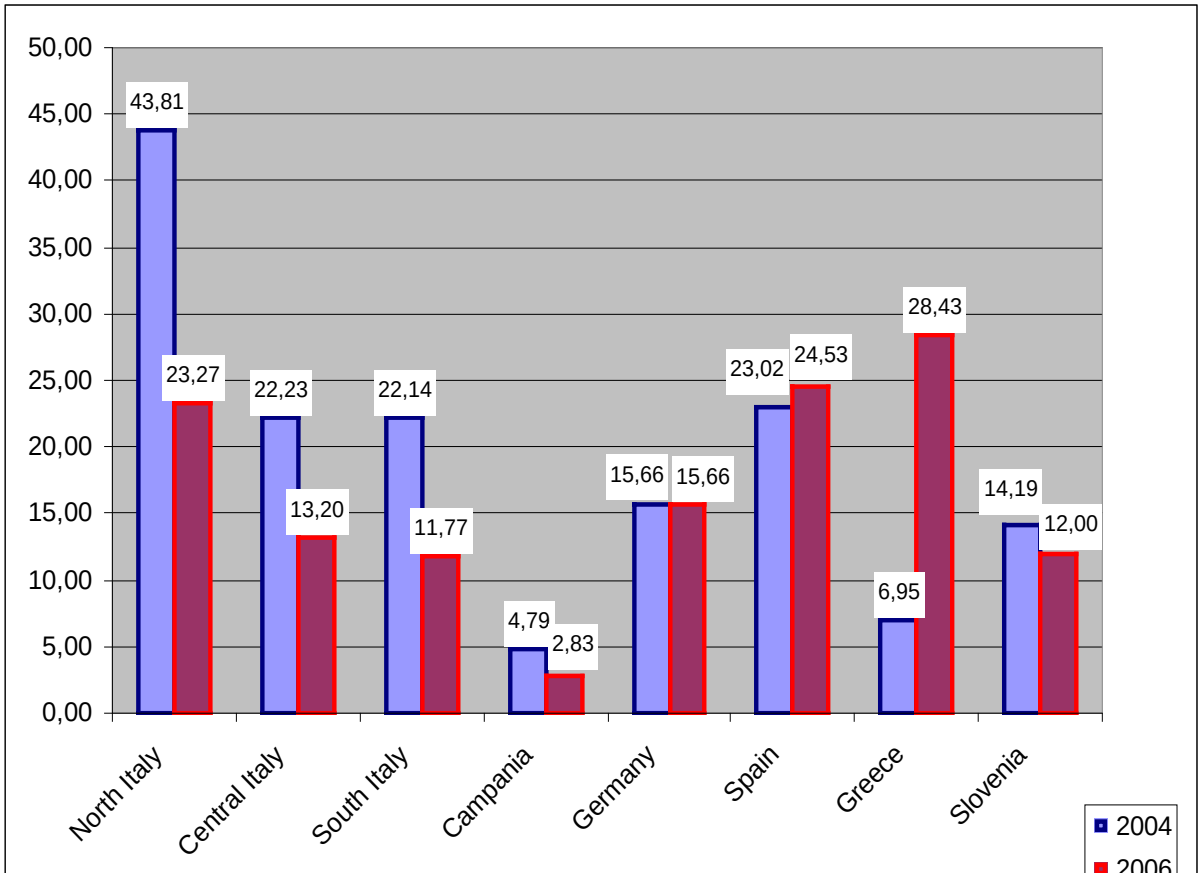

Figure 2: the innovation performance in 2004 and 2006. The comparison between Campania and the other European Convergence Regions

A further comparison to give a clearer idea of differences between Campania and the other Regions can be deduced by Figure 3 and Figure 4. According to another PRO INNO Europe classification, the analysed Regions of this study are grouped in four classes: Innovation leaders, Innovation Followers, Moderate innovators and Modeste innovators (including Campania). Furthermore, in these graphs the groups are compared with respect to the level they reach in 7 different innovation dimensions. Figure 3 reports the comparison made for the year 2004 and Figure 4 that of 2006.

The Innovation leaders and the Innovation followers have the smallest variance in their performance across the different dimensions. This suggests that high levels of performance require Regions to perform relatively well over all the dimensions of innovation.

For the Innovation followers performance in "Firm investments" is a relative point of weakness with respect to the Innovation leaders, whilst Innovation followers perform better of Innovation leaders with respect to "Throughputs" dimesion, reporting the level of EPO patents. As expected, the best performance of Innovation leaders concerns the outputs of innovation: the dimension "Innovators" and the dimension "Economic effects".

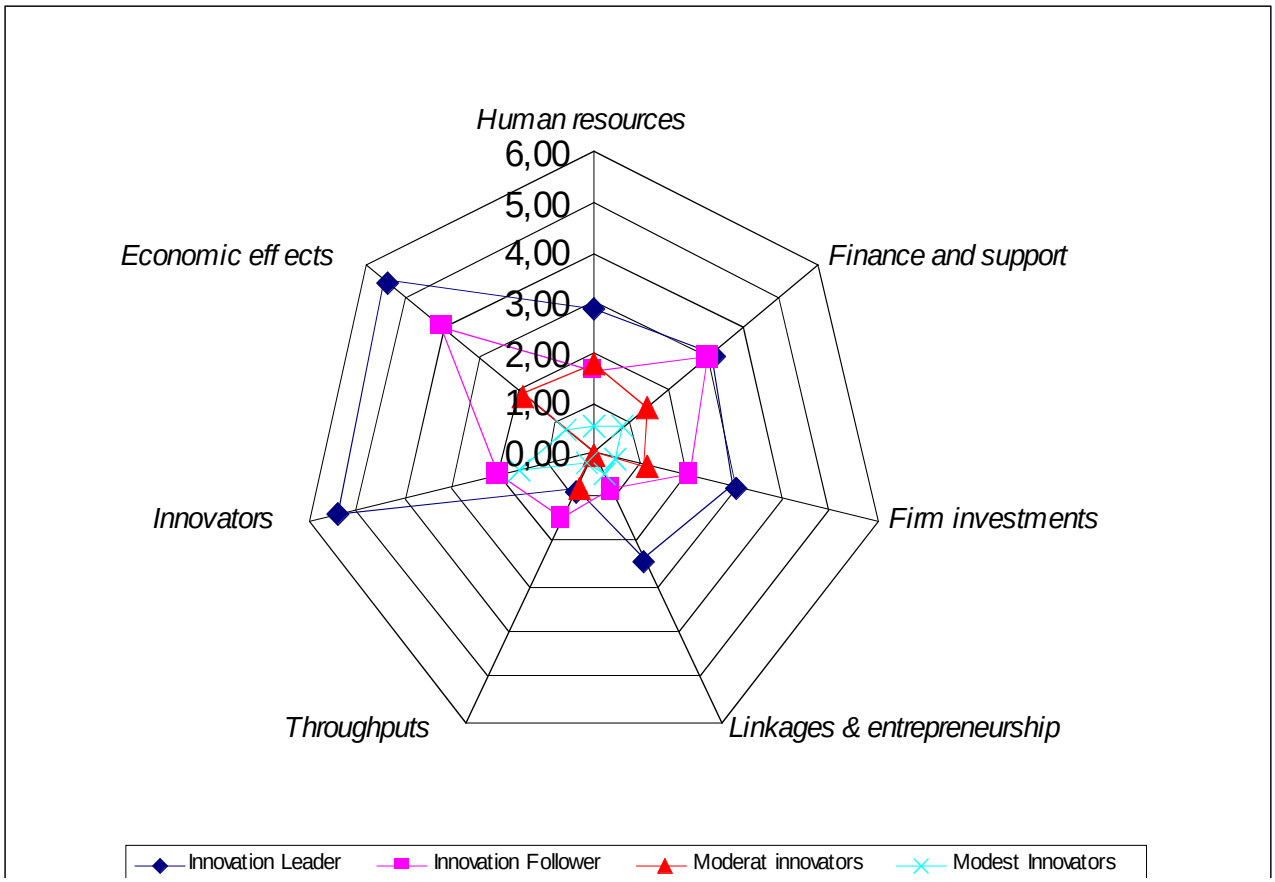

Figure 3: the comparison among Regions with respect to the value of innovation performance dimensions (2004)

The same graph for 2006 (Figure 4) shows a similar situation with respect to 2004 for Innovation leaders and followers. In addition we can notice that Moderate Innovators improve their performances with respect to Innovators and Economic effects dimensions.

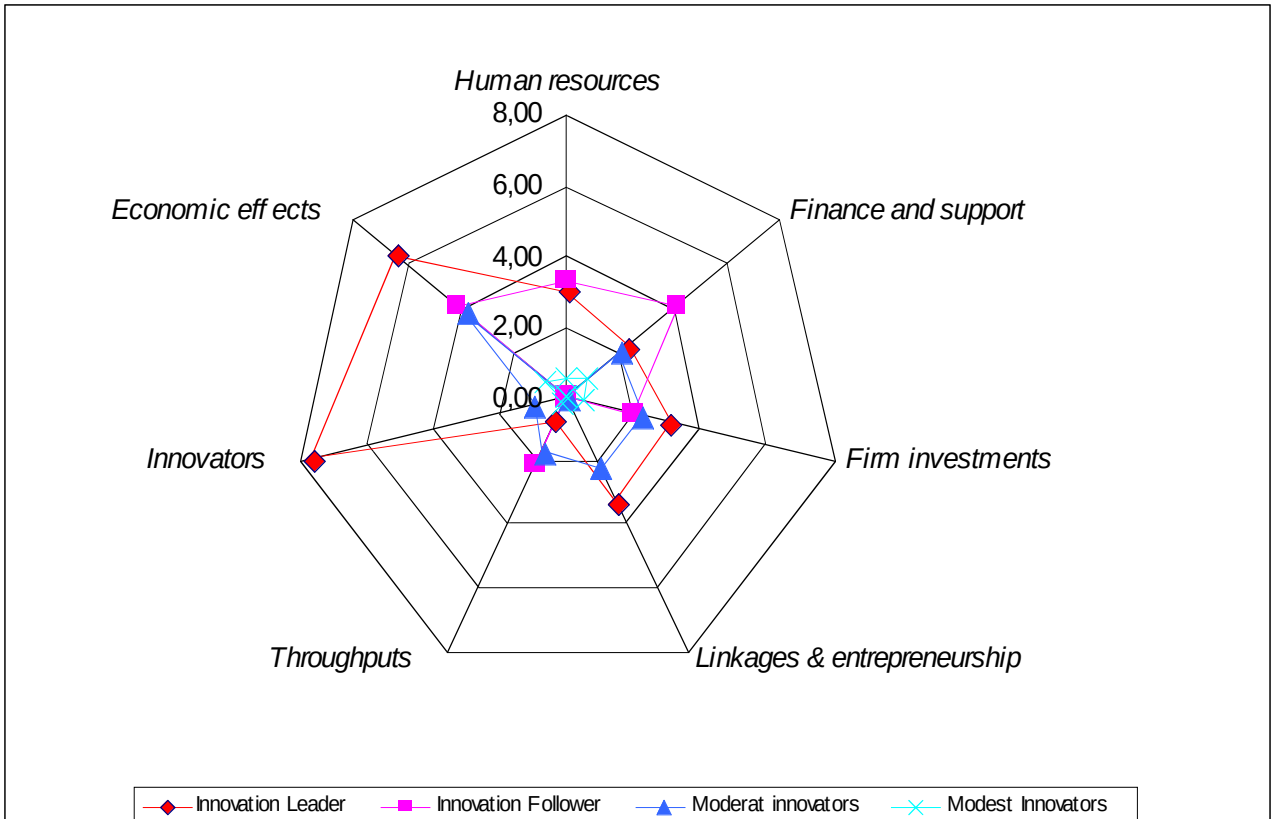

Figure 4: the comparison among Regions with respect to the value of innovation performance dimensions (2006)

Figure 5 and Figure 6 focus on Italian Regions classified in the four groups used in Figure 3 and 4.

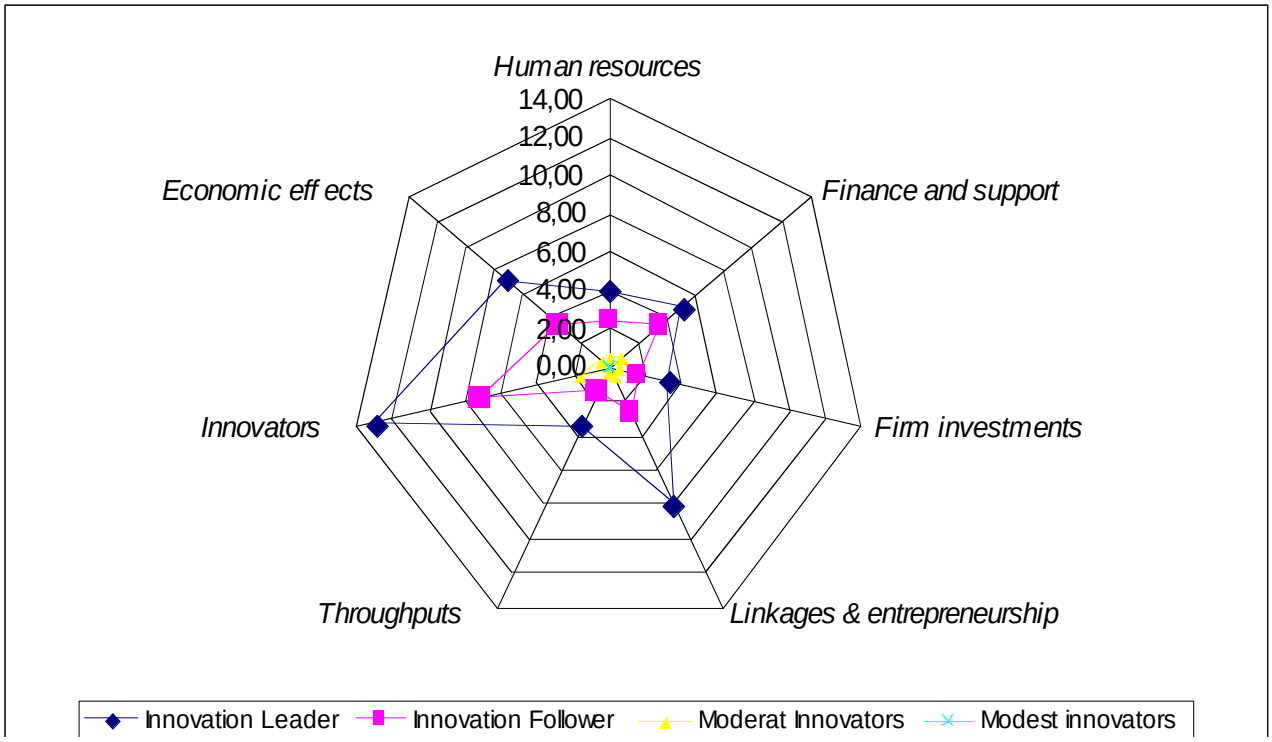

Figure 5: the comparison among italian Regions with respect to the value of innovation performance dimensions (2004)

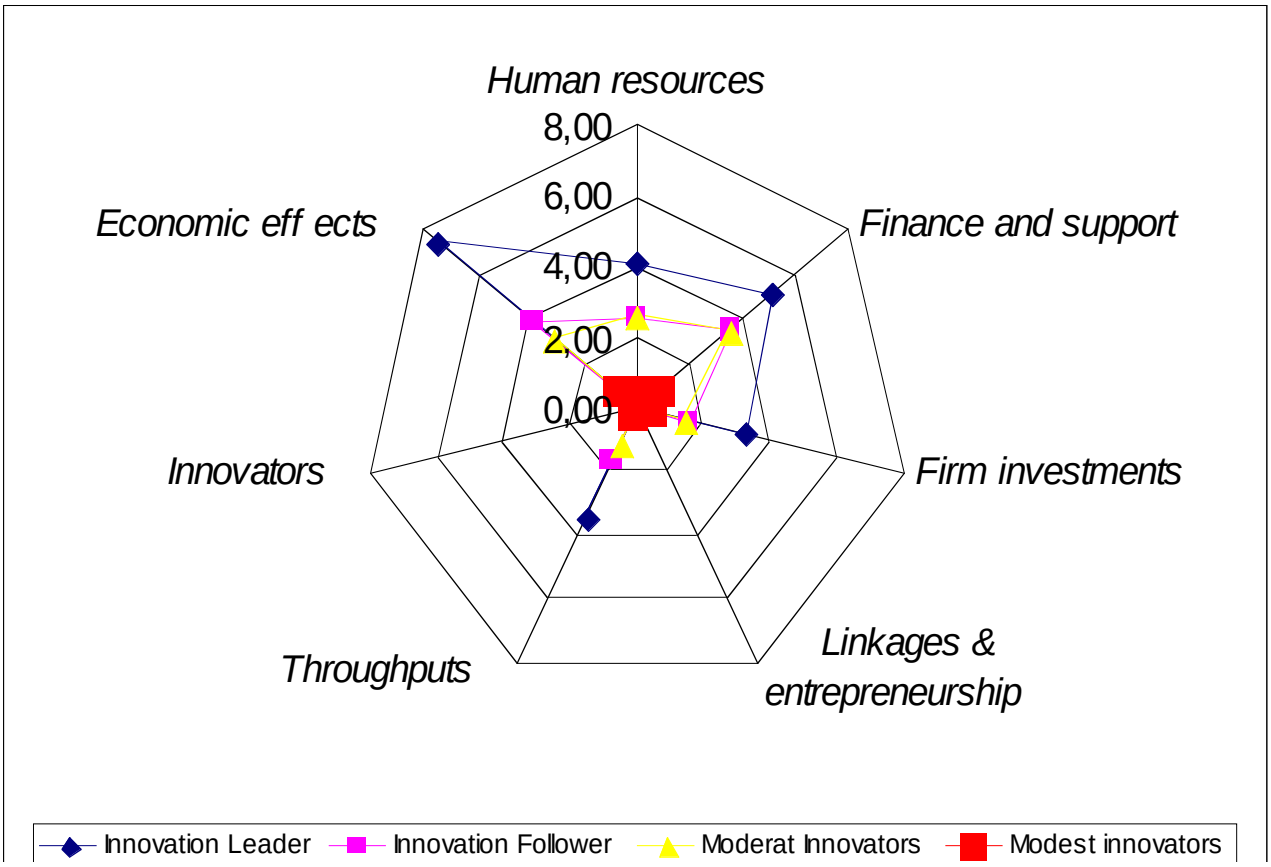

Figure 6: the comparison among Italian Regions with respect to the value of innovation performance dimensions (2006)

In 2004 the Innovation leaders and, in a reduced measure, Innovation followers perform better with respect to the dimensions "Innovators", representing the outputs of innovation, and to "linkages and entrepreneurship", representing the capability of small firms to innovate in house or using collaboration with others. Modest innovators are not able to improve their performance from 2004 to 2006, whilst the other groups growth with respect to "Throughputs" (level of EPO patents), to "Finance and support" and to "Human Resource".
The descriptive analysis above produced is an aggregate analysis that generates the following general results:

- Italians Regions show decreasing performances passing from 2004 to 2006 with respect to the value of the global innovation performance;
- Campania Region is the worst performer with respect to the average performance of North of Italy, Center of Italy, and South of Italy;
- Only Convergence regions of Spain and Greece in Europe increase their performances passing from 2004 to 2006;
- If we group the Regions included in our analysis in different classes, according to an additional classification provided by PRO INNO Europe, such as Innovation leaders, Innovation followers, Moderate Innovators and Modest Innovators, we can notice that Innovation leaders perform better in most of the dimensions of the innovation performance. This fact implies that high levels of

performance require Regions to perform relatively well over all the dimensions of innovation;

- Innovation leaders, Innovation followers ad Moderate Innovators in Italy are able to improve the values of most of their dimensions in 2006 with respect to 2004, whilst Modest innovators are not able to exit from their stagnating situation.

Finally, table 3 reports, for each of the 17 indicators of the innovative performance, the distance between Campania Region and the other Regions considered in this study.

This more analytical comparison shows some interesting and maybe unexpected results. In general, Campania Region performances for most of the dimensions and for most of the indicators are negative if compared with the other Regions, but there are some indicators for which the negative distance is not very significant. This is the case of most of the enablers and of some indicators regarding firm activities such as "Tertiary education", " Public R&D expenditures", "Non R&D innovation expenditures", and "Innovative SMEs collaborating with others". This fact means that Campania has some potential in human capital, education and also in the amount of public investment. The distance with respect to other Regions (in 2004) increases if we consider some indicators related to firms' efforts in innovation (SMEs innovating in house, Business R&D expenditures, EPO patents) and when we focus on the outputs of the innovation (SMEs introducing product or process innovations, SMEs introducing marketing or organisational innovations, Employment in medium-high & high-tech manufacturing, Employment in knowledge-intensive services). Summing up, those data give the first support to the hypothesis that the Campania regional innovation system is a system locked by the absence of circulation of knowledge between research institutions and world of small firms. Furthermore, it seems that Campania Regional Innovation System lacks of capabilities to translate the human capital potential ad also the public efforts in innovation outputs. In 2004 a positive performance in comparison to Germany and to Greece is underlined for the indicators: "SMEs introducing product or process innovations", "SMEs introducing marketing or organisational innovations", "Reduced labour costs", "Reduced use of materials and energy". This superior result is not confirmed in 2006, but we can notice that in 2006 the distance between Campania Region and the other Italian Regions decreases, mostly with respect to the indicators related to the dimension "Outputs".

This fact is maybe related to the decline of the total Italian performance in 2006 and not to the capability of Campania to improve its innovative performance .

Finally we can conclude that the negative performance of Campania is mainly due to the lack of an effective link between the capability to invest in innovation enablers and the capability to transform these investments in innovation outputs. The distance between Campania and the other Regions here analysed is generally reduced in 2006 with respect to 2004, but this fact is mainly due to the decrease of the performances of the other regions rather than to an improvement of Campania.

A closer analysis of Innovation Regional Systems of Italian best performer Regions show that the most important differences are due almost exclusively to the presence in that Regions of services that: i) promote the circulation of technical and scientific knowledge from researchers to SMEs; 2) provide organizational and managerial knowledge necessary to SMEs to manage effectively innovative technologies (Table 4). From Table 4 we see that most of these services are provided free of charge to SMEs from a variety of actors, public and private, which act as catalyst for both explorers (scientists and technologists) and exploiters (entrepreneurs and technicians). The catalysts ensure the creation of links, their stability on long-term and the provision of additional services that transform technology opportunities into innovative business.

	2004	Distance Campania from North Italy	Distance Campania from Central Italy	Distance Campania from South Italy	Distance Campania from Germany	Distance Campania from Spain	Distance Campania from Greece	Distance Campania from Slovenia
Enablers	Human resources							
	1.1.3 Tertiary education	-0,90	-0,56	-0,45	-1,64	-1,49	-1,27	0,16
	1.1.4 Life-long learning	-2,56	-1,31	-1,52	-1,15	-0,87	0,00	0,38
	Total Human resources	-3,46	-1,88	-1,97	-2,79	-2,36	-1,28	0,53
	Finance and support							
	1.2.1 Broadband access by fi rms	-2,43	-1,77	-1,81	-1,46	-1,29	-0,73	-0,37
	1.2.4 Public R&D expenditures	-1,85	-0,91	-0,85	-1,86	-1,06	0,08	-0,82
	Total Finance and support	-4,28	-2,69	-2,66	-3,32	-2,35	-0,65	-1,19
FIRM ACTIVITIES	Firm investments							
	2.1.1 Business R&D expenditures	-2,83	-1,16	-0,96	-1,55	-1,03	-0,66	-0,67
	2.1.3 Non-R&D innovation expenditures	0,00	0,00	0,00	0,00	-1,50	0,00	-0,92
	Total Firm investments	-2,83	-1,16	-0,96	-1,55	-2,53	-0,66	-1,59
	Linkages & entrepreneurship							
	2.2.1 SMEs innovating in-house	-5,57	-1,91	-1,40	0,41	-1,02	0,41	-0,25
	2.2.2 Innovative SMEs collaborating with others	-1,84	-0,45	-0,70	0,07	-0,83	0,07	-0,89
	Total Linkages & entrepreneurship	-7,41	-2,35	-2,09	0,48	-1,85	0,48	-1,13
	Throughputs							
	2.3.1 EPO patents	-3,13	-1,40	-0,89	-1,82	-0,54	-0,46	-0,58
	Total Throughputs	-3,13	-1,40	-0,89	-1,82	-0,54	-0,46	-0,58
OUTPUTS	Innovators							
	3.1.1 SMEs introducing product or process innovations	-4,48	-1,59	-1,02	0,31	-1,26	0,31	-0,32
	3.1.2 SMEs introducing marketing or organisational innovations	-3,57	-1,54	-1,83	0,45	-0,55	0,45	-0,64
	3.1.3a Reduced labour costs	-2,09	-1,09	-2,61	0,52	-0,84	0,52	-0,67
	3.1.3b Reduced use of materials and energy	-1,19	-0,60	-0,86	0,30	-1,18	0,30	-0,72
	Total Innovators	-11,33	-4,81	-6,31	1,58	-3,83	1,58	-2,34
	Economic eff ects							
	3.2.1 Employment in medium-high & high-tech manufacturing	-3,37	-1,35	-0,82	-2,05	-0,36	-0,30	-0,75
	3.2.2 Employment in knowledge-intensive services	-3,19	-1,80	-1,64	-1,39	-0,79	-0,87	-0,25
	3.2.5 New-to-market sales	0,00	0,00	0,00	0,00	-1,43	0,00	-1,08
	3.2.6 New-to-fi rm sales	0,00	0,00	0,00	0,00	-2,21	0,00	-1,00
	Total Economic eff ects	-6,57	-3,15	-2,46	-3,44	-4,78	-1,17	-3,09
	2006							
Enablers	Human resources							
	1.1.3 Tertiary education	-1,03	-0,69	-0,59	-1,43	-1,75	-1,37	0,19
	1.1.4 Life-long learning	-2,51	-1,33	-1,49	-1,34	-1,72	-0,10	0,36
	Total Human resources	-3,54	-2,02	-2,08	-2,78	-3,47	-1,47	0,54
	Finance and support							
	1.2.1 Broadband access by fi rms	-2,43	-1,77	-1,81	-1,46	-1,29	-0,73	-0,37
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	Total Finance and support	-4,28	-2,69	-2,66	-3,32	-2,35	-0,65	-1,19
	2.1.1 Business R&D expenditures	-2,83	-1,16	-0,96	-1,55	-1,03	-0,66	
	2.1.3 Non-R&D innovation expenditures	0,00	0,00	0,00	0,00	-1,40	-2,27	-0,67
	Total Firm investments	-2,83	-1,16	-0,96	-1,55	-2,43	-2,93	-0,67
	Linkages & entrepreneurship							
	2.2.1 SMEs innovating in-house	0,00	0,00	0,00	0,00	-1,10	-2,29	-0,95
	2.2.2 Innovative SMEs collaborating with others	0,00	0,00	0,00	0,00	-0,69	-2,42	-1,24
	Total Linkages & entrepreneurship	0,00	0,00	0,00	0,00	-1,79	-4,71	-2,19

	Throughputs							
	2.3.1 EPO patents	-3,13	-1,40	-0,89	-1,82	-0,54	-0,46	-0,58
	Total Throughputs	-3,13	-1,40	-0,89	-1,82	-0,54	-0,46	-0,58
	Innovators							
	3.1.1 SMEs introducing product or process innovations	0,00	0,00	0,00	0,00	-1,33	-2,34	-0,99
	3.1.2 SMEs introducing marketing or organisational innovations	0,00	0,00	0,00	0,00	-1,30	-3,16	0,00
	3.1.3a Reduced labour costs	0,00	0,00	0,00	0,00	-1,58	-1,94	0,00
	3.1.3b Reduced use of materials and energy	0,00	0,00	0,00	0,00	-1,69	-1,94	0,00
OUTPUTS	**Total Innovators**	0,00	0,00	0,00	0,00	-5,89	-9,38	-0,99
	Economic eff ects							
	3.2.1 Employment in medium-high & high-tech manufacturing	-3,32	-1,35	-0,77	-1,97	-0,39	-0,21	-0,72
	3.2.2 Employment in knowledge-intensive services	-3,33	-1,76	-1,58	-1,39	-0,83	-0,90	-0,28
	3.2.5 New-to-market sales	0,00	0,00	0,00	0,00	-1,62	-2,56	-0,98
	3.2.6 New-to-fi rm sales	0,00	0,00	0,00	0,00	-2,39	-2,34	-0,99
	Total Economic eff ects	-6,66	-3,11	-2,35	-3,36	-5,23	-6,00	-2,97

Table 3: The distance between Campania Region and the other European Convergence Regions

The lack of catalysts in the Campania Region is the main barrier to the development of a regional innovation system that acts as a self-sustaining Learning System. It would be interesting to investigate political, economic and social reasons for which local actors did not developed spontaneously innovation services in the presence of a relevant, but implicit, demand and in the presence of significant incentives from the local government and the European Community. Maybe, it's the model of Learning Region to provide an answer. The model provides for a fourth actor, who plays the strong role of Governor, or activator and regulator of the learning regional system. In many developed regions around the world the Governor's role was played by a large enterprise or a by famous universities or by the local government. This central actor set in motion the local innovation system and generated the rules of the game. In Campania this subject is historically lacking.

Typology	Service	Friuli Venezia Giulia	Emilia Romagna	Lombardia
Information	Info on financial resources	Free	Free	Free
	Tutoring on innovative ideas	Free	Free	Pay
	Demand and supply of technology	Pay	Free	Pay
	Info on patents	Free	Free	Free
Consultancy	Legal services	Free		
	Financial services	Free	Free	Call
	Technology Check-up	Free	Free	Pay
	Benchmarking	Pay	Free	
	Technology Audit	Call	Free	Pay
	Pre-incubation		Free	Free
	Incubation	Pay	Free	Call
	Company Profiling	Free	Free	Free
	Brokering	Free	Free	Free
	Laboratories	Free	Free	Pay
Training	Training actvities	Call	Free	Pay
	Master	Call		

Table 4 – Innovation services of best Italian innovative Regions

5. 2 The Analysis of clusters and Factorial Analysis

Our cluster analysis starts from the Matrix of distances reported in Table 5. From this Matrix we can confirm that the North of Italy is an Innovation leader with respect to the others and that Campania is more close to Slovenia than to the rest of Italy.

Caso	Euclidean squared distances							
	1:GERMANY	2:GREECE	3:SPAIN	4:Northern Italy	5:Central Italy	6:Campania	7:Southern Italy	8:SLOVENIA
1:GERMANY	,000	75,343	51,593	155,449	33,023	49,948	33,846	50,030
2:GREECE	75,343	,000	37,378	270,943	106,594	59,666	85,000	44,486
3:SPAIN	51,593	37,378	,000	169,480	53,871	54,481	40,463	28,779
4:Nord Italia	155,449	270,943	169,480	,000	58,712	239,993	107,920	197,971
5:Centro Italia	33,023	106,594	53,871	58,712	,000	68,967	11,206	55,028
6:Campania	49,948	59,666	54,481	239,993	68,967	,000	37,316	16,725
7:Sud Italia	33,846	85,000	40,463	107,920	11,206	37,316	,000	32,816
8:SLOVENIA	50,030	44,486	28,779	197,971	55,028	16,725	32,816	,000

Table 5: Matrix of Euclidean distances among the regions of our sample

Columns values in this matrix represent the advantage, in terms of global innovative performance, of the Region in the selected column with respect to the Regions in the rows. The bigger distances exist between the North of Italy and the Campania Region (239,993) and between the North of Italy and the Convergence Regions of Greece. The difference between Central Italy and the South of Italy is contained. Also the Convergence Regions of Slovenia have little advantage with respect to Campania.

Similar conclusions can be deduced by the representation of the position of Regions in the factorial plane (Figure 7), where Regions have been grouped according to the factorial analysis. As said before, we can notice that the North of Italy has the best innovative performance and that it is the Region with higher distances with respect to the others.

Central Italy, South of Italy and Germany are located in the same region of the space. Despite their limited distance, we can notice that Central Italy and Germany have better performances than Southern Italy. Greece and Spain show a positive innovative performance, with a little dominance of Greece over the Spain. Finally, Slovenia and Campania are very similar Regions, with a negative performance in terms of innovation. The position of Campania in the plane demonstrates analytically that this Region is very far from the rest of Italy and it is one of worst performing regions in Europe.

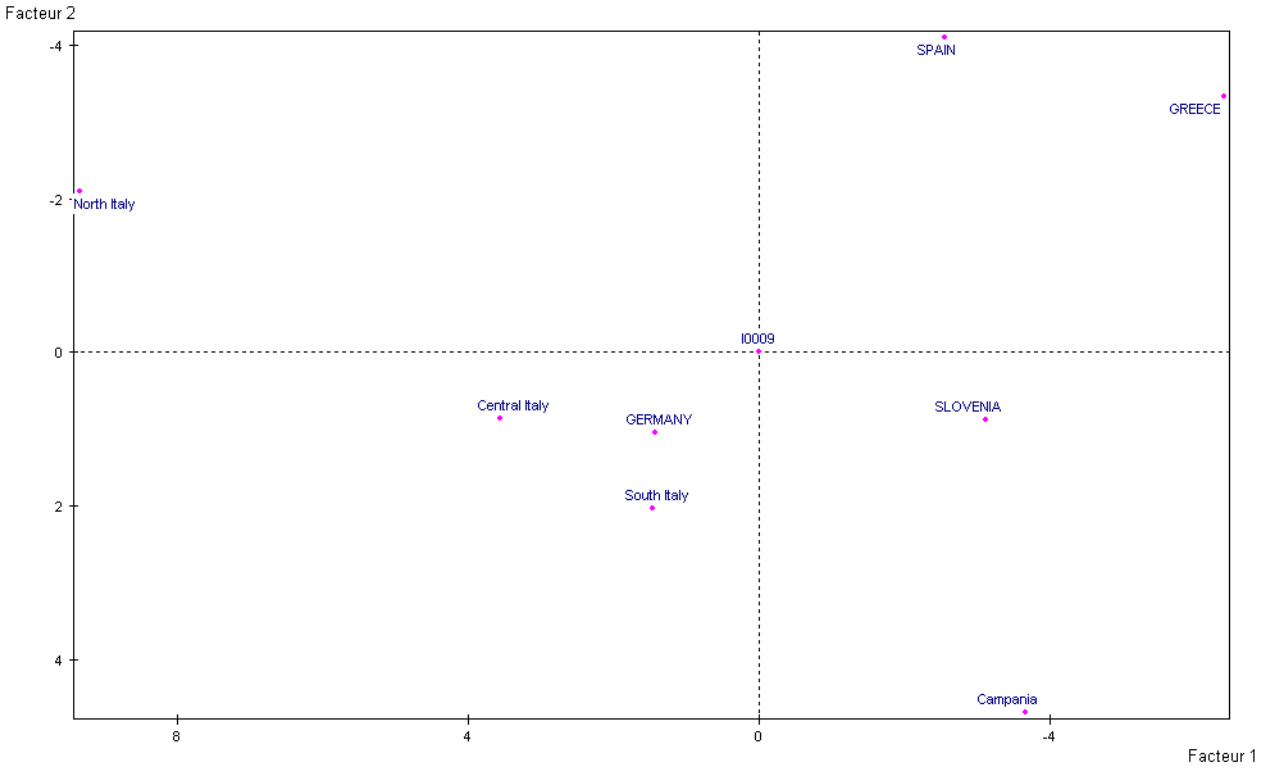

Figure 7: Factorial plane and clusters of Region

6. Conclusions

The analysis of the strengths and weaknesses of the innovation system of the Campania region has highlighted the need to sustain the development of local actors that will give researchers and SMEs a variety of services to help technology transfer and innovative business. As the market has not be able to develop the birth and development of these skills, a strong political action is needed to establish an institution playing the role of Agency for innovation. In order to reach the goal of creating an intregated Innovation Regional System the Agency should focus in developing the competencies of innovation catalysts able to remove some barriers such as: inadequacy of competencies for the innovation; lack of proper logistic services; lack of proper capabilities to manage national and international projects; fragmentation of intermediaries of innovation; lack of synergies among competencies and services; lack of coordination among actors.

The high concentration of intellectual resources is a fundamental base for the development of CRIS. To utilize this resource it is necessary to create incentives for the cooperation among research groups and local institutions, and foster the development of methods and structures for the technology transfer, for academic spin-offs and for technical and professional services for SMEs.

Finally, the empirical evidence of Campania Region confirms that in less-developed Regions the role of public institutions is essential to develop a local innovation system. Indeed, only the local government is able to make investment that can push local economic actors to leave the block in which they are forced by barriers they face.

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