



**MASTER THESIS**

**THE ROLE OF INNOVATION  
IN REGIONAL DEVELOPMENT IN GREECE**

**POSING A GREEK CASE STUDY BETWEEN THE DEBATE OF PLACE-  
BASED VS SPATIAL BLIND POLICIES**

**BY**

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FACULTY OF SPATIAL SCIENCES  
RESEARCH MASTER IN REGIONAL STUDIES:  
SPACES AND PLACES, ANALYSIS AND INTERVENTION

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## **ABSTRACT**

The role of innovation in regional economic development attracts increasingly the interest of public policies. Especially among the regions of the EU, the innovation policy and its relation to the cohesion policy framework gather much of this interest. This master thesis examines the role of innovation policy in regional development of a particular case study region in Greece. In order to investigate this role, the master thesis draws a special attention into the debate between the spatial blind policy argument (World Bank) and the place-based policy argument (OECD) and their policy implications. The review of the theory and the policy debate provides the most important insights for guidance of this research. In the first stage of this research, the investigation of prominent documents and studies on innovation performance of Greece, Greek regions and the region of Attica in particular highlights some key policy areas for consideration. The second stage of this research is devoted to interviews with policy experts with respect to innovation. The results of the interviews were extracted through the framework analysis approach to qualitative research.

After all the most important conclusions show that the role of innovation policy in regional development in the region of Attica is important though not simple. The several dimensions through which innovation policy was analyzed indicate that (1) there is a need for a clear and distinguishable dimension of innovation policy in the regional level, (2) a distinct philosophy and character of the policy (place-specific vs. centralized) will determine its final efficiency, (3) the contribution of smart specialization has catalytically impacted the new policy design, (4) the governance issues are of major importance due to the large number of actors present in the region and (5) the severe socioeconomic condition of the region has to be taken into consideration in the new regional innovation policy.

Key words: Innovation policy, Smart Specialisation, regional development, spatial blind, place-based policy, Greece, region of Attica

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## ACRONYMS

EC	European Commission
EU	European Union
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GSRT	General Secretariat for Research and Technology
GVA	Gross Value Added
HEIs	Higher Education Institutes
ICTs	Information Communication Technologies
IMA	Intermediate Managing Authority
NCRT	National Council of Research and Technology
NDC	National Documentation Centre
NIS	National Innovation System
NSRF	National Strategic Framework for Research and Innovation
OECD	Organization for Economic Cooperation and Development
OPs	Operational Programmes
PA	Partnership Agreement
PRAI	Regional Programmes of Innovative Actions
PRCs	Public Research Centers
R&D	Research and Development
R&I	Research and Innovation
RICs	Regional Innovation Councils
RIP	Regional Innovation Poles
RIS	Regional Innovation Systems
RIS3	Regional Innovation Smart Specialization Strategies
ROPs	Regional Operational programmes
RTDI	Research, Technology Development and Innovation
SF	Structural Funds
SMEs	Small and Medium-sized Enterprises

## 1. INTRODUCTION

Innovation is a topic attracting a growing public interest. Through the time, the concept of innovation reflects many different ideas according to the scientific fields that study it. In this dissertation, the author having a background in regional studies adopts the logic of innovation as a factor in the intractable equation of production process. In that sense, innovation is an element that is embedded and can also be an outcome of development. However, in innovation literature, innovation is not manna from heaven but needs certain conditions to be exploited. The means to create the appropriate conditions for the exploitation of innovation is through policies that enhance the multiple dimensions of innovation (for example institutional capacity, human capital, business environment).

Observing that in times of crises and scarcity of economic capital public development policies draw considerable attention to the role of innovation in development, the current design of regional development policy has to manage how innovation can contribute to the development of an area, a region or even an entire country. At this very moment there is a similar discussion among the leadership of the European Union (EU), the member-states and the regional administrations in their track to design the new cohesion policies towards the year 2020. Especially for countries that faced severely the impacts of the recent economic crisis, the regional development agenda constitutes a fundamental source both for financing and prioritizing policies and within this agenda the role of innovation in growth has been upgraded (smart growth).

From a theoretical point of view, the role of innovation and its relation to growth is rich as well considering the various strands of literature that deal with it. From the role of information and technological spillovers in the geographical proximity and agglomeration economies argument to the diversification and urbanization economies (Jacobs externalities) and from the evolutionary economic geography literature to the innovation systems approach, all the approaches rise the issue of innovation.

However, innovation is a phenomenon which is difficult to conceptualize and operationalize in policy discourse and academic research. This difficulty is transmitted to research topics studying innovation and translated to different or misleading interpretations of

policy outcomes. Additionally, when the issue of lack of the appropriate data is existent, even the formation of policies related to innovation may be a headache for policy makers.

### *1.1 MOTIVATION*

All the issues mentioned above motivated the author of this dissertation to consider innovation as an ideal research topic for the accomplishment of his master thesis. The discussion of innovation is real and growing the last few years not only in my country of origin, Greece but in all the countries around the EU. This reality triggered my interest to investigate innovation and innovation policy in the Greek context.

The outgoing decade Greece was in the foreground of developments for positive as well as negative reasons. From the generally accepted successful Olympic Games in 2004 which lent recognition and glamour to the deep impacts of unemployment and recession of the recent economic crisis, Greece was confronted with numerous unprecedented events. Recently, the situation of Greece is stigmatized by the enormous downturn of Greek economy (Greek GDP has fallen more than 20% since the beginning of crisis in 2008), the severe losses of jobs (the unemployment rate is over 27%, especially for young people is over 60% and more than 120.000 young highly educated people have migrate abroad since 2010) and the structural and institutional mismatches comparing to the global challenges.

As a response to this situation, Greece is implementing a hard and strict programme of reforms in every dimension of public duty according to the supervision of its international partners (the European Commission, the European Central Bank and the International Monetary Fund). However, the year 2014 is considered as a turning point from recession towards growth again and in this effort the ongoing negotiations with the EC on the structure of the cohesion operational programmes in Greece involve the road map of development policies for the next seven years.

In the domestic political and social scene, the negotiations on the European funding and the establishment of the national and regional operational plans attract much of attention. This is because a positive ending of this procedure may stimulate targeted development programmes to the vast majority of economic activities that face the lack of financial fluidity. Numerous of these activities refer to new businesses and old businesses that aim to modernize their expertise by using innovation as a key factor. In addition, in the coming programmatic period (2014-2020) a considerable percentage of the overall budget is directed explicitly for boosting innovation and entrepreneurship.

Innovation and entrepreneurship are seen as gates for development under the prerequisite that Greece will invest either directly as public investments or indirectly through the attraction of Foreign Direct Investments in knowledge and technology sectors. Among the proposals of the OECD for the reforms in the Greek economy, it is vigorously mentioned that *'Greece has been slow in taking advantage of the potential of the knowledge and green economies'* and needs to catch up the performance of other technologically advanced economies (OECD, 2013a).

## 1.2 RESEARCH PROBLEM

Innovation performance and innovation-related research were not extensively studied topics in Greece. However the emergence of innovation-led development agenda has attracted the interest of Greek researchers the last few years. With regard to the research area that links innovation with regional development, there are many issues to be charted.

This research topic aims to investigate a small part of the linkage of innovation with the field of regional development through revising and summarizing the recent developments on the national and regional level. Most of these developments refer to the promotion of the dimension of innovation in the design of future development policies under the smart specialization logic of the EU. Additionally, from an innovation perspective, this dissertation correlates the developments of regional development policies in Greece to the debate of place-based against spatial-blind policies. This correlation provides an additional dimension to the domestic regional development policy thinking in Greece. However, due to feasibility reasons this research cannot examine in detail the whole country as research area. To this respect, although desk research includes both national and regional overview of innovation policy developments, a case study research in the region of Attica will investigate the main issues of this policy for the purposes of this study.

The main research question to be addressed is:

- What is the role of Research and Innovation policy in regional development of the region of Attica?

This research question deals with the concept of innovation and innovation policy in general and relates them to the overall regional development policy in Greece. Apparently, the chronological period examined cannot exceed a period of five to ten in order to give a distinct picture of the current situation. Moreover region of Attica is selected because it concentrates

distinguished innovation and development potential which renders it as a choice of special interest (more details in chapter 6).

Supplementary to the main research question, the following questions will be progressively addressed as well.

- What is the role of innovation in regional development in theory?
- How innovation and regional development policies are linked?
- What is the innovation performance of Greece and its regions?
- What is the innovation performance of Attica region and how it is related to the regional programming?

All these questions have both theoretical and practical base. The first set of two questions refers mainly to the review of theories behind the link of innovation and regional development, but it will provide fruitful soil for thinking for the rest of the research. The second set of questions is oriented to Greece and Attica and reflects the focus of this study.

### *1.3 THE GOALS AND CONTRIBUTION OF THIS RESEARCH*

This thesis has four main goals. Initially, this dissertation aims to intervene in the discussion around innovation and regional growth in Greece. Although regional growth research is well established in Greece there are limited examples of studies considering regional growth from an innovation perspective. Furthermore, it is ambiguous if recent studies on regional development in Greece realize the changing agendas for policy making emerging from the big international debates (such as the place-based vs. spatial blind policies debate). Secondly, the revision of innovation literature in Greece can highlight the strengths and weaknesses of previous policies on innovation and pose them in the core of the ongoing developments.

Thirdly, this study tries to collect and present coherently the state-of-the-art of the developments in the promotion of innovation policies and strategies. By doing so, obstacles and potentialities become more apparent for policy intervention. Eventually, this thesis aims to provide a pragmatic picture regarding the potentialities for innovation in the context of the region of Attica.

With regards to the contribution on the existing literature, this thesis has a twofold orientation. Firstly, it attempts to revise and extend the discussion for innovation and regional development in the Greek context by considering other relevant influential debates as well. This innovation may provide additional insights with respect to policy issues. Secondly, this

research attempts to be an effort of understanding the changing role of innovation and innovation policy in Greece and Attica in particular, by analyzing the most recent information available and the views of innovation policy experts.

#### *1.4 STRUCTURE*

The thesis structure is as follows. The first chapter introduces the topic and the research questions. Chapter 2 provides the literature review concerning the relation of innovation with regional economic development. Inevitably, this relation reveals some policy implications with respect also to the regional innovation systems approach. Chapter 3 focuses on the implications of two fundamental approaches to regional development and their policy relevance to innovation issues. Chapter 4 describes the methodology and research design of the thesis. Chapter 5 and 6 give an overview of the topic adjusted to the national and regional specificities of Greece. Special focus is given to the specificities of the selected case study, the region of Attica. These two chapters present the initial results of this study and form the content of the next methodological part. Consequently, the results of the interviews conducted in the case study region are presented in Chapter 7. Chapter 8 deals with the interpretation and discussion of the findings raised in this thesis. Finally, chapter 9 concludes the thesis.

## CHAPTER 2. REVIEW OF THE THEORY

This chapter attempts to review the most important streams of literature relating to innovation and how it is linked with regional development. Initially, a familiarization with the definition and the types of innovation is made. Subsequently, the leading theoretical approaches on the role of innovation in growth are presented. Literature regarding the link between innovation and geography is reviewed next. To this direction the contribution of innovation system is examined separately considering also its policy implications.

### *2.1 DEFINITIONS AND TYPES OF INNOVATION*

Innovation often is used as an abstract concept both in meaning and content. For this reason, this thesis sets as a starting point to mention a series of definitions followed this concept.

The most common definition used in the international literature is given by the Oslo Manual (OECD and Eurostat, 2005):

‘An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations’.

Recently the World Bank (2010) in a volume published for innovation policy in developing countries supports that:

‘Innovation means technologies or practices that are new to a given society. They are not necessarily new in absolute terms. These technologies or practices are being diffused in that economy or society’.

Dosi (1988) defines innovation as:

‘the search for, and the discovery, experimentation, development, imitation and adoption of new products, new production processes and the organizational set-ups’.

Respectively, Porter and Stern (1999) define innovation as:

‘Innovation -the transformation of knowledge into new products, processes and services- involves more than just science and technology. It involves discerning and meeting the needs of customers. Improvements in marketing, distribution and

service are innovations that can be as important as those generated in laboratories involving new products and processes’.

Finally, Barca (2009) in his prominent report for place-based policy approach demonstrates:

‘In its broad definition [innovation] embraces any discontinuity -of technologies, organisations and institutions- in the workings of the economy and society. A narrower definition, the one used here, includes those changes that have the (direct) effect of inventing general purpose technologies or bringing about their application in a specific domain (business activities, healthcare, the environment, culture and so on)’.

All these definitions describe innovation as a shift from an old towards a completely or partly new version of a product or process or service. This was not always the case as the definitions of innovation evolved in parallel with the content of this concept. As being discusses in the next section the meaning of the concept of innovation was devoted primarily to the change from old technologies to new ones and not to innovations encountered after the organizational and managerial breakthroughs during the decades 1970 and 1980.

The changes in the definitions of innovation are also reflected on the different types of innovation described in the literature. Initially, the Schumpeterian thinking defined five types of innovation: (a) introduction of new products or new species of already known products, (b) introduction of new methods of productions, (c) opening of new markets, (d) acquiring of new sources of supply for raw materials or other inputs and (e) creation of new industry structures (Schumpeter, 1934). In Schumpeter’s view, innovations can be either ‘radical’ which cause a major change in the function of the economy or ‘incremental’ which gradually lead to progress and change. Furthermore, OECD distinguishes four main types of innovation: (a) product innovation which refers to a good or service that is new or improved, (b) process innovation referring to a new or improved product or delivery method, (c) marketing innovation which relies on changes in design, packaging, promotion or pricing of a product and (d) organizational innovation which means shifts in practices, organization or relations within a firm (OECD, 2011; OECD and Eurostat, 2005).

## *2.2 THE ROLE OF INNOVATION IN ECONOMIC DEVELOPMENT: THEORETICAL APPROACHES*

Although it is widely spread and contemporarily has emerged almost in all policy discussions, the idea of innovation is considered as a very old creation originating from two Schumpeter’s seminal works (Schumpeter, 1934; 1942). Schumpeter is known as the first

economist introduced the concept of innovation ('new contributions') posing it from a firm's perspective at the heart of economic change. The core of this change is a dynamic process where old technologies are being replaced by new ones, a process called 'creative destruction' (Schumpeter, 1942). It is the dynamic activity of the entrepreneur which reflects their ability to find new discoveries and opportunities for investment. In Schumpeter's thinking, innovation process involves in four dimensions: *invention*, *innovation*, *diffusion* and *imitation*. Although invention is important for a product or technology to enter the market, proceed to a commercial phase and become innovation, the diffusion of innovation is the factor which can provide the major impact in economy and society. At that phase other entrepreneurs (imitators) can realize the potential for profit created by the new product and start to mobilize for the exploitation of it (Śledzik, 2013).

The dynamic of the idea of 'creative destruction' however did not dominate the thinking over the role innovation in the production function. According to McCann and Ortega-Argilés (2013), up to the 1980s it was the neo-classical growth framework which played the primary role in the discussion on growth primarily due to the work of Arrow. Arrow (1962) argues in particular over the role of information and the impact of research and invention in the optimal allocation of resources for firms. Among the conclusions of this work was the fact that not firms as such but individual or other organizations responsible for research should be the subject of support by firms and public policies in order the gains for growth to be maximized. In parallel, Griliches (1979, 1998) was among the pioneers to account for the contribution of knowledge to growth and the exogenous role of firms in order to acquire access to new economic knowledge. Although he was aware of the lack of appropriate data resources, he prominently built a production function econometric model including a factor of technological knowledge (measured as a function of current and past R&D expenditures) in productivity growth. This work was also a starting point for the recognition of knowledge spillovers as a conducive factor in growth theories.

The endogenous growth literature (see also table 1), mainly through the works of Romer (1986) and Lucas (1988) focused on the role of knowledge spillovers- and human capital-related externalities on growth rates and wealth levels (McCann and Ortega-Argilés, 2013; World Bank, 2009). Their main contribution can be summarized through the reasoning that in an economy the more human capital exists, the bigger is the value from the stock of knowledge for R&D resulting to higher value of doing R&D activities and subsequently to the accumulation of stock of knowledge and knowledge spillovers. Following the main contribution of Romer and Lucas on knowledge accumulation as a source for growth, Aghion

and Howitt (1992) built an endogenous growth model analyzing the role of industrial innovations in growth. Using the Schumpeterian idea of ‘creative destruction’ they supported that technological innovation result to growth originated by the competition among research firms (Aghion and Howitt, 1992). In a step further, Crépon et al (1998) based on firm level econometric analysis identified the result that firm innovation output raises with its research effort and firm productivity is positively correlated with innovation output, elements proving the role of innovation both as input and output in a model. These developments signaled the recognition of innovation as a basic factor for growth and part of general structure or system (McCann and Ortega-Argilés, 2013).

Table 1: The endogenous growth turn according to the World Bank report 2009

Endogenous growth, 1980s	Perfect competition and knowledge-related or human capital-related externalities imply aggregate increasing returns and explain why growth rates may not fall over time and why wealth levels across countries do not converge	Romer, 1986; Lucas Jr., 1988
Endogenous growth, 1990s	Imperfect competition explains why the incentives to spend on R&D does not fall, and knowledge spillovers explain why the R&D costs fall over time, resulting in more and better products that fuel growth	Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1992
Endogenous growth, 2000s	Imperfect competition and Schumpeterian entry and exit of firms, with entrants bringing new technologies, explain how a country’s growth and optimal policies vary with distance to the technology frontier; knowledge accumulation in cities leads to growth	Aghion and Howitt, 2005; Rossi-Hansberg and Wright, 2007; Duranton, 2007

Source: World Bank, 2009

However, the idea that innovation is a systemic phenomenon is embedded to the evolutionary approaches originated by the pioneering work of Nelson and Winter (1982). The authors distanced from the vested essence of innovation within the firm and they stressed their attention to the institutional aspects of firms seen as complex organizations, the various social mechanisms associated with the dissemination of information, the link and interdependence of institutional arrangements in relation to the evolution of firms and industries and finally the policy relevance of institutional changes in the broader economic settings of places (Nelson and Winter, 1982). Their work emerged an orgasm of studies on the role on innovation within evolutionary and systems thinking and led to the creation on new strands for innovation and innovation policy research for the last two decades (including concepts such as National Innovation Systems, Regional Innovation Systems, learning regions and the role of institutions in innovation policy). This recent trends on evolutionary and systems approaches raised also the interest of geography in innovation processes as it is shown in the next sub-chapter.

### 2.3 THE LINK BETWEEN INNOVATION, GEOGRAPHY AND POLICY

The importance of geography and the relation of economic actors in proximal space were already well established by Marshall since the start of the previous century. The agglomeration economies argument refers to externalities created in economies irrespective of the behavior of a single firm and thus the fact that firms select to concentrate in space in order to enjoy increasing returns to scale from their vicinity. The sources attributed to these externalities are (1) *information spillovers* originating from the information exchanged by employees in firms co-located in a cluster, (2) *non-traded local inputs* referring to sources (e.g. experts or services) that are more easily accessible for firms which are in proximity with other related firms, and (3) *local skilled labor pool* related to the possibility of a firm to find in proximity skilled labor force without spending enormous amounts of resources for education and training (McCann, 2013).

The existence of agglomeration economies emerges the debate among specialization and diversification externalities and what is the most contributing to knowledge spillovers and innovation. On the one side, the specialization argument relies on the synergies and relation of firms located in a place within the same industry (localization economies). In this case firms can exploit all the sources available and construct specialized production structures which can promote knowledge to spillover within the firms. To this respect, Glaeser et al. (1992) put together the insights of Marshall (1890), Arrow (1962), and Romer (1986) in a so called MAR externalities argument and re-posed the thesis that knowledge is primarily a matter of firms between the same industry. Similarly, Porter externalities agree with specialization and proximity arguments including the parameter of local competition between firms as a force to adopt innovation processes (Glaeser et al, 1992). In this case, competition and visibility of advances among firms leads them to the desire to improve their own competitive position.

On the other side, urbanization economies benefit from knowledge externalities between firms from different sectors of the economy located in the same place. The fact that knowledge exchanges enter different firms in an economy triggers multiple structures of production to emerge therefore innovative activity is more likely to occur in diversified economies (Jacobs externalities). Jacobs (1969) argues that because it is difficult to recognize and codify tacit knowledge<sup>1</sup>, proximity plays an important role for new knowledge to spill over and develop new applications.

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<sup>1</sup> Tacit knowledge is understood as the knowledge which is not written or codified but related to production processes.

Although both specialization and diversification externalities concentrate considerable attention in theoretical terms, there is no clear and exclusive evidence on the role of these externalities in economic growth. A relative recent study by van der Panne on this debate demonstrates that studies suggest either specialization externalities or diversification externalities or both may occur according to the content, data and methodology employed in each study (van der Panne, 2004).

Recent facts, however, recognize further characteristics that are crucial for the evolution of innovation. As Freeman (1995) argues first the various developments on economic thinking after the Second World War forced the World Bank to admit that it is not the physical capital investments that determine predominantly knowledge accumulation but investments in ‘intangibles’. In addition, referring also to the work of Luntvall (1992), Freeman distinguishes the role of institutions and their transformations within enterprises that are conducive to economic and technological change (Freeman, 1995). The institutional transformations within firms also incorporate the massive changes in organizational structures signaled in big firms under the changes in industrial models occurred in 1970s and 1980s globally (e.g. Just-in-Time model). Another discussion besides these transformations is triggered by the impacts of globalization processes taking places the last few decades in global and national economies. All these changes highlight the rise of the role of geography, linkages and systems in the innovative process calling for a more systemic aspect and promoting the concept of National Innovation Systems in innovation thinking (Freeman, 1995). Furthermore the interplay between globalization and knowledge accumulation and diffusion raised another interesting debate on whether the world is flat or whether it consists of local knowledge peaks (OECD, 2011; McCann, 2008).

The initial works on innovation systems are detected back in the middle of 1980s with the works of Lundvall (1985) and Freeman (1987) and Dosi (1988) (Lundvall et al, 2002). However there are plenty other related concepts encountered namely ‘sectoral systems of innovation’ (Nelson and Winter, 1982; Breschi and Malerba, 1997), ‘technological systems of innovation’ (Carlsson and Jacobsson, 1997), ‘regional systems of innovation’ (Cooke, 2004; Cooke, 1996; Maskell and Malmberg, 1999), (McCann and Ortega-Argilés, 2013; Lundvall et al, 2002), while others introduced additional concepts such as ‘regional innovation potential’ (Mayer and Kramer, 1985), ‘innovative milieu’ (Aydalot, 1986; Mailat and Vasserot, 1986) and ‘innovation networks’ (Camagni, 1991) (Petraikos, 2008).

Initially, Lundvall (1992) defined a National Innovation System (NIS) as:

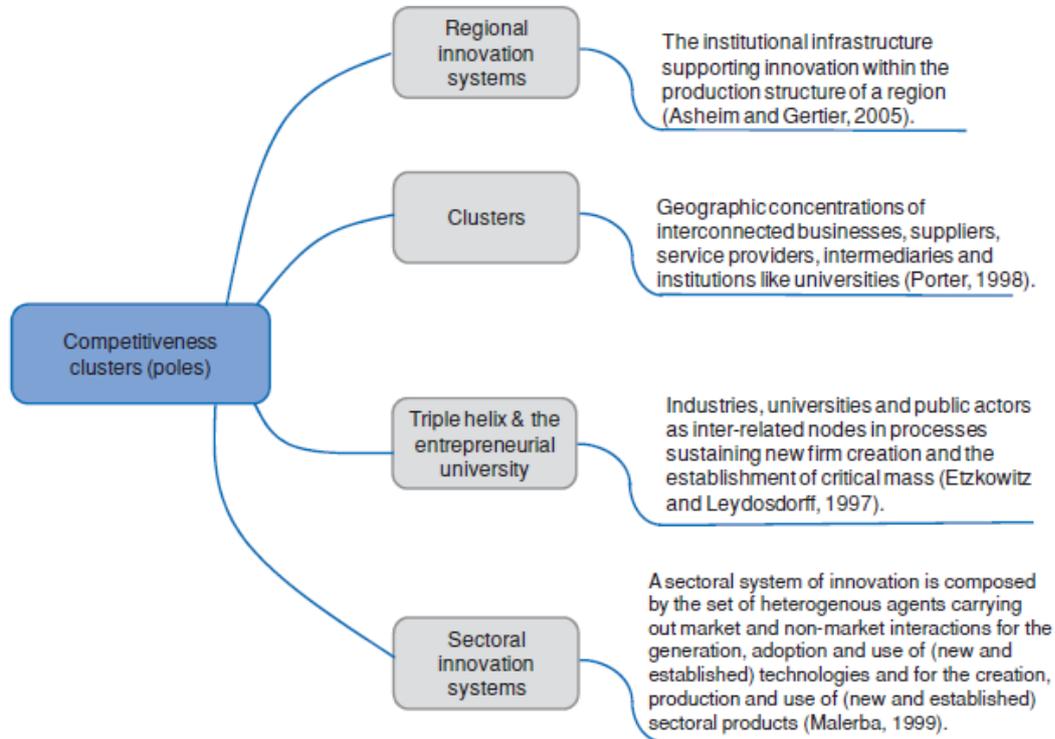
‘a system of innovation is constituted by elements and relationships which interact in the production, diffusion and use of new, and economically useful knowledge and that a national system encompasses elements and relationships either located within or rooted inside the borders of a nation state’.

In a more recent study on the evolution of NIS, Lundvall et al (2002) underline the new elements embodied in the concept. Firstly, at the analytical level, the NIS approach enriched with aspects about backward linkages, learning by doing and learning by searching processes, different stages in the life cycle framework and open economy references. These additions followed by considerations on market function with the supply chain approach being the major innovation in the thinking. Furthermore, the realisation of ‘non-price relationships’ between actors in the economy upgraded the role of learning processes in which national contexts identified as the appropriate scale for the diffusion of knowledge. Accordingly, institutions both formal such as laws and norms or informal like ‘trust’, ‘rationality’ and ‘time horizon of agents’ in the context of innovation give unprecedented conceptual and policy power to NIS (Lundvall et al, 2002).

Receiving the conceptual power of NIS as a tool for understanding the links and relations of actors in innovation systems, changes in rationale and policy thinking emerged. The focus of NIS on knowledge flows signalled the need for mapping those flows mainly emanating from the interactions among business institutions, public institutions and academic institutions. As a result innovation is seen as a complex process between actors and institutions. Firms remain in the middle of this process but now they use and integrate inputs coming from other organisations such as universities and research centres. To this respect policy interventions hold a twofold role. On the one hand horizontal policies (like regulations, taxes and incentives) determine the general environment for innovation, while on the other hand policies may interfere in the structure and distribution of innovation processes (OECD, 1997).

From a different perspective, as Lambooy (referred to Castells and Hirman, 2002) supports globalisation and technological processes cause consecutive ‘changes in social and economic structures, such as the sectoral and regional composition of production and a changing position of labour’ thus governments and policy makers needed to reconsider sets of policies in promoting innovation (Lambooy, 2005). Putting this logic also in Porter’s thinking geography and home nation seems stronger than ever as sources of skills and technology for constructing competitive advantage (Porter, 1990). To this respect there is a variety of options that underpin competitiveness in regional and national growth (figure 1).

Figure 1: Theoretical underpinning of competitiveness and clusters



Source: OECD, 2011 based on Technopolis (2010) background paper for the OECD

In this line of reasoning the regional dimensions of innovation led to the adjustment of NIS in a lower level. Thus Cooke et al (2004) created a definition for Regional Innovation Systems (RIS).

‘A regional innovation system consists of interacting knowledge generation and exploitation sub-systems linked to global, national and other regional systems for commercializing new knowledge’.

Respectively Lambooy provides an alternative definition of RIS (Lambooy, 2005 referred to Lambooy, 2003):

‘Regional innovation systems can be considered as interactive, dynamic structures, consisting of partners in regional production. These systems enable regional economic actors to utilize fully and expand their competencies. They also encompass governments and organizations that specialize in building cognitive competencies (learning, research) and in setting up inter-firm networks. End users, such as retailers and consumers, are also an important part of the system, because as end users they can express their needs, which could give rise to innovations. The process of innovation and transfer results in the anchoring of competencies in dynamic institutions and in facilitating the development of new firms, new products, new technologies, new consumers and new organizational structures’.

The use of the RIS approach allows for new margins for learning capabilities and possibilities of innovation performance in the regional business environment. According to Doloreux and Parto, the new approach is a useful tool to understanding technological change

in the regional scale while it incorporates the dimensions of knowledge circulation and investments in intangibles (Doloreux and Parto, 2004).

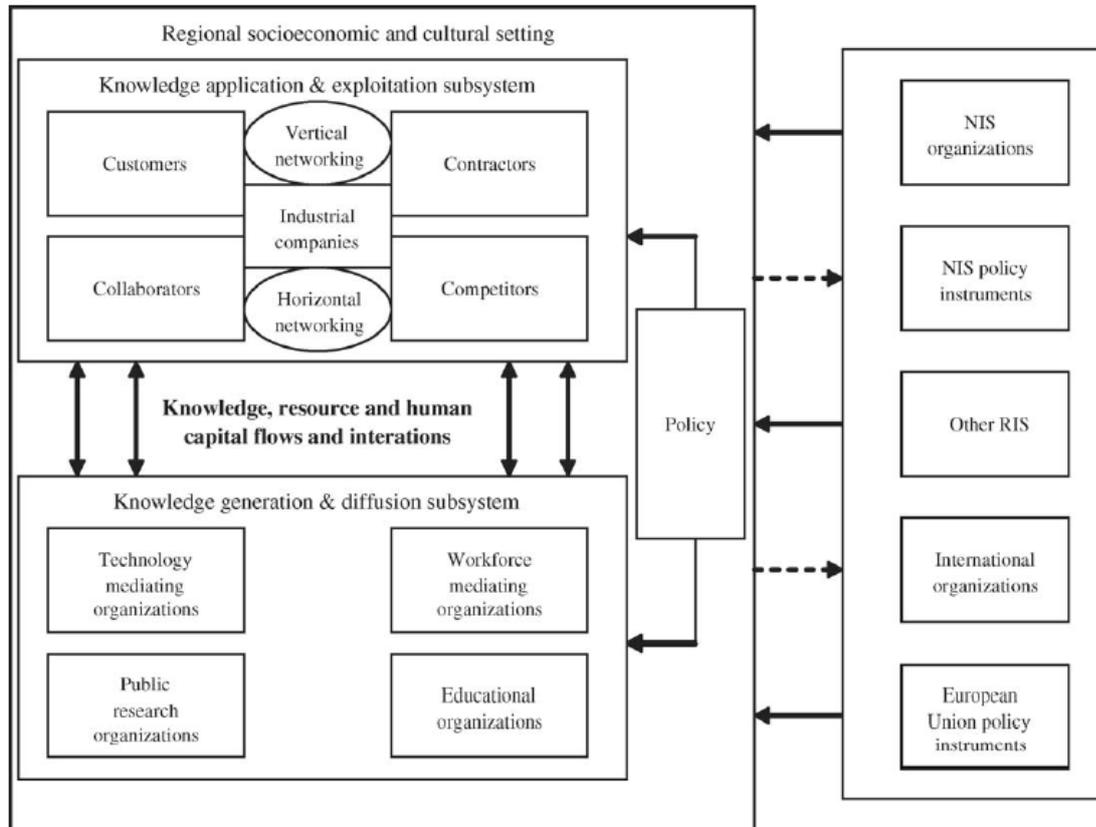
Although RIS approach holds its roots on Marshall's industrial districts, it gives a relative wideness of territorial, learning and sociological aspects in comparison to clusters and innovative milieu approaches (Asheim et al, 2011). Therefore, the idea of knowledge is in the core of the RIS, while the geographical dimensions are a key in innovation performance. In addition, although firms remain the basic players in the search for knowledge and innovation, innovative performance relates also to other factors such as 'other agents' like universities, 'framework conditions' (such as regulations) and 'forces shaping the demand side' (OECD, 2011). To this respect and considering the growing role of regions in the trajectory to construct competitive advantages, RIS approach is considered to have great impact in policy thinking.

Following the logic of Braczyk et al (1998) RIS can be identified in two dimensions: (a) governance and (b) business innovation. The first dimension is mainly referring to public policy, institutions and knowledge infrastructure or alternatively 'soft' interventions and 'soft' infrastructure. In that sense this dimension is closely attached to the supply side due to policy interventions intent to provide mechanism and facilities that utilise the local potential of the system. The second dimension primarily relates to the economic and industrial composition of the system. This dimension is closer to the demand side because its main role is to support actions internal to a firm. To this direction policies target to ensuring proper policy mixes for the development of links between different actors.

Based on the same logic mentioned above, Cooke et al (2004) argued that a RIS can result to three different forms: (1) grassroots, (2) network and (3) dirigiste. The first form represents a RIS with a local character where the outcomes of the interrelation between institutions and actors remain usually to a small geographical scale. The network RIS refers to the interaction of various actors and institutions in multiple geographical scales and has a wide character of activities. Last is the dirigiste form of RIS which reflects a predetermined character of activities derived from centrally designed policies (Cooke et al, 2004).

Turning now to policy agendas, earlier innovation policy considerations were basically adopting their innovation agenda based on 'best practices' and 'successful examples'. This is especially true for the evolution of NIS policy agenda. However, the recent insights of RIS approach show imperatively the need for more differentiated innovation policies (Tödting and Trippel, 2005). Although there is agreement between the authors that no specific recipe for a RIS exists, they adopt the scheme presented in figure 2.

Figure 2: Main structure of the RIS



Source: Tödting and Trippl, 2005

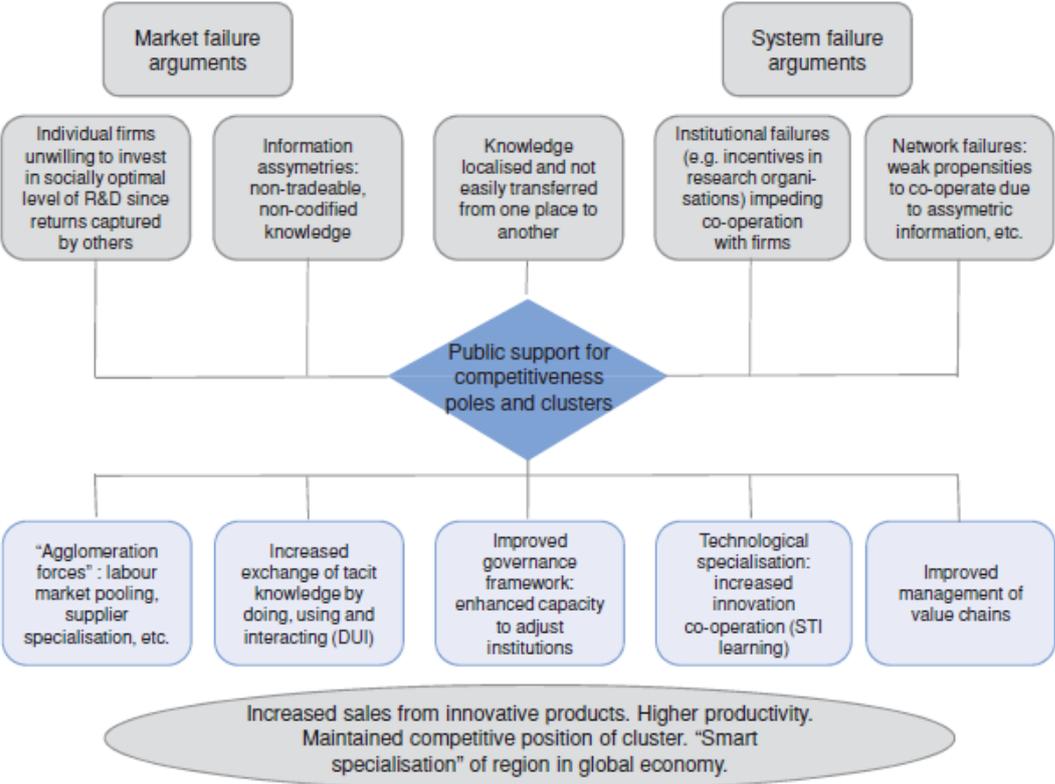
For Tödting and Trippl, among a regional socioeconomic and cultural setting two separated subsystems can be included. In the knowledge application and exploitation subsystem dominate the different transactions between economic actors. This subsystem can be alternatively understood as the idea of a cluster. In contrast the knowledge generation and diffusion subsystem consists of various actors and organisations which are responsible for transmitting and spreading the knowledge produced. In parallel with the interaction of these two subsystems, Tödting and Trippl situate a regional policy dimension affecting both subsystems. The role of multi-level governance therefore is stressed as a decisive factor of development and sustainability of the RIS. Eventually, a list of other interacting parameters besides the regional socioeconomic setting certifies the necessity of extroversion and external information in a RIS.

The final element to mention is the current policy perspectives on innovation and how the RIS approach has contributed. The first issue related here is that of governance. The growing importance of the region in innovation prerequisites a sufficient level of multi-level governance both among the different levels of public administration and between regions and other private actors. In particular there are two processes contributing to regional innovation policy and governance. Initially is a ‘top-down’ process in which the central state shapes

exogenously institutional changes towards the region. In this case the policies predominantly refer to grants or incentives given to beneficiaries for the promotion of innovation. In contrast, the ‘bottom-up’ process seeks for the mobilisation of the domestic potential of the region. In this case the policy focus is given to the creation of entire regional strategies in order to reach a ‘critical mass’ of infrastructure and skills within the region (Petraikos, 2008). These approaches can be alternatively identified as regionalisation and regionalism of policies.

The second trajectory of policy related implications identifies market failures and system failures in regional innovation policies. The category of market failure lies for example on issues like ‘appropriability’ meaning the ability of a firm to gain benefits from knowledge investments taking place inside the firm. In contrary, a system failure is considered transition or lock-in problems which restrict the progress of the system (McCann and Ortega-Argilés, 2013). Following the same logic (figure 3) the OECD stresses problematic areas and solutions which public policies are called to tackle with.

Figure 3: The logic of policy intervention relating to innovation context



Source: OECD, 2011 based on Technopolis, 2010 background paper

Concluding Petraikos (2008) summarizes a list of factors crucial to form successful regional innovation policies:

- (a) reinforcement of institutions mainly referring to improvements in the institutional capacity
- (b) enhancement of infrastructure to create better initial conditions in the region

- (c) reinforcement of trust and networks especially with other successful regions
- (d) support of clusters in the level of development and exploitation of innovation
- (e) balance of measures between the supply and demand side
- (f) flexibility of policies in order to recognise strengths and weaknesses in the regions
- (g) balance between the targets of regional convergence and competitiveness
- (h) adoption of proper evaluation techniques regarding innovation performance
- (i) vigilance in a sense to grasp new niches of innovation.

## CHAPTER 3. THE DEBATE BETWEEN PLACE-BASED AND SPATIAL BLIND POLICIES

The main focus of this chapter is to investigate the debate between the World Bank approach on spatial-blind policies and the OECD approach on place-based policies for development. This debate is considered of great importance as it influences the agenda of priorities that policy-makers have to consider while they design development policies. Here, the main arguments and policy recommendations of each approach are presented and summarized. Furthermore, various critical reflections on this debate are presented. In the end of this chapter, we consider the role of innovation within this debate.

### 3.1 THE WORLD BANK DEVELOPMENT REPORT ARGUMENT

The World Bank development report 2009 ‘Reshaping Economic Geography’ was a prominent intervention of the World Bank in the discussion on development policies in all geographical levels. The main message of the report was summarized by statements like ‘*economic growth will be unbalanced*’, ‘*to try to spread out economic activity is to discourage it*’ and ‘*the way to get both the benefits of growth is through economic integration*’ (World Bank, 2009). The intention of the Report is to challenge arguments in favor of place-based approaches and promote an alternative policy thinking for development among policy makers.

The Report based on conclusions derived from three independent debates (geographic unevenness, circular causation and neighborhood effects) demonstrates that public authorities need to re-consider the ‘policy mix’ for development in relation to the ‘economic geography of places’. To this respect, the Report suggests that development policies have to emphasize how to connect the less developed areas with the leading ones and integrate the deprived urban areas with the rest of the urban fabric.

More specifically, the World Bank scholars use three basic dimensions of analysis. The first dimension is *density* and refers to the *intensity of economic activity per unit of land* (for example square kilometer). This dimension aims to the geographic unevenness debate and supports the idea that large cities concentrate higher level of economic activities due to

agglomeration economies. Growth (measured as economic and population density) is a selective process and does not act evenly in space. Big cities and urban centers concentrate significant potential for growth thus economic activities will choose these places to locate. So, higher densities imply increasing opportunities for economic activities to select a region to locate. The main request for public policy then is to create appropriate conditions for market forces in order to activate domestic capital and produce new growth. Although higher growth levels may initially cause divergence in welfare, soon growth will spread over space especially through channels between regions (such as rural-urban, leading-lagging). This process is described as inclusive development and may include measures against disparities between and within different regions.

The second dimension is *distance* which refers to the *costs of getting to places with economic density* and deals with circular causation phenomena. This dimension implies the vicinity or distance to places with core economic activities and the main principle here is that the closer you are to economic activities the more relative benefits you obtain. Moreover vicinity to economic activities means higher opportunities for growth both for employees and firms. Subsequently, this leads to higher densities and circular causation phenomenon. To this respect, the main role of policy relies on interventions promoting migration (essentially internal migration) as a mechanism of spreading the outcomes of growth.

The third dimension is *division* and relates to *sociopolitical geography* of a 'region', that is the advantages (*spillovers*) that a place enjoys when is situated within a broader coalition of places (regional integration). The main principle of this dimension is that being integrated with other countries (or regions) causes convergence in growth and welfare levels. So, lack of divisions within a region can spread the impacts of development across neighboring regions. In addition, division relies on market integration of a place with others and the ability to cope with challenges derived from the globalised economies.

After all, the World Bank supports the argument that development policies have to '*let concentration of economic activities to produce growth*' and eventually policies should '*manage the outcomes of growth*'. To do so, a particular 'policy mix' needs to be formulated according to the degree of urbanization of an 'area'<sup>2</sup> and the assessment of dimensions mentioned above. The policy mix uses three main instruments for economic integration in such a way to '*sequence and calibrate*'<sup>3</sup> policy interventions (see also table 2).

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<sup>2</sup> see more World Bank, 2009 p.35, 201

<sup>3</sup> see more World Bank, 2009 p.201

Table 2: Policy instruments for urbanization challenges

	Area		
	Incipient urbanization	Intermediate urbanization	Advanced urbanization
Urban shares	Less than 25 percent	About 50 percent	More than 75 percent
Examples	Kampong Speu, Cambodia; Lindi, Tanzania	Chengdu, China; Hyderabad, India	Greater Cairo, the Arab Republic of Egypt; Rio de Janeiro, Brazil
Dimensions of policy challenge	1-D: Build density	2-D: Build density, reduce distance	3-D: Build density, reduce distance, eliminate division
<b>Instruments for integration</b>			
Institutions	Land rights; basic education, health and water and sanitation	Land use regulations; universal provision of basic and social services	Land use regulation and land taxation; universal provision of basic services
Infrastructure		Transport infrastructure	Transport infrastructure; demand management
Interventions			Slum area development; targeted programs to reduce crime and environmental degradation

Source: World Bank, 2009

The first instrument is *spatial blind ‘institutions’* referring to policies that improve the economic environment for people and firms to work, invest and prosper in an area. Spatial blind policies are laws, orders and measures that governments take and which aim to simplify and ensure the stability of market function, facilitate the economic environment for firms and provide the basic services to economic actors (e.g. standards for public services such as education and health, property rights and land use regulations). The second instrument is *spatially connective infrastructure*. This instrument describes measures relating to the provision of infrastructure and better market connectivity for people and firms. The policies target at the improvement of access to big markets either through building new road, marine and air facilities or through the facilitation of commuting and migration processes. The third instrument is *spatially targeted interventions* mainly referring to place-specific interventions that act directly in the core of spatial phenomena and integrate the provisions of the other two instruments. Especially for *spatially targeted interventions*, the World Bank Report highlights that they should be a further stage, after the spatial blind ‘institutions’ and spatially connective infrastructure have already launched. In support, the World Bank report attempts to undermine the practical role of place-specific policies using country-specific cases as evidence (table 3).

Table 3: Assessing the performance of area development policies

Performance criteria	Reduce inequalities across regions? (interregional equity)	Pro-poor? (interpersonal equity)	Avoid tradeoff with spatial efficiency?
Institutions	Yes	Yes	Yes
Infrastructure	No	No	Yes
Incentives	No	No	No

Source: World Bank, 2009, based on country-specific case studies

### 3.2 THE PLACE-BASED ARGUMENT AND THE CONTRIBUTION OF THE OECD

In contrast to the World Bank approach, the OECD scholars follow a much different line of thinking and reasoning on development policies. While the World Bank Report argues in favor of concentration of economic activities and supporting the standards of public services, the OECD has as a starting point that all regions have potential for development and thus regional development policies need to work on their *capacity to fuel growth* (OECD, 2009a; 2009b). To this respect, the OECD report challenges the concentration argument by stating that *'simple concentration of sources in a place does not necessarily translate into economies of agglomeration and new growth'* and by contesting it as the *'only path to development'* (OECD, 2009b).

Subsequently the OECD argues from an exogenous intervention perspective that there is a role for regional development policies to create growth in all regions based on the mobilization and exploitation of the regions' domestic potential. This can be materialized by activating market and employment forces, supporting innovative activities and therefore using public funding in such a way to compensate market failures. Development policies have to target at boosting the competitive advantages of the regions or creating new advantages according to activities of the economy that can produce higher levels of added value and improve productivity levels within the region. The role of regional policy then is concentrated on putting in motion local assets and resources in order for subsidies and support measures to become more targeted and efficient in terms of policy intervention. To this respect, place based policies argue in favor of place specific interventions and reject the one-size-fits-all logic (OECD, 2009b).

The place based policy approach is comprehensively described through the seminal report prepared by Fabrizio Barca in 2009 as a contribution in the discussion around the EU cohesion policy reform. In the executive summary of the report the place based policy approach is defined as (Barca, 2009):

*'A place-based policy is a long-term strategy aimed at tackling persistent underutilization of potential and reducing persistent social exclusion in specific places through external interventions and multilevel governance. It promotes the supply of integrated goods and services tailored to contexts, and it triggers institutional changes. In a place-based policy, public interventions rely on local knowledge and are verifiable and submitted to scrutiny, while linkages among places are taken into account.'*

The place based policy approach (or ‘new paradigm of regional policy’ according to the OECD) stresses the focus of policies on two key issues. First is the efficiency of economic conditions in a place. This issue points to the lower economic output than what was expected from the initial resources present at the region. In cases with inefficient exploitation of existing potential, development policies need to act and utilize those resources. Second issue for place based policies is the reduction of social and economic disparities among different places. In lagging places, policy interventions have to overcome institutional rigidities and promote economic transformations according to higher living and productivity standards. The basic element in this point is the place-specific (tailored) character of interventions. To this direction the Barca report puts into the table several key policy areas such as innovation, climate change and migration to name some that potentially can be in the core of development policies (ibid).

Except from the efficient and equal character and the place-based specialization of policies, special significance in the Barca report is given to the governance system and accountability issues. The multi-level governance system proposed by the report practically requires higher degree of decentralization of administrative services and closer vertical coordination between the different levels of government. The central state keeps a strategic role in policy designation while lower administrative authorities feed and specify the policy objectives. The embodiment of local level actors, however, emerges issues of accountability, universality<sup>4</sup> and monitoring of the policy. Both the three characteristics (efficiency and equality, tailoring to places and governance) are specifically integrated in the logic of smart specialization strategies (section 3.4).

### *3.3 CRITICAL REFLECTIONS ON THE DEBATE*

The depiction of the basic arguments within the debate shows the different starting points of the organizations (World Bank, OECD, EU etc) on how development policies should be perceived. One step further this fact signs different proposals for policy approaches and tools. To this direction, severe critiques and contradictory arguments have emerged among academic and policy literature.

Rigg et al (2009) in their work present some ‘geographical reflections’ on the World Bank report. The authors take issue with the disciplinary nature and substance of the evidence used in the Report in order to challenge the economist perspective that dominates. They

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<sup>4</sup> policy including all policy actors and covering a wide range of interests without the dominance of ‘big players’

support that there is a lack of references from the contributions of geographers and overrepresentation of the new economist contributions. Moreover authors are worried about the simplification and omissions existing in the report. They underline the way that World Bank scholars use their empirical evidence in such a way to make case appropriate for their arguments, while they omit significant parameters for economic geography issues such as society and environment and the debates around them. To this respect, the World Bank report is accused of its narrow multidisciplinary synthesis.

From a disciplinary point of view, Rodriguez-Pose (2011) deals with the diverging paths followed by the two arguments of the development policies debate and supports the need for greater interaction between geographers and economists. By this interaction he argues that many differences within the debate can be bridged, since both disciplines agree on the spiky pattern of development, the role of places (especially metropolitan areas) and the meaning of proximity to economic activities. To this respect, the author proposes an agenda of issues in which the different disciplines and potentially the various arguments can interact and synthesize towards the evolution of development debate. The integration of geographical aspects in economic thinking will help catalytically to this.

Drawing from an economic perspective in their note, Garcilazo et al (2010) demonstrate that there is a false dichotomy between the place-based and the spatial blind policies, since economic policies occasionally need to have spatial dimension. They follow a similar way of reasoning as the OECD do and they highlight that place-based policies in practice should not neglect aspects or act antagonistically of spatial blind specifications, but only accounting for specificities of some places. Therefore, if place-based policies aim to mobilize the local assets of some regions in order to enhance growth and society's prosperity, there is no opposition to the spatial blind objectives. In contrast, the authors clarify, place-based policies achieve to activate the non-urban potential which still represents the 2/3 of overall growth.

Finally, Barca et al (2012) give a special focus on the deeper underlying assumptions of the debate. They examine the difference in philosophy between the arguments using real examples and they stress their main attention at the institutional configurations which are called to formulate, design and implement development policies. In their focus, governance system and the way that actors are involved in the process of policy design should ensure the participation, interaction and potentially representation of policy beneficiaries. Therefore development policies need to be *'more "place-aware" by taking into consideration the sheer*

*variety of factors in diverse geographical locations that may affect the potential returns of intervention*’ (Barca et al, 2012).

### 3.4 THE ROLE OF INNOVATION IN THE DEBATE

The role of innovation and innovation policy in the debate of development policies is not always apparent. As discussed in section 3.1, the line of thinking in the World Bank report is catalytically imbued with the theoretical underpinnings of agglomeration economies literature. Cities, there, are qualified as main growth engines since they concentrated the most dynamic potential and can provide higher possibilities for economies of scale, lower costs for economic production and proximity effects between firms and entrepreneurs. Furthermore the recognition that external economies (seen as localization and urbanization economies) have growing impacts on growth shall cause changes to the provisions of urban policies. Small cities build up on sectors where they have a distinct comparative advantage, while large cities focus on more diversified economies based on knowledge-intensive services and high value added activities.

According to the World Bank report *‘large cities diversify, incubate new ideas and firms, and push out mature industries’*. This is because big cities are based not only in one specific industry but on a number of industries which they can share common infrastructures, practices and related activities. Urban diversity stimulates the exchange of ideas and face-to-face interactions between industries while the existence of specialized labour force and proximity effects instigate the creation and development of new ideas and firms.

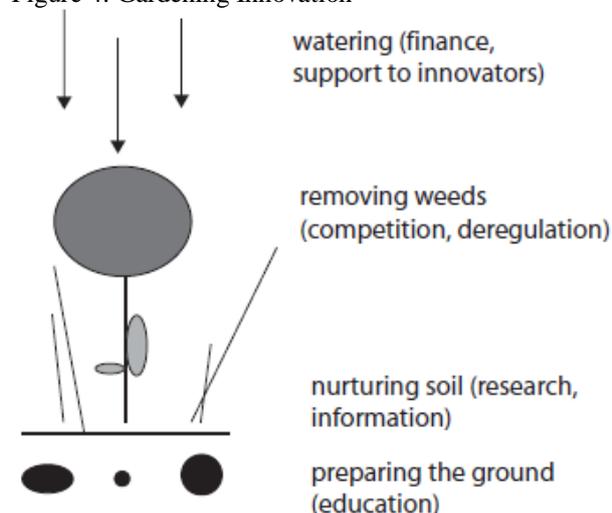
However, World Bank clearly recognizes the role of innovation and innovation policy in a complementary massive report named *Innovation Policy: a guide for developing countries* in 2010. In this new Report, the World Bank calls for *‘proactive’* innovation policies which aim to re-form the framework conditions<sup>5</sup> of a given country and therefore create a better economic environment for growth. To this respect, innovation policy involves horizontal changes in various policy areas (such as education, business environment and decentralization). These changes are mainly introduced through the form of laws or economic incentives and derive from the legislation route of national governments. This means that innovation policy attempts to create a proper climate for innovation and according to the Report this can be only done via a *‘whole-of-government’* approach (World Bank, 2010).

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<sup>5</sup> According to the report these condition relate among other s to economy, governance, education and infrastructure of a country (World Bank, 2010)

This approach describes the role of government as ‘gardeners’ who have the tasks to: (1) support innovators through appropriate incentives and mechanisms (‘watering the plants’), (2) remove obstacles to innovative initiatives (‘removing weeds and pests’), (3) establish responsive research structures (‘nurturing the soil’), and (4) form a creative and receptive population through appropriate educational systems (‘preparing the ground’) (see also figure 4). Eventually, to do so, governments need to employ innovation strategies (‘pragmatic agendas’) in which they have to detect those sectors, places and human sources with the biggest potential to build on. Concluding, well-designed and well-implemented strategies in combination with well-established institutional settings guarantee a successful development outcome (ibid).

Figure 4: Gardening Innovation



Source: World Bank, 2010

In contrast, the Barca report acknowledges the role of innovation as a key case for place-based policies in the EU (Barca, 2009). The report recognizes both efficiency deficits and institutional failures that undermine the significant potential for innovation to grow. In addition, it points to the local and regional character of innovation and the need for extracting the experience of local actors in the task of formulating appropriate policies. To this respect, the report was a precursor of smart specialization framework and the idea of place to place capacity building in order to create place-based innovation policy.

Drawing from the same lines, the OECD warmly managed to enhance this transformation of innovation policy framework into new bases. Initially, the OECD Review on *Regions and Innovation Policy* settled the principles on how innovation policy contributes to the mobilization of regional resources and assets towards the development objectives. To this direction, the Review proposes policy makers to (1) acknowledge the diversity of regional economic and innovation profiles by considering the specificities of local systems and

characteristics in the Science and Technology sector, (2) open the black box of regional innovation policies by advocating the institutional context, the regional innovation system and the strategic choices available in the region and (3) enable regions to become agents of change by placing them in the core of the institutional transformation to occur (OECD, 2011).

Essentially, OECD refers to a new policy framework which aims to create appropriate conditions for endogenous growth through the assessment of growth factors such as production structure, historical and cultural patterns, institutional capacity and degree of connectivity of regions among others. By doing so, the focus of investments targets at educating human capital, broadening knowledge infrastructure and promoting knowledge-intensive activities. In addition, attention is given to other agents (such as universities and research centres), but also to horizontal interventions such as standards and regulations (OECD, 2011). However because all these interventions are materialised by institutional schemes in the regional level, a primary request is to work extensively on the institutional capacity of the regions.

In turn, based on the logic of the new paradigm of regional policy, the OECD supported actively the smart specialization idea by conducting a report about the new concept. The definition attributed to the concept is quoted as follows (OECD, 2013b):

‘Smart specialization is an industrial and innovation framework for regional economies that aims to illustrate how public policies, framework conditions, but especially R&D and innovation investment policies can influence economic, scientific and technological specialization of a region and consequently its productivity, competitiveness and economic growth path. It is a logical continuation in the process of deepening, diversifying and specializing of more general innovation strategies, taking into account regional specificities and inter-regional aspects, and thus a possible way to help advanced OECD economies – as well as emerging economies- restart economic growth by leveraging innovation led/ knowledge-based investments in regions’.

The concept of smart specialization consists of several innovative elements. Firstly, it foresees the upgraded role of regional institutions due to the existence of local employment pools and economic capital. Secondly, actors within the regions are called to establish the process of ‘entrepreneurial discovery’ which means that they need to consider thoroughly the sectors of the regional economy where comparative advantage exist. Then using various methodologies (e.g. analytical studies or focus groups) regions should identify specific economic activities in which they will find innovative potential. These activities can be either existing or entirely new, where regions can develop advantages. The latter seeks for detailed

research for such activities and high level of coordination between public and private stakeholders.

Lastly, the policy needs ex ante (1) a deep mapping of areas with high technological and economic specialization in the region, (2) the ability to select the activities with critical mass and comparative advantage for growth and (3) the determination of appropriate institutions able to transform the analytical discoveries into real economic results. As most policy frameworks do, smart specialization too aims to reduce existing economic failures, while it recognizes the regional economic context and specificities and targets at finding the strengths and instruments which can foster regional development (OECD, 2013b).

## CHAPTER 4. METHODOLOGY AND RESEARCH DESIGN

The aim of this chapter is the transition from the theoretical part to the influences and research design of this thesis. In other words the goal of this chapter is to explain the underlying philosophical and methodological basis of the Master Thesis topic by providing the ideas and influences behind the research approach and some basic issues relating to the methodology employed in this dissertation (type of research, research approach, case study selection, data collection and data analysis).

### *4.1 INFLUENCES AND MOTIVES BEHIND THE TOPIC*

The selection of this topic implies the motivation of the researcher to analyze, understand and ideally intervene in the discussion about innovation and regional development in Greece. It is apparent that in the context of a master thesis research limited room of maneuver exists. This means that both the understanding of the complex national and regional systems and the possibility of comprehensive analytical results of the research can reach only an initial level of the current reality (real implementation). Nevertheless, the intention of this research is to describe the current situation and potentialities of the regional innovation systems in Greece (the ‘what is going on’ question) and then to explore how these potentialities can be further exploited within the ongoing process of compliment of the smart specialization strategies in Greece.

In other words, the motives are both positive and normative. On the one hand, they are positive because the description of regional innovation systems aims to explain what the current situation is. To do so, there is a need for a number of quantitative indicators that unfold the concepts and the facts contained in the regional system. On the other hand, the final synthesis and contributions to the broader discussion target the field of what should be added in or exploited by the current condition.

With respect to the intellectual influences, two basic paradigms should be mentioned and determine the positioning of the researcher over the topic. Firstly, I was influenced by the structural functionalism paradigm taking into consideration that the systems approach is already prominent in the literature of innovation and growth. Structural functionalism

paradigm provides a framework that society can be viewed as an organism and the different parts of this society (agents such as public institutions or economic actors) operate around specific functions (Babbie, 2013). In such a point of view a regional innovation system is composed of agents (e.g. public authorities, entrepreneurs, big firms and research institutions) that target at producing innovation and they serve the development and wellbeing of the regional society.

Although structural functionalism can be a very useful paradigm for my research, it still has some limitations. The most important one is its weakness to incorporate power relations and especially evolution of the system. In my research the possibility for policy interventions and shifts from the old unsuccessful model to a new innovative-led model of development holds an important role for the system. This means that my thinking has to consider other paradigms as well. To this direction, I find useful to employ the Social System Paradigm as described by Tang (Tang, 2011:234).

Despite the limited endowments for exploring the evolution of regional innovation systems in Greece, I need a dynamic paradigm that eliminates the weaknesses of the structural functionalism paradigm and links forces of other paradigms into an entire paradigm. To this respect, Social System Paradigm (SSP) combines the systemic approach with social structure (such as institutional and cultural context) and allows for explanation of different phenomena or behaviors inside the system through tools of other useful paradigms. This flexibility is necessary for this research because there are dilemmas that can be overcome only by an interpretivist or critical realism point of view.

For example, as discussed below, the second stage of qualitative analysis of this thesis includes the conduction of interviews. Interviews, as a qualitative method, are used in order for the researcher to collect a holistic picture and interpretation of the issues related to this topic by the specific view of scientific and policy experts. The selection of qualitative research and analysis, however, share the same philosophical base as the interpretivist paradigm. Thus the provision of interpretivism strengthens the dynamic nature of SSP and is used as a significant input of thinking in this study.

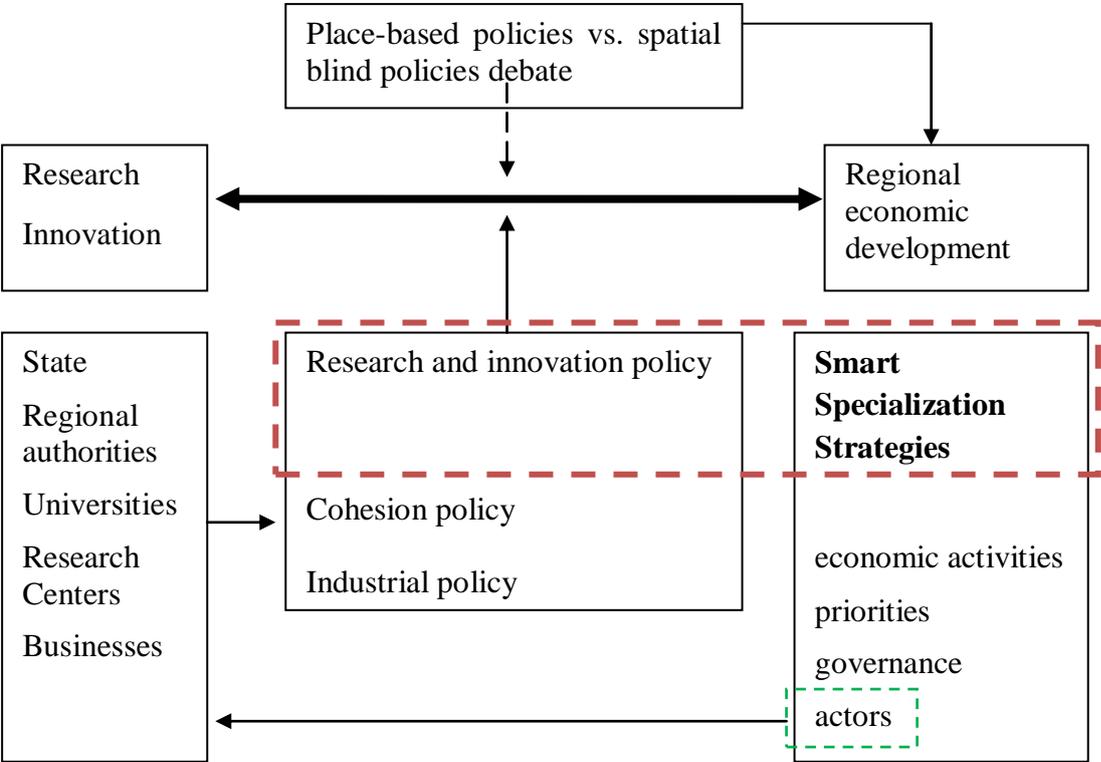
In a certain extent the selection of the Social System Paradigm satisfies the problems associated with the research design too. The issue of ‘observational equivalence’ (McCann, 2007) in my case meets the majority of the problems and inconsistencies incorporated into the concept of ‘regional innovation system’. Furthermore, the nature of my research having both positive and normative characteristics threatens the credibility of my analysis and results. In order to avoid these problems, the formation of my research question focuses on specific parts

(like the Research and Innovation policy and the region of Attica as case study) over the whole discussion thus allowing for targeted research in specific concepts, while the selection of the appropriate methodological techniques (desk research and interviews) ensure the added value and the contribution of my research. Eventually, there is a high degree of policy relevance of this topic, element that is identified by the fact that both innovation policy and smart specialization agenda are under construction in Greece at this very moment. To this respect, the contribution of this research lies on the ongoing facts and developments taking place in the case study area.

4.2 CONCEPTUAL FRAMEWORK

This master thesis takes issue with the link between Research and Innovation concepts and their contribution to the regional economic development. Considering the ongoing developments around the smart specialization agenda for all the regions of the EU, this dissertation tries to investigate the arena of issues related to research and innovation policy in Greece and especially how smart specialization strategies as imposed by the EC are developed in the region of Attica.

Figure 5: Conceptual Framework



The core of my inspiration was the link between innovation and regional development concepts (figure 5). In this link policies play a crucial role. On the one side, a tripartite of

policies influences the regional development agenda with respect to innovation: research and innovation policy, cohesion policy and industrial policy. On the other side the debate between place-based and spatial blind policies is also an influential component in this scheme.

Furthermore, the recent agenda of the EU on smart specialization strategies (RIS3) and the obligation of every European region to conduct one RIS3 as a prerequisite for getting the European funding is added as an intermediate stage between policies and regional development. A central role in the design of RIS3 occupies the idea of finding economic activities where regions have competitive advantages and set priorities in order to maximize the contribution of the development strategy. To this respect governance schemes, the implication of more actors and implementation and evaluation mechanisms come to the foreground of the policy.

#### *4.3 ISSUES RELATED TO THE RESEARCH DESIGN*

Starting from the general link of innovation with regional development and focusing to the facts and developments in the regional innovation systems of Greece and Attica in particular the approach of this study seems deductive. However this is also driven by the strategy employed in this research. Due to time and space limitations, the basic strategy followed is a case study research. Because in the context of a master thesis is difficult to examine a national innovation system in detail, the researcher decided to investigate the basic issues related to the regional innovation system of the region of Attica.

The selection of the case study is based on a series of criteria. Firstly, the case study constitutes a special case in the Greek context because it concentrates the largest potential in terms of population, economic activities and research and innovation activities. Thus the region of Attica is the most important case to study in the Greek territory. Secondly, Attica region is considered among Greek regions as the one with high potentialities for attracting the majority of the focus of the coming programming for the period 2014-2020. Thirdly, Attica has the vast majority of research organizations and businesses in Greece thus it concentrates the higher probabilities for the researcher to find sources and persons to investigate. Finally, for accessibility reasons (physical distance) the region of Attica was considered the most appropriate in comparison to other candidate regions such as Crete and Thessaly.

#### *4.4 SELECTION OF METHODOLOGY AND ANALYSIS TECHNIQUES*

This master thesis uses qualitative research as a method to answer the main research question. The nature of the methodology is mainly descriptive and secondarily exploratory. This is partly explained also because of the positive and normative motivation of this study. For the case study mentioned above we proceed two stages of research.

In the first stage, the desk research technique is used in order to collect the proper inputs for the current condition of the national and regional innovation systems in Greece. Therefore, prominent documents from international and national organizations were collected and studied. Reports from OECD, secretariats of the EC, national and individual organizations were used in order to summarize the most important characteristics and facts which stigmatize the innovation systems in Greece (Chapter 5). Those characteristics and facts formed thematic areas of special interest which in turn were used as basic inputs for the formation of interviews.

In the second stage, semi-structured interviews were employed. Semi-structured interviews are a type of interviews between structured and unstructured and allows for open ended questions where the interviewees can answer with a free choice of answers. This type of interviews help the interlocutors to discuss the topic of interest in detail and especially the interviewer to grasp the entire amount of information needed for the topic. In addition, this type of interviews allows the researcher to direct the discussion according to the personal needs and agenda (Srivastava and Thomson, 2009).

Initially, the researcher constructed a list of questions to be addressed. However, during the first interview this list proved quite broad in content and time-consuming thus the researcher constructed a new list of questions based on the most important thematic areas emerged from the previous stage of the research (see Appendix 1). This list followed the principle of open-questions driven by the research agenda of the researcher. In addition, the persons interviewed were selected according to two criteria. First, the researcher approached academic professors, scholars and experts who were already familiar with the topic and some of them were also cited in the documents mentioned in the desk research stage. Second, the researcher approached new candidates for interviews suggested by other interviewees during the field work. In total, the list presented in the appendix indicates the final respondents and other persons called but did not respond as well (see Appendix 2). The interviews took place during 23 June to 18 July 2014.

What concerns the data collection, in all the steps of this thesis most of the data and documents used were easily accessible. The data used in the desk research stage were collected from the Eurostat databases which are digitally accessible, while some of the data used originate from electronically available studies and reports. It is worth to note that additional useful material was provided directly from some of the interviewees thus the researcher had to return to previous parts of the thesis and update some of the information.

With respect to data analysis, two points should be mentioned. Firstly, the desk research was used as a technique to concentrate the most important facts and characteristics of the Research and Innovation policy in Greece and build the agenda of this research. All the documents and reports are judged as reliable coming from international organizations (such as OECD and EC) or commissioned by them. Secondly, the type of analysis employed for the interviews is based on the framework analysis approach to qualitative research (Srivastava and Thomson, 2009 quoted by Ritchie & Spencer, 1994). According to Ritchie & Spencer (1994) framework analysis is appropriate for research that has *'specific questions, a limited time frame, a pre-designed sample (e.g. professional participants) and a priori issues (e.g. organizational and integration issues) that need to be dealt with'* (Srivastava and Thomson, 2009). The selection of this methodology was decided because it allows the researcher to deploy 'thematic analysis'. In this analysis, themes emerged from the organization of the interviews conducted because each question involves a different thematic area of interest. In general, the framework analysis approach evolves in five steps: (1) familiarization, when the researcher transcribes and gets familiar with the data, (2) identifying a thematic framework, when the research finds out the most important themes, (3) indexing, which is the stage where the coding procedure is developed, (4) charting, which refers to the rearrangement of themes and codes into a concrete chart of information and (5) mapping and interpretation, which is the step of reporting and interpreting the results of the analysis (Srivastava and Thomson, 2009 quoted by Ritchie & Spencer, 1994).

## **CHAPTER 5. AN OVERVIEW OF INNOVATION AND INNOVATION POLICY IN THE REGIONAL DEVELOPMENT IN GREECE**

This chapter surveys some basic characteristics of the economic environment and research and innovation system in Greece. The intention of this chapter is to link the theoretical discussion presented in chapters 2 and 3 with the current situation of innovation and regional development policies in the Greek context. Therefore, this chapter attempts to give an overview of the Greek economy and its regional development profile (described as ‘regional problem’). It also presents how innovation was promoted through the previous decade. Subsequently, the current status and the most important components of the National Innovation System (NIS) in Greece are analyzed. Finally, shifts in the policy framework due to the ‘smart specialization strategy’ agenda are considered as well. The most important findings are summarized in the last part of this chapter.

### *5.1 PRODUCTION PROFILE*

#### **5.1.1 The Greek economy**

Since 2008, the Greek economy has been stigmatized by the great recession of the economic system and the deduced reforms imposed by the cooperation of the state with its lenders. Table 4 provides some basic data that outline recent developments in the Greek economy. The economy of Greece in terms of GDP in 2012 was in the same level as in 2005 but during the period 2011-2012 the loss of output was around 14%. The GDP per capita and Gross National Income (GNI) per capita indicators for the same period (2005-2012) has been deteriorated. The Gross Value Added (GVA) per inhabitant has lost a part of its value and especially in 2011-2012 this loss reached 12%. The debt of general government has soared into 157,2 % of GDP while in 2005 it was 100%. Another aspect of the economic environment is reflected in the level of investments (as % of GDP) which is also reducing during this period.

What regard to the structure of the economy during 2005-2012 period, services sector has gained much of the change in employment against the secondary sector. The percentage

of tertiary sector has increased by 5% since 2005. In 2012 the share of employment in primary sector was 13% of the total employment, secondary sector accounts for approximately 17% of the total employment while almost 70% of the people are employed in the tertiary sector.

Table 4: Basic facts for the economy of Greece

Data	indicator	2005	2008	2011	2012
<b>GDP (market prices)</b>	million euros	193,1	233,2	208,5	193,4
<b>GDP (market prices)</b>	%	1,4	-1,5	-6,9	-7,1
<b>GDP per capita</b>	PPS per inhabitant	20.400	23.200	20.300	19.500
<b>GVA</b>	PPS per inhabitant	18.200	20.400	17.900	17.200
<b>GVA (basic prices)</b>	change in %	2,4	-3,3	-5,2	-6,6
<b>GNI disposable</b>	PPS per inhabitant	20.100	22.400	19.600	19.600
<b>Cross Capita formation</b>	PPS per inhabitant	4.400	5.600	3.300	2.700
<b>Taxes on production and imports less subsidies</b>	PPS per inhabitant	2.100	2.600	2.300	2.100
<b>General government gross debt</b>	% of GDP	100,0	112,9	170,3	157,2
<b>GDP deflator</b>	number	1,9	4,7	1,0	-0,3
<b>Investments</b>	% GDP		22,6	15,1	13
<b>Labour productivity</b>	y-o-y change %		3,5	-0,6	1,5
<b>Unit labour cost</b>	y-o-y change %		5,1	-1,8	-5,1
<b>Unemployment rate</b>	%	9,6	7,2	16,3	23,6
	age 15-29 % of total	19,2	16,2	34,6	43,6
<b>Employment growth</b>	%	3	1,2	-5,6	-8,3
<b>Share of employment</b>	primary sector	12,4	11,3	12,4	13,0
	secondary sector	22,5	22,3	17,8	16,7
	tertiary	65,2	66,3	69,8	70,4
<b>Self-employed</b>	% total employment	35,6	33,7	34,2	34,6
<b>Services</b>	% total employment	68,4	69,2	71,7	72,2
<b>Industry</b>	% total employment	19,7	19,9	16,6	15,6
<b>Risk of poverty</b>	age over 18 % of total	30,2	27,8	31,1	34,8
<b>FDI flows</b>	% of GDP (EU27)	0,3 (1,2)	1,3 (1,5)	0,4 (1,8)	0,7 (2,3)
<b>Market integration</b>	FDI intensity (EU27)	0,4 (1,7)	1 (2,3)	0,5 (2,1)	0,5 (2,1)

Source: Eurostat, 2014

In relation to the business structure (table 5), the vast majority of enterprises in Greece have very small size in between 0-9 employers (approx. 96% of all enterprises). Considering in particular the number of SMEs in Greece then 99,9 percent of the whole business activity in the country takes place in enterprises employing less than 250 employers. Additionally, comparing the absolute number of enterprises during the period 2008-2014, we can observe a reduction of 81.949 firms or 36,9%. In terms of employment, there is a significant loss of jobs in all the categories of enterprises. However in absolute numbers around 277.500 employers lost their jobs during the period 2008-2014, while more the half of them (54,8% or more than

152.000) derive from very small enterprises. The share of small enterprises and SMEs in total employment is 53,1% and 85,8% in 2014 respectively. Furthermore, a considerable loss in value added is apparent for the same period of reference. During 2008-2014, almost € 5,5 billion have been lost from business activity in Greece. The importance of small enterprises and SMEs is indicated by a respective share of 30,0% for the first and 64,3% for the latter. All these statistics attempt to declare the production base of the Greek firms and in particular its special dependence on very small firms usually with a family character.

Table 5: Business structure, all sectors

Topic	Year	0-9	Share (%)	10-49	50-249	SMEs	Share (%)	250+	Total
Number of firms	2008	213.827	96,3	6.778	1.176	221.781	99,9	165	221.946
	2011	152.241	96,6	4.330	916	157488	99,9	135	157.623
	2014	135.093	96,5	3.947	838	139.877	99,9	120	139997
Number of employers (in thousands)	2008	419,6	53,7	142,8	118,2	680,7	87,2	100,2	781,0
	2011	298,7	53,3	89,0	91,2	479,0	85,5	81,4	560,5
	2014	267,5	53,1	80,6	83,7	431,8	85,8	71,6	503,5
Value added (in million €)	2008	5.895	26,8	3.805	4.404	14.104	64,2	7.860	21.964
	2011	5.469	30,2	2.720	3.528	11.717	64,7	6.384	18.101
	2014	4.924	30,0	2.446	3.182	10.552	64,3	5.859	16.411

Source: Eurostat et al, 2013

Moreover the recent downturn of the Greek economy has emerged further crucial impacts. Firstly, unemployment rate has increased dramatically over 23% (in March 2014 this rate was over 26%) and especially for young population unemployment rate reached 43,6%. This reality becomes even more serious considering that the employment growth decreased as well (-8,3 % only in 2012). Moreover, these changes in conjunction with reforms on labour markets do not seem to benefit productivity of the Greek economy as its development is poor. In contrast unit labour cost dropped considerably the last few years (-5,1 in 2012).

In fact, the Greek economy shows signs of adjustment towards a new economic reality because of the fiscal consolidation programme. Due to this adjustment is still on way it is risky to comment upon the yield of these changes. The main request for the Greek economy is to overcome the difficulties of crisis by setting the entire economy in a new basis and contemplating the needs of its society.

### **5.1.2 Regional disparities and regional development in Greece**

Except the overall picture of the Greek economy, special interest presents the regional structure of the country. Greece is a relatively small country in the EU but is confronted with significant inequalities (table 6). It suffers from the dominance of the capital region of Attica against the rest of the country. The region of Attica concentrates around 48% of the total GDP and almost 36% of the total population of the country. In addition, Attica hosts the highest

share of high-educated labour force considering that almost four out of ten people with a master or doctorate degree reside there. A similar percentage of people is devoted to High Resources in Science and Research (40,5%).

Table 6: Regional Disparities in Greece, 2011

	GDP				Population	Education	
	share % in total GDP	Millions of PPS	Change 2005-2011	PPS per inh in % EU28	share & in total	share % in total*	HRST % of active population
<b>Greece</b>	100	226.286	0,1	80	100	100	32,4
<b>Anatoliki Makedonia-Thraki</b>	3,9	8.928	-2,0	57	5,4	4,7	24,9
<b>Kentriki Makedonia</b>	13,5	30.488	-2,5	62	17,3	19,8	34,1
<b>Dytiki Makedonia</b>	2,6	5.829	8,0	80	2,6	3,6	25,0
<b>Thessalia</b>	4,8	10.749	-9,2	56	6,5	4,3	28,4
<b>Ipeiros</b>	2,2	4.882	-4,3	55	3,2	4,4	28,8
<b>Ionia Nisia</b>	1,8	4.033	-10,0	75	2,1	1,2	22,4
<b>Dytiki Ellada</b>	4,6	10.412	-8,6	59	6,6	12,4	27,9
<b>Stereia Ellada</b>	4,6	10.355	-7,0	72	4,9	3,2	22,5
<b>Peloponnisos</b>	4,3	9.743	-2,4	65	5,2	1,5	21,9
<b>Attiki</b>	48,1	108.859	4,7	107	36,4	36,9	40,5
<b>Voreio Aigaio</b>	1,4	3.265	-0,7	63	1,8	1,4	25,4
<b>Notio Aigaio</b>	3,4	7.679	1,5	89	2,7	0,5	21,2
<b>Kriti</b>	4,9	11.065	-3,0	69	5,4	6,1	24,7

\* Students (ISCED 5-6) at regional level - as % of total country level students (ISCED 5-6)

Source: Eurostat,2014

Following Attica, the region of Kentriki Makedonia plays an important role in regional development in Greece. The second biggest city of Greece (Thessaloniki) functions as the second largest pole for development and concentrates significant growth potential. However Kentriki Makedonia lags behind Athens with respect to GDP level (62) in comparison with the national level (80) and the European level (100) respectively. The rest of the regions contribute much lower in development though they possess special comparative advantages. In terms of share of GDP, the rest of the regions vary between 1,4 to 4,9%, in comparison with the average GDP of the EU28 (100), while the share of high educated personnel is below 7% except the region of Dytiki Makedonia. Therefore the level of regional disparities sustains high in Greece and development policies need to overcome these obstacles.

Except the current downturn of the Greek economy and the extensive cuts on public expenditures, there are other crucial factors that restrict the efficiency of regional policies in

Greece. Petrakos and Psycharis describe a number of factors that shape the ‘regional problem’ in Greece (table 7). The factors refer to historical, political and economic reasons among others (Petrakos and Psycharis, 2004).

Table 7: Factors of regional disparities in Greece

Type of factors	Facts	Impact
Historical	Gradual expansion of Greek state	As old urban center Athens benefited from better initial conditions for growth
	Greece-Turkey war 1918-1922	The end of the war led 246.000 immigrants to establish around Athens
	Historical and political turbulences 1949-1989	Conflicts with neighboring (former socialist) countries in border regions weakened urban center in the North of the country
Geomorphologic	Geological variety of Greek terrain	People were attracted to areas nearby valleys and coasts, while mountainous areas lost parts of their population
Political	Centralized structure of the public administration	The lack of independence and the fragmentation of the local and regional governments
	Lack of redistribution policies towards the lagging regions	Mismatched policies among regions and their needs
	Inefficient use of EU funding during 1989-1999	Small scale interventions with limited added value
	‘Lack of democracy’	Spatial polarization and concentration of people close to policy making centers
Economic	Economies of scale	Bigger urban areas attract more activities
	Production structure and human resources	Modern economic sector substitute traditional economic activities
	Internationalization of economy	Increase of risk because of competition
	Impact of economic cycles	High rates of growth can cause higher levels of inequalities
	Past regional development policies	Vague result of redistribution policies

Source: Petrakos and Psycharis, 2004

Against disparities Greece has adopted a regional policy based on national contribution under the Greek Programme of Public Investments and predominantly the Community allocations under Cohesion Policy programmes. The most recent national document is the National Strategic Reference Framework for 2007-2013 but a new document for the period 2014-2020 has already delivered to the European Commission for approval.

The main objectives of the policy are to reduce growth gaps and catch the EU average standards. Besides that, Greek regional development policy seeks for the pan-european objectives for social, economic and territorial cohesion and contributes to the achievement of the Europe 2020 strategy goals for smart, sustainable and inclusive growth. To do so, the policy aims to activate growth potential, increase productivity levels and improve the well being of Greek society (OECD, 2010b).

The basic tools for regional policy are multiple. Greek authorities select different policy mixes according to current priorities. First, the national and regional operational

programmes constitute the core of regional policy. Second, the various public expenditures and Development Laws are used to share incentives for investments both in leading and lagging areas. Moreover Developments Laws allocate quotas for investment support to new businesses and thus enact as basic tools for the activation of the local potential of lagging and remote regions. Additional policy tools considered the sectoral and thematic individual programmes like the Rural Development Programme of Greece. Other relevant policy instruments are measures for boosting labour and capital mobility, direct support to Small and Medium-sized Enterprises (SMEs), cluster policies and creation of Hubs of Innovation and finally establishment of new scientific institutions such as Higher Education Institutes (HEIs) and Research Centers (OECD, 2010b; Petrakos and Psycharis, 2004).

## 5.2 INNOVATION PERFORMANCE IN GREECE

### **5.2.1 The innovative profile of Greece**

Greece shows a deficit in exploiting its innovative potential. Most of the main innovation indicators show that Greece performs very poor and quite below the EU average. According to the Innovation Union Scoreboard 2014 in particular Greece is considered as a *moderate innovator* (Hollanders and Es-Sadki, 2014).

In more detail, all the indicators referring to expenditures on research and development declare a poor performance (table 8). The overall R&D intensity as percentage of GDP in Greece (0,69) remains very low comparing to the EU average (2,07). In the business sector expenditures are in 0,24% of GDP while in the government sector 0,17% comparing to the European average which is 1,31% and 0,25% respectively. Basic role in the promotion of R&D have the Higher Education Institutions and primarily the Greek universities. The public sector occupies bigger proportion in R&D expenditures given that universities in Greece are public too.

Considering the academic quality of research in Greece, scientific personnel holds noteworthy output as both scientific publications are close to EU average and international co-publications perform higher than the EU. However, innovations as an output of research do not appear striking relating to the contribution of high-tech products and services to the overall exports. Besides that patenting activity is much lower than the EU average. Especially for licensing of new products or services, a big issue is existent between the academic researchers and business sector due to the lack of appropriate legal base. Lastly, the share of employment in knowledge-intensive activities and the share of people between 30-34 with

tertiary education both perform lower than the EU average and indicate the urgent needs to catch up the international standards (for example goals of the Europe 2020 strategy).

Table 8: Basic indicators for innovative profile of Greece

Indicator	Value	Year	EU average
New doctoral graduates (ISCED 6) per thousand population aged 25-34	1,15	2010	1,69
R&D intensity (GERD in % of GDP)	0,69	2012	2,07
Business enterprise expenditure on R&D (BERD) as % of GDP	0,24	2012	1,31
Government expenditure on R&D (GOVERD) as % of GDP	0,17	2012	0,25
HEI expenditure on R&D as % of GDP	0,28	2012	0,49
PNPS expenditure on R&D as % of GDP	0,01	2012	0,02
Public sector share of R&D (%)	65	2012	
Private sector share of R&D (%)	34	2012	
Venture capital (% of GDP)	0,004	2011	0,35
Scientific publications within the 10% most cited scientific publications worldwide (% of total publications of the country)	9,5	2008	10,9
International scientific co-publications per million population	544	2011	300
Public– private scientific co-publications per million population	16	2011	55
License and patent revenues from abroad as % of GDP	0,02	2011	0,58
Sales of new-to- market and new-to-firm innovations as % of turnover	25,6	2006	14,4
Knowledge-intensive service exports as % total service exports	5,4	2010	45,1
Contribution of high-tech and medium-tech products to the trade balance as % of total exports plus imports of products	-5,69	2011	4,20
Growth of total factor productivity (total economy)- 2000=100	99	2012	103
Employment in knowledge-intensive activities (manufacturing and business services) as % of total employment aged 15-64	11,4	2011	13,6
SMEs introducing product or process innovations as % of SMEs	37,3	2006	38,4
Population 15-64 with tertiary education (%)	23,0	2012	
Share of population aged 30-34 who have successfully completed tertiary education (%)	28,9	2011	34,6

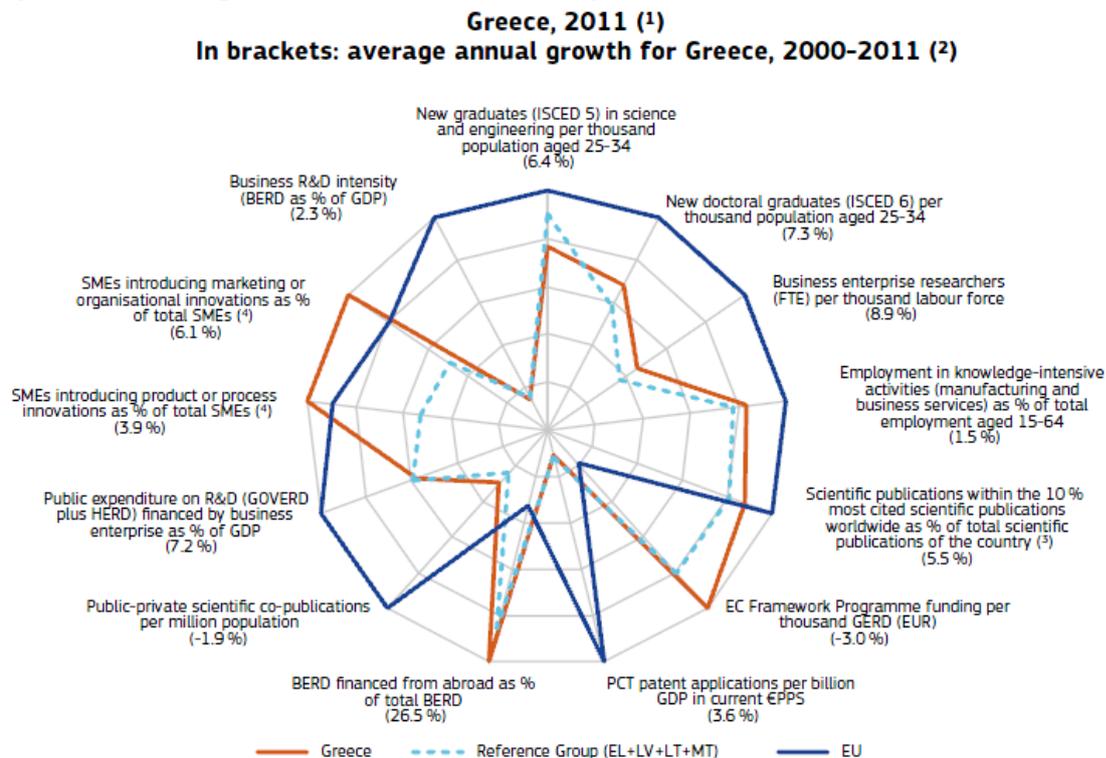
Source: DG Research and Innovation, 2013; Eurostat database

The Science, Technology and Industry Outlook 2012 of the OECD highlights some other aspects of the innovation system in Greece. First is the tight links between universities and industry and the inconsistency in the supply-demand balance for R&D between the two. Second is the moderate share of active population with tertiary education. Third is the relative low quality of the Greek universities. Last is the brain drain phenomenon occurring in Greek economy and academia due to the crisis (OECD, 2012).

Using the illustration of the figure 6, DG for Research and Innovation notes the *imported* character of Greek innovation as the domestic production of knowledge remains in very low levels. In the same study it is underlined that Greek innovation system needs to adjust and find new alternatives for development against global challenges. To this direction, alternatives for scientific research are qualified in the areas of construction, ICT, security, aeronautics and space, transport, production and energy. Construction, ICT, security and automobiles constitute sectors of high scientific specialization for Greece, while food and

agriculture, space, construction, aeronautics and environment sectors can be potential areas for Greece's technological specialization (DG Research and Innovation, 2013).

Figure 6: Innovation performance in Greece, over time growth



Source: DG Research and Innovation, 2013

### 5.2.2 The innovative profile of the Greek regions

According to the Regional Innovation Scoreboard 2014 all Greek NUTS-1 regions are considered ‘*moderate innovators*’. In all indicators Greek regions perform lower than the EU average as it is depicted in the table 9 (normalized values). There is no change of the innovation performance in the regions throughout the time, element that shows relatively stable profile (Hollanders et al, 2014). However a serious difficulty is the lack of available data that hampers the specification of regional characteristics of innovation.

The Regional Innovation Scoreboard data indicate that within the Greek regions there is a mixed picture of performance. Attiki has the highest outcome in people with tertiary education and employment in knowledge-intensive activities. The NUTS1 region of Nisia Aigaiou and Kriti presents higher values in indicators such as non-R&D innovation expenditures, SMEs innovating in house, SMEs introducing product or process innovations and SMEs introducing marketing or organizational innovations. This performance can be partially explained due to the island character of the region and the structure of the economy

targeting to tourism and services sectors. On the other side, Kentriki Ellada has a higher value in innovative SMEs collaborating with others. It is noteworthy that all regions show a very low patent activity which is consistent with the findings of the previous chapter.

Table 9: The regional innovative profile according to Regional Innovation Scoreboard 2014

Region	Voreia Ellada	Kentriki Ellada	Attiki	Nisia Aigaiou, Kriti
Population with tertiary education	0,375	0,301	0,583	0,326
R&D expenditure in the public sector	n/a	n/a	n/a	n/a
R&D expenditure in the business sector	n/a	n/a	n/a	n/a
Non-R&D innovation expenditures	0,156	0,472	0,335	0,814
SMEs innovating in house	0,459	0,429	0,477	0,566
Innovative SMEs collaborating with others	0,461	0,638	0,371	0,476
EPO patent applications	0,071	0,055	0,106	0,112
SMEs introducing product or process innovations	0,459	0,499	0,548	0,653
SMEs introducing marketing or organizational innovations	0,601	0,636	0,542	0,647
Employment in knowledge-intensive activities	0,246	0,212	0,545	0,351
Sales of new-to-market and new-to-firm innovations	0,926	0,519	0,766	0,500
OECD innovation-related typology of Greek regions	Primary-sector-intensive regions	Primary-sector-intensive regions	Medium-tech manufacturing and service providers	Primary-sector-intensive regions

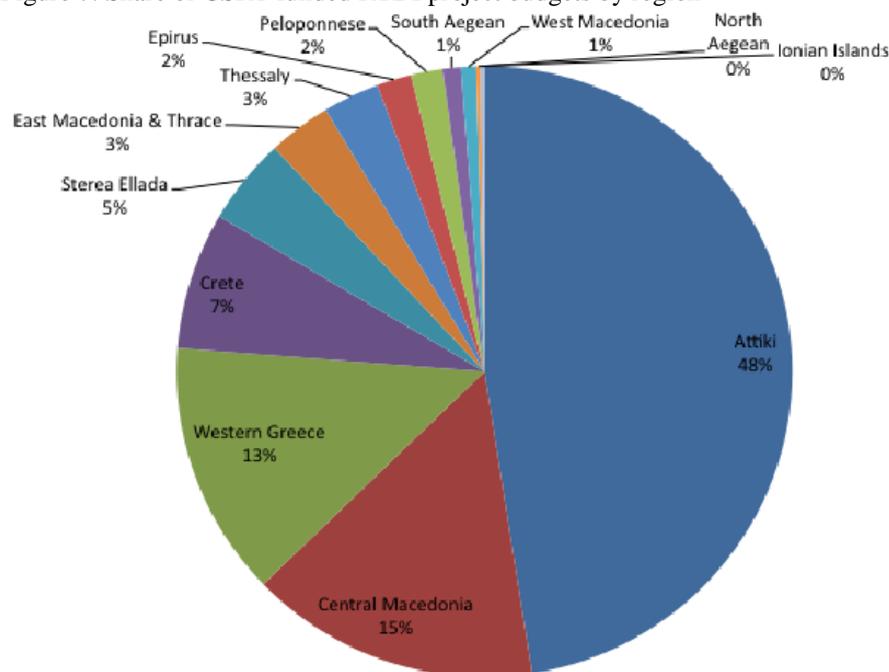
Source: Hollanders et al, 2014; Ajmone Marsan and Maguire, 2011

Complementarily, it is important to add the OECD typology of Greek regions according to innovation-related variables for the same spatial scale. Most Greek NUTS1 regions are considered as ‘*primary-sector-intensive regions*’ while only Attiki is ‘*Medium-tech manufacturing and service provider*’ (Ajmone Marsan and Maguire, 2011).

Data on the absorption of Structural Funds (SF) funding (under RTDI priorities) show that the Greek regions hold low absorption rate as most of them are below 50% of the average except Attiki and Anatoliki Makedonia-Thraki which are below 75%. In terms of the relevant taxonomy, 4 NUTS2 regions (Attiki, Voreio Aigaio, Notio Aigaio and Kriti) are classified as FP leading absorbers, the Anatoliki Makedonia-Thraki region is the only SF leading user on business innovation and commercialization, in Kentriki Makedonia, Dytiki Makedonia regions no data is available, while the rest of the regions are sorted as SF low users (Hollanders et al, 2014). On the other side, based on the regional distribution RTDI project

(figure 7) it is apparent that Attiki is the main receiver of funding among all the regions of Greece.

Figure 7: Share of GSRT funded RTDI project budgets by region



Source Reid et al, 2012 based on data received from the GSRT

Using the logic of the Regional Scoreboard mentioned above, this study managed to create a similar regional innovation profile based on data available from Eurostat for the Greek regions. Some indicators that are related with data from the Community Innovation Survey were not available so are neglected in the table 10.

Similarly to previous findings, Greece poses a very low R&D intensity in relation to the EU (0,7 and 2,0 % of GDP in 2011 respectively). In the regional level only three regions perform sufficiently in this indicator (Ipeiros 0,9, Attiki 0,8 and Kriti 1,0 %). However this share for Ipeiros and Kriti is based on the public expenditures dominantly driven by the two Universities of Ioannina and Crete. The higher participation of business sector in R&D expenditures is observed in Attiki and Sterea Ellada regions.

Respectively the R&D personnel as percentage of active population in full time equivalents (FTE) is concentrated in Kriti, Voreio Aigaio and Attiki. But in absolute numbers Attiki and Thessaloniki (Kentriki Makedonia) hold almost 60% of the total R&D personnel employed. The same metropolitan regions (Attiki and Kentriki Makedonia) have the highest share of young population with tertiary education and constitute the only two regions where this share is higher than the EU average. Attiki is the region with the highest employment in knowledge-intensive activities and the only one above EU average. Last is an indicator about

patenting activity which highlights that Kriti, Kentriki Makedonia and Attiki are the most active players.

Table 10: The regional innovative profile according to Regional Innovation Scoreboard 2014

Region	R&D intensity	R&D in public sector	R&D in business sector	R&D personnel, % of active population in FTE	R&D personnel, Head count	Population aged 30-34 with tertiary education attainment	HRST with tertiary education in S&T, % of active pop	Employment in knowledge-intensive activities	EPO patent applications (per billion GDP)
	2011	2011	2011	2011	2011	2013	2012	2012	2009
EU 28	2,0	0,7	1,3	1,08	3.982.669	36,8			
Greece	0,7	0,4	0,2	0,74	70.229	34,6	16,2	36,3	
Anatoliki Makedonia-Thraki	0,6	0,4	0,2	0,58	3.535	22,6	11,5	31,6	0,11
Kentriki Makedonia	0,7	0,5	0,2	0,76	11.954	37,4	17,0	35,6	0,53
Dytiki Makedonia	0,2	0,2	0,1	0,52	1.535	30,3	11,2	28,7	0,18
Thessalia	0,4	0,4	0,0	0,68	5.499	29,7	13,8	30,2	0,09
Ipeiros	0,9	0,8	0,0	0,75	3.130	33,5	14,1	31,2	0,20
Ionia Nisia	0,1	0,1	0,0	0,13	245	18,7	9,1	24,5	0,00
Dytiki Ellada	0,8	0,6	0,1	0,63	3.832	28,0	12,5	30,4	0,44
Stereia Ellada	0,4	0,1	0,3	0,32	1.120	22,1	10,1	23,3	0,36
Peloponnisos	0,4	0,3	0,1	0,38	1.660	22,0	9,9	25,3	0,03
Attiki	0,8	0,4	0,4	0,87	28.727	44,0	21,2	46,0	0,48
Voreio Aigaio	0,5	0,5	0,0	0,95	1.661	21,3	13,2	38,2	0,00
Notio Aigaio	0,2	0,2	0,0	0,44	1.152	26,4	12,2	29,5	0,21
Kriti	1,0	1,0	0,1	1,32	6.179	25,6	11,5	27,2	0,59

Source: Eurostat, 2014

To sum up, this analysis indicates the key role of three regions in the R&I system of Greece. Dominantly Attiki and secondarily Kentriki Makedonia and Kriti dominate the system because of the R&D activity of their universities and the existence of numerous research centers. Some regions concentrate interesting characteristics in their regional innovation systems like Ipeiros and Stereia Ellada and Voreio Aigaio, while others possess less dynamic character.

The main findings of our analysis are consistent with the most important facts derived from the ERAWATCH assessment of the regional innovation profiles of the Greek regions. Further ERAWATCH platform highlights the reform in governance institutions introduced in 2011 and the changing balance of power that potentially will emerge in policy making. The centralized role of GSRT is possible to be transformed as well due to the extended budgets of

regional administrations. More specifically the budget allocated to the 13 Regional Operational Programmes for the period 2014-2020 will be 35% of the total allocations while during 2007-2013 the same budget was 22% (ERAWATCH, 2014). Nevertheless the dominance of Attiki and Kentriki Makedonia regions in the allocations directed to regions it is not easy to change dramatically and this is a matter of great importance in relation to innovation policy mix.

### *5.3. ADMINISTRATION STRUCTURE*

Greece is a unitary country with three main scales of administration. In its history Greece faced many transformations of its boundaries and subsequently of its administration. The current structure of the state administration comprises of the national government (and its ministries), the regional administrations (which include the 51 prefectures of Greece) and the municipal administrations. The law 3852/2010 or 'Kallikratis plan' formally separate the Greek territory in 7 Decentralized Administrations, 13 regions (NUTS-2 level) and 325 municipalities (NUTS-3 level). Kallikratis plan brought many changes in the public structure, however a variety of administrative competences has not yet fully assigned to the new bodies and most importantly funding has remained in low levels. After this plan, the central state has a tactician role, but lower administrative levels have not staffed by suitably qualified human capital to make the administration work properly.

Although Kallikratis plan was an effort for decentralization reform, it is still ambiguous if it is equally effective. Most of the policies with regard to development and financial programming, though attributed to the regional authorities, originate from the central state authorities (Ministry of Development is responsible). The central state remains powerful in policy making and determines the allocation of expenditures over the regions and other operational programmes. The role of regional authorities commences when the regional and horizontal policies have been launched and the regional authorities manage to spread funding proportionally to the needs of their territories. To this respect institutional capacity of regions is weak and need discrete autonomy. Steps to this direction are being taken especially regarding the growing activation of the regional authorities against impacts of the crisis but this is not close to the desire for a decentralized administration.

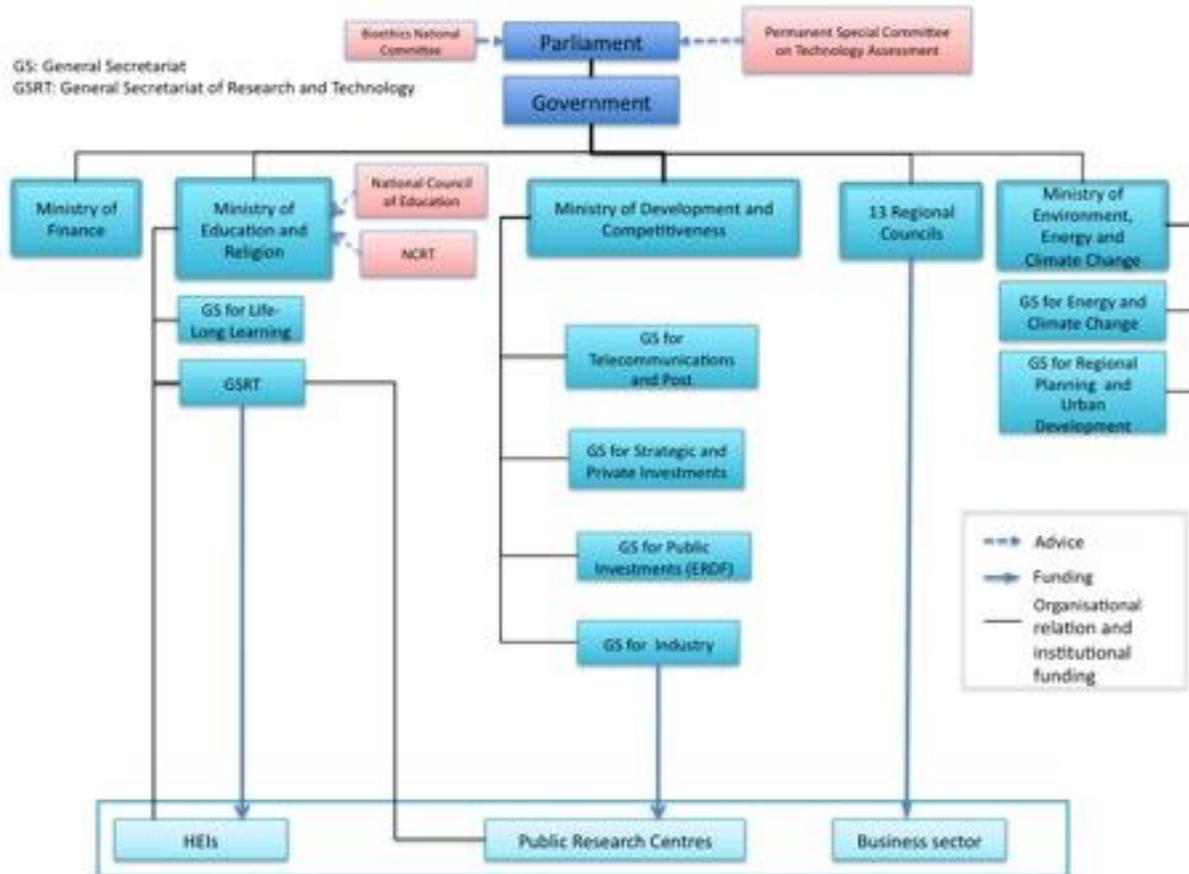
#### *5.4 THE NATIONAL INNOVATION SYSTEM IN GREECE*

At the top policy level, the Greek government and the Parliament with its advisory bodies determine the legal base of the system (see also figure 8). Subsequently four ministries (Finance, Education, Development and Environment) undertake to make the R&I strategy operational through the consultation of the 13 Regional Councils. The General Secretariat for Research and Technology (GSRT) under the ministry of Education is the key player in Research and innovation policies design. This Agency in cooperation with the National Council of Research and Technology (NCRT) and the National Documentation Centre (NDC) compose the policy maker experts who are responsible for the management of funds by the announcement of central calls in national level.

Higher Education Institutions and Public Research Centers cooperate with the above mentioned bodies in order to ensure funding and organization relations. However, the dependence of the research and innovation system on supranational research programmes (like FP7) have showcased the Higher Education Institutions (HEIs) as the only systematic research players and dominant beneficiaries of the system. In contrast, the business sector does not influence main policy choices because of its low participation in R&D. The business sector enters in the innovation system in the final operational stage, that is the implementation of policies. The situation described here demonstrates a gap between the top policy level and the beneficiaries.

The main instruments to finance R&I policy interventions in Greece are the National Strategic Reference Framework, the horizontal Operational Programmes (OPs) and the Regional Operational programmes (ROPs). More specifically, the Operational Programme ‘Competitiveness and Entrepreneurship’ and the 13 ROPs predict the main objectives that every policy measure has to accomplish. However, the entire policy follows a ‘top-down’ approach and its efficiency is difficult to be apparent. Furthermore the difficulty to retain links between actors in short-term projects weaken the importance of the policy, like in some RIP in Greece after the completion of one financing period and before the start of the new one (Komninos, 2007). More details for the formation and evolution of R&I policies follow in the section 5.5.

Figure 8: Structure of the Greek Science and Innovation system



Source: ERAWATCH, 2014

## 5.5 POLICIES RELATED TO INNOVATION AND REGIONAL DEVELOPMENT

### 5.5.1 Evolution of research and innovation policies in Greece

The initial efforts for establishing innovation policies in Greece are dated in mid 1980s. However, this becomes more systematic in mid 1990s. Since then several individual projects and programmes have financed the promotion of innovation actions under the European Regional Development Fund. During the 2001-2005 period, the Regional Programmes of Innovative Actions (PRAI) initiative settled the base for regional innovation in Greece. More than €50 million signed numerous actions for boosting technological innovation, networking and collaboration of the information society in all Greek regions (Bezirtzoglou, 2008; Bezirtzoglou, 2006).

The next step was the Regional Innovation Poles (RIP). The main objective of RIP policy was to enhance the innovation systems of Greek regions. The core of the policy was to establish a large innovation pole in each region in order to achieve technological convergence with the rest of EU regions. Each RIP was described as complex cluster that contains one or multiple clusters which in turn develop linkages and interactions with other actors within and

outside the cluster (Komninou, 2007). Up to 2007 five RIPs were implemented in Kentriki Makedonia, Dytiki Ellada, Dytiki Makedonia, Thessaly and Kriti regions with an overall budget €20 million (GSRT, 2007).

In 2007 the Greek Ministry of Development launched the National Strategic Plan for Research and Development 2007-13 which reflected the new science, technology and innovation strategy for Greece. As main objective placed *the restructuring of the Greek economy towards high value added products and services and the transition to the knowledge economy and society*, while the main priorities referred to (1) *the improvement of R&D capabilities* and (2) *the promotion of links between research and industry in order to accelerate the dissemination of innovation*. The quantitative target for the strategy was for the Gross Expenditures in R&D (GERD) to reach 1,5% of the GDP (OECD, 2012; MoD, 2007). The new strategy relied on maintenance and enhancing of the existing RIP and the creation of the Corallia initiative in the region of Attica.

The National Strategic Plan for Research and Development 2007-13 was conducted for the purposes of the overall development policy of Greece and it was focusing only on Research and innovation promotion. In 2011 the General Secretariat for Research and Technology introduced a revised research and innovation strategy based on main areas of the logic of key areas of strategic importance. These areas were (1) agro-food, (2) information and communication technologies, (3) materials/ chemicals, (4) energy/environment, and (5) health/biomedical sectors (DG Research and Innovation, 2013). Moreover, in 2012, €30 million were directed to the creation of innovation clusters in the most knowledge intensive services of those areas (Tsipouri and Athanassopoulou, 2012). Although the strategy did not yielded due to the crisis and the severe cuts in all public expenditures, it acted as the foundation of the research and innovation strategy for 2014-2020 and its linkage with the logic of smart specialization.

Despite the National Strategic Plan, the period 2011 onwards was stigmatized by crucial legal reforms in the Greek research and innovation system. Firstly, the ‘Athena plan’ was a legal framework that merged academic and administration departments within the higher education system in order to achieve economies of scale. A public consultation motivated by the ministry of education tried to introduce a new legal framework, but the procedure delayed due to it roused heavy reactions of the academic society. The framework included intervention such as the creation of a National Council for Research, Technology

and Innovation, measures in favor of research mobility but also issues relating to sources of funding different than the public character of universities (OECD, 2012).

Additionally, ambitious reforms were undertaken with respect to entrepreneurship and business environment. Various laws promoted by the ministries of Development and Finance launched support measures in benefit of young employment and young researchers mobility, enhancing entrepreneurship and the embodiment of innovation in new businesses, development of industrial areas and scientific parks, support of SMEs through the creation of a specific Innovation for Growth Fund and removing vested obstacles and delays for establishing a new business. To a certain extent all these interventions changed also the potentialities for connection and cooperation of research communities with the business sector (DG Research and Innovation, 2013b; OECD, 2012). However, the amount and massiveness of legislative work have not catalytically reduced the administrative and financing obstacles that Greek enterprises face.

Moreover, a long process towards the formation of the current research and innovation strategy started since 2012. The mobilization and cooperation of ministerial agencies (such as the GSRT) with the Hellenic Federation of Enterprises (SEV) and academic laboratories led to longstanding process of analysis, configuration and adoption of the seven most important sectors of the Greek economy with technological and entrepreneurial priorities for investment. In other words, the outcome of this cooperation end up with a study which defines several production value chains within the sectors of the national economy (such as energy, environment, construction materials and metals, food and agro-food, ICTs, health, and garment and creative industries). Each value chain is further analyzed in actions and business opportunities which can contribute to economic development (SEV, 2013).

Based on this, the GSRT proposed a new policy mix which co-shaped with the design of the proposals for development in 2014-2020. This proposal constitutes the most comprehensive analysis and design for research and innovation in Greece so far. It recognizes the basic problems and challenges of the Greek innovation system and attempts to bridge the most important needs of the R&I system with the provisions of the coming development strategy of Greece. The proposal highlights the sectoral approach in innovation promotion defining six key sectors of strategic importance for the development of innovation. To this direction the main objective of policy is to reach 2% of expenditure in R&D (GERD as % of GDP) and 40% contribution of the private sector (GSRT, 2013).

In 2014, a draft of the National Strategic Framework for Research and Innovation 2014-2020 became publicly available under the consultation procedure. The Framework describes the revised R&D objectives (1,2% GDP), vision and main pillars for strategy implementation. The main policy sectors for smart specialization strategies are outlined into (1) agro-food, (2) tourism, (3) energy, (4) health/ medicals, (5) ICTs, (6) transportations and logistics, (7) environment and sustainable development and (8) materials/ constructions (GSRT, 2014a). However, even the new Strategic Framework for R&I does not cover all the commitments of Greece against the EC. In particular under the conditionality of smart specialization strategy, the new Cohesion framework for development policies obligates the member states (like Greece) to link their national of regional R&I strategies with the overall development programming. Different aspects and issues relating to this obligation are analyzed in the next sections.

### **5.5.2 Relation of R&I policies with cohesion policies in Greece**

As discussed above, the majority of policies regarding Research and Innovation in Greece are closely related to programmes and financial sources deriving from the European budget. Therefore this section analyses the relevance of R&I policies in the overall programming for regional development policies.

To this direction, Greece has a longstanding tradition within the schemes of cohesion policy. The country receives support since the 1980s and throughout the time has improved both in terms of management and efficiency of the exploitation of the European budget. It is worthy to mention that Greece is placed between the top three member states that delivered the new policy design for 2014-2020 period. In the beginning of 2014 Greece was in the fourth position in the rate of absorption of cohesion sources for the previous programmatic period (around 75% of the total).

For 2007-2013 period, Greek development programmes have been credited with €20,4 billion from which €3,6 billion directed to R&D and innovation measures and €2,2 billion to training and education (OECD, 2010b). According to the European Commission (EC, 2014) the impact of the programme was calculated:

- more than 21.000 jobs (over 20.000 of these jobs in SMEs)
- more than 2.400 start-up businesses and invested directly in over 30.000 SMEs
- extended coverage of broadband internet to 800.000 additional citizens
- improvement in urban transport to the benefit of over 27.000 people

- investment in water projects benefiting over 450 000 people.

For the next programmatic period (2014-2020), Greece opts for €15,5 billion (table 11). The priorities of the policy target at: (1) development of human resources, (2) higher labour market participation, (3) support for entrepreneurship and innovation, (4) support of sustainable economy and (5) enhancing institutional capacity. All priorities highlight the objective to shift towards a knowledge and information based economy. Considering the allocations explicitly related to innovation, this amount will be increased significantly for the next period from €1,29 billion to €3,65 billion.

Table 11: Cohesion policy in Greece (in billions €)

<b>2007-2013</b>	<b>Allocation</b>	<b>2014-2020</b>	<b>Allocation</b>
Total budget	20,4	Total budget	15,52
Convergence	9,42	Less developed regions	7,03
Phasing out regions	6,45	Transition regions	2,31
Phasing in regions	0,635	More developed regions	2,53
Cohesion Fund	3,69	Cohesion Fund	3,25
European Territorial Cooperation	0,210	European Territorial Cooperation	0,321
		Youth Employment Initiative	0,171
		European Social Fund	3,33
<b>Innovation-related programmes</b>	<b>1,29</b>	<b>Innovation-related programmes</b>	<b>3,65</b>

Source: EC, 2014; DG Regio, 2006

### **5.5.3 The shifts in policy priorities for the coming years- National level**

Initially, the National Agreement for Regional Development (PA) declares a ‘*new development paradigm*’ which takes place through institutional and organizational changes based on the ‘*competitiveness, innovation and extroversion of Greek businesses*’ in all sectors of the economy and the ‘*creation of new competitive advantages*’ in dynamic and extroverted sectors in the national and regional level. According to the programming, the realization of this new development paradigm depends on the directions of the smart specialization strategy. (Ministry of Development, 2014).

The role of research and innovation seem to conquer a discrete position in the entire cohesion policy of Greece through the thematic objective ‘Enhancing research, technological development and innovation’, which covers institutional and organizational interventions targeting at ‘*the creation of environment friendly to the businesses which attract investments*’. This thematic objective aims primarily to spatial blind policies that can improve the innovation environment. Especially the upgraded role of innovation can be seen through the goals: (1) *shift to economic and social growth based on knowledge and sustainable specialization*, (2) *improvement of competitiveness and productivity of Greek enterprises through the production, diffusion and inclusion of knowledge and the linkage of academic*

*research with the economy, (3) development of excellence in research and alignment of Research and innovation supply with the business demand and (4) targeting of resources to selected sectors of economic activity* (Ministry of Development, 2014).

An interesting reference is made with respect to the change of mentality for doing business. The *new development paradigm* needs collaborative thinking thus special weight is given to the role of smart specialization strategies. To this direction, policy priorities focus on the promotion of investments in Research and Innovation and linkage of Higher Education Institutions with private enterprises. Referring to the latter, attention is given to the demand and supply balance for private sector. For all the coverage of the thematic objective key prerequisite is to find the appropriate ‘*support mechanisms*’ to contribute to the cooperation of the various participants (ibid).

In the operational stage, the OP ‘Competitiveness, Entrepreneurship and Innovation’ allocates funding for the purposes of the policy in the national level. The main objective of the national OP is ‘*the support of competitiveness and extroversion of enterprises and the transition towards qualitative entrepreneurship by having innovation and rise of domestic value added as peaks*’. In addition, the OP attempts to contribute to the implementation of the new development model by supporting the establishment of ‘the appropriate business environment (“ecosystem”) which can help enterprises to exploit new opportunities and participate in broader value chains’ (Ministry of Development and Competitiveness, 2014). To this direction the OP pumps resources from the first thematic objectives of the PA (i.e. ‘Enhancing research, technological development and innovation’) and seeks for additional complementarities and synergies with other thematic objectives that contribute to the same direction as well. Finally, the basic economic sectors that the actions of the OP target are: agro-food, tourism, energy, health, ICTs, transportations and logistics, environment and materials/constructions. Besides that, the content of the actions defined after a unprecedented process in which GSRT established several thematic ‘Innovation Platforms’ where representatives from central and regional authorities, other institutions and individual actors could intervene in the discussion.

At the institutional level, the NSFRI 2014-2020 foresees further arrangements such as the creation of Regional Innovations Councils (RICs) which accompanied by the upgraded General Secretariat for Research, Technology and Innovation (GSRTI) will monitor the evolution of regional innovation smart specialization strategies in the full implementation

(GSRT, 2014a). This development seems as the very first step for transition to a more ‘bottom-up’ approach on policy making rendering regions as key players in policy design.

#### **5.5.4 The shifts in policy priorities for the coming years- Regional level**

In the regional level, there is a growing recognition that regions have to be substantially involved in planning and funding of R&I actions that enhance regional development. To this direction regions are committed to study, recognize and exploit their regional advantages in order to eliminate regional disparities. To do so, a specific reference is made towards ‘the adoption of different policy mix for each region’ (GSRT, 2014a).

The policy design adjusts further according to the R&I potential of each Greek region. The 13 regions are grouped in four main categories (MoD, 2014; Reid et al, 2012):

- Category 1: Regions with advanced research and technology capabilities (Attiki, Kentriki Makedonia, Kriti, Dytiki Ellada)
- Category 2: Regions with strong manufacturing potential and mid-level innovation capacity (Sterea Ellada, Dytiki Makedonia, Anatoliki Makedonia-Thraki)
- Category 3: Regions relying on traditional production sectors with innovation potential in local products (Ipeiros, Thessalia, Peloponnisos) and
- Category 4: Regions with strong potential in tourism and extremely low technological (R&D based) innovation potential (Notio Aigaio, Voreio Aigaio, Ionia Nisia).

This categorization determines the overall logic of policy formation and subsequently creates a frame of evaluation between the regions of the same category. The indicative structure of funding has already been conducted and it remains the public administration to settle the framework of the R&I strategy in the regional level (table 12). What is already agreed within this framework is the character of actions attributed to the regional authorities. This character refers to issues of development and diffusion of technology and innovation to enterprises and in most regions has only a regional dimension, that only regions under category 1 can exceed. To this respect, the 13 ROPs support small scale RTDI interventions in targeted economic activities in the regional level, but category 1 regions may receive additional funds for research purposes.

Table 12: Indicative distribution of funding 2014-2020

Operational Programme	Funding (million €)	Type of region
Competitiveness, entrepreneurship and innovation	3,646	
Anatoliki Makedonia-Thraki	406	Less developed
Kentriki Makedonia	771	Less developed
Dytiki Makedonia	264	Transition
Thessalia	320	Less developed
Ipeiros	260	Less developed
Ionia Nisia	181	Transition
Dytiki Ellada	392	Less developed
Stereia Ellada	95	Transition
Peloponnisos	216	Transition
Attiki	911	More developed
Voreio Aigaio	241	Transition
Notio Aigaio	84	More developed
Kriti	347	Transition
Rural Development	4,223	

Source: Ministry of Development, 2014

According to the RIS3 assessments for all regions of Greece the core economic sectors and the basic priorities for development policy can be summarized in the table 13. It is important to note that the basic recommendations of these assessments are the main inputs for constructing the new policy design in the regional level. So, the main points noteworthy to mention are (1) that all regions build their vision upon specific key sectors considered as the most dynamic, (2) the main priorities mentioned aim to shape the main policy axes for implementation and (3) all regions seem willing to undertake initiatives (either as cluster policies or specialization measures) for the promotion of regional development.

Table 13: Main sectors and priorities of Smart Specialization Strategies in the Greek regions

Region (Category of R&I potential)	Dynamic sectors	Priorities	Target/intention of policies
Anatoliki Makedonia-Thraki (C2)	manufacturing and regeneration of the industrial tissue of the region	stronger innovation policy, identification of niche markets, competitiveness of SMEs	implement cluster policies for sectors with competitive advantage
Kentriki Makedonia (C1)	manufacturing, agriculture and service (green ICT and tourism), energy and materials	eco-innovation, regionally focused actions, stronger institutional capacity	implement cluster policies, seven clusters are proposed
Dytiki Makedonia (C2)	Energy, higher-value added activities with a strong focus on exports	more diversified approach building on existing clusters of business activity	deploy the Energopolis plan to implement integrated interventions in selected clusters and geographical areas
Thessalia (C3)	agro-food and value chain links to agriculture, metal production and construction materials	competitiveness of firms, integration of key enabling technologies, access to knowledge intensive business services, enhancement of non-technological innovation	clusters as an opportunity
Ipeiros (C3)	dairy industry and related firms, ICT in health and	RTDI investment on R&D, more detailed analysis of	implement a cluster policy for sectors with an identifiable

	tourism services, manufacturing, environmental protection and biodiversity	technology needs and opportunities in regional firms	competitive advantage
Ionia Nisia (C4)	Tourism, bio-economy, blue-biotech, marine energy	Production of new crops, reduce the energy cost basis	specialisation and actions towards the development of key sectors
Dytiki Ellada (C1)	natural resources, human capital and niche business and technology	future research and innovation actions on the 'bio-economy'	implement cluster policy measures for sectors with a competitive advantage
Stereia Ellada (C2)	agro-food industry as a key business sector, agriculture, tourism, environmental and energy saving, ICT	modernise the agro-food sector and link it with other sectors along the value chain	specialisation and actions towards the development of specific sectors
Peloponnisos (C3)	agro-food, tourism and manufacturing	cluster programmes, cross-sectoral support for technological upgrading of business sector	specialisation and actions towards the development of key sectors
Attiki (C1)	transport systems, creative industries, knowledge intensive business services; (green) ICT as a key enabling technology	eco-innovation for the enhancement of urban environment	'the creation of trans-sectoral, trans-institutional and trans-business networks (clusters), with the aim to improve exports orientation and the integration, production and promotion of innovation'
Voreio Aigaio (C4)	bio-economy, branding based on natural environment	research and innovation actions on the potential of the bio-economy	implement cluster policies for sectors with competitive advantage
Notio Aigaio (C4)	energy, waste management, tourism	cross-sectoral technology upgrading and adaptation of production processes	no previous experience on cluster policies, no cluster 'culture' and no clusters operating in the region
Kriti (C1)	agro-food, the cultural-tourism, and technological educational	reduction of the dual economy, key enabling technologies of a cross-sectoral nature (e.g. ICT, 'blue-biotech' etc.).	implement cluster policies for sectors with competitive advantage

Source: Reid et al, 2012

## 5.6 OTHER EXISTING ASSESSMENTS ON THE GREEK INNOVATION SYSTEM

In 2012 European Commission commissioned an assessment of the national innovation of Greece. The main findings of this report that complement the analysis of this study can be summarized in the following points (Tsipouri and Athanassopoulou, 2012):

- The Greek NIS performs moderately in comparison with the EU average in almost all innovation-related indicators. The strengths of the system are in areas of *human resources for research, linkages and entrepreneurship and innovators*, in contrast to *financial support, firm investments and intellectual assets* which are areas of weakness

- due to institutional capacity limitations in the Greek system there are existent signs of *fragmented planning interventions, low absorption* of the available sources, *neglect of policy priorities* and *opportunistic behaviour* of research organisations
- lack of continuity in the R&I strategies mainly because of persisting changes in the function of leading agency
- low impact of R&I in competitiveness in terms of GERD
- significant changes with respect to innovation derive from institutional reforms such as changes in the function of HEIs, mergers of Public Research Centers, creation of Innovation Fund, launch for ‘Development Proposals of Research Organisations-KRIPIS’ and salaries cuts of researchers
- Although regions hold financial allocations for the purposes of research, these allocations are managed by national policy making agencies

Finally the authors end up to two interesting remarks. The first is the current economic crisis in Greece has an influence on the role of R&I but they do not document this conclusion with further evidence. Second is that innovation can be conducive factor in the development of Greek economy especially in services sector, that is because corporate investments focus specifically this sector the last few years (Tsipouri and Athanassopoulou, 2012).

The second assessment was conducted in 2012 for the purposes of the RIS3 strategy of the European Commission. The main adding points to this research may seem contradicting in comparison with the previous assessment but can be epitomized by the following arguments (Reid et al, 2012):

- the NIS is distinguished by a *‘project-based’ approach*, such as the Regional Innovation Poles, which did not yield the expected results due to organisational and governance failures.
- the exploitation of existing funding *‘have not targeted regional comparative strengths in RTDI’* resulting a *‘divergence in regional innovation performance rather than fostering a convergence of performance’*
- the evolution of Greek R&I strategies shows *‘persistent weak governance, insufficient attention to a mismatch between scientific and industrial strengths and weaknesses, and an inadequate focus on performance assessment, strategic goals and targets setting’*
- the targets for R&D investments have diverged significantly and it is distinct that this happened because of the current crisis

As mentioned before, the authors doubt about the success of past R&I policies and they attribute weaknesses regarding to (1) the lack of integration of the policies with local actors, (2) the top-down approach of the policies, (3) the provision of long-term programming and (4) the institutional inability for flexibility against the operation needs of participants in the policies (Reid et al, 2012).

### *5.7 SUMMARIZING THE MAIN FINDINGS*

The Greek economy is confronted with the severe impacts of crisis and the growing competitiveness against other markets globally. The economy is heavily oriented towards services and tertiary sector, where most of the development capital is concentrated. Regional disparities indicate that the capital region is dominant in the regional development in Greece and development programmes need to bring a balance in growth levels activating competitive advantages in each region. To this direction, the increase of budget towards innovation actions seems a first step but not the necessary and sufficient condition for de facto development. At the institutional level, although Kallikratis plan was a form of decentralization of administrative competences, central state is still interfering to policy design and regions remain weak and dependent on top-down budget management.

With respect to the national innovation profile, Greece has a great scientific and research personnel but most of the indicators show low performance of the NIS, especially in relation to the business sector. The Greek NIS mainly suffers from tight links between research communities and the business sector. Additional negative drivers are brain drain phenomena, low patenting activity and low levels of domestic production of knowledge. All these factors deteriorate the growth dynamic against global challenges. In the regional level innovation performance shows a mixed picture among regions while absorption rates for RDTI research performs poorly. It is apparent that regions with stronger research institutions (such as universities) dominate the innovation arena.

Concerning governance issues, regional administrations seem weak though a decentralization reform took place a few years before. Among the actors in the NIS, HEIs are the dominants in receiving the benefits of R&I policy while GSRT as a central state agency undertakes to burden to design the policy. Finally, significant reforms have been implemented both in R&I policy framework and business environment. R&I policy priorities focus on several economic sector that show competitive advantages and potentialities for innovation opportunities. However the R&I policy framework (referring to the OP for Competitiveness

and Innovation) in conjunction with the provisions of the new cohesion policy framework for Greece indicate that main policy priority is the establishment of a business friendly environment that attracts investments. This element approximates primarily to horizontal spatial blind policies at least in the national level. In the regional level, regions design their RIS3 strategies according to their innovation potential and focus on their existing assets and comparative advantages.

## CHAPTER 6. INSIGHTS INTO INNOVATION AND INNOVATION POLICY IN THE REGIONAL DEVELOPMENT IN THE REGION OF ATTICA

### 6.1 OVERVIEW OF THE REGIONAL PRODUCTION PROFILE

The region of Attica (Attiki) is the largest and most important economic and political center in Greece. It is also the geographical center of the country rendering its position distinguished compared to other southern countries in the EU. Attica includes the capital city of Greece, Athens which is the only metropolitan city in the country and collects the most dynamic economic and human capital. Athens and the surrounding areas cover a total area of 3.808 square kilometers (2,9% of the total area) and host 4.113.979 inhabitants which represents 36,4% of the total population in the country. Furthermore, population density in Attica reaches the top value of 1.080,3 inhabitants per square kilometer (table 14).

Figure 9: Location of the region in the national map



Source: Wikipedia, 2008

In economic terms the region of Attica is the strongest region in the country counting a share of 48,1% of the total GDP produced. The main pillar of the regional economy is

tertiary sector which concentrates 87,7% of the regional GDP in GVA terms and 81,2% of total employment in the region. Respectively secondary sector produces 11,8% of regional GDP and 17,6% of the active population, while primary sector has a very limited contribution 0,4% of GDP and 1,2% of employment.

With respect to economic and business structure, the region of Attica gathers significant shares in the sectors of: services, trade, financial services, transport and ICTs, health services, real estate, recreation, research and business services. Especially in the manufacturing sector, food industry, metals, chemicals and pharmaceuticals revealed the most important sectors. Recently, ICTs and electronics emerged as dynamic sectors due to their concentration and integration in international value chains. Although Attica has a variety of dynamic sectors, it is poorly specialized to these activities, especially to knowledge-intensive or high-tech activities. Therefore, based on facts above, the assessment of the RIS3 in the region of Attica recommended the region to focus its regional strategy to a selection of dynamic sectors. For the assessors, transport systems, knowledge intensive business services, (green) ICTs as Key Enabling Technologies, creative industries, 'eco-innovation' and waste management constitute potential sources of comparative advantage and foci of economic activities (Reid et al, 2012b).

Focusing on the sectoral and sub-sectoral production base of Attica Kaloghirou et al (2011) ended up with a taxonomy of dynamic sectors in manufacturing in the region controlling for their importance in manufacturing and their financial condition. To this respect, foods and beverages, products from non-metal minerals, chemical industries, publishing, printing etc, metal products except machineries, construction of machineries and equipment, petroleum refining and basic metals are concluded as sectors that represent 50% of enterprises in Attica and 80% of total sales. Following these sector the authors propose four types of sectors which can be potentially developed into clusters: (1) ICT sectors (e.g. micro-electronics, mobile services etc), (2) high-tech sectors (e.g. health diagnostic systems), (3) food and beverages sectors (like bio-food and high quality food) and (4) construction- and materials- related sectors (towards environmental efficiency products) (Kaloghirou et al, 2011).

However, a key issue in the regional economy of Attica is the impressively high level of unemployment rate (17,6%) in 2011 adding the even higher levels for youth unemployment 43,2%. In addition, according to background document conducted by the region of Attica, the impacts of recent economic crisis have influenced severely the regional profile of the region.

Considering the current situation of the economic base of the region in relation to 2009, constructions have fallen by 75%, industry faces losses by 24%, retail activities are confronted with reduction of 22% (Region of Attica, 2012).

To a certain extent the regional profile of Attica approaches the picture shaped in the national level but this is not the case referring to the research and technology potential of the region. Attica accounts for the 36,9% of the national highly-educated labour force and considering those employed in the Science and Technology sectors this percentage turns to 40,5 % of the national labour force.

Table 14: Regional profile in 2011

<b>Indicator</b>	<b>Attiki</b>	<b>Greece</b>
<b>GDP</b>		
Millions of PPS	108.859	226.286
share % in total GDP	48,1	100
PPS per inh EU28=100	107	80
<b>Gross Value Added</b>		
% primary sector	0,4	3,4
% secondary sector	11,8	15,8
% tertiary sector	87,7	80,8
<b>Population</b>		
inhabitants	4.113.979	11.309.885
share & in total	36,4	100
population density, pop./sq km	1.080,30	86,4
<b>Employment</b>		
% primary sector	1,2	12,4
% secondary sector	17,6	17,8
% tertiary sector	81,2	69,8
<b>Unemployment rate</b>		
%	17,6	17,7
age 15-24 % of total	43,2	44,4
<b>Education</b>		
share % in total*	36,9	100
HRST % of active population	40,5	32,4
Risk of poverty or social exclusion (2010)	23,1	27,7
Total Regional Area, sq km	3.808	131.957

\* Students (ISCED 5-6) at regional level - as % of total country level students (ISCED 5-6)

Source: Eurostat, 2014

Moreover, region of Attica possesses further prominent specificities. At the administrative level, all the main organs and mechanism for decision making are located in Attica. All central government ministries (except the ministry of Macedonia and Thrace) and remaining public services are situated there. The region is famous for its historical and cultural heritage while it confirms its name as birthplace of democracy hosting the legislative, judicial, and executive authorities of the Greek State.

## 6.2 THE INNOVATION PROFILE OF THE REGION

From the previous sections of this study has become already distinct that the region of Attica has a special position among the Greek regions. Region of Attica is ranked within regions with advanced research and technology capabilities. Comparing to the national level (table 15), all innovation indicators indicate that Attica has significant potential to exploit. The major R&D intensity indicator in Attica is higher than the national value but far below the EU average and the Europe 2020 goal of 3%. Public expenditures are in the same level as the national level but business sector expenditures in R&D are higher than that of Greece. R&D personnel indicator reflects a concentration of specialised labour force in the region of Attica, while in absolute numbers the region gathers 40,9% of the total R&D personnel. The same conclusion applies for young population with tertiary education and Higher Resources in R&D population with the same education level. To sum up, Attica region constitutes a case study region of special interest in terms of innovative performance in Greece.

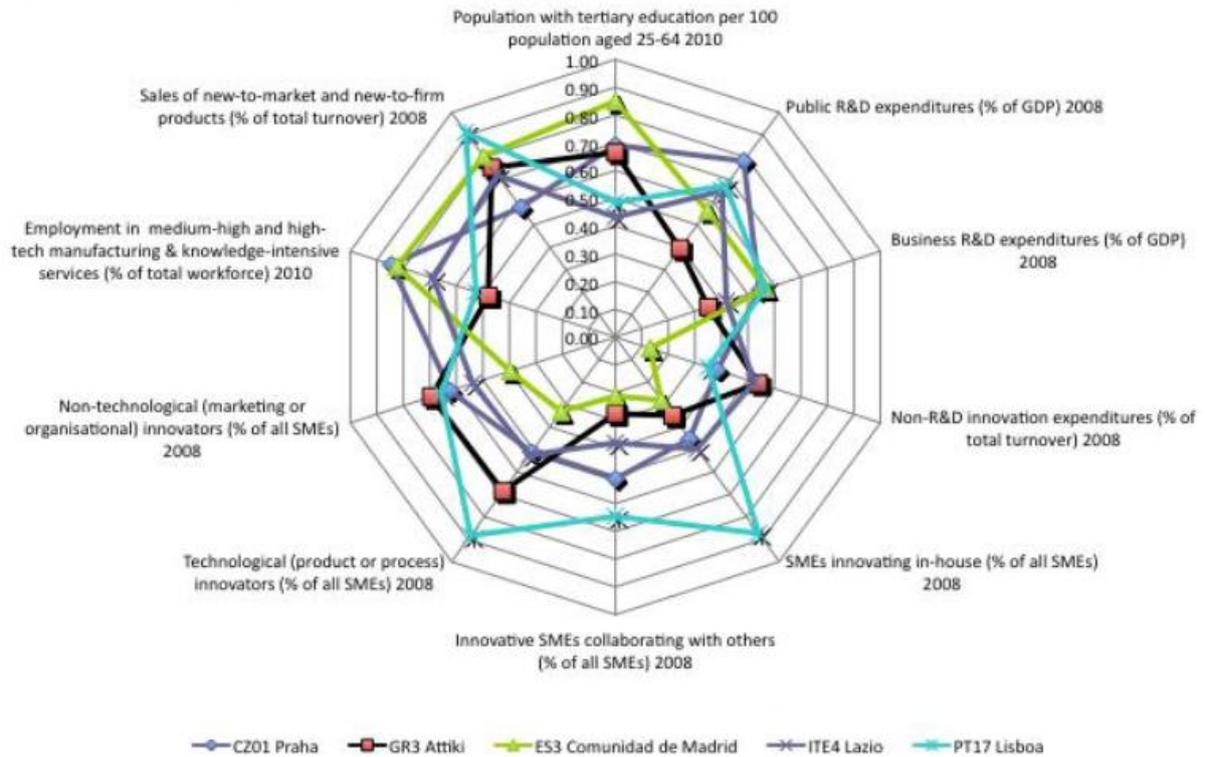
Table 15: The regional innovative profile of Attica

Indicator	Year	Attiki	Greece	EU28
R&D intensity	2011	0,8	0,7	2,0
R&D in public sector	2011	0,4	0,4	0,7
R&D in business sector	2011	0,4	0,2	1,3
R&D personnel, % of active population in FTE	2011	0,87	0,74	1,08
R&D personnel, Head count	2011	28.727	70.229	3.982.669
Population aged 30-34 with tertiary education attainment	2013	44,0	34,6	36,8
HRST with tertiary education in S&T , % of active pop	2012	21,2	16,2	
Employment in knowledge-intensive activities	2012	46,0	36,3	
EPO patent applications (per billion GDP)	2009	0,48		
Number of Higher Education Institutions		11	32	
Number of Public Research Institutes		10	13	

Source: Eurostat, 2014; personal elaboration

However, the picture of innovation performance in Attica accrues interest in comparison with the other European metropolitan regions (such as Prague, Madrid, Lazio, and Lisbon) and the EU average. For example Attica region lags behind other similar EU region in indicators such as public and business R&D expenditures, SMEs innovating in house, SMEs collaborating with others and employment in medium- high and high tech manufacturing and knowledge intensive services (figure 10). In contrast Attica region outperforms in indicators like non-R&D innovation expenditures and non-technological (marketing or organizational) innovators, facts that can be partly explained by its dependence on services- related sectors.

Figure 10: Attica compared to selected EU metropolitan regions

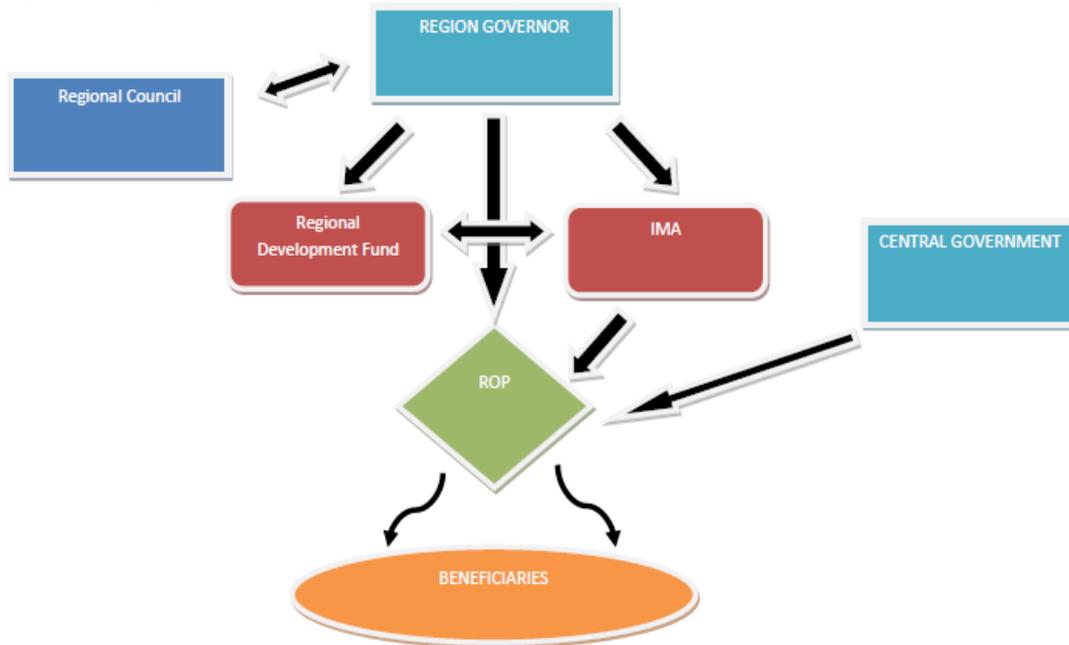


Source: Reid et al, 2012b

### 6.3 THE ADMINISTRATION STRUCTURE OF THE REGION

After ‘Kallikratis’ reform, the region of Attica has transformed regarding its administrative structure. The regional administration is governed by the Regional Governor and the Regional Council, that are directly elected by the citizens. The region is divided into eight regional districts which cover the total area of the region. Local and thematic vice-governors in cooperation with several advisory Committees are responsible to manage the allocation of funding across the region; however, the final decision making is determined by the Regional Governor. Here, it is important to note that the regional administration structure foresees a separated General Secretariat which is responsible to design development policies (including the ROP) for the region under the supervision of the governors mentioned above. Instead, the body responsible for the management and implementation of ROP Attica is the Intermediate Management Authority (IMA) which was transferred from the supervision of the central state to Governor’s direct control (Region, of Attica, 2012). However, at this moment, the IMA of Attica region has undertaken to design the new ROP for 2014-2020, while it has credited with the duty to promote the smart specialization agenda for the region of Attica. A simplified illustration of the structure is presented in figure 11.

Figure 11: Regional Operation Programme design and implementation structure



Source: Region of Attica, 2012

#### 6.4 MAIN ACTORS IN THE REGIONAL INNOVATION SYSTEM OF ATTICA

At the regional level, there are numerous research institutes and organisations that compose the RIS of Attica (table 16). All the actors presented in this section supplement the national agencies (ministries, GSRT, NCRT) and provide them useful input for policy making. In advance, it is noted that the existence of such actors in the region clarifies its dominant position and its specific weight among other regions.

Table 16: Main research actors in RIS of Attica

Higher Education Institutions	Public Research Centers
National and Kapodistrian University of Athens	ATHENA - Research Centre for Innovation in Information, Communication and Knowledge Technologies
National Technical University of Athens	Athens National Space Observatory
Athens University of Economics and Business	National Research Institute
Agricultural University of Athens	Natural Sciences National Research Centre "DEMOCRITUS"
University of Piraeus	National Social Research Centre
Technological Education Institute of Athens	National Documentation Centre
Technological Education Institute of Piraeus	National Pasteur Institute
Harokopio University of Athens	National Centre for Marine Research
Panteion University of Political and Social Sciences	National Biomedical Sciences Research Centre "Alexander Fleming"
Athens School of Fine Arts	Renewable Energy Resources Centre
School of Pedagogical and Technological Education	

Source: Region of Attica, 2014a; GSRT,

On the one hand, 34% of the total number of HEIs is located in the region of Attica. The region has 11 institutions of higher education divided into 129 Academic Departments

and 260 Postgraduate Programmes, accounting more than 120.000 undergraduate and 15.000 doctoral researches. On the other hand, ten out of thirteen PRCs of the country are situated in Athens, covering a variety of research areas such as medical/ biomedical studies, informatics, energy, microelectronics, nanotechnology, nuclear and theoretical physics to social/political sciences and marine biology (Region of Attica, 2014a).

To sum up, Attica gathers the majority of research actors in Greece. This fact most of times blurs the regional research and scientific specialization of Attica in comparison with the entire country. The same applies also to other aspects of R&I policy. For example all ministries and ministerial agencies responsible for the policy design locate in Attica rendering policy design for the region as a national issues and not a regional one. Finally, the role of enterprises and clusters in R&I policy is a puzzled issue. The vast majority of large companies both in terms of output and innovation performance are located in Attica. The size and importance constitute these companies as main actors meaning that policy design has to be more inclusive to them. Additionally, firms cooperating in clusters are particularly evident in Attica. To this respect, R&I policy provisions need to consider their needs and evaluate their practices as inputs to the overall policy. Consequently, existing governance schemes are challenged while the new R&I policy framework obligated more open and participatory processes.

### *6.5 RESEARCH AND INNOVATION POLICIES IN THE REGION*

Prior to 2006 very limited actions for R&I were initiated in the region. In 2007-2013 programmatic period, measures and actions on RTDI in Attica were implemented due to the provisions of the Regional Operational Programme Attica 2007-2013 (€3,05 billion) and partially through horizontal measures of OPs ‘Digital Convergence’ and ‘Competitiveness and Entrepreneurship’. From the innovation dimension, the ROP of Attica settled as basic objectives (1) *to render the Region more appealing as an International Business Hub* and (2) *to improve the economy's competitiveness by encouraging innovation, entrepreneurship, research and technology and the promotion and use of new IT technologies*. More detailed goals were described under the ‘*Priority Axis 3: Strengthening Competitiveness, Innovation and Digital Convergence*’ (NSRF, 2010).

Finally, various support measures (table 17) were launched and contributed to the development of innovation in the regional economy, but most of those measures were patronized by the GSRT and not the regional managing authorities. Attiki were the top region

referring to the share of allocations towards RTDI measures devoting €251 million or 8,2% of the total ROP 2007-2013 funds. A concise list of support measures in the region of Attica is provided below, mainly targeting knowledge- intensive economic sectors like ICT, health and microelectronics (ERAWATCH, 2014).

Table 17: List of support measures in Attica region

Measure	Objective	Target group	Funds
Development and support of new highly knowledge intensive innovative enterprises	exploitation of research results; restructuring of the regional economy towards higher value added and knowledge intensive sectors	spin-offs and spinouts	€9 million
Technological clusters in microelectronics Corallia-second phase	support the already established microelectronics cluster manager Corallia	start up firms and the public laboratories in the network of Corallia	€33 million
Support newly established firms in their research and development activities	encouraging new firms or firms without previous R&D activity to undertake such activity through collaboration or outsourcing	experimental development projects	€3 million
Collaboration	improving the competitiveness of the firms into selected fields	Health, Biotechnology, Energy-Environment - Climate, Nanotechnology, Transportation, Social Sciences and Culture, ICT and Manufacturing	€27,1 million
Innovation Vouchers	support problem solving in SMEs; increase technology transfer	460 SMEs	€3,2 million
Support Groups of SME's	support groups of established SMEs in order to undertake R&D activities in collaboration with R&D performers	irrespective of their sector of economic activity	€6 million
Other measures	support of the infrastructures	public research organisations	€21 million

Source: RIM Plus, 2014

According to the recently submitted ROP of Attica, the measures supporting R&I purposes resulted to (Region of Attica, 2014b):

- Clusters support: 30 investment plans, budget: €19,2 million
- Creation of new innovation clusters: 40 investment plans, budget: €10,1 million
- 19 new proposals from research actors, budget: €22,6 million
- Innovation vouchers: 118 SMEs
- New start-ups: 17 knowledge intensive enterprises, budget: €6,3 million
- Support to SMEs: 70 investment plans, budget: €7,2 million
- Collaboration in research and technology sectors: 591 investment plans, budget: €105,1 million
- European collaboration in R&I: 44 investment plans, budget: €8,7 million
- Bilateral collaboration in R&I: 129 investment plans, budget: €10,9 million

Since the future plans for these support measures are not publicly available, we can only consider the logic of the measures and their contiguity with the smart specialization logic. To this respect, most of the measures mentioned above are imbued with the logic for sector-specific action and promote collaboration and networking as key issues in innovation activities. This is also consistent with the recommendations of the expert group for RIS3 strategy in Attica (Reid et al, 2012b). However, in the experts' report further tools for use are mentioned such as an explicit regional innovation policy, an evaluation unit and public-private partnership schemes that can exploit the real innovation potential of the region.

Unfortunately, at this very moment, both ROP and RIS3 of Attica are under configuration. Especially for RIS3 there is no final or consultation draft published yet. Therefore many issues related to the topic of this thesis cannot be fulfilled in this desk research stage. Many aspects of the new R&I policy in Attica will be addressed during the interviews of this study and discussed in the next chapter of this dissertation. Here, we can only refer to the vision, challenges and priorities being into negotiation within the policy discourses based on a preliminary document on RIS3 in the region of Attica.

Hence, the RIS3 of Attica is recognized as a vehicle which can help the regional economy and entrepreneurship to become more innovative, transit into more technology intensive products and implement new technologies in traditional sectors such as tourism, maritime economy and creative industries. In this way, the main challenges of the regional innovation policy are: *(1) the interconnection of infrastructure with production base, (2) the reinforcement of knowledge intensive services and linkage of them with dynamic sectors, (3) the extension of cluster policies into new dynamic sectors (e.g. creative industry) and new technologies (e.g. based on Corallia model), (4) the search for interface between technologies and sectors in order to help entrepreneurial discovery and (5) the reinforcement of knowledge level of human capital.* Therefore the provisions for RIS3 of Attica are based on seven main policy areas: *(1) land and water transportations, (2) medical tourism, wellbeing tourism, medicals, (3) alternative tourism, (4) microelectronics, computers and mobile applications, (5) Creative economy, (6) Specialized foods and characteristic products of Attica, (7) Environmental (green) technologies* (Region of Attica, 2014a).

## 6.6 CORALLIA CLUSTERS INITIATIVE: A GUIDANCE FOR GROWTH?

The Corallia Clusters Initiative (Corallia) is the most characteristic example of public policy on innovation that essentially activated domestic capital. Corallia was initially

launched in 2006 as a pilot programme of the OP ‘Competitiveness’ for the development and promotion of clustering in Greece. During the first two years of its life cycle, Corallia achieved to concentrate various collaborative activities and create the first complete national cluster in nano/micro-electronics sector, namely ‘mi-Cluster’. Since 2008, the support measure ‘Technological clusters in microelectronics Corallia- second phase’ has contributed to the creation of two new clusters, the ‘si-Cluster’ in space technologies and the ‘gi-Cluster’ in gaming technologies. ‘mi-Cluster’ activities account for 130 members, more than 5.000 employees, total turnover €5,7 billion and more than €162 million on exports. Respectively, the output of other two clusters includes 21 and 19 members participating, more than 600 and 1000 employees, turnover of €100 million and €1,2 billion and exports €15 million and €750 million. The function and efficiency of the partners within Corallia have yielded some remarkable results such as (1) growth rate of the business cycle of firms +145,4%, (2) employment growth rate +69,7%, (3) exports growth rate +108,5%, (4) growth rate of private sector investments +269,3%, (5) patenting applications growth rate +177,3%, (6) master and PHD theses collaborations growth rate +106% (GSRT, 2014b; Papailiou, 2013). In fact the results of Corallia highlight how a small portion of public funding (€33 million since 2008) can produce an overall turnover almost €7 billion in so short period of time.

Today, Corallia constitutes a unique example of successful implementation and management of cluster activities. Joint actions and programmes within the clusters target at selected economic sectors and exploit new comparative advantages based on knowledge-intensive and extroverted-oriented ideas. Finally, the vision that Corallia initiative aims to support regional development impacts through (GSRT, 2014):

- *the formation of high-tech sectors with geographical and sectoral diversification in regional level*
- *enhancing the links between universities, research centers and business sector in selected thematic areas with the support of research and development of clusters in local and regional level*
- *the creation of completed structures for development of new and small firms with services of acceleration of entrepreneurship in technological sectors*
- *investment in high value added human capital of the country and cultivation of strong relations with diaspora in specific thematic areas*
- *focus on improvement of the competitiveness of Greek firms and acquisition of sustainable competitive advantage on the basis of exporting orientation*

➤ *support sustainable development in sectoral and regional level.*

## 6.7 SUMMARIZING THE MAIN FINDINGS

Region of Attica is unambiguously the economic, political, administrative and business center in Greece. In addition the concentration of population, growth output and most educated human capital highlights all the potential benefits of agglomeration economies in a metropolitan region. However, the region suffers from an enormous unemployment rate and a longstanding shock in its production base. The structure of the production base in Attica is predominantly oriented to the tertiary sector and in particular to services sectors. In manufacturing, the most dynamic sectors are food, metals, pharmaceuticals and ICTs industries.

With respect to innovation performance indicators the region of Attica performs equal or better than the whole country. But this changes when Attica is compared to the EU average or other similar EU metropolitan regions. The only advantage of Attica has pinpointed in indicators non-R&D and non-technological in nature.

What regards governance issues, the region of Attica shows similar performance as the rest of the regions. Key player in policy management and strangely in policy design is the Intermediate Management Authority of the region which in charge of preparing the new ROP (regional development) and RIS3 (Research and Innovation) frameworks for the region. To this direction a headache might be how to ensure the engagement of all actors and institutions related to the policies.

Finally, the region has no rich history in R&I policies. Despite this history, since 2007 a variety of policies and measures have been implemented in the region of Attica. The results seem interesting while the development of the Corallia cluster initiative is considered as a successful example of a cluster policy. To conclude, although the preliminary RIS3 ideas reveal the basic challenges and the main policy areas for the regional R&I policy in Attica, a number of issues still need to become clear in the near future.

## **CHAPTER 7. EMPIRICAL EVIDENCE FOR INNOVATION IN GREECE**

This chapter provides the results derived from the analysis of the interviews conducted by the researcher. Firstly, the logic and the methodology employed are described. Subsequently, the answers of the respondents are presented in relation to each topic of interest (themes). In addition, further comments or reflections are added.

### *7.1 THE LOGIC BEHIND THE ANALYSIS OF THE INTERVIEWS*

As already mentioned in chapter 4, the second methodological stage of this research is the semi-structured interviews. The approach of analysis used is framework analysis. Therefore the various steps followed are referred here. Firstly the researcher transcribed the interviews and prepared the data. A first read helped to recognize the main themes arising from the interviewees and how these issues are related to the conceptual framework of this research. This framework was also the guide for indentifying the analysis framework of this study. The main themes are consistent with the previous stages of this thesis (theory and desk research) and in close relation with each question addressed by the interviewer. To this respect, the content of interviews was sifted and coded according to these themes.

A concrete representation of this process is the ‘framework analysis table’ (Appendix 3). This table shows the coding process in relation to the themes and respondents (cases). Finally, the researcher decided to report the results of this analysis by using all the codes (topics) raised by respondents for each theme discussed. However, detailed quotes (the translation of quoted was made by the researcher without the use of any translation tool) are used only for the most frequently cited codes. This decision was crucial with respect to the time and space available for this thesis. It is worth to note that the interpretation and associations of the results are not present in this chapter but in the next chapter (chapter 8).

### *7.2 REFLECTIONS FROM THE INTERVIEWEES*

It is important to mention how the presentation reflections are presented below. First each sub-section is a separated theme of interest. This means that in every sub-section all the

codes (issues raised by the respondents) are listed. For the most frequent codes, the most characteristic quotes are cited as well. Besides in every code the researcher summarizes the name of the code and the number of quotes where the code is present. Additionally, after each quotation it is presented the interview and relative ID of each quotation (see respectively Appendix 3).

### **7.2.1 The regional dimension and challenges of the R&I policy in Greece**

The first question in the interviews was about the regional dimension of the R&I policy in Greece and the focus of this question was drawn on the basic challenges that the policy has to overcome.

The first outcome regarding the regional dimension and challenges of the Research and Innovation policy in Greece is related to the requirements imposed by the EC and the cohesion policy (code: Policy imposed- EC and cohesion policy commitments, 7 related quotes).

‘While the new programmatic period gives severe emphasis to R&I in regional level, at the beginning we faced an enormous barrier by the regions’ (Interview 1, quote A.2.1)

‘I am afraid that this will be forced. Viz in Greece it will be done because it has to be done. Because it cannot happen otherwise.’ (Interview 6, A.2.2)

‘The things change again due to the new programmatic period which has strong regional dimension. Viz the Community pushes for regional policies for R&I. It also pushes as far as it is possible the allocations of R&I to be managed by the regions through regional smart specialisation strategies’ (Interview 7, A.2.5)

‘The first I want to say for the regional dimension of R&I policy is that it is not unlinked with the regional development policies in general. R&I policy is a pillar of this broader policy for supporting the development of regions’ (Interview 8, A.2.6)

‘The most important pressure in those thing is EC itself. Viz once the EC defines regions and proposes that its co-financing programmes must have a regional dimension this itself creates a condition’ (Interview 9, A.2.7)

Secondarily, two issues gathered the attention of interviewees. The link between regional and national provisions of the R&I policy (code: Link between regional and national strategies, 12 related quotes) and the capacity of the regions to confront with the new policy design (code: Capacity of regions, 5 related quotes).

‘Our view is that the national RIS3...should cover and give solutions to the requests presented in the regional RIS3’ (Interview 1, A.1.1)

‘...in order to be successful it has to be interlinked with the needs, the local advantages of productive system and the existing structures of technology production either universities or research centres or productive initiatives and productive actors, local factors etc’ (Interview 2, A.1.2)

‘Here there is a substantial problem of coordination. It has somehow the national and the regional strategies to be linked’ (Interview 4, A.1.4)

‘...there is a big issue how to engage the regional and the national [scale]. In principle. policy in national level is not a sum of the regional needs. As a system the total is more than the sum of individuals. Subsequently

it is meaningless to gather the 13 [regional strategies]. Thus it started an effort by GSRT to find out what is the national needs by looking the system as total in order to gather dispersed resources, infrastructure and foci of competitiveness... which in local level might not mean something but in national level if you gather them they may be something important' 'The first dimension is to find out how common goals can be accomplished, with which division of competences and actions(between regions and GSRT). A general rule followed is that if it is production of new knowledge it goes in national level, while the diffusion of knowhow and applications goes to regional. Distinction is the four large regions that I mentioned, which they have the resources and capacity to do it. The other dimension is to see how individual needs of regions which do not directly relate to the national strategy could be supported by the national strategy' (Interview 7, A.1.9, A.1.11)

'They did not know. Indeed. ... there was a strongly negative idea for innovation. Therefore lack of information and for the audience in general.' 'They knew nothing. They were also negative in particular regional councils' (Interview 1, A.3.1, A.3.2)

'... [challenge is] to realise that it is a very serious problem because it has to do with where the regions is going [figuratively]. You have to build mechanisms in those that are permanent structures (local state, municipalities, regions). To understand that they need to have money to spend and if they do not have money to fight in order to find' (Interview 6, A.3.3)

'The second problem regarding the regional dimension of R&I policy is the immaturity the administrative mechanisms in regions. It is a very big issue. Because we refer to regional research policy or regional innovation policy without existent subjects in the region to manage this issue' (Interview 7, A.3.4)

'When we have weak regions we look for strengthening them. This is the rational response. We look for giving them the tools to have their own economic and investment policy' (Interview 8, A.3.5)

In contrast, some respondents argued that there is no regional dimension in the R&I policy in Greece (at least so far) (code: Regional dimension- not existent, 5 related quotes).

'The regional dimension or R&I policy in Greece substantively does not exist. Unfortunately it is not existent and this is an issue. There have been efforts [for regional dimension] to exist, but they have been done with means derived from theories and books and not from reality and action. As well, these attempts were methodologically from a side that cannot work, from the side of supply' (Interview 3, A.6.1)

'... the regional dimension for R&I declines, likewise all the regional dimensions. Viz the regional dimension is not that I give [competences] to the regional level or that regional administrations participate [for the competences] to be given' (Interview 6, A.6.3)

'In principle up to now there was no regional dimension of R&I policy for many reasons. One main reason is the way that the funding is allocated. It is odd to start thinking... usually you consider what I want to do and then you think how you serve the funds. In Greece whereas always the funding of Research was not a main priority, the question of how I structure my policy was depended on where I can find the funds. And because the funds originated from the Structural Funds and allocated through the Operational Programmes, the structure of interventions had a respective logic. And it still has a respective logic.' (Interview 7, A.6.5)

Additional contributions to this thematic area are the responses over the dominance of some regions (more developed in R&I) over the rest of the regions (code: Inequality, some regions more developed in R&I, 2 related quotes) and the need to mobilize firms through supporting measures from the demand side (code: Support from the demand side- mobilization of firms, 3 related quotes).

'So Attica is such a system and not only in ICTs, it is also in food and some other sectors.... Second is Thessaloniki because it gathers both university strengths and manufacturing (Attica surely gathers larger proportion of manufacture). Next is Patra which certainly has the problem that its manufacture has collapsed but it has some small and new firms. Crete is, I think, one of the best systems, because it has the FORTH (Foundation for Research and Technology- Hellas), the university and various firms around.... Viz these four are

maybe the most important. Beyond that Thessaly has some potential while the rest are coming in second place' (Interview 9, A.5.2)

'To help firms you need to e.g. help them networking. You need to give them paradigms. You need to support them travel and not consider it as wasted funds... to send them let's say to Germany. The issue is what they are going to see there, what connections they will make, what paradigms they will see. Firms need ideas, representations. You work for innovation in mind, it is not an issue of allowances. So the challenge is to mobilise all the firms' (Interview 3, A.7.2)

Finally, minor reference is made to some other issues. These issues are: (1) the low performance of Greece in R&I (code: Low performance in R&I, one related quote), (2) the practical ability of policy makers to transfer the theoretical concept of 'entrepreneurial discovery' to the systems approach (code: Transferability of theoretical concepts in policy, one related quote), (3) the need for the policy to specialize into sectors with comparative advantage (code: Specialization in sectors with comparative advantage, one related quote), (4) the need for reconsideration of the tools available for policy (code: Tools for policy, 4 related quotes), (5) the challenge for regional dimension for R&I policy as a social need due to the transition of population in peripheral regions (code: Social need, one related quote) and (6) a challenge emerged from production restructuring of the Greek economy (code: Employment issues and need for restructuring of the industrial base, one related quote).

### **7.2.2 Past policies in relation to R&I**

The first question is linked with the blueprint of past policies for R&I in the Greek context. The intention of the question was to investigate whether the old R&I policies had a place-based or horizontal (spatial blind) character.

The most important finding regarding the role of previous policies in R&I lies on the link between the research community with the business community (code: Problem in cooperation between research institutions and businesses-missing link, 8 related quotes).

'In every case, the mistake from the fact that we have not solved basic problems of cooperation between the Research and Businesses. Either through structures of open innovation like R&I or through structures of other character, the problem remains the same. Whenever you have this kind of problem whatever you do will be wrong' 'The Innovation Pole poses certain incentives... for the approach of two areas, such as the researchers and the SMEs. The point is that there are structural weaknesses more deep. Those incentives were not sufficient to confront the weaknesses. Structural weaknesses are how the R&I policy is designed and how the policy is engaged throughout its design with businesses. To make it more distinct. Firms are called to cooperate with Research once the State designs a programme either it is called innovation pole or it is named in more common actions for innovation. Then, the firms are called to support the initiatives of the State. Never before, [the firms in general] were asked what is the right design of those actions and with which actions they are willing to participate' (Interview 8, B.6.1, B.6.2)

'The greek production many times does not consider the issue of knowledge as necessary to upgrade its position in the division of labor, and many universities too believe that [link with businesses] is not a concern for them, we [referring to universities] work for knowledge. Or many times there is let's say an ideological reaction that [universities] do not want industries to spoil the character of universities etc. Thus there is a missing link in

the system. The notion of innovation system presupposes that all these actors have an interrelation.’ (Interview 9, B.6.5)

‘The main characteristic problem that Greece has is the poor cooperation between the university community and the businesses’ (Interview 10, B.6.7)

A second insight of this question is that past policies for R&I targeted the general improvement of innovation environment in Greece (code: Better innovation environment, two related quotes).

‘For example they introduced the RIS programmes (programmes related to innovation during early 2000s)... follow the logic that the State build the roads for the cars to come’ (Interview 3, B.2.1)

‘I think that the thing is not applicable, viz that... as the audience can understand, as the experts understand, everybody will say... that in Greece it was mainly issues related to infrastructure of every type, more ‘soft’ etc’ (Interview 6, B.2.2)

Minor significance is stressed to issues such as: (1) The role of Regional Innovation Poles (RIP) in disseminating knowledge and technology to local markets (code: RIPs-externalities and diffusion of knowledge and technology in local level, one related quote), (2) the similar logic of RIPs with the current smart specialization agenda (code: RIPs-similar logic as ‘smart specialization’, 3 related quotes), (3) the need for considering the diversity among regions meaning to abandon the horizontal in character policies (code: Need for differentiation among regions- not one-size-fits-all approaches, one related quote), (4) the horizontal character of policies which were focused on the confrontation of system failures (code: Horizontal character-confrontation of system failures, one related quote), (5) the mixed character of past policies referring to both regional attempts and individual measures in funding programmes (code: Mixed character, one related quote) and (6) the mismatch between the directions of top-down planning with the potentialities of this policy in reality (code: Top-down approach- not successful, one related quote).

### **7.2.3 The contribution of ‘smart specialization strategy’ to R&I policy in Attica**

The third theme to discuss is the contribution of ‘start specialization strategy’ (RIS3) towards a regional R&I policy in the region of Attica. The intention of this question considering also the fact that the RIS3 of Attica is an ongoing process, was to investigate some developments and changes in policy planning processes and how the logic of this new strategy is transmitted in the context of the largest Greek region. To this respect this question does not aim only to take a list of priorities of the strategy tailored to this particular region but describes up to a certain extent the undergoing procedures linked to the strategy as well.

The most important finding reflects in delays and weaknesses in the compilation of RIS3 in the region of Attica (code: Severe delays and weaknesses in RIS3 compilation, 5 related quotes).

‘Attica at this very moment is the most delayed region. It is the only region which has not presented RIS3 yet, the only region which do not seem to understand completely this process; according to our view, [Attica] has not accomplished the procedure with businesses, viz the entrepreneurial discovery is not done during the meetings of RIS3; Attica has not called firms; the participation of private sector and stakeholders in general was disappointing; so therefore Attica has a tremendous problem’ (Interview 1, C.1.1)

‘... the synopsis is that Attica as the most important region in Greece with characteristic weaknesses, with a course with respect to entrepreneurial discovery process unfinished yet, it has an ambiguity between the national and the regional scale of smart specialisation’ (Interview 4, C.1.3)

‘Yes. To this in Attica we have a problem. Because [for Attica] being chaotic, how to do the entrepreneurial discovery required in Attica? We talk for the entire Greece substantially.’ (Interview 7, C.1.4)

‘I believe there is a central issue of how the innovation system is structured. Viz how the “emerging” part of the system is raised, which many times complicates such designs. Viz the danger about these designs is eventually only a few things to be done and emerge a pressure to find [new] ways [for finalising the policy design].’ (Interview 9, C.1.5)

For the researcher is worthy to mention two further answers as important to understand the ongoing processes for RIS3 in Attica. The extra points refer to how the systemic approach is perceived in the Attica context (code: Systemic approach, 3 related quotes) and how is perceived the need for establishing a distinguished regional R&I policy in Attica (code: No need for R&I policy so far, one related quote).

‘This systemic approach through the indicators (and the analysis of indicators from innovation scoreboard) has the logic for inputs and outputs. It can be observed that the big weakness is that we have high inputs but we do not have high outputs. Therefore this approach gives the opportunity to find out where the weaknesses are. Subsequently you form policies according to the weaknesses. But neither this is done. Viz while the GSRT adopted the innovation systems approach since 2006 onwards and they knew the weaknesses; this later on did not transformed into policy. Policy has an irrationality that it does not detect the main weaknesses.’ (Interview 4, C.3.1)

‘In principle regional R&I policy in Attica was not existent because of obvious reasons. Here is the centre. It is very difficult to distinguish Attica from the rest of the country because 60-70% of activities of the policy are here. In businesses R&D no, because there is also in Sterea Ellada, where certainly are located Athenian firms, so the decisions are made here. And population-wise and based on the concentration; the largest universities and majority of research centres are here. Therefore there is a huge difficulty to split Attica from the totality. Also what is called stakeholders in Attica they were always talking directly with the State. GSRT is responsible for the research centers and it is located here. Universities are bodies under the Ministry of Education and it is located here. Firms did not contact the region; they can go directly to the minister. So there was no need.’ (Interview 7, C.5.1)

Nevertheless, one interview provided the most recent version of priorities related to RIS3 in Attica.

‘So, the main priorities are: (1) land and water transportations, (2) medical tourism, wellbeing tourism, medicals, (3) alternative tourism, (4) microelectronics, computers and mobile applications, (5) Creative economy, (6) Specialized foods and characteristic products of Attica, (7) Environmental (green) technologies. This is the main framework.’ (Interview 7, C.6.1)

Finally minor references referred to (1) the need for supporting universities towards more research activities (code: More research activities, better research environment and extroversions for research institutions, 4 related quotes), (2) the doubts whether smart specialization exists in Attica or not (code: Ambiguity regarding ‘smart specialization’, 2 related quotes) and (3) the real potential for Attica to establish open innovation infrastructure within the region (code: Opportunities for open innovation infrastructure, 4 related quotes).

#### **7.2.4 The role of governance and actors in R&I policy in Attica**

The role of different actors holds a significant role in the design and implementation of R&I policy especially under the ‘smart specialization strategies’. In addition, actors and the configurations into which these actors form the R&I policy (governance) acquire a growing interest within the innovation systems literature (as presented in Chapter 1 as well). All these issues were the subject of discussion under question number 4.

Firstly, the respondents commented on the newly proposed structures of governance for R&I policy, the Innovation Councils (code: Innovation Councils, 5 related quotes).

‘In principle after the motivation of EC there were established a few regional councils and innovation councils. With the new law for R&TD promoting to the Parliament, the GSRT establishes Scientific Councils for R&I in every region. Therefore it ensures that there will be these councils as before it was not compulsory’ (Interview 1, D.3.1)

‘Yes, Attica is not the ideal example. It is not a good example for this issue because it is chaotic. A topic which EC and the assessors in the 13+1 reports propose is Regional Innovation Councils (RICs) to be created in every region. There are some regions already with RICs. In Attica the question raised was how can be involved? In terms of actors we have around 20. Which one from the universities should be called and which not? All of them? There are 6-7. What about the Research actors? You will call one? You will call the GSRT as a representative? Viz we discuss for councils of 30-50 persons. This is not an Innovation Council. How you select how to leave outside? It is the Management Authority it is going to decide? It is the Regional Governor who has to take a political decision that I appoint these 10 persons. It is a matter of political decision which could not be taken during elections period...’ ‘... I do not have a proper answer to give at this moment. Because it is an issue towards investigation. It is one million dollar question.’ (Interview 7, D.3.2,D.3.3)

‘It depends on how they are going to work. I am not against. Surely it will be great a RIC to exist, but it is possible some times to become a typical procedure that we have to talk for this and that issue as well.’ (Interview 9, D.3.4)

‘I believe that many people to engage maybe is not good. And I do not believe that we have not ever met the typical processes required etc. I think that there was always the margin for consultation and for actors to express their opinion but on a base which smaller groups of people and actors have shaped the basic directions’ (Interview 10, D.3.5)

Secondly, two topics gather significant interest of the interviewees. The first is linked with the bottom-up process deriving from the smart specialization strategy (code: Bottom-up process, 6 related quotes) and the second targets the capacity of institutions to face the difficulties of the new policy framework (code: Institutional capacity, 4 related quotes).

‘We must ensure that we have talked with ALL of the potentially interested; with ALL of those capable of saying something; from the largest firm up to the smallest...’ ‘So we provided some questionnaires, they

responded, we edited those questionnaires, some activities started to emerge, we resent the questionnaires and throughout this process they were continuously informed.’ (Interview 1, D.2.2, D.2.3)

‘... the governance required by the smart specialization is a bottom-up type of governance. Bottom-up type of governance means an open process therefore a transparent process. In this type of governance who is going to detect priorities? Who can say where there are opportunities in pharmaceuticals, in foods? But this is not happening thus we have again a pyramid design, from the State, the nation administration, the ministries. Regions though they have elected representatives, they have with respect to Innovation and Technology issues a psychological handicap; they are afraid to manage it independently. And participatory processes are very limited. Viz a document will be published, somebody will make a comment and afterwards the same persons who edited this document they will make the synthesis of conclusions.’ (Interview 4, D.2.4)

‘Beyond that I cannot say that we have reached a point of successful practices within the various parts of the entrepreneurial discovery process. We stand off and I think that Greece is not the only country standing off.’ ‘Viz we still have distance on how starting from the determination of a technological priority, we can reach the detection of technological market that we want to target’ (Interview 8, D.2.5, D.2.6)

‘I believe that that the plans that have already conducted have positive elements but they do not have the capacity; viz there is the “innovation paradox” as it is called. Viz you give some funds in a region, but the region is incapable of going further with respect to Innovation.’ ‘In any case, the innovation paradox lies on the shallowness of institutions. The institutions responsible to implement policies, sometimes are shallow. They do not know what to do and this is not a fault of the servants. It is also an issue of competences and initiatives that these institutions do not take.’ (Interview 3, D.6.1, D.6.2)

‘I do not know whether it will end up again as “we do not know how to do it and please tell us what we must do”; again in a top-down level.’ (Interview 10, D.6.4)

In addition, there is another set of topics closely related to the perception of the new policy framework by the various actors. This set refers to: (1) the innovation platforms as a tool for bottom-up policy processes (code: Innovation platforms, 4 related quotes), (2) the transparency as a factor of smooth policy designation (code: Transparency, 3 related quotes) and (3) the consideration of a transition period for Greek innovation systems from their previous status to the new policy era (code: Transition of the system, 2 related quotes).

‘We consider Innovation Platforms as dialogue fora and bottom-up prioritization processes. This is because you take the edge of the yarn by observing the sectors you are interested in but you also need to involve the rest of the actors in order to find out which are the activities which give value added to those sectors. So, innovation platforms were working groups in which firms of various sectors participated and we considered that they [firms] can engage.’ ‘Their [innovation platforms] function was extremely targeted. I have to say that if you want to be creditable, you have to do a great preparation and engage the rest of the actors.... it is not enough to call someone and just ask them for their opinion. Therefore what we do is that for each sector there is a special servant who according with their professional subject deals with the issues of this particular sector’ (Interview 1, D.1.1, D.1.3)

‘A thought is for [innovation] platforms to be utilized. Anyway to a large extent there originate from here. Consequently you can utilize the pool of expertise existing there; you can mobilize and engage them to regional issues’ (Interview 7, D.1.4)

‘What is assigned to regions is an issue. We are pro to decentralization but whatever is assigned to region is evaporating. They do not know how to use it, they cannot exploit it and in general it is vague what they do’ (Interview 3, D.7.1)

‘This is a second chapter in relation to governance. It is not only participation but transparency of policies as well. Because the mismatch between policy and analysis shows interests and lobbies which direct interventions towards a particular area.’ (Interview 4, D.7.2)

‘There is an issue in transition stage. When it is policy-driven there is no automatism. There is a fundamentalism from the market side, viz give incentives and markets will do everything. Markets will do whatever they know or whatever they are used to. From the other side, you will take policy measures, you will design a policy, you will publish it in a beautiful book etc, but to what extent this can mobilize actors? The latter is very important, I believe. Is it only the financial incentives? I think no. Many times it is also other actions and activities like the “cultivation” of actors to see things differently and many other things. Viz I think that this scheme must be heard; because many times there are many talks spread here and there, also from Europeans etc who neglect the transition of systems’ (Interview 9, D.11.1)

‘There is a transition issue. Viz you cannot implement a policy without taking into consideration which are the existing structures to implement it’ (Interview 10, D.11.2)

Finally, there are a few additional responses about: (1) the role of central government administration structures in national or local level which help fundamentally to the diffusion of policy experiences and can significantly contribute to current designs (code: State structures- hierarchically decentralized, 5 related quotes), (2) the contribution of ‘triple helix’ model in the activation of actors (code: Triple helix, one related quote), (3) the potentialities available for decentralization of R&I policy in relation to the network of Greek universities (code: Decentralization by using the network of universities, one related quote), (4) the role of existing innovation infrastructure in mobilizing firms interest (code: Innovation infrastructure, 2 related quotes), (5) the inauguration of cooperation between State and businesses with respect to the definition of policy priorities (code: First time when the State and business community cooperated, one related quote), and (6) the non-propulsive role of consultants (code: Role of consultants, one related quote).

### **7.2.5 Reflections on the role of R&I policy in Attica**

Question number 5 seems identical with the main research question of this thesis and it was addressed by the interviewer as the last question of each interview. The intention of this question is to summarize crucial issues related to R&I policy in the region of Attica according to the interviewees’ perspective. Therefore, the results of this question will be potentially significant inputs of the interpretation stage in the next chapter.

The first finding here is almost apparent in all interviews (code: Attica≈ whole country, potentialities due to the size, agglomeration economies, 9 related quotes).

‘The region of Attica is almost equal with the entire country; viz if you consider Attica, it is the as considering 80% of the country’ ‘The role of R&I in the region of Attica is extremely important because [Attica] has the largest number of research centers (all of them are accumulated here)...’ (Interview 1, E.2.1, E.2.2).

‘To this respect Attica is the only case where you can have technological innovation... which is more identified in Attica due to the size and education of people, the turnover of firms, the vicinity with Administration, the convenience to export etc’ (Interview 3, E.2.3)

‘Concerning R&I whatever applies to Greece it is the same for Attica. What is going to happen in Attica determines approximately 60 or 70% of what happens to Greece.’ (Interview 4, E.2.6)

‘... it is interesting to exploit the fact of a metropolis including its benefits and its promotion to entrepreneurial activity. Moreover due to the concentration of universities and students, there is a greater chance for new ideas, new start-ups... and therefore incubators and other ideas such as the egg [referring to an initiative-incubator of young entrepreneurs introduced recently in Attica] are developed’ (Interview7, E.2.7)

‘Attica has all these advantages, it has the critical mass of people, firms etc. This is the most important’ (Interview 9, E.2.8)

‘Here [in Attica] you have the advantage of having the main actors and infrastructure you need, thus you have the chance to organize such a thing [referring to R&I policy]; [R&I policy in Attica] can be done because [Attica] is the capital [region] of Greece’ (Interview 10, E.2.9)

Secondly, some respondents highlighted the role of R&I policy in the region mainly through the position of Attica as a sufficient plain to test new policies (code: Attica- a place to test new policies for R&I, 3 related quotes).

‘Attica has to test new forms of governance as other European metropolises do; to test new forms of public-private partnerships... and foster competitiveness at least in the European level.’ (Interview 2, E.3.1)

‘I believe that for all those things that we said, Attica can be the test bed...’ (Interview 9, E.3.2)

‘In Attica new things can be tested because you have the critical mass which is required. In Attica you have the large universities of the country and their students; so here you can test all these trial structures like start-ups, [scientific] parks, incubators etc. Similarly the Corallia cluster was developed here. Therefore maybe Attica is the region where these kind of policies can be easily tested.’ (Interview 10, E.3.3)

Finally, there is an additional set of aspects that R&I policy in Attica has to consider according to the respondents. These aspects refer to: (1) the necessity of policy to introduce the appropriate tools in order to manage the significantly different needs for funding across regions (code: Tools for funding, 2 related quotes), (2) taken the ‘helix model’ approach for the development of R&I, there is a lot more way for Attica to cover (code: Based on triple helix model: academic entities → lower than expected, second helix: administration → capacity problems, third helix: businesses → better possibilities to contribute, 3 related quotes), (3) the crucial dilemma for the national and regional development in Greece towards a society and economy more knowledge-intensive or a more de-specialized and cheap in labor (code: Development dilemma- knowledge intensive and innovation or de-specialization and competitiveness of labor, one related quote), (4) and similar to the previous one, the long-term development perspectives of Greece (code: Marginal role- related to the long-term future of Greece, one related quote), (5) the targeting of policy to sectors with higher multiplier effects (code: Focus on sectors with multiplier-effects and complementarities, one related quote), and (6) the introduction of distinct roles between economic actors with respect to R&I development (code: Action plan, 4 related quotes).

### **7.2.6 Other reflections in relation to the topic**

In this section the interviewer gathers ideas and aspects raised during the interviews and cannot be easily contained in the rest of the themes. This is because either these ideas are

relatively different than the previous or the respondent used a different context. To this respect the codes and quotation presented here have both statistical (in terms of frequency) and conceptual (content used by the interviewee) substance.

To start with the most frequent topics, macroeconomic stability was mentioned as an issue that influences the behaviour of investors in general but also their willingness to invest to innovative activities in particular (code: Macroeconomic stability, 2 related quotes).

‘... it is an issue of horizontal policies and mainly an issue of macroeconomic stability. Viz there is no stability for someone coming from abroad in Greece and make an investment.’ (Interview 5, F.3.1)

‘... There are issues to discuss in Greece unless we had not this problem [referring to economic stability]. In other words, it is like discussing if this cancer patient (who is tennis player) has to improve his backhand whilst he is moribund. This is a different type of problem.’ (Interview 6, F.3.2)

Secondly, few respondents argued that the emergence of R&I as a hot topic for discussion in Greece commenced after the prompts of external agendas and not as an endogenous need between the actors and the State (code: Imported character of innovation-not endogenous need, 4 related quotes).

‘... I observe that in any case the concept of innovation (e.g. in the university) does not exist. Viz even at the political level sadly I see that everything is imported’ ‘Even the discussion for Innovation that we conduct now is imported. To this respect I think that it does not match to Greece.’ ‘’ (Interview 6, F.6.1, F.6.2)

‘... however given the opportunity of smart specialization it was shown the weakness of regions to design substantially and concretely their development policy. Smart specialization introduced as an external coercion in order to guarantee [financial] programmes. Simply, [smart specialization] was not an endogenous need consistent with the actions of each region.’ (Interview 8, F.6.4)

From a different view, some respondents stressed their attention to the production structure of Greek firms while referred to R&I (code: Relatively small scale of production (structure of firms, family-firms), 2 related quotes).

‘... in Greece production process was of low scale (family structure, small firms etc) in relation to other countries’ (Interview 6, F.7.1)

‘Greece has a problem in relation to other [countries of south Europe]; we have much less large and much more small [firms], up to individual. We have to remember that prior to crisis all companies have reached the number of 700.000.’ (Interview 9, F.7.2)

Furthermore, funding tools for R&I policy have been a subject of interest in other themes. Here these tools are used under a different consideration (code: Tools for funding, 2 related quotes).

‘... incentive allowances in Greece that could trigger various innovation activities (hypothetically), in reality they were “take money and do it” under the form of tax exemptions’ (Interview 6, F.8.1)

‘Because they were located in different regions, they had to find matching funds and organize too many bureaucratic issues in order to conduct a common programme. Here you see how the regional specialization of ROPs does not allow a firm which was interested to cooperate with the university finally not to cooperate.’ (Interview 10, F.8.2)

Respectively, the idea of an action plan needed was expressed previous. In this section action plan involves the necessity not only to design policy and propose of some measures but also to detect the plan through which all these provisions can be organized and implemented in practice. For the respondent this action plan can be a basic tool to shift away from the opportunistic behavior of stakeholders (code: Action plan-against individual agendas, 2 related quotes).

‘Consequently some ideas are introduced. Our difficulty is how to organize the implementation; and strategy to me is not only to describe some objectives or the existing condition etc, but what is the action plan you implement... the “implementation matters”. So many times this is what we miss.’ ‘So this logic [referring to smart specialization] attempts to reduce the story of accumulating various personal requests, that is a weakness of regional programming in Greece. Viz every group has its request. We have difficulties in cooperating for something bigger. Everyone has their one agenda. This is a basic problem.’ (Interview 9, F.9.1, F.9.2)

In the end two special cases are presented. Initially, one respondent argued for a shift of policy direction in Greece from the ‘regional innovation systems’ approach to R&I towards a more ‘national innovation system’ approach where the State need to reconsider policies according to the first nature of geography potentialities of the country (code: Pragmatic possibility for Greece is NIS through specialization in first nature geography and use of spatial blind policies, 4 related quotes). To this respect, geographical and physical endowments determine the development and R&I policies in conjunction with spatial blind policies which target a more stable investment and labour market for Greece. For the respondent national policies have to focus on the comparative advantages of the Greek regions and exploit agglomeration economies wherever are existent or can be created (code: Agglomeration economies and focus on comparative advantage, 3 related quotes).

‘In countries like Greece due to comparatively to other countries it does not have high growth level (we know also the impacts of the crisis etc) and it has a low level of decentralization (around 40% of the population live in Athens), it is difficult to argue for regional innovation system. It is more likely to argue for national innovation system which means whatever type of innovation primarily is controlled by the central state and the central administration and then they decide how the allocation of funds is structured etc. This is my opinion for the regional level. Certainly, Greece is a special case for innovation issues. Greece can specialize in innovation issues in relation with what is called “first nature of geography”.’ ‘Viz to my opinion you have to form some spatial policies according to the first nature geography and the physical endowments which leads to comparative advantage compared to other regions and above all you promote some horizontal policies by providing incentives to citizens... So, the issue is long-term to bring back the people leaving the country...’ ‘I am in favor to select some regions, invest in them according to their comparative advantage, implement some horizontal policies and then given the developed city or region, market itself will feed growth also to neighboring regions.’ (Interview 5, F.1.1, F.1.3, F.1.4)

‘We need a threshold, a critical mass. Let’s say, why is that all cities to have universities and not to have less cities with universities resulting to economies of scale and larger benefits, so better Research and Technology. This is the only way to talk about regional innovation systems. If we do not have the appropriate infrastructure, it is like we build palaces in deserts’ ‘This points to the difficulty to refer to regional innovation systems in Greece. To do so, we have to find regions with comparative advantages (e.g. the islands, maybe Volos or some very good universities) and invest there in spatial policies in combination with spatial blind policies with the form of incentives which potentially can attract labor force from other cities and regions.’ (Interview 5, F.2.1, F.2.2)

The second special case analyzed R&I in Greece from a historical and institutional point of view. Therefore the respondent drew considerable attention to two elements. First is the definition of ‘country’ and ‘region’ in the Greek context (code: Region, Country- Need for clear definition, 3 related quotes) and second is the fact that longstanding reasons led Greece to specialize its economy towards the tertiary sector which in the Greek context has low capabilities for innovation (code: Shift to tertiary sector- low innovation capabilities, 2 related quotes).

‘I consider that we have to understand what the “region” is (and to be clear in our minds), e.g. if the Dytiki Makedonia region has the executives who can solve these problems, have access to finances and design innovation etc. To this respect, I believe that we have a big problem.’ ‘... a big theoretical issue that I have is the one that we passed quickly and has to do with regions. I think that at some point we need a serious discussion in the EU... to homogenize regions? That is the reason I said before you need to be independent. To have regions as they are in your case... at this moment you cannot compare the existing NUTS2 regions. They do not match. I do not discuss even for NUTS3, let them away... Viz the subject [meaning the region] discussed has no substance. We talk for something that does not exist in reality.’ (Interview 6, F.4.2, F.4.3)

‘Taking all these into consideration, Greece shifted towards the tertiary sector in which according to my view there is no margin for Innovation; this is because the vast amount of products are imported and you only get the very last piece of the chain e.g. the touristic product which is in the end. This can be observed even in the most powerful sectors that we have like food industries which they do have innovative parts but they have not managed to interrelate with other production sector... Viz if innovation is certain sectors, it to my view is isolated. It cannot be diffused and it cannot give a sign to the whole economy that it has to be innovative.’ (Interview 6, F.5.1)

## 8. DISCUSSION

This study attempts to review and intervene in the ongoing discussion concerning the link between research and innovation policy and regional development programming in Greece. This discussion accrues big interest at this very moment because various processes related to it are in progress. Equally important is the linking point between those two elements i.e. the smart specialization agenda and its implications on policy design. In addition, there is a heated debate on regional development policies which also influences policy discourses. However, for the purposes of this research a special case study was selected. Taken together this thesis attempts to examine what is the role of R&I policy in regional development in the region of Attica.

In our track to answer this question a number of crucial decisions needed to be made in order to overcome the difficulties of the topic. A characteristic challenge was to define the main dimensions through which the question could be answered. These dimensions obtained from the theoretical and desk research stages of this study. Therefore the first dimension defined is the regional blueprint (dimension) of the R&I policy in Greece. This dimension attempts to grasp how the assets and specificities of Greek regions are perceived by R&I policy. Issues related to this dimension include the economic condition, the production and business structure and other structural specificities of the region. The second dimension related to the character of previous policies with respect to R&I. To a certain extent this dimension has a twofold intention. It examines the impacts of previous R&I policies while it correlates them with the insights of place-based vs. spatial blind debate.

Turning explicitly to the case study context, the third dimension examines the contributions of ‘smart specialization’ towards a regional R&I policy in the region of Attica. This dimension though relevant to governance processes attempts to identify the content of priorities and strategic choices which R&I policy aims to address. The fourth dimension is exclusively linked with governance issues like processes of actors engagement, institutional capacity issues and gaps in the regional innovation system. By contrasting and interpreting the

findings of these four dimensions with the results derived from the interviews with policy experts we end up to the most important findings of this research.

Starting from the first dimension of this discussion (the regional blueprint of the R&I policy) there are several issues to mention. Initially, there is a difficulty of understanding the regional dimension of R&I policy in the Greek context. Although theoretically R&I policy calls for a region-specific dimension this seems very challenging to realize in Greece. To this direction contribute several facts embedded to the Greek programming tradition such as the lack of distinct regional innovation policies, the low capacity of regional administrations to design R&I policies in decentralized level and the special ‘regional problem’ of Greece. Therefore, a matter of the R&I policy is how it can be translated into this context.

Secondly, findings from interviews support the view that the regional dimension of R&I policy in Greece arise as a commitment of the country against the overall European policy. Regional innovation in Greece emerges as a choice imposed by the regional innovation strategies of the EU and does not seem to originate as an endogenous need from the Greek research and innovation base (research institutions or businesses). In support to this, this research highlights the severe specificities of the Greek regions in relation to the impacts of crisis, the economic and business structure of the national and regional economies and the significant inequalities in their innovation profiles. In that sense more issues raised in terms of policy considerations.

A third issue is how to link challenges, objectives and financing of the R&I strategies between the national and the regional level. This problem reflects to the categorization of the Greek regions according to their innovation potential without preparing correspondingly the financial base of the cohesion policies. So a relevant discussion refers to the appropriate tools that accompany the R&I policy.

The second dimension of this analysis reflects the character of previous policies with respect to R&I. A significant number of interviewees stressed their focus on the poor link between research institutions and businesses. This finding is consistent with findings of other assessments for R&I policy reviewed in chapter 5. An additional finding reveals the targeting of previous R&I policies in Greece towards a general improvement of innovation environment in the country. Although some interviewees argued for a mixed character of the previous policies, the majority of them admitted the general direction of the policy towards horizontal interventions. This finding reflects in two points of our analysis. The first point

relates to the theoretical argument of the World Bank for spatial blind policies and its focus that policy need to improve the overall economic environment. Indeed, the vast majority of programmes and actions related to innovation were designed and implemented from national agencies (like GSRT) and targeted to improve the conditions for innovation activities. The second point reflects the philosophy of the new development paradigm espoused the Greek government for growth of the economy. To our view, the latter raises the question how challenges and weaknesses of R&I policy will be addressed if the new development paradigm follows the same recipes as the previous policies did?

The third dimension of this analysis deals with the contributions of ‘smart specialization’ towards a regional R&I policy in the region of Attica. A clear finding obtained from the interviews is the delays and weaknesses in compilation of the RIS3 of Attica. There are several interpretations in order to understand this finding. Firstly we need to search deeply in the conception of ‘smart specialization’ idea. Smart specialization adopts a complex way of thinking comprising of bottom-up processes in defining policy priorities (such as the ‘entrepreneurial discovery’ process), open governance schemes for policy design and continuous monitoring and evaluation of the policy outline. All these requirements are not always easy to occur in practice. Complementary to smart specialization there are further issues contributing to RIS3 delays. For example one concern is the institutional capacity of the region. The policy design has been credited to a regional body which is not officially responsible to serve these kind of duties. For this reason, the configuration of the RIS3 of Attica has assigned to private company. Exactly in this stage other governance issues emerge. For example, a number of interviewees demonstrated the difficulty to distinguish the regional R&I policy of Attica from that of the entire country. This fact is not odd considering the number of actors, the size and the research potentialities of Attica in comparison with the rest of the country (see chapter 6). After all it is worthy to keep that the philosophy and main policy areas for intervention of the policy are not completed yet, but the main framework of the RIS3 is summarized as presented in section 6.5 in this thesis.

The fourth dimension of this discussion is devoted explicitly to governance issues. As mentioned above governance is an important component of the smart specialization agenda. Reflecting to theory smart specialization follows in principle the logic of place-based policies which also draw considerable attention to multi-level governance and institutions. In that sense the first finding of this research is the presumably positive role of Innovation Councils as a form of governance. Innovation Councils (whatever is the final name of the body in the

new regulation) revealed as important innovations in terms of governance. However practical issues in the function of Innovation Councils became apparent as well. Characteristically, in the case of Attica region there is a need to define who participates and who does not in those bodies. Another issue is how current administrations herein or Innovation Councils later on ensure the smooth participation and representation of different private interests in policy design. To this respect institutional capacity emerged again as a disadvantage. In response to that, GSRT adopted the innovation platforms as means of dialogue among stakeholders and the state but transparency issues still remain in consultations. To sum up, all the findings presented in this dimension advocate the problematic function of the bottom-up approach in regional R&I policy of Attica.

Besides the dimensions analyzed above there are some supplementary reflections deriving from the content of this research. Initially, the region of Attica being a metropolitan region concentrates all the benefits related to agglomerations economies. The advantages derived from its size, population, economic and political power and research potential constitute Attica as a fruitful field for the development of innovation. However, the economic specialization of the region (into services) seems to determine its innovation performance (strong only in non-R&D and non-technological indicator). In this context, R&I policy in Attica should not be restricted only to find economic sectors and activities with comparative advantage. For Attica, it is more necessary than in any other region in Greece to find new niches for innovation and rethink its position in terms of competitiveness in the national, European and global scale.

Finally, the role of institutions does matters in the case of Attica. The region of Attica is too big in the Greek frame therefore R&I policies cannot find a distinguished regional reference. The fact that on the hand, public research institutes concentrate in Athens and have close relationship with agencies which design and implement the policy and on the other hand big enterprises and business groups have direct access to civilian personnel distorts the role of the governance and institutions. Therefore the case of Attica is a characteristic example of region in request for institutional transformation described in the OECD argument. With a critical intention, we should recall the idea of establishing an action plan (see chapter 7) which can determine duties for the various actors in the R&I policy in the Attica region.

In the end of this chapter the limitations of this research are presented. The first limitation reflects the theoretical approach chosen. The researcher adopted the innovation systems approach in order to unfold the various aspects of this research topic. The innovation

systems approach is unambiguously a powerful theoretical tool to analyze innovation policy issues, however the evolution of this research indicated some gaps in the chain of systems thinking in the case of Attica and Greece in general. One reason is that interactions and interrelations among innovation actors are not so obvious in the Greek context. Another reason potentially is the fact that the RIS framework does not fit to the significant inequalities between and within the socioeconomic regional settings in Greece. Therefore, the limitation of this analysis is stigmatized by the lack of some components necessary for a RIS to develop.

The second limitation related to the methodology. For the purposes of this research the qualitative approach was extremely useful and the framework analysis technique supported catalytically the organization and detection of the most important information. However, the credibility of the results becomes weak because of the limited number of interviews. The intention of the researcher was to interview a larger number of experts, but some people did not respond to invitations. Therefore, I feel grateful to praise the immediate response of my final respondents and thank them cordially for their help.

Lastly one of the limitations relates to the factor time. On the one hand time was a limitation because of practical issues. The basic developments in the topic take place precisely at this moment, thus many aspects of this topic cannot complete with this dissertation. In contrast this fact may be very important because this is a contribution of this research in the literature. On the other hand factor time influences some other aspects of this research. We believe so because the analysis indicated that innovation performance in Attica and Greece in general are closely linked with Greek entrepreneurship and the structure of firms. Therefore it is possible this thesis to neglect additional qualitative factors contributing to innovation.

## 9. CONCLUSIONS

This chapter concludes this thesis. To do so, first we recall the purpose of this research and the main issues raised in the introduction. Then we summarize the basic points made during the main body of this dissertation. These points hopefully will help the reader to understand how the researcher thought and answered the questions posed in the beginning. In addition the most important findings of this research are presented in order to support the main arguments. In the end this chapter closes with the final conclusion.

This study aims to investigate a small part of the link between innovation policy and the field of regional development in Greece. So, chapters 2 and 3 of this thesis were devoted to the theoretical understanding of this link. After the apposition of the relevant definitions for the concept of innovation, a theoretical overview with respect to the role of innovation in regional development was presented in chapter 2. As it became apparent, innovation is crucial factor to growth either through the generation of new knowledge and new innovations in the production process or through the diffusion of knowledge and innovations (e.g. knowledge spillovers, human capital mobility or new spin-off companies). The role of innovation attracted more attention with the institutional turn accompanied with the evolutionary approaches. As a result innovation is seen as a complex process between actors and institutions. Following this institutional turn, the systems approach reveals the role of geographical dimensions as a key to innovation performance. Therefore the RIS approach is considered to have great impact in policy thinking, considering the growing role of regions in the trajectory to construct competitive advantages. Hence the review of chapter 2 highlights a set of issues for consideration in the rest of the research. These issues are: geographical dimensions, building comparative advantages, governance, institutions and the importance of policy.

The developments described in chapter 2 caused a significant rethinking concerning the importance of innovation and regional development policies. This shift is the subject of discussion in the second half of chapter 2 and the entire chapter 3 of this thesis. Primarily innovation policy is important to different innovation and geographical contexts. For

example, policy measures may target market failures and system failures present in a particular economy. Otherwise policy interventions aim to differentiate the conditions in terms of governance or business environment. This can be promoted either through supply-driven or demand-driven interventions. All these forms of interventions constitute components of different policy mixes.

Furthermore, the debate analysed in chapter 3 indicated that innovation policy is indeed a means for systemic organisation and exploitation of innovation potential in particular socioeconomic settings. However the logic and content of policy differ structurally according to each side of this debate. The World Bank approach on spatial blind policies calls for horizontal policies across geographical entities. The policies are mainly implemented from the central state and aim to ensure better framework conditions in an economy. In this argument the role of the state is that of a ‘gardener’ while main engines for growth are already developed places. In contrast the OECD approach on place-based policies aims to mobilise assets and domestic potential in all regions in a country. This approach primarily seeks for the recognition of weaknesses and strengths of the region. Then policy interventions attempt to change the efficiency and competitiveness of this particular region. The driving force to this change is a thoroughgoing transformation of regional institutions which force economic and innovation actors to act. Following the same logic the smart specialisation agenda was adopted by the EC and its member states to guide their innovation and regional development policies for the next coming years (2014-2020).

Taking into consideration all the above, the interaction of innovation policy with the smart specialization agenda and the regional programming of Greece determine the focus point of this topic. In that sense the main research question of this thesis focus exactly on this point (see in more detail the conceptual framework in chapter 4). In order to reach this focus point this research followed some steps. In chapter 5 the innovation performance of Greece and its regions was examined. The most important findings with respect to (1) economic and production structure (2) innovation performance, (3) governance issues and (4) issues related to policies can be summarized in the following points:

- The national and regional economies in Greece are confronted with the severe challenges. Firstly there is a need to overcome the impacts of the recent economic crisis and the growing competition with other markets. Secondly the big growth gap between the capital region Athens and the rest of the regions influences severely the national development model and the regional dimension of innovation and regional development policies in

Greece. Thirdly both national and regional economies specialize unilaterally to the tertiary sector, fact that seems to determine their attitude towards innovation activities (non-technological innovation).

- The innovation performance in Greece is poor. Although Greece performs well in terms of scientific and research personnel, the majority of innovation indicators demonstrate severe weaknesses in the innovation system. The most important weakness are the tight links between research communities and the business sector, the low patenting activity and limited participation of Businesses in R&D activities. At the regional level, an innovation gap is apparent between regions with strong innovation potential (such as large universities) and tradition-oriented regions. This innovation gap may influence decisively the new R&I policy in Greece.
- Regarding governance issues, although Kallikratis plan was a form of decentralization of administrative competences, central state is still interfering to policy design and regions remain weak and dependent on top-down budget management. Within the innovation system, Higher Education Institutions remain powerful players in contrast to the private sector that do not actively engage in the policy design.
- Finally, R&I policy in Greece is predominantly implemented through the European budget funding. The overview of R&I policies in Greece indicated a mixed character of their implications. Earlier policies targeted the creation of networks and links between various actors while more recent policies aim to improve the innovation and business environment. Currently the main policy priority is the establishment of a business friendly environment that attracts investments. However, this desire implies a mismatch in the philosophy of the policy considering the regional dimension of ‘smart specialization strategies’.

Using the same line of thinking, chapter 6 focuses on the region of Attica. Hence, the main findings are:

- The region of Attica is unambiguously the economic, political, administrative and business center in Greece. The capital region gathers huge possibilities for innovation activities, but it suffers from an enormous unemployment rate and a longstanding shock in its production base. As the rest of the country do, Attica is predominantly oriented to the tertiary sector and in particular to services sectors. However a considerable activity in manufacturing is also evident in the region.

- With respect to innovation performance, the region of Attica performs sufficiently compared to other Greek regions but this not the case when compared to other EU regions. The only advantage of Attica has pinpointed in non-R&D and non-technological indicators.
- Weaknesses in governance are obvious in the case of Attica. Although the regional administration has a substantially large proportion of funds devoted to innovation, the policy is still implemented by superior agencies. This is particularly evident from the fact that development and innovation strategies in Attica are not designed from the administrative bodies which are assigned to do so.
- Eventually, the region of Attica has a short tradition in implementing R&I policies. Despite this, the most successful R&I policies are developed in this region due to the richness in actors and human capital for innovation. The time being the new regional innovation strategy is under configuration thus many issues related to the policy are not completely clear yet.

So far, a set of issues related to the research topic was obtained by the theoretical part. Subsequently, a variety of additional issues emerged from the analysis of the desk research. All these issues combined were used as sources for defining the agenda of questions during the interviews stage. For the purposes of the data analysis the researcher adopted the framework analysis technique and the results are described in chapter 7. For the economy of this research, we do not present again the most important findings of these results. However by comparing and contrasting those findings with the findings of the previous stages we end up to the final conclusion of this research.

The main research question of this research is: what is the role of Research and Innovation policy in regional development of the region of Attica? For the researcher now is clearer than ever before that this question has not a single answer. The role of R&I policy is definitely important for the regional development in Attica. However, this research showed that in order to answer this research question there is a real need to think the various dimensions in which R&I policy consists of. Therefore the final conclusion of this study is summarized in the following points:

- *With respect to the regional dimension of the R&I policy in Attica.* The region of Attica is special case for R&I policy in Greece. Attica is a noticeable peak in the economic geography of Greece considering its economic, political and institutional position in the Greek context. Therefore due to the provisions of the new R&I policy framework in

Greece and the EU, the regional dimension of the R&I policy in Attica has to be clear and distinguishable from the national dimension. If the region of Attica is capable of defining its own strengths, weakness and needs then the regional R&I policy can be more efficient. Consequently, the national R&I policy will be improved as well.

- *With respect to the philosophy and the character of the R&I policy in Attica.* The underlying principles penetrating the R&I policy in Attica has to be clear as well. Considering the debate presented in chapter 3 and its policy implications, it is apparent that a distinct philosophy and targeting of the regional R&I policy will determine its final design and implementation. To this direction the institutional capacity of the region is highlighted as the major concern.
- *With respect to the relation of the R&I policy in Attica with smart specialization.* Smart specialization though very demanding and complex is a powerful tool for R&I policy in Attica. However, the link of smart specialization strategy with the regional budget has created an unprecedented condition for policy design in the region. This condition has led to significant delays and weaknesses in the policy design process. Therefore there is an imperative need for national and regional administrations to work harder and bring the vehicle back on track.
- *With respect to governance issues related to the R&I policy in Attica.* Inevitably the large number of actors and institutions aiming to benefit from the regional R&I policy in Attica is a challenge from a governance perspective. However, limited efforts have been paid in order all the stakeholders to cooperate and engage in policy processes. Therefore the role of R&I policy is twofold here. First is to test new governance schemes according to the existing comparative advantages of the regional economy. Second is to mobilize new groups of actors that can detect new niches for economic activities. Finally, the idea of establishing an action plan which can promote the actions of the regional R&I policy has to be assessed seriously.
- *With respect to the R&I policy in Attica and the socioeconomic condition of the region.* Innovation is certainly an important factor for growth and R&I policy has to ensure its contribution to regional contexts. However, the R&I policy in Attica has to take into account the severe socioeconomic impacts of crisis and the condition of production base in the region. Therefore another challenge for policy interventions is to confront real needs of the regional economy.

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## APPENDICES

### Appendix 1: Interviews, list of questions

-----English version-----

#### General

1. What is your name?
2. What is your affiliation?
3. What is the subject of your interest or your organisation?

#### Main questions

4. What is the regional dimension of the Research and Innovation policy (R&I policy)?
  - What are the basic challenges that it has to face?
5. The policies relating to R&I policy up to now followed a model of targeted intervention per region (e.g. innovation poles) or they had a horizontal character in favor of the improvement of the environment of innovation?
6. How does the ‘smart specialization strategy’ contribute to the development of a regional R&I policy in the region of Attica?
  - What are the main priorities of R&I policy in Attica?
7. How do you believe more actors can be mobilized in the design and implementation of R&I policy in Attica?
  - What are the implications for the governance of the policy?

#### Concluding

8. What is the role of R&I policy in the region of Attica?

#### Notes

- Do you prefer to remain anonymous in the apposition of the final results of the interviews?
- Do you want to send you a digital copy of the final thesis?

-----end of English version-----

### **Γενικές**

1. Ποιο είναι το όνομά σας?
2. Ποια η ιδιότητά σας?
3. Ποιο το αντικείμενο το δικό σας ή της υπηρεσίας σας?

### **Κύριες ερωτήσεις**

4. Ποια είναι η περιφερειακή διάσταση της πολιτικής E&K?
  - Ποιες είναι οι βασικές προκλήσεις που έχει να αντιμετωπίσει?
5. Οι πολιτικές σχετικές με την E&K μέχρι σήμερα ακολουθούσαν ένα μοντέλο στοχευμένων παρεμβάσεων ανά περιοχή (π.χ. πόλοι καινοτομίας) ή είχαν έναν οριζόντιο χαρακτήρα προς όφελος της βελτίωσης του περιβάλλοντος για την καινοτομία?
6. Πως συνεισφέρει η 'στρατηγική έξυπνης εξειδίκευσης' στην ανάπτυξη της περιφερειακής πολιτικής E&K στην Αττική?
  - Βασικές προτεραιότητες της E&K στην Αττική?
7. Πως πιστεύετε ότι μπορούν να ενεργοποιηθούν περισσότεροι φορείς στο σχεδιασμό και την υλοποίηση της πολιτικής για την E&K και τι προεκτάσεις έχει αυτό στο ζήτημα της διακυβέρνησης της πολιτικής?

### **Καταλήγοντας**

8. Ποιος είναι ο ρόλος της έρευνας και καινοτομίας στην Αττική?

### **ΣΗΜΕΙΩΣΕΙΣ**

- Θέλετε να παραμείνετε ανώνυμος στην παράθεση των αποτελεσμάτων της συνέντευξης?
- Θέλετε να σας αποστείλω ηλεκτρονικό αντίγραφο της τελικής διπλωματικής μου?

## Appendix 2: Interviews, list of respondents

Interview	Name	Authority/service	Date of interview
<b>Final respondents</b>			
1	Evangelia Sofouli	Directorate for Planning and Programming in GSRT	26 June 2014
2	Yannis Psycharis	Professor in Regional Economic Theory and Policy, Panteion University	28 June 2014
3	Pantoleon Skayiannis	Professor in Technology and Innovation Policy, University of Thessaly	28 June 2014
4	Nikos Komninos	Professor in Urban Development and Innovation Policy Aristotle University of Thessaloniki, Director of URENIO lab	2 July 2014 (skype)
5	Vassilis Tselios	Lecturer in Economic Geography University of Southampton, Researcher in Regional Economic Development	2 July 2014
6	Antonis Rovolis	Assistant Professor in Spatial Economics Panteion University	3 July 2014
7	Nikos Maroulis	Policy Analyst in Research and Innovation Policy, Partner in Logotech SA	9 July 2014
8	Dimitris Hatzantonis	Director Entrepreneurship in Hellenic Federation of Enterprises	14 July 2014
9	Yannis Kaloghirou	Professor in Technology Economics and Industrial Strategy Laboratory of Industrial and Energy Economics National Technical University of Athens	14 July 2014
10	Aggelos Tsakanikas	Assistant Professor Laboratory of Industrial and Energy Economics National Technical University of Athens	14 July 2014

### Appendix 3: Framework analysis matrix

Cases/Themes	A: Challenges of R&I policy, Regional dimension	B: Prior policies in R&I in Greece	C: RIS3 priorities and regional R&I policy in Attica	D: Actors mobilization and governance	E: Role of R&I policy in Attica	F: Other reflections
<b>Interview 1</b>	1. Link between regional and national strategies (A.1.1) 2. Policy imposed- EC and cohesion policy commitments (A.2.1) 3. Capacity of regions (A.3.1, A.3.2)		1. Severe delays and weaknesses in RIS3 compilation (C.1.1, C.1.2)	1. Innovation platforms (D.1.1, D.1.2, D.1.3) 2. Bottom-up process (D.2.1, D.2.2, D.2.3) 3. Innovation Councils (D.3.1)	1. Tools for funding (E.1.1, E.1.2) 2. Attica≈ whole country, potentialities due to the size (E.2.1, E.2.2)	
<b>Interview 2</b>	1. Link between regional and national strategies (A.1.2) 4. Low performance in R&I (A.4.1) 5. Inequality, some regions more developed in R&I (A.5.1)	1. RIPs- externalities and diffusion of knowledge and technology in local level (B.1.1)	2. More research activities, better research environment and extroversion for research institutions (C.2.1, C.2.2, C.2.3, C.2.4)	4. State structures- hierarchically decentralized (D.4.1, D.4.2, D.4.3, D.4.4, D.4.5)	3. Attica- a place to test new policies for R&I (E.3.1)	
<b>Interview 3</b>	6. Regional dimension- not existent (A.6.1, A.6.2) 7. Support from the demand side- mobilization of firms (A.7.1, A.7.2)	2. Better innovation environment (B.2.1)		5. Triple helix (D.5.1) 6. Institutional capacity (D.6.1, D.6.2) 7. Transparency (D.7.1)	2. Attica≈ whole country, potentialities due to the size, agglomeration economies (E.2.3, E.2.4, E.2.5) 4. Based on triple helix model: academic entities→ lower than expected, second helix: administration→ capacity problems, third helix: businesses→ better possibilities to contribute (E.4.1, E.4.2, E.4.3)	
<b>Interview 4</b>	1. Link between	3. RIPs-similar logic	1. Severe delays and	2. Bottom-up	2. Attica≈ whole country,	

	regional and national strategies (A.1.3, A.1.4, A.1.5) 8. Transferability of theoretical concepts in policy (entrepreneurial discovery in systems approach) (A.8.1)	as 'smart specialisation' (B.3.1, B.3.2, B.3.3)	weaknesses in RIS3 compilation (C.1.3) 3. Systemic approach (C.3.1, C.3.2, C.3.3)	process (D.2.4) 7. Transparency (D.7.2, D.7.3) 8. Decentralization by using the network of universities (D.8.1)	potentialities due to the size, agglomeration economies (E.2.6) 5. Development dilemma- knowledge intensive and innovation or de-specialization and competitiveness of labor (E.5.1)	
<b>Interview 5</b>						1. Pragmatic possibility for Greece is NIS through specialization in first nature geography and use of spatial blind policies (F.1.1, F.1.2, F.1.3, F.1.4) 2. Agglomeration economies and focus on comparative advantage (F.2.1, F.2.2, F.2.3) 3. Macroeconomic stability (F.3.1)
<b>Interview 6</b>	2. Policy imposed- EC and cohesion policy commitments (A.2.2) 3. Capacity of regions (A.3.3) 6. Regional dimension- not existent (A.6.3, A.6.4) 9. Specialization in sectors with comparative advantage (A.9.1)	2. Better innovation environment (B.2.2) 4. Need for differentiation among regions- not one-size-fits-all approaches (B.4.1)	4. Ambiguity regarding 'smart specialisation' (C.4.1, C.4.2)	6. Institutional capacity (D.6.3)	6. Marginal role- related to the long-term future of Greece (E.6.1)	3. Macroeconomic stability (F.3.2) 4. Region, Country- Need for clear definition (F.4.1, F.4.2, F.4.3) 5. Shift to tertiary sector- low innovation capabilities (F.5.1, F.5.2) 6. Imported character of innovation- not endogenous need (F.6.1, F.6.2, F.6.3) 7. Relatively small scale of production (structure of firms, family-firms) (F.7.1) 8. Tools for funding

						(F.8.1)
<b>Interview 7</b>	<p>1. Link between regional and national strategies (A.1.6, A.1.7, A.1.8, A.1.9, A.1.10, A.1.11, A.1.12).</p> <p>2. Policy imposed- EC and cohesion policy commitments (A.2.3, A.2.4, A.2.5)</p> <p>3. Capacity of regions (A.3.4)</p> <p>6. Regional dimension- not existent (A.6.5)</p> <p>7. Support from the demand side- mobilization of firms (A.7.3)</p>	<p>5. Horizontal character- confrontation of system failures (B.5.1)</p>	<p>1. Severe delays and weaknesses in RIS3 compilation (C.1.4)</p> <p>5. No need for regional R&amp;I policy so far (C.5.1)</p> <p>6. Seven priorities defined for R&amp;I policy in Attica (C.6.1, C.6.2)</p>	<p>1. Innovation platforms (D.1.4)</p> <p>3. Innovation Councils (D.3.2, D.3.3)</p>	<p>2. Attica≈ whole country, potentialities due to the size, agglomeration economies (E.2.7)</p> <p>7. Focus on sectors with multiplier-effects and complementarities (E.7.1)</p>	
<b>Interview 8</b>	<p>2. Policy imposed- EC and cohesion policy commitments (A.2.6)</p> <p>3. Capacity of regions (A.3.5)</p> <p>10. Tools for policy (A.10.1, A.10.2, A.10.3, A.10.4)</p>	<p>6. Problem in cooperation between research institutions and businesses- missing link (B.6.1, B.6.2, B.6.3, B.6.4)</p>	<p>7. Opportunities for open innovation infrastructure (C.7.1, C.7.2, C.7.3, C.7.4)</p>	<p>2. Bottom-up process (D.2.5, D.2.6)</p> <p>9. First time when the State and business community cooperated (D.9.1)</p> <p>10. Innovation infrastructure (D.10.1, D.10.2)</p>	<p>8. Action plan (E.8.1, E.8.2, E.8.3, E.8.4)</p>	<p>6. Imported character of innovation- not endogenous need (F.6.4)</p>
<b>Interview 9</b>	<p>2. Policy imposed- EC and cohesion policy commitments (A.2.7)</p> <p>5. Inequality, some regions more developed in R&amp;I (A.5.2)</p> <p>11. Social need</p>	<p>6. Problem in cooperation between research institutions and businesses- missing link (B.6.5, B.6.6)</p> <p>7. Mixed character (B.7.1)</p>	<p>1. Severe delays and weaknesses in RIS3 compilation (C.1.5)</p>	<p>3. Innovation Councils (D.3.4)</p> <p>11. Transition of the system (D.11.1)</p>	<p>2. Attica≈ whole country, potentialities due to the size, agglomeration economies (E.2.8)</p> <p>3. Attica- a place to test new policies for R&amp;I (E.3.2)</p>	<p>7. Relatively small scale of production (structure of firms, family-firms) (F.7.2)</p> <p>9. Action plan-against individual agendas (F.9.1, F.9.2)</p>

	(A.11.1) 12. Employment issues and need for restructuring of the industrial base (A.12.1)					
<b>Interview 10</b>		6. Problem in cooperation between research institutions and businesses- missing link (B.6.7, B.6.8) 8. Top-down approach- not successful (B.8.1)		3. Innovation Councils (D.3.5) 6. Institutional capacity (D.6.4) 11. Transition of the system (D.11.2) 12. Role of consultants (D.12.1)	2. Attica≈ whole country, potentialities due to the size, agglomeration economies (E.2.9) 3. Attica- a place to test new policies for R&I (E.3.3)	8. Tools for funding (F.8.2)

