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Politiche per l'innovazione in Europa. Un confronto tra Italia e Portogallo

Innovation Policies in Europe: A comparison between Italy And Portugal

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INTRODUCTION

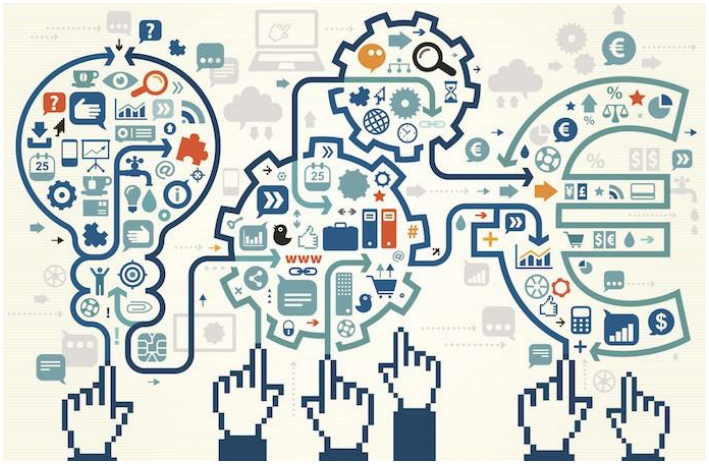
The choice of the topic of this thesis stems from the evolution of a growing interest, since secondary school, for the EU institutions and for the policies of the EU established by it, for their economic operation in favour of the citizen in a free market of people, capital and work. The choice was also determined by an exchange period spent in Lisbon at the ISEG University. In fact, this thesis covers various indicators on the policies of the European Union for innovation by making a special comparison between Italy and, precisely, Portugal.

The aim of this study is to examine whether, through various indicators such as access to forms of public funding, R & D spending, product or process innovations, and companies that have found barriers to innovation, innovation policies have given that contribution hoped for during the seventh framework program (2007-2013) based on data from the Eurostat and OECD platform, in particular CIS2006-CIS2014, giving a hint to the policies underway for the new Horizon 2020 program and the direction Europe will have to take , about innovation, beyond 2020.

At the beginning, the study tries to understand the definition of innovation not only from an economic but also social point of view. It then explains how Europe comes into action and supports innovation policies.
Afterwards, a set of data on public funding for companies in the various Nace sectors of economic activity and size class divisions is analysed, together with a study of R & D expenditure in the two countries that will later be compared with the EU's resources.

[1] Nicoletta Rosati has recently joined the Joint Research Center, the European Commission's science and knowledge service. However, the views expressed in this thesis are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission.

Finally, we will see the economic impact of the policies and performance of the two countries, showing the strengths and weaknesses and the areas of specialization. The conclusion will be not only economic but will give an idea of what future challenges there will be for innovation to be able to break the differences across countries and reach a union of innovation.



1. What is innovation?

This century is characterized by innovation. New technologies, new products, new services, whole new industries have emerged.

Innovation has never been so intense.

The natural question that is a heavy rock on the head of our society is what is innovation. The answer is not so easy how can seem. "*New products, business processes and organic changes that create wealth or social welfare*"[2] OECD thinks . "Something that creates value" would say the fresh thinker!

Operationally, "innovation" is defined as "introducing something new", the introduction of new systems and criteria. So, moving from a lower stage toward a higher level. But we should be careful; innovation is not equal to invention. Innovation is something that generates value for the world, as said before, it makes something faster, better, cheaper, it gives someone satisfaction, while invention is an idea, a technology, a patent.

The right equation is: INNOVATION= invention * commercialization

So, invention without commercialization does not valuable. *"The fact is, innovation means different things to different people*."[3]

[2] "Something new under the sun" , The Economist,2007, www.economist.com/node/9928154

[3] Jeff Dance, "What is Innovation? 30+ definitions lead to one fresh summary: Fresh Thinking that Creates Value",2008 www.freshconsulting.com/what-is-innovation

We should take a look behind the economy that is used to favour analytic-deductive models where it's possible to determinate previously the behaviour of the actors.
The economic sociology favours a more inductive approach, with the actor who does not act only on a simple utilitarian reason (in fact it tries to limit the generalisations). For these reasons, causal connections, besides being limited, are more empirically grounded.
In sociology, the influence of social factors (values, norms) on individual action is stressed, while in economics there is more emphasis on rational pursuit of individual interest by individuals.
Social innovation is over than “tout court” innovation, which arises from market competition and pursuit of a greater profit. At the origin of these innovation processes there are social pressures exerted by unsatisfied needs (proximity health services), wasted resources (soil consumption), environmental (air quality in inhabited centres) or social emergencies(growing areas of discomfort and marginality).
The direct supply of products and services that meet these needs is no longer guaranteed either by the market or by public administrations. This political vacuum and market failure opens the field to the resources and forces of social private, entrepreneurship from the bottom, to community communities that are organized to meet new and old needs, to optimize the use of resources (human and natural) to ensure social improvement, to achieve more satisfying solutions to their own values and aspirations.

Social innovation is not just a more or less radical idea, but an innovative practice, that is the effective and sustainable application of a new product, service, model idea.
The ability to be effective refers to the optimal use of resources for achieving a social result (outcome), in practice demonstrating that the idea works better than existing solutions and generates value for society; Sustainability is an essential and typical component of social innovation that distinguishes it from traditional practices of social assistance and promotion, that is, the ability to "stay on the market" and to finance it through revenues generated by the activity itself or the ability of those who promotes it in order to dedicate time and work.

This element points to the entrepreneurial dimension of innovation as a possible (unnecessary) outcome for the implementation of a new idea. It has nothing to do with the profit or not-profit dimension of the enterprise, as much as the sense of innovation that has as its purpose the creation of a positive impact for society that is as wide as possible. Social innovation not only respond innovatively to some needs, but also propose new ways of decision-making and action.
In particular, they propose to deal with complex horizontal issues through reticulate intervention

mechanisms, adopting the full range of available tools, using forms of coordination and collaboration rather than vertical forms of control. They also require the use of design thinking support tools and processes, understood as the ability to formulate and implement solutions. This increases the capacity of the community to mobilize, creates new roles and relationships among the actors involved, involves the production of human resources and human capital underutilization. The process leading to the production of a certain output (product, service, behaviour model, etc.) is therefore fundamental in achieving what we define the social outcome. The potential impact of an innovative practice on the social context is the greater the more inclusive the community engagement process, following ever-evolving models. This human resource mobilization leads to a widespread activism that can multiply energies and initiatives in the service of social improvement.

There are no more suitable actors and sectors than others in developing social innovation practices. Indeed, we can say that the most interesting and radical experiences are the fruit of the collaboration between different actors belonging to different worlds. Social innovation practices tend to be located on the border between non-profit, public, private, civil society (volunteering, movements, collective action, etc.), are transversal and result of interesting contaminations of values and perspectives. They emerge from new forms of collaboration and cooperation between different subjects who find a line of interest in achieving a common goal. So social innovation has a strong collective dimension, it does not only belong to the imagination and creativity of a single actor, as to the collective ability to start from an intuition and to develop it to transform it into widespread practice (outcome / outcome).

One of the most important and controversial elements of social innovation is the impact it can exert in social terms. Attention to the assessment of this impact is so high that it has begun a process of processing metrics and tools capable of providing a quantitative indication of the social value created. We believe that this approach, at a stage of defining and studying the dynamics and characteristics of social innovation, risks shifting attention only to measurable results rather than to the complexity of implicit relationships in practice. Social innovation is embedded in the social fabric of communities where it is practiced, in the qualitative value of these relationships, in the complexity of spontaneous governance models. These elements as we have already mentioned are essential to assess the impact on the community. For this reason, we prefer not to bring the impact of innovation only to the social value created but to the social improvement that is capable of generating. In fact, the study of this thesis is focused on the socio-economic impact on European community.

Innovation may be the result of both radical and incremental changes to products, processes or

services. The often-unspoken goal of innovation is to solve a problem. Innovation is the topic shared in different sectors of studies as economics, business, technology, sociology, and engineering. Since innovation is also considered a major driver of the economy, the factors that lead to innovation are also considered to be critical to policy makers.
In order to address the long-term challenges (globalization, pressure on natural resources, population aging), Europe has to act collectively and has decided to revitalize its economy with the EUROPA 2020 strategy to transform the EU into a ' smart, sustainable and inclusive economy characterized by high levels of employment, productivity and social cohesion. Smart growth means promoting knowledge and innovation as engines of our future economy. It is therefore necessary to improve the quality of education, to strengthen research in Europe, to promote innovation and the transfer of knowledge to all citizens to face the challenges of European and world society
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It is important to consider Innovations do not necessarily have to be a discontinuity for the market in which the company operates, in fact it is sufficient that they are discontinuous for the company that introduces them. They take different forms, ranging from research and development, to adjusting the production process, to exploiting new markets, to using new organizational approaches, or to creating new concepts in marketing. Innovation is in fact the fundamental tool through which companies can increase the productivity of factors and thus enable the economic system to achieve greater competitiveness

To increase the capacity for innovation, you need to learn how to use, create and spread knowledge in the economic system. Innovation is as important as competition through prices. Businesses must therefore play an active role in this field, in particular by exploiting the results of research and contributing to the growth of the competitiveness of the European Union. However, this is a

complex process that can be accomplished in a variety of ways, but it is never linear, but chained: inputs and feedback are generated from every node in our system.

To do this, there are not enough simple researchers working in the lab, on the contrary, there is a need for professionals who are able to capture any useful signal, interpret and support it through an efficient ICT system that can share information and transform them into knowledge. Most importantly, it is possible to reuse elements of knowledge already present inside and outside an enterprise: it is not enough to be good tool builders for example, but a whole set of "pieces" of knowledge recognizable in other system nodes, know how to reuse and then find new applications that are innovative. The intensity of the different levels of innovation in Europe varies depending on the country in which you are located, depending on the regions, you can find it in comparison with comforting data such as those highlighted in Finland and Sweden, within which innovation represents about 3.4% and 3.8% respectively of GDP. If, on the other hand, the southern countries of the EU are analyzed, for example Italy with innovation of about 1% of GDP only, the differences are evident and the need for coordination through differentiated policies for reach by 2020 the target of 3% of GDP.

This work will focus on two counties of the south of Europe: Italy and Portugal.

The new economic scenario in the business sector is characterized by a series of articulated and complex phenomena that tend to reward efficiency and strategic capability; this helps to make it indispensable within businesses, product innovation and / or of process. They then change the lines of industrial politics and the renewed managerial mentality that tend to favour efficiency, dynamism and therefore innovation. If the password becomes competitive, this means advancing competitors in the market by providing products and services at the right time, anticipating customer needs in a timely manner, thus possessing the skills needed to innovate and improve products. The company must make a change in the mindset, opening itself to changes through a complex process that does not run out of simple technological evolution, but also invests in the structure and internal organization of the enterprise itself. It is not conceivable to introduce new technologies while maintaining organizational structures unchanged, simply by applying new tools to pre-existing procedures. By playing the innovation card as a strategic factor, the organization of an enterprise is called upon to change, finding in technology a valid support to accomplish.

The benefits of innovation that result from its business are surely visible in the medium to long term, affecting long-term strategies and policies. These are advantages linked to their operating modes such as flexibility, rapidity of action and closeness to the customer; social benefits, including

the environment and employment, are not negligible: innovation is bound to improve work conditions and enhance qualifications and specializations.

1.1 Why do we need a European research and innovation policy?

Research and innovation are crucial in helping Europe to not simply overcome the current crisis, but to build a stable economy for the future based on smart sustainable growth.
Eu should become a better place in which to live and work so we need R&I policies.
these policies could be the best solutions for both urgent as refugee's phenomenon and long-term social challenges like transports, climate change or energy.
In fact, innovation can produce higher levels of security, better health protection, higher quality products, and environmentally friendly products and services.
It has dramatically increased productivity compared to previous generations, and has fundamentally changed all aspects of our lifestyle. Innovation and education are key factors in our global success in a knowledge-based economy.
An ever-evolving world creates challenges and opportunities for companies, and innovation can enter in this process by helping businesses to exploit the full potential. There are several transformations that create opportunities to innovate: the changing needs and expectations of consumers, competition, technology, a different external regulatory environment and an increasingly global and dynamic market. Innovation can stimulate lower production costs, build new markets and increase competitiveness; it can also function as a performance engine, creating profitability, generating employment and boosting market share and growth rate.

According to the the publication that explains what the EU does in different policy areas, why the EU is involved and what the results are, the EU is a major player in international science and technology and a clear leader in many areas such as renewable energy and environmental protection. The EU is the main knowledge factory in the world. It accounts for almost a third of global science and technology production. We have great strengths in the EU. We are open, we have great diversity and we are home to many excellent companies and research institutions. However, the EU is facing increased global competition in research and technology production and needs to make sure innovative ideas turn into successful new products and technologies. All EU Member States have their own research policies and funding schemes, but there are many key issues

that can be best tackled by working together — which is why research and innovation is also funded at the EU level.
open innovation è stato intressante il disocrso fatto da Carlos Moedas che ha fissato 3 obiettivi per le politiche di ricerca e innovazione in europa: Open innovation, Open science and open to the word.

These goal show how research and innovation contribute across the European Commission's political priorities. They do not represent a new policy initiative or funding programme but a way to reinforce existing programmes, such as Horizon 2020, and reinvigorate existing policies such as the European Research Area

Open Innovation is to open up the innovation process to all active players so that knowledge can circulate more freely and be transformed into products and services that create new markets, fostering a stronger culture of entrepreneurship. In order to innovate, the economy needs ideas, products talents but all of this cannot come from the internal side of the firm. What happens outside is to be considered in the same way as what is born inside, provided it is consistent with the business model of the company itself.
The EU registered many scientific output but something is changing for the science, turning towards a sort of openness and collaboration, a new approach to the scientific process, based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools. For example, an interesting news that helps the launch of open science comes from the Commission project instituted to provide a cloud-based services and world-class data infrastructure to do not lose the opportunity to ride the wave of the open innovation and big data revolution in the entrepreneurial sector, public sectors and science sector. In the purpose of linking the existing research infrastructure, *"the Commission plans to create a* ***new European Open Science Cloud*** *that will offer Europe's 1.7 million researchers and 70 million science and technology professionals in a virtual environment to store, share and reuse their data across disciplines and borders"*[4].
All of this will be supported by a big infrastructure with high capacity and performance in elaboration and storage large data set.
This is why we need an European policy for research and innovation. The globalization occurred many years ago, as we will see in the next page, and it lead to a change from open source to open innovation.

[4]European Commission, " European Cloud Initiative to give Europe a global lead in the data-driven economy",2016

1.2 The effects of globalization on innovation

A factor that has greatly influenced the trend of recent years in technological innovation is the strong process of globalization, which has been under way for some decades, which is upsetting the international economic scenario. With globalization, in fact, there are strong links between the markets around the globe. First of all, it pushes individual economies towards the specialization of productions, obtaining cost reduction and a consequent increase in the growth rate or in any case of the growth potential of the economy as a whole. Following the process of globalization, products will have to acquire features tailored to the demands of people with cultures other than local ones and this will make them more and more similar. The most innovative companies will need to adopt new distribution and supply strategies. However, the impact of globalized markets will be different depending on the sectors: only those who have access to more information can easily acquire new economic models and more easily adopt new market competition and adapt more easily. The main effects of globalization on businesses are the greater opportunities to operate simultaneously in more markets, in a broader range of strategies for incorporating the possibility of creating a link between local experience. Unfortunately, globalization will lead to the decline of traditional forms of competitive advantage and will push labor and production delocalization processes that make factors such as tacit knowledge and other intangible assets critical to competitiveness on international markets. In addition, the combined action of globalization and technological development has substantially altered the composition and the size of costs that companies are forced to support when they decide to invest in R & D to remain competitive in the international market due to changes described above. Therefore, companies, smothered in this wave of change, increasingly resort to cooperative relationships to minimize research costs and support each other in this increasingly economic climate of uncertainty.

1.3 How does the EU support research and innovation?

Innovation as a growth and employment's engine of EU.
Innovation cannot ignore interaction and collaboration between different actors: innovators, businesses, research centres, innovation and development agencies, technology transfer offices, education and training institutes, investors, etc.
The EU favours the interaction between regional and cluster initiatives.

The European Union has run its research and innovation policies and funding on the basis of seven multiannual framework programmes, between 1984 and 2013, and operational programs of the European Structural Funds. The goal of these actions is to stimulate the growth of member countries and to reduce existing gaps in the region. The new programme is Horizon 2020[5], the last framework programme that supports thousands research and innovation projects. It drives real breakthroughs, discoveries and innovation by helping take great ideas from lab to market.

By connecting excellent research directly to innovation, Horizon plays a decisive role in strengthening the competitiveness of European industry in facing the challenges of the digital era: "it is not sensible to face them individually at national level" said Carlos Moedas, European commissioner for research science and innovation during a speech; he says also that there is a clear and proven relationship between investment in research and innovation and competitiveness, growth and job creation: between 1995 and 2007, innovation accounted for 62% of growth in Europe.[6]

In fact the EU Commission has intervened since the beginning of the crisis to ensure "healthy" public finances, and at the same time continued to invest in growth-enhancing areas such as research, innovation and education. The Juncker Commission is committed to giving strong impetus to private investment and this is the absolute priority of its Investment Plan for Europe which has invested 236 billion euro, of which a fifth to support research and innovation.

Europe tries to reduce differences by promoting economic growth, job creation and competivness with the cohesion policy defining The European structural and investment funds

This is possible thanks to the European regional development fund (ERDF)– *promotes balanced development in the different regions of the EU*, European social fund (ESF) - *supports employment-related projects throughout Europe and invests in Europe's human capital* and Cohesion fund (CF) – funds transport and environment projects in countries where the gross national income (GNI) per inhabitant is less than 90% of the EU average. This indicators, according to several reports written by commission on this topic, toghether represent 1/3 of the total budget and they are coordinated with the Agricultural funds for Rural Development and the European Maritime and Fishery Fund and complement other sources of EU funding.

[5] ec.europa.eu/research/horizon2020/pdf/press/fact_sheet_on_horizon2020_budget.pdf

[6] Eurostat statistics platform

These amount to € 43.73 billion for the period 2014-2020 (ERDF). If these funds add about 22 billion in national contributions, the total funds will be 65.75 billion euros.

The two core objectives of Horizon2020 are:

- Investments in favor of growth and jobs, which are a common objective for all three categories of regions, less developed, transitional and more developed regions (supported by the ERDF-european regional development funds- the ESF -european social fund- and the Cohesion Fund) ;
- European territorial cooperation, to be supported by the ERDF

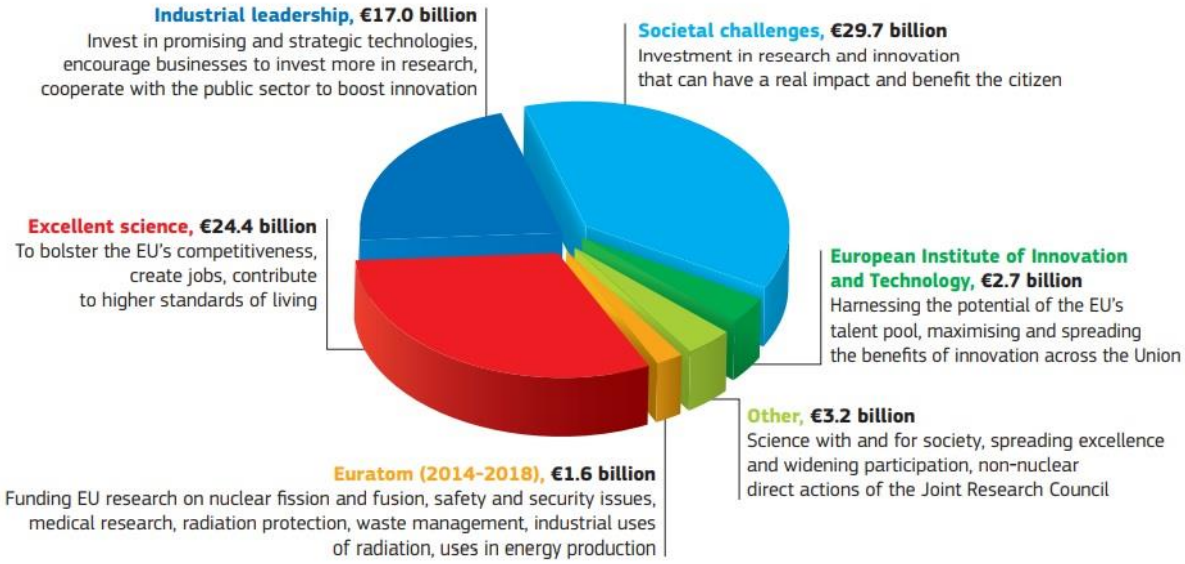


Figure 1"Horizon 2020 budget", 2014, European commision

According to a report on Research and Innovation of the European Commission, the implementation of the Horizon 2020 program provides for a budget of € 77,028.3 million. Horizon 2020 has priority objectives to help in building a knowledge-based society and knowledge-based economy in the European Union by mobilizing additional funding for research, development and innovation and contributing to the achievement of research and development objectives, including the target of 3%for GDP for research and development throughout the Union by 2020.

The general objective is pursued through three priorities devoted to: a) Scientific excellence; b) Industrial Leadership; c) Challenges for society. It is also pursued through the specific objectives of "Spreading excellence and widening participation" and "Science with and for society" and through the contribution of the JRC (Joint Research Center) and the European Institute of Innovation and Technology (EIT).

The table below shows the indicative allocation of the budget between the different specific objectives (as defined in the Framework Program established by Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013).

Horizon 2020 (2014-2020)		
	Final breakdown	**Estimated final amount in million euro (in current prices)**
I Excellent science, *of which:*	**31.73%**	**24 441**
1. The European Research Council	17%	13 095
2. Future and Emerging Technologies	3.50%	2 696
3. Marie-Skłodowska-Curie Actions	8%	6 162
4. European research infrastructures (including eInfrastructures)	3.23%	2 488
II Industrial leadership, *of which:*	**22.09%**	**17 016**
1. Leadership in enabling and industrial technologies	17.60%	13 557
2. Access to risk finance	3.69%	2 842
3. Innovation in SMEs	0.80%	615
III Societal challenges, *of which*	**38.53%**	**29 679**
1. Health, demographic change and wellbeing;	9.70%	7 472
2. Food security, sustainable agriculture and forestry, marine maritime and inland water research and the Bioeconomy;	5%	3 851
3. Secure, clean and efficient energy	7.70%	5 931

Figure 2"Horizon2020",2014, European Commission[7]

[7] https://ec.europa.eu/research/horizon2020

4. Smart, green and integrated transport	8.23%	6 339
5. Climate action, environment resource efficiency and raw materials	4%	3 081
6. Europe in a changing world - Inclusive innovative and reflective societies	1.70%	1 309
7. Secure societies – Protecting freedom and security of Europe and its citizens	2.20%	1 695
Science with and for society	**0.60%**	**462**
Spreading excellence and widening participation	**1.06%**	**816**
European Institute of Innovation and Technology (EIT)	**3.52%**	**2 711**
Non-nuclear direct actions of the JRC	**2.47%**	**1 903**
TOTAL EU REGULATION	**100%**	**77 028**

Fusion indirect actions	**45.42%**	**728**
Fission indirect actions	**19.68%**	**316**
Nuclear direct actions of the JRC	**34.90%**	**560**
TOTAL EURATOM REGULATION 2014-2018	**100%**	**1 603**

Figure 3Horizon2020,2014,European Commission[8]

[8] https://ec.europa.eu/research/horizon2020

2. Innovation in Italy And Portugal

In this second chapter, we will try to illustrate the innovation policies in the individual countries, that are considered in this thesis, and their evolution. We will also understand how these policies are managed and coordinated by both the central government and the individual regions.
First, the illustration will be general and then it will be deeper and focused on firms' innovation only in the next chapter where there will be a statistical analysis.

2.1 Italian situation

It's really interesting the paper of M.Sobrero (2015) Professor at Bologna university of economy and management of innovation, who explains that it is possible to identify three elements that have characterized the development of innovation policies in Italy. The first observation is related to the kind of policies that have been outlined over the years. In Italy, attention has been systematically focused on deliveries. This is true from the start of the first national law for research and innovation support, the 1089/1968 institute of the *applied research fund* (FRA), the development of the program with Law 46/1982 establishing the *Fund for technological innovation* (FIT), the implementation of Law 297/1999 and several recent interventions related to regional innovation laws, as well as the tax relief setting in the various forms experienced in recent years, to conclude with the program called Industry 2015. Always as an enhancement of the offer can be seen interventions aimed at encouraging a greater role of universities and EPRs in the transfer of knowledge to the market, but very fragmented and difficult to trace to a precise institutional design, as well as support, progressively depleted as they show all the statistics impetuously, research activities of these institutions. The ratio of this focus on the supply side is linked to internationally-known comparisons that have always shown a strong distance between Italy and others countries on the amount of research invested. Almost nothing has been done about policies' diffusion. The second observation is that the political responsibility and the direction of innovation initiatives has progressively been fragmented both in terms of ministerial competences and in the distribution of competences between the state and the regions. On the ministerial front, the first element is the progressive segregation of interventions. While the conceptual framework of the FRA and FIT provided for transversality of themes and areas of intervention (reinterpreted in the key themes of intersectoral themes from the Industry 2015 program), the second half of the 1980s saw the spread of interventions associated with related themes to sectoral competences such as environment and energy, health or health or transport, to conclude with the very specialization related to the

aerospace sector and the associated related programs, which have progressively confined within the Finmeccanica group or, even more striking, to the constitution of a ministry (albeit without a portfolio) where innovation is confined to the ICT (Information and Communication Technologies) world and its application to public administration to this trend, with the implementation of the "Title V" with reform provided by Constitutional Law 3/2001, the initiative of the main regions has been added to the application of the principle of competing power in research and innovation and the launch of policies and regional laws, also very concentrated on the supply side and often similar in the system to national instruments, or by interpreting the problem of demand in a limited, albeit important, way linked to the relationship between research and enterprise institutions. This has occurred in a period of substantial limbo of national policies, thus limiting possible inefficiencies linked to duplication in interventions, but which remain a relevant element to be considered. At the same time, the distance from European policies has become abysmal, both in terms of coordination with national policies, as well as on the distinction of roles and functions, as is concretely possible to detect the indirect influence exercised on regional policies by the increasing use of funds Structural Support for Innovation in the territories.

The third consideration concerns the absolute absence from the debate on the importance of market functioning for a real effectiveness of policies in support of research and innovation. Not only the focus on dissemination policies has been virtually absent, but it was taken for granted that, once the bid was backed up, the conditions for disseminating the results of this support were already present and well-functioning. Unfortunately, things are not so on different fronts, as we recall many debates about the weakness of competition in the country in different sectors, the inefficiency of some structural elements, which recently attracted a lot of attention to the level of technological development of telecommunications networks, or the very strong regulation of research institutions. a real change of route occurred when a more open and competitive research and innovation system started, in line with the objectives of EU. In 2013, after the difficult situation of the crisis, the reform of regulation of recruitment introduced in the Italian doctoral training system lead to a creating attractive and competitive doctoral schools in Italy, especially for foreign students. However, we will see if the level of funding was appropriate or not, otherwise it with the lack of career opportunities in universities could reduce the positive effects of the reform significantly. at the same time Italy's innovation capacity and public private collaboration have been fostered through the development of several measures with smart specializations and technological strategies. Finally, in 2013, the commercial law on entrepreneurship in Italy has been implemented

with the identification of innovative start-up and the access' simplification to finance SME's. The big problem remained the inadequate fiscal credit or tax incentive.
Another important introduction by MISE (ministry of economic development) was the National Operational Programme for Research and Competitiveness (PONREC), a grant that has been an important instrument for implementing Research & Innovation, in particular in the south part of Italy: Calabria, Campania, Puglia and Sicilia. This programme focuses on three main priorities: (i) supporting structural changes and scientific and technological improvement for a transition towards a knowledge economy; (ii) improving the innovative context for the development of competitiveness; and (iii) technical support and coaching.

2.2Portugal situation

Portugal understands the importance of the European Structural Funds because people of this country have seen and still are fundamental today, essential to promoting research and entrepreneurial innovation. All this is confirmed by the partnership agreement between Portugal and Europe called Portugal 2020. It brings together the 5 Structural Funds mentioned in the previous chapter.

The principles followed by Portugal 2020[9] are the same as those of Horizon2020, namely smart, sustainable and inclusive growth

Portugal's research and innovation strategy, to achieve a degree of specialization, aims at identifying major challenges in the scientific, technological and economic spheres. "*Therefore innovation and qualifications for the active population are vitally important to overcome the restrictions on the competitiveness of Portugal; 57% of the total cohesion funds were allocated to competitiveness (36%) and human capital (21%), compared with 37% in the EU-28 (27% and 10% respectively)*."[10]

According to the European Scoreboard for Innovation 2016[11] and how it will be explained leater, Portugal has a "moderate innovator" profile below the EU average.

How does Portugal invest through co-financing in the seven regions of Portugal so subdivided?

Less developed regions (GDP per capita <75% EU average): North, Center, Alentejo and RA Azores have a fund co-financing rate: 85%, Transition Regions (GDP per capita between 75% and 90%): Algarve ha a co-financing rate of 80% and, finally, more developed regions (GDP per capita> 90%), which are Lisbon and Madeira, verify a co-financing rate of funds: 50% (Lisbon) and 85% (RAM)

[9] www.portugal2020.pt/Portal2020/o-que-e-o-portugal2020
[10] Data from http://ec.europa.eu/regional_policy
[11] ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en,2016

2.3 Ralations Between Italy And Portugal

Economic and trade relations with Italy are characterized by moderate growth. In 2015, Italy increased its exports to Portugal (+ 5.2%) to fourth place among exporting countries (after Spain, Germany and France) with a market share of 5, 4% equal to a total of 3.2 billion euros. In the same period, imports of Portuguese products increased by 2.9%, confirming Italy as the eighth market as the outlet market, preceded by Spain, France, Germany, United Kingdom, United States of America, Angola and the Netherlands, with a market share of 3.2%, worth 1.6 billion euros. The Italian / Portuguese bilateral trade balance in 2015 thus confirms with a positive balance for Italy estimated at about 1.2 billion euros. The statistics therefore show how Italy remains a reference partner for Portugal, especially in some areas of major manufacturing specialization (mechanical, chemical, pharmaceutical, automotive, textiles and clothing).

There is a different situation with regard to the flow of bilateral investment. Even at alternating stages, the Italian IDEs towards Portugal in recent years have marked a substantially negative evolution and in any case with significantly lower volumes than the major European partners. For years, Italy has not been ranked in the ranking of the top ten investors in the Iberian country, and annual flows are declining. In 2014, Italian investments were 736.5 million, while in 2015 they dropped dramatically to 27.2 million. The sunset of the big public investment season (especially in the infrastructure sector) has undoubtedly undermined part of the potential interest of our production system towards this country. Even more limited Portuguese IDEs to Italy, with a total of 7.7 mln invested in 2014 and 12.3 mln in 2015.

There are about 150 Italian-owned companies operating in Portugal, mostly small and medium-sized enterprises with a commercial presence (branches, branch offices, distribution centers or retail outlets). There are, however, bigger Italian groups, which operate through a stable production presence or in the form of industrial partnerships with local partners, including Gres-Panaria (ceramics), OLI (hydraulic systems), Seda Group (packaging). In Portugal there are also major Italian multinationals, including ENI, Agusta Westland, FCA, Generali, Ferrero, Calzedonia Group, Benetton, GiGroup.

The steady presence of Portuguese companies in Italy is more limited. The Italian market is often considered attractive but at the same time difficult to manage and highly competitive. The most

important Portuguese investment sectors are represented by real estate (3 shopping centers run by the Sonae Sierra group), the plastic packaging industry (Logoplaste), the renewable energy sector, wind power (EDP Renovaveis) and photovoltaic (Martifer Solar) in the Pharmaceutical Industry (BIAL)

3. The Analisys

The purpose of this analysis is to provide evidence-based support to the policies, instruments and measurement needs of a smart, sustainable and inclusive growth in Europe; the analysis focuses on two countries of the PIGS: Italy and Portugal

1. to better understand how innovation policies work, at local or regional or national, and also the "innovation system" in the EU;
2. how Italy and Portugal invest in Research and innovation.
3. to assess the EU's current innovation performance, by attempting to measure ICT innovation in Europe and measuring the impact of existing policies and instruments (such as FP7 and Horizon 2020);
4. to explore and suggest how policy makers could make innovation in the EU work better.

This work uses mainly data from Eurostat[12], to estimate the relationship between public funding and subsidies to firms' innovation and R&D and innovation performance, and from the INNOVATION UNION SCOREBOARD (IUS)[13].

The assessment of the innovative capacity of a territory is a fundamental process for defining its growth and development opportunities. The European Commission periodically promotes Community innovation surveys called CIS (Community Innovation Survey); such surveys are drawn up by the statistical offices of individual EU member states. The CIS provides information on the innovative capacity of the various industrial sectors and, in aggregate, of the entire regional system under consideration. The Community Innovation Survey is one of the main sources of the Innovation Union Scoreboard (IUS), the main statistical tool promoted by the European Commission to assess comparatively Member States on the basis of innovation indicators.

CIS are carried out with two years' frequency by EU member states and number of ESS member countries. Compiling CIS data is voluntary to the countries, which means that in different surveys years different countries are involved. It focuses on innovation activity in enterprises, providing statistics broken down by countries, type of innovators, economic activities and size classes.

The recommended target population of the CIS is the total population of enterprises in

NACE Rev. 2 sections A to N. These sections include most market activities. The survey

[12] ec.europa.eu/eurostat/data/database
[13] http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

excludes activities O to U consisting of public administration, education, health and social work, arts, entertainment and recreation; other service activities (professional organisations and personal services), households and extraterritorial bodies.

3.1 Classification of Economic Activities, NACE rev.2

The economic sector used for the analysis are in the list below while the data of the others sectors not mentioned are not available.

1. A agriculture, forestry and fishing
2. C manufacturing
3. D electricity, gas, steam and air conditioner
4. E water supply
5. F construction
6. H transpostation and storage
7. I accommodation and food services activities
8. J information and communication
9. K financial and insurance activities
10. L real estate activities
11. M professional, scientific and technical activities
12. N administrative and support services activities

3.2 Size class

It is recommended that all enterprises be included in the target population. However, the mandatory coverage consists of the enterprises with 10 employees or more. Given that some data of different size class (employees:10-49, 50-249, 250 and more)
are missed in euroastat, we consider only the total number of employes

3.3 The reference period

The reference period to be covered by the surveys shall be 2006-2014 inclusive i.e. the three-year period from January 1st 2006 to December 31st 2014. Few questions however refer only to one year.

3.4 Changes over time in Italy and Portugal's innovation performance

Where the IUS 2013 analysed innovation performance over a five-year period, for the IUS 2014 the analysis has been extended to an eight-year period. This longer time frame will allow comparing performance changes before and during the crisis. As it was mentioned before the eight years period corresponds with data availability from the Community Innovation Survey starting with the CIS 2006. Performance changes over time will be discussed later with all the statistical data and 2 different variable: number and percentage for each of the innovation performance. Italy and Portugal are considered Moderate innovators according to European Commission, which lists 190 European regions based on their ability to keep up with technological innovations, looking at the quality of universities, availability of business and technical talent, the number and size of R&D-heavy companies and technology startups and whether or not innovation is among the key priorities of the government. So the most important indicators to measure the innovation potential of a country include factors such as the amount of R&D funding – both private and public, the number of patents filed or the venture capital activity. The other cotegories are Leader innovatior, modest innovator and follower innvator.

The graph below shows the moderate groups where there are Italy and Portugal.

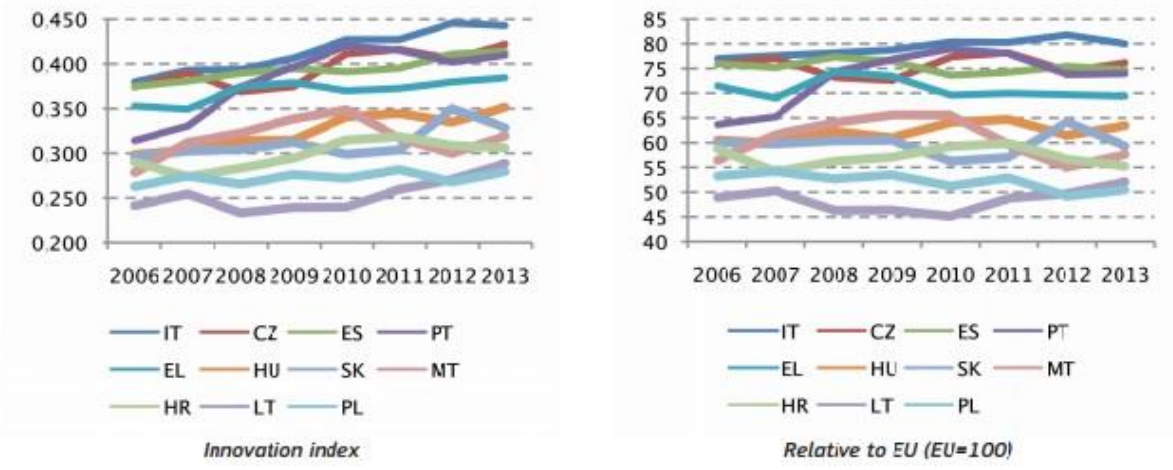


Figure 4Scoreboard 2014

Innovation performance has been improving for all Moderate innovators (left-hand side). Italy has consistently been the best performing country within this group. Both Portugal and Italy experienced rapid increases between 2006 and 2010.

Performance has improved strongest for Portugal at an average annual rate of 3.9% followed Italy (2.2%). These two Moderate innovators were growing at a higher rate than the EU and their relative performance to the EU has improved.

Collecting and processing data

Data collected by CIS 2006, CIS 2008, CIS 2010, CIS 2012 E CIS 2014 have been organised in a table of product process innovation per NACE rev2

1. enterprises by main type of innovation
2. public funding for innovation by NACE2
3. expenditure in research and development

In the table above there are data for Italy and Portugal from 2006 to 2014, dived per NACE2 sectors A, C, E,F, H, I, J, K, L, M, N

B and G are insignificant because most of the times they are missed.

In the next table, we provide information on the characteristics of innovation activities at enterprise level. As we have said before CIS's allows Europe's progress to be monitored in the area of innovation, creating a better understanding of the innovation process with analyses of the objectives and the effects of innovation. These results can also be linked to variables related to competitiveness, employment and economic growth. The concepts are in line with those recommended by the Oslo Manual (2005, 3rd edition), which is the internationally recognised standard methodology for collecting innovation statistics.

These tables collected information on product, process, CIS results offer a broad set of indicators on innovation activities, innovation development, innovation expenditures, public funding, innovation cooperation and organisational and marketing innovation.

Main concepts and definitions used for the CIS data collection:

An innovation is the implementation of a new or significantly improved product (good or service), process, in business practices, workplace organisation or external relations. This definition of

innovation encompasses a wide range of possible innovations. An innovation can be categorised as the implementation of one or more types of innovations, for instance product and process innovation.

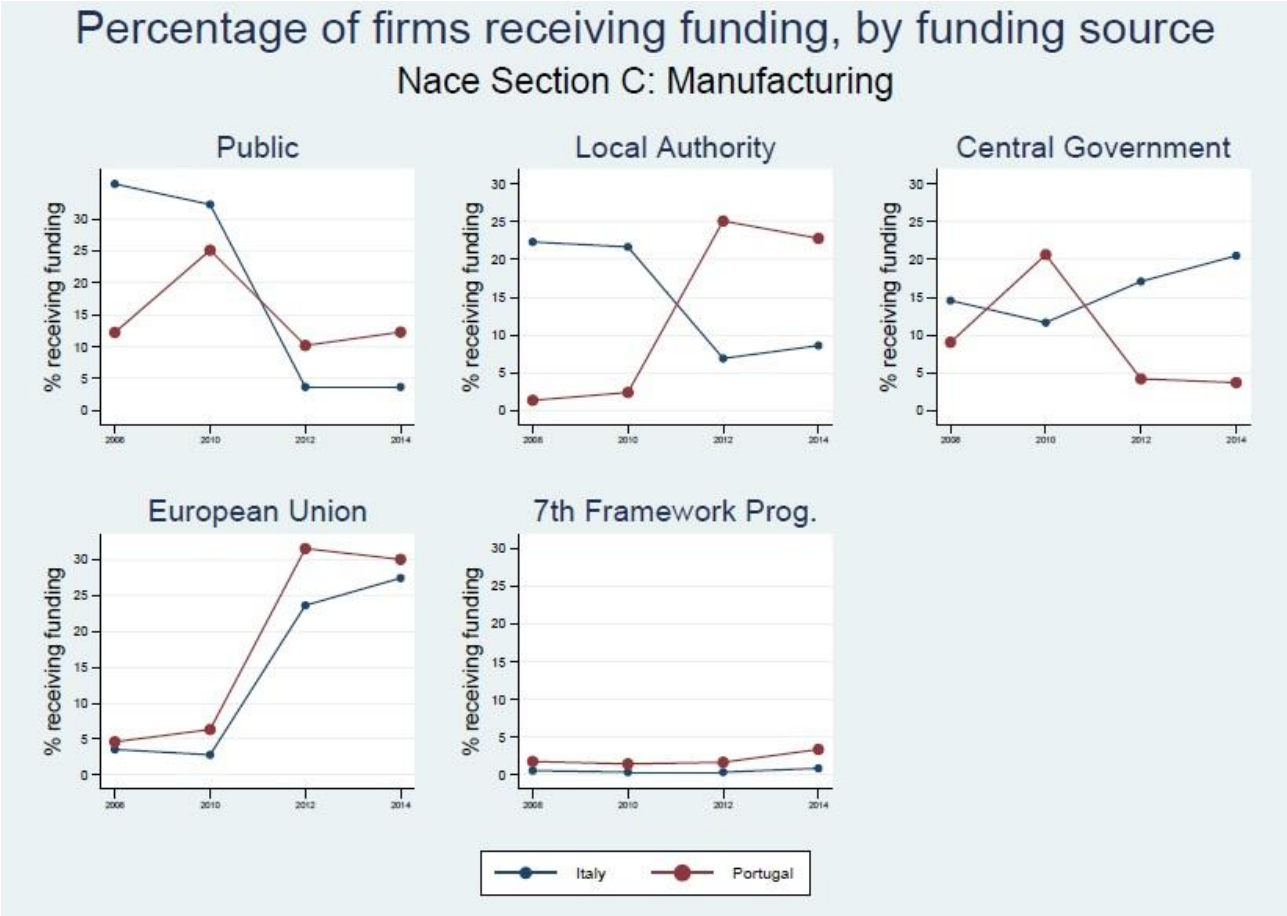
The minimum requirement for an innovation to occur is that the product or process must be new or significantly improved to the firm. This includes not only products, processes that firms are the first to develop but also those that have been adopted from other firms or organisations.

Product innovative enterprises are those who introduced, during 2006-2014, new or significantly improved goods and/or services with respect to their capabilities, user friendliness, components or sub-systems. Changes of a solely aesthetic nature and the simple resale of new goods and services purchased from other enterprises are not considered as innovation.

Process innovative enterprises implemented new or significantly improved production process, distribution method or supplying activity during 2006-2014.

3.5 Access To Funding

The following graphs are based on Micro-data resulting from an Eurostat standardized micro aggregation procedure applied to the four CIS'S (2008-2014) about receiving funding by funding source. The data are collected and processed in a *.xls file* with a sample includes only the innovative firms because these have to fill out all the questionnaire, different types of public support programs: i) public support to innovation from public; ii) public support to innovation from local authority; public support from central government public funding from EU and from the 7th framework programme. Data have been divided 1) by size class of the firms but, due to some missing values, we have considered just the total 2) by NACE2[14].

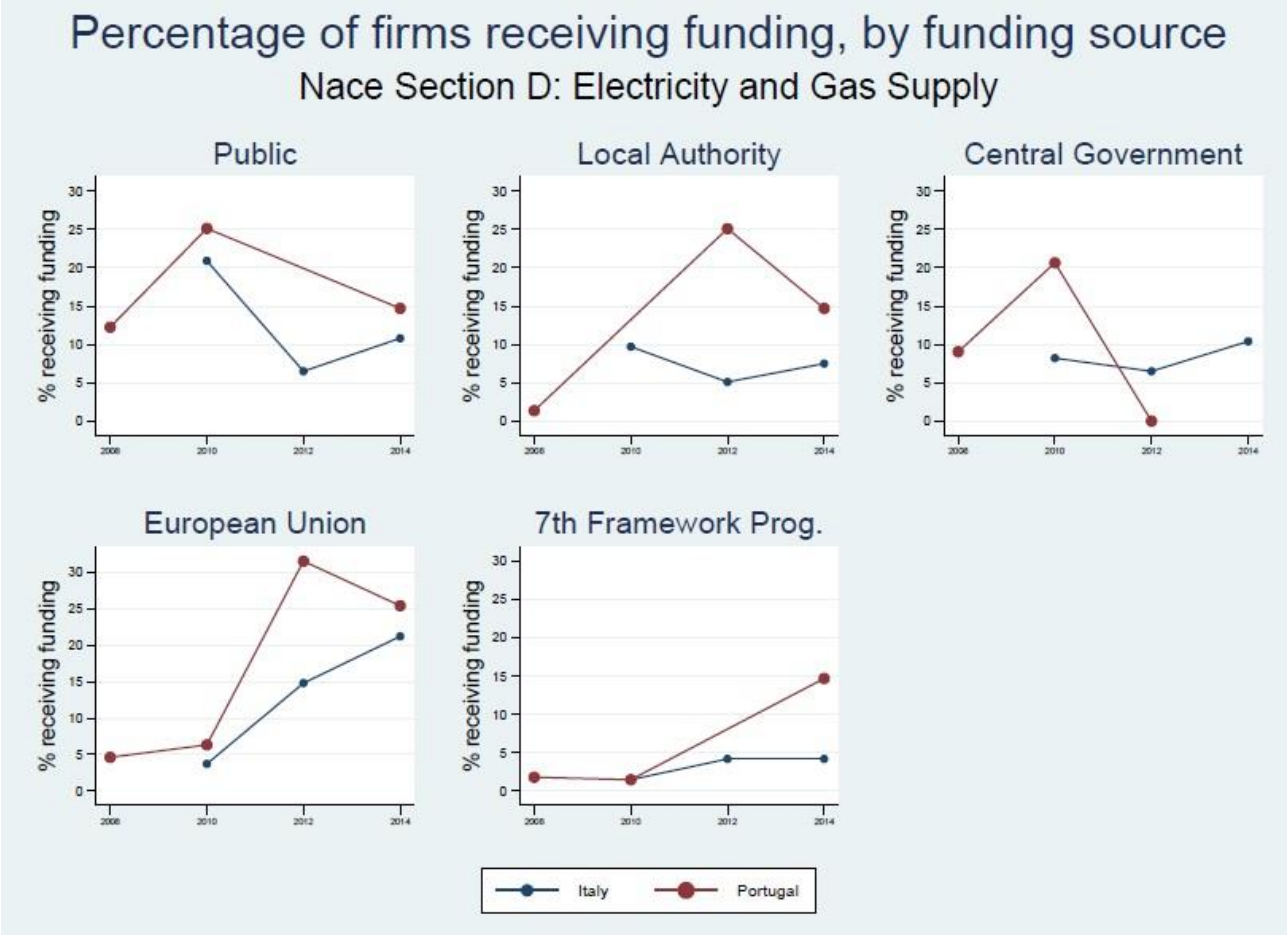


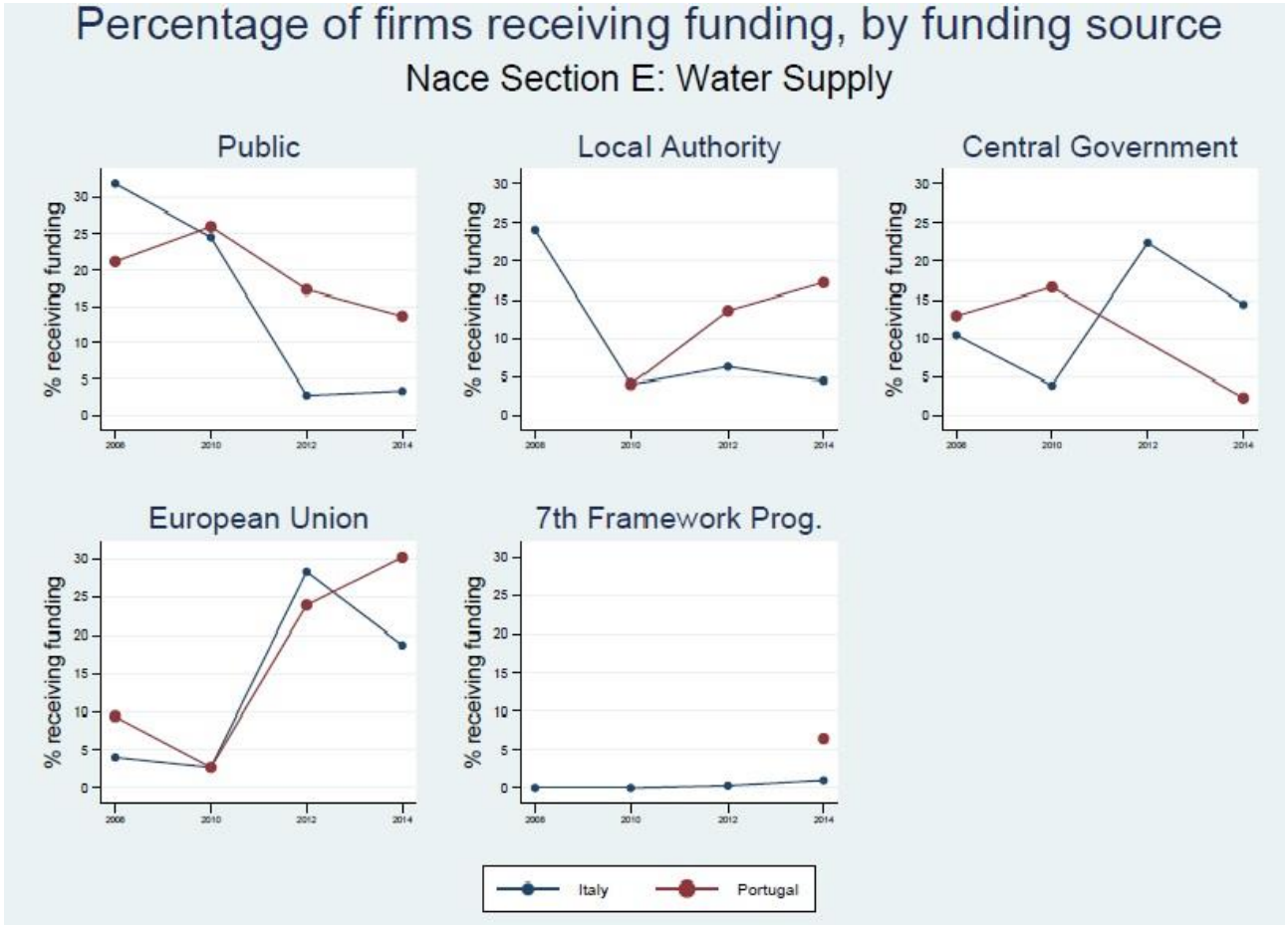
[14] NACE rev.2 is the Statistical classification of economic activities in the European Community

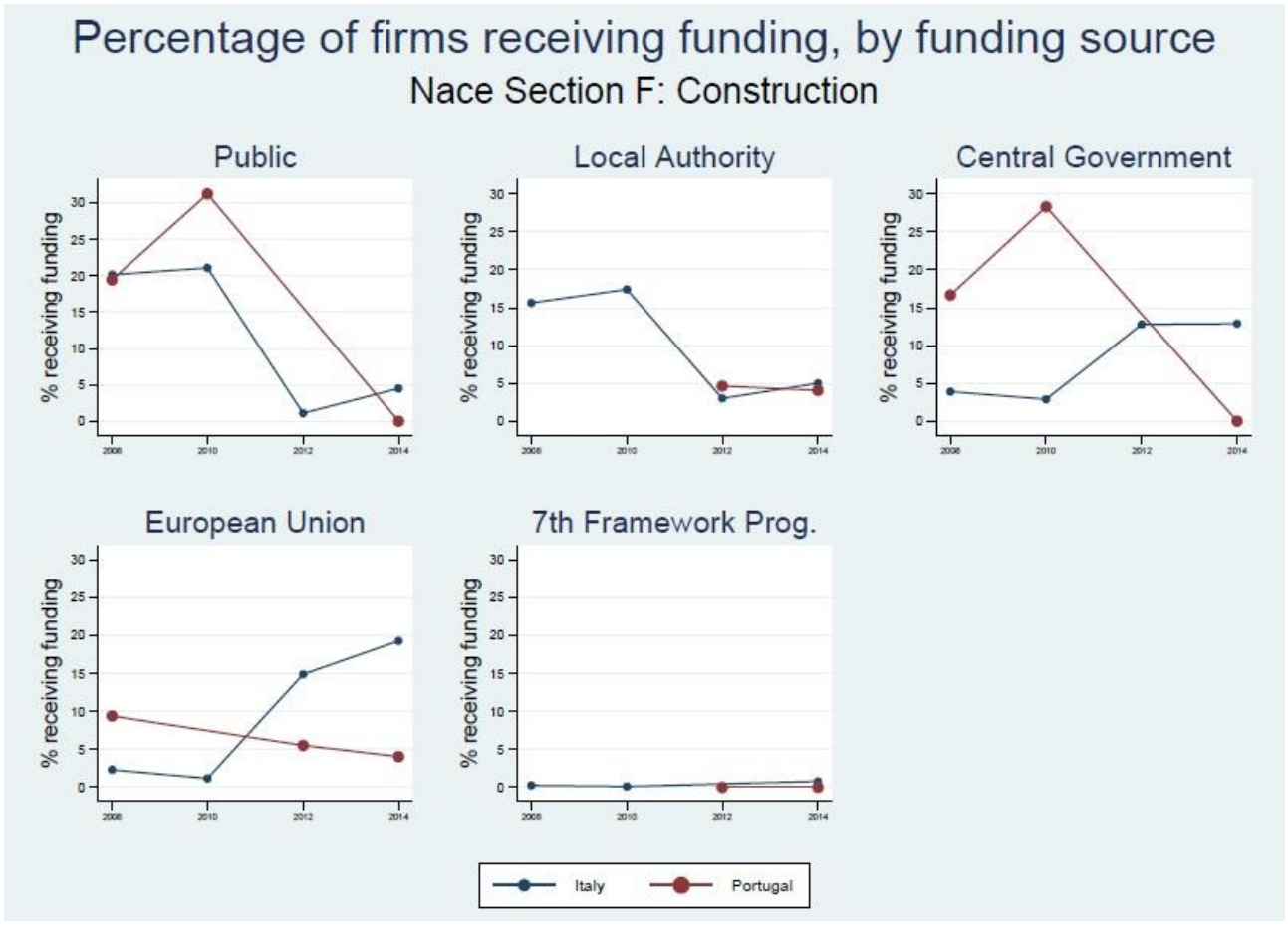
Consolidated 2014 data change the narrative for some countries. Italy has put a halt to recurrent budget cuts to the sector, with an increase in real terms of 6.39% compared to 2013.

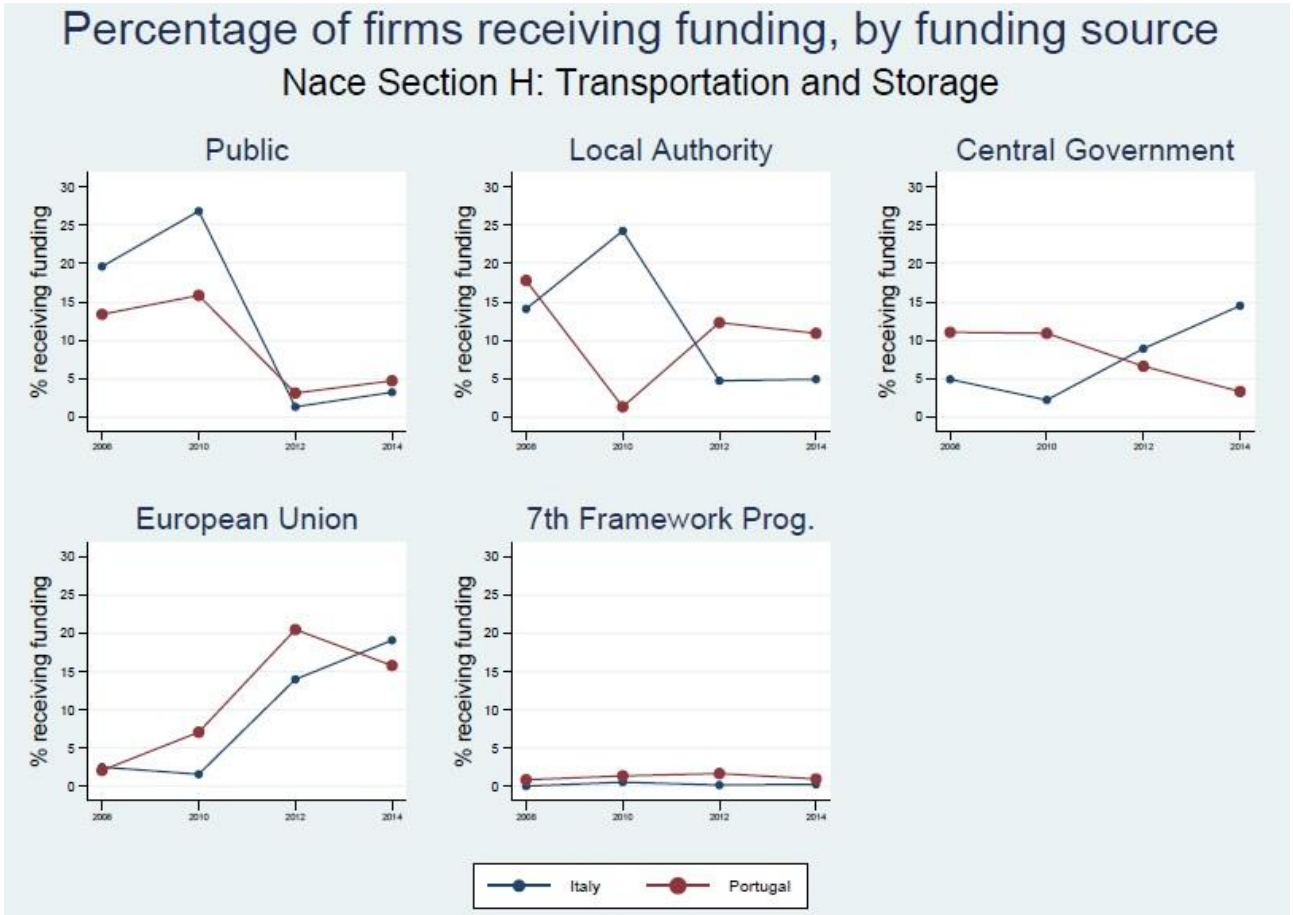
In most of Eastern and Southern Europe, even if public funding cuts have sometimes decelerated or stopped in the short-term, there is no sign of funding levels returning to 2008 levels.

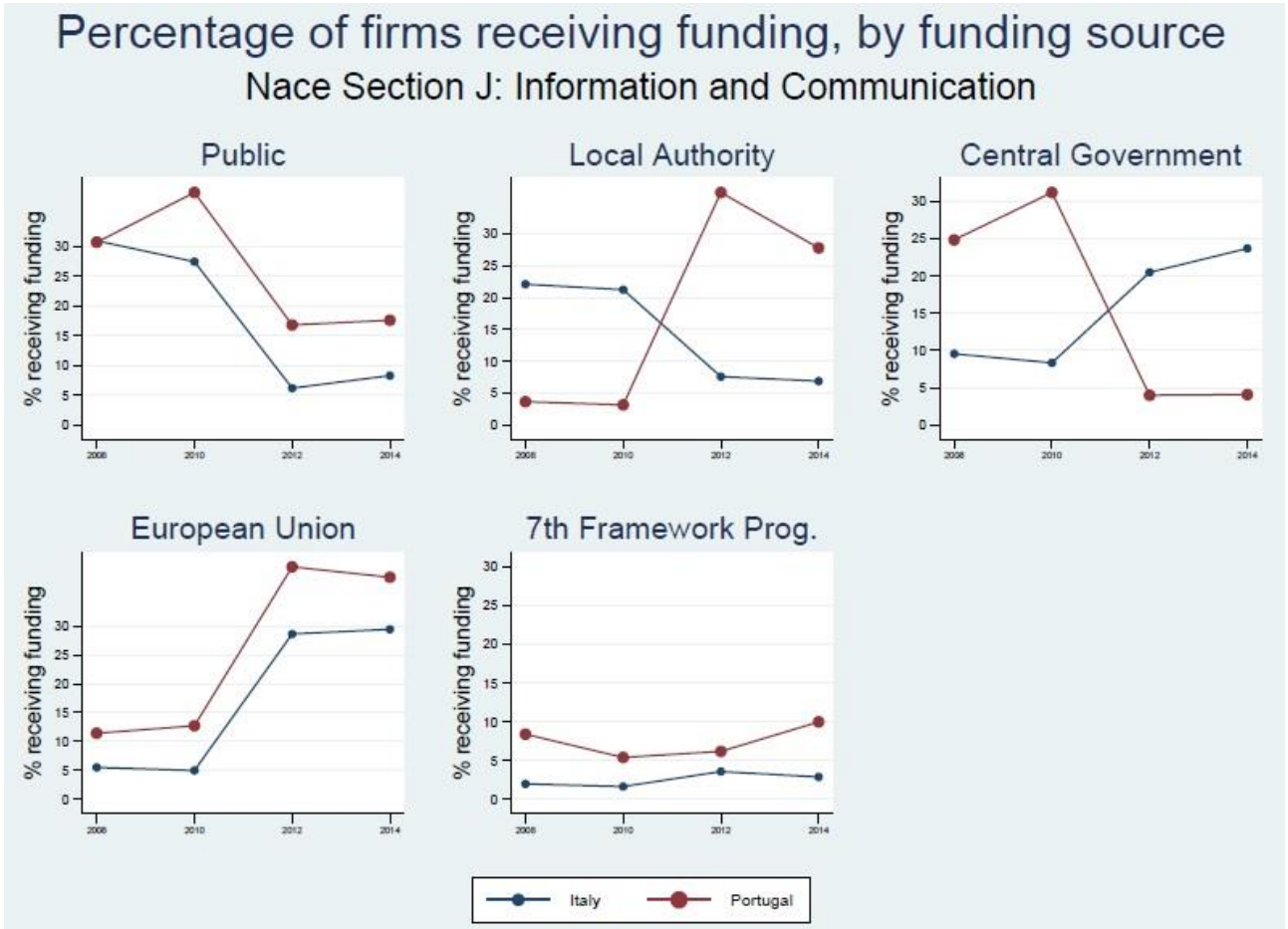
The 2014 data confirms the increase between countries where public funding come back to rise, and countries that starts to invests again in manufacturing, as one of the most important sector, after a collapse in the middle. This is a significant challenge to the consolidation of the European Research Areas.

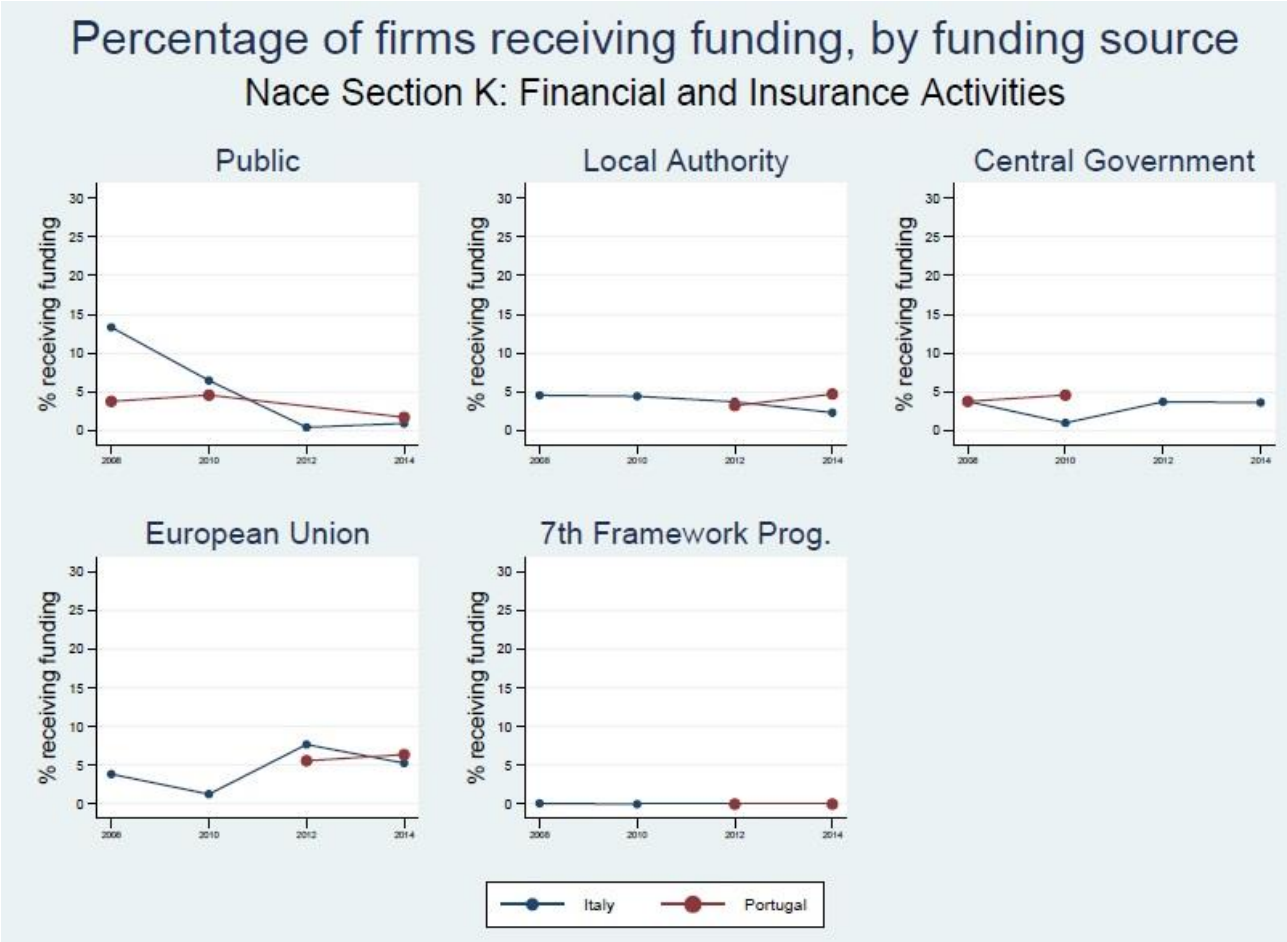


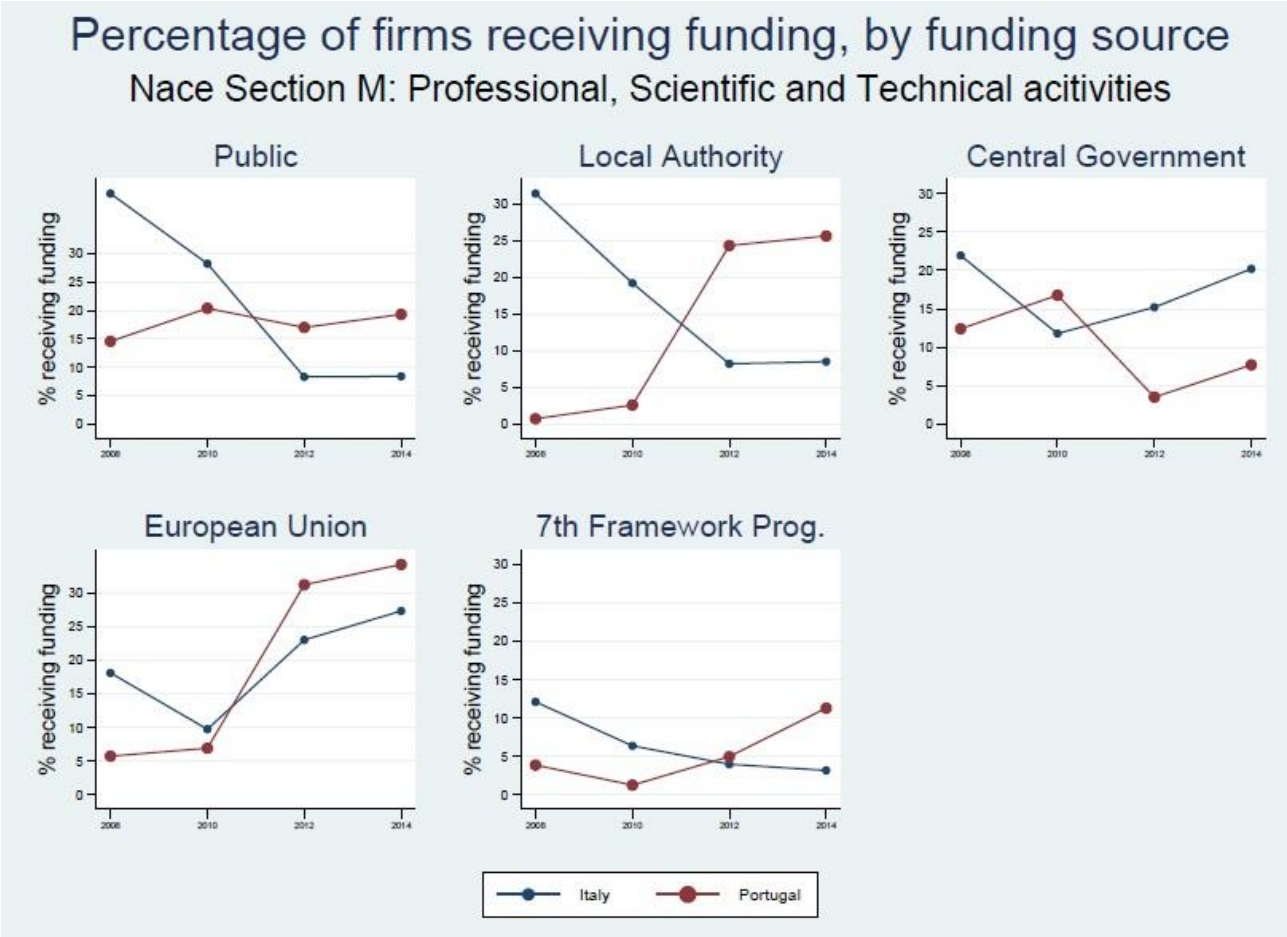

Percentage of firms receiving funding, by funding source
Nace Section E: Water Supply
Public
Local Authority
Central Government
European Union
7th Framework Prog.
% receiving funding
Italy
Portugal


Percentage of firms receiving funding, by funding source
Nace Section F: Construction
Public
Local Authority
Central Government
European Union
7th Framework Prog.
% receiving funding
Italy
Portugal


Percentage of firms receiving funding, by funding source
Nace Section H: Transportation and Storage
Public
Local Authority
Central Government
European Union
7th Framework Prog.
% receiving funding
Italy
Portugal


Percentage of firms receiving funding, by funding source
Nace Section J: Information and Communication
Public
Local Authority
Central Government
European Union
7th Framework Prog.
% receiving funding
Italy
Portugal


Percentage of firms receiving funding, by funding source
Nace Section K: Financial and Insurance Activities
Public
Local Authority
Central Government
European Union
7th Framework Prog.
% receiving funding
0
5
10
15
20
25
30
2008
2010
2012
2014
Italy
Portugal



Public is the percentage of the total number of companies receiving funding from the Local Authorities, funding from regions and municipalities in Italy and the 18 districts and municipalities in Portugal that received funding from the central government or the European Union and finally from the 7th Framework Program is a Multiannual Financial Framework (MFF) 2007-13 approved in June 2005 by Heads of State or Government at the Brussels European Council on 15-16 December 2005. The agreement between EU institutions for supporting innovation was full of budgetary but also qualitative proposals to help in the effort of a new Europe with a technological development in research and innovation. In fact with this programme there is an increase of expenditure +193,8% for competitiveness for growth and employment as part of the expenditure for sustainable growth. (data from the report on public finance of EU)

Starting from the results of the micro data processing of the 7th framework program, they show a constant in each sector for Italian companies, which have received on average € 500 million (EU expenditure and revenue 2007-2013) while Portugal has seen an increase in the number of enterprises financed through increased spending from € 27 million in 2007 to € 86 million in

2013.(see figure)

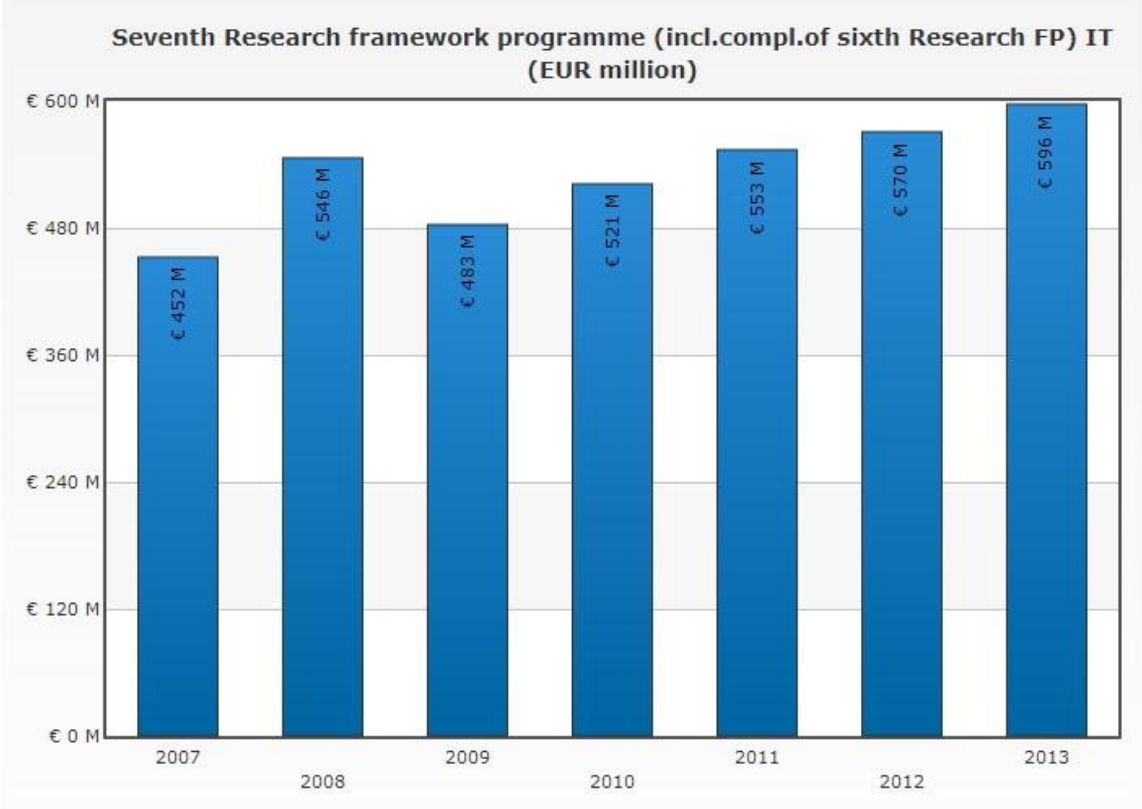


Figure 57th framework programme website

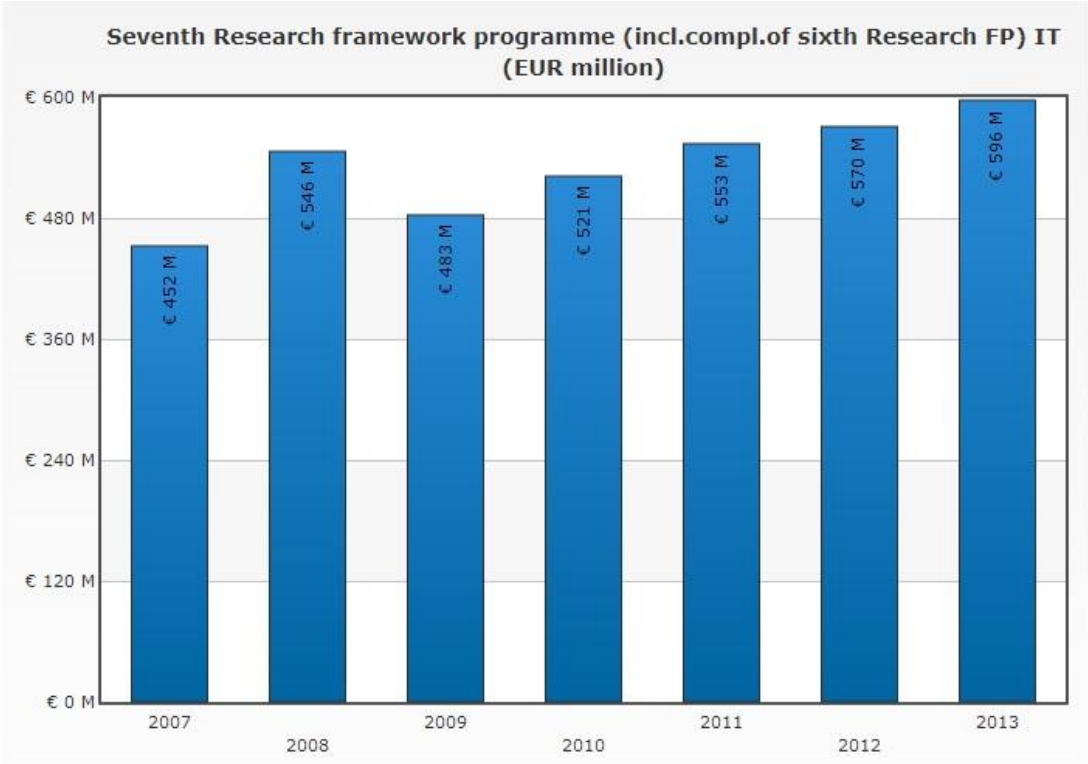


Figure 6 7th framework programme website

In both countries, the local authorities are an important source of funding with an high percentage in Italy at the starting period taken into account, especially in the sector C, E, F, H, J, K, M, and almost in every sector a strong decrease between 2008 and 2010 (e.g. from 22,32%in 2008 till 8,6% in2014 for manufacturing). In Portugal, instead, the opposite happens with few firms that receive a funding and an increase in the following years (e.g. from 1,67% in 2006 till 22,8% in2014). It's possible to explain, but not sure, this opposite trend as an effect or consequence of the recent crisis of 2008. In Italy , the political and economic instability lead to a significant reduction of expenditure by public institutions, local or national; according to an ISTAT report on innovation in the enterprises the expenditure for innovation is cut of 3,2%. Another factor to considerate is that a lot of firms received a funding from local authority at the beginning of the period then they had not the requirements to apply for funding again. Il 3,4% delle imprese ha dichiarato di aver abbandonato i progetti di innovazione alla fine del 2014. For this reason the next part will show the the number of firms that have arrived to the end in innovating product or process. Portugal has seen this rise in number of firms that received a funding from local authorities because they understood that the innovation could be the antidote to the critical economic situation of Portugal itself with Greece, Spain and Italy.

"Following the Oslo Manual, we consider a firm innovative if, in the period considered, it has introduced in the market or within its own organisation some non-negligible innovations, either technological (implying a change in the product or in the production process) or not (implying a change in the organisational structure of the firm or in the product presentation or other marketing elements). The introduction of an innovation at the firm level is the outcome of a process originating from the environment in which the firm operates and developed through its own effort. After looking at environmental and input indicators, we evaluate the position of Italy with respect to the outcome of the innovation process looking at two different measures: firms declaring they perform innovation in CIS survey data" (Questioni di economia e finanza, banca d' Italia,2013) Unfortunately the data on firms that have effectively innovated in product or process do not confirm or delate the hypothesis showed before.

Table 1 Elaboration from the author

	2014		Enterprises that have		Enterprises that have	
			n	p	n	p
IT	C	tot	12094	63,70%	12089	64%
IT	D	tot	73	67,00%	58	53%
IT	E	tot	251	63,10%	212	53%
IT	F	tot	1239	65,70%	1125	60%
IT	H	tot	1006	87,30%	422	37%
IT	I	tot				
IT	J	tot	1396	59,50%	1641	70%
IT	K	tot	475	68,20%	382	55%
IT	L	tot				
IT	M	tot	704	62,60%	690	61%
IT	N	tot				
PT	C	tot	2207	71,00%	1538	49%
PT	D	tot	7	76,80%	5	62%
PT	E	tot	39	63,60%	31	51%
PT	F	tot			4	79%
PT	H	tot	250	78,60%	111	35%
PT	I	tot				
PT	J	tot	256	58,30%	306	69.7%
PT	K	tot	135	81,40%	58	35%
PT	L	tot				
PT	M	tot	292	71,90%	218	61%
PT	N	tot				

This table represents the percentage and number of Enterprises that have introduced new or significantly improved products or process that were only new to the firm (1st column with values) and Enterprises that have introduced new or significantly improved products or process that were new to the market (2nd column with values.

It's not possible to see all the period 2006-2014 because of different type of investigation in the CIS 2014 from the previous Surveys.

Anyway, there are high values for products or process new to the firm but low values for product or process new to the market. The evidence is spotted or observable especially in Portugal side, in the sector of manufacturing, transportation and storage, financial and insurance activities where the enterprises are less active, while they are more active in services and process innovation.

Other interesting indicators are the number of firms that not innovate because of some reasons as brakes to the innovation that rise the “Innovation Gap” of the countries. These are the barriers of innovation. This part seeks to understand how barriers can influence the capacity to innovate giving a specific focus on the data on the difficulties in obtaing grants is an important barrier.

sector/ country	C	D	E	F	H	J	K	M	N
ITALY	12,5	2,4	9,3	9,1	6,7	7,1		2,7	
PORTUGAL	10,4	0	6,6	0	4,7	12		93,8	

In the table the important evidence is in sector M, professional, scientific and technical activities, where the lack of public funding was an important barrier. In Italy almost in every sector has a percentage of 10% of enterprises that did not innovated cause a lack of public fundings.
These confirms the importance of the role of government, local authority or European Union of distributing funds and what emerges is that Italian and Portugal public funding to firms is widespread.

Therefore, it is essential that the financing process is properly managed and accessed to it. Improvements should be made to how the supply process and funding management work. In particular, the action to improve it should take into account a wide range of interconnected factors, namely the ability of public financial institutions to channel long-term financing, cross-cutting factors that allow savings and long-term financing such as taxation and accounting principles; the ease of access of SMEs to bank and non-bank financing. As far as the long-term investment funds are concerned, stakeholders suggest that a new instrument of this kind could help raise capital throughout the Union and help institutional investors of medium and large size to invest, diversify and resume risk.

4. R&D

“Research is, first and foremost, a dynamic activity which aims to build a growing patrimony of knowledge and, in a lesser vision reductive, an activity with the goal of giving new lymph to the production system, through the transfer knowledge and technology to make it more competitive.

It is not automatic that research generates innovation and that the latter, in turn, generate more competitiveness. The result can be achieved by activating a virtuous mechanism according to which research, innovation and competitiveness grow harmoniously, in balance with the individual and collective needs of the country, as if they were the four vertices of a quadrilateral which contains them and that they "dilate" with them "(Fabio Pistella, president of CNR)

Research, innovation, competitiveness are the inputs for development of a country. The Lisbon agenda has focused on these three factors since the year 2000.

only in the presence of these factors it can make Europe a reality capable to ensure a competitive economic system, to create new employment, major wellness and major social cohesion and thereby overcome the challenge of globalization

All this is not possible without a great incentive to research in order to develop the maximum efficiency in every country.

For a growing number of countries, the good functioning of the national economy is increasingly dependent on the ability of its economic operators to compete on international markets, the efficiency of their systems and economic subsystems, and their ability to integrate with other systems. In order to remain competitive, economic operators in a global economy, in addition to innovating on their own, need that their economic system of origin and their subsystems be sufficiently competitive or specialized than those of similar countries or with which there is an integration.

In practice, in a global economy, competitiveness does not only affect economic operators, but also the economic and social structures of the countries of origin.

And as the global economic environment is constantly changing - countries that have a growing economic burden, new economic operators that become increasingly competitive, national and transnational economic systems that evolve - to remain competitive, economic systems are likely to change and have the capacity to adapt quickly.

4.1 A big share of the innovation comes from R & D activities

Research & Development (R & D) is still the main investment in innovation,

So let's start by giving an overview of the geography of innovations knowing that R & D expenditure in a country is the sum of the expense of businesses, universities, public institutions and non-profit institutions. Among the various countries there is a clear correlation between the level of economic development and the share of research carried out from businesses: more a country is placed at high levels of income, the higher the share of R & D of enterprises. Conversely, in countries with the lowest level of economic development the share of universities and public research organizations is predominant.

Scientific research is a highly concentrated phenomenon at country level, of regions, of sectors, of public and private organizations.

Focusing on firms level, we can identify the position reached by the various EU countries about the performance in R&D.

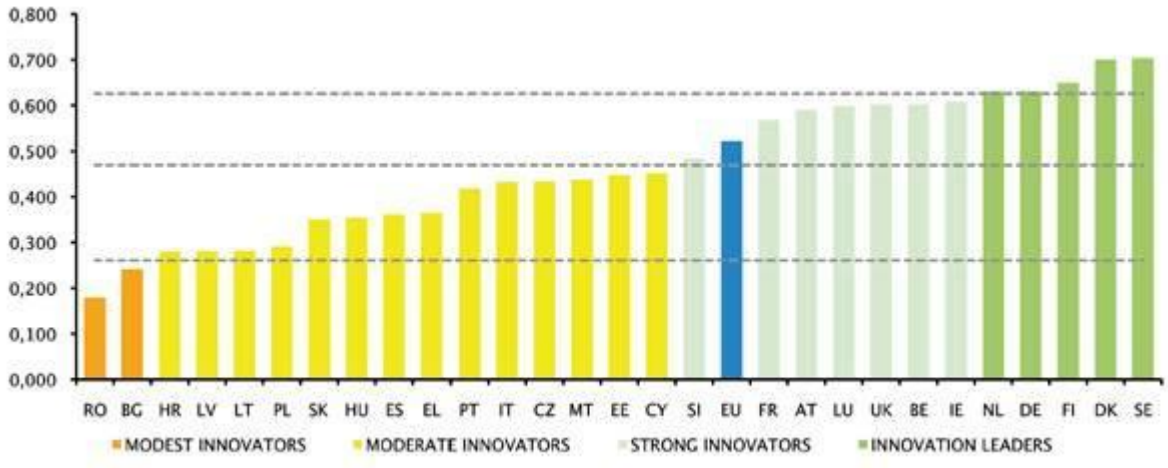


Figure 7 Innovation scoreboard 2015

As we have mentioned before, Sweden remains the leader of innovation in the EU, followed by Denmark, Finland, the Netherlands, and the United Kingdom. All countries in the rankings are considered "leader" of innovation and "strong" innovators.

Then there are those presented as "moderate" innovative countries, a consistent group (after which there are only those considered "modest"), where, after the Czech Republic, we finally find Italy and Portugal. they show all their limits on research and innovation, in a position that we may consider low ranking.

The first spontaneous question is why Italy and Portugal are in this situation. In Europe, the impact of the economic downturn on innovation was lower than expected. The differences between European countries in recent years have decreased, albeit at a modest pace, but Italy and Portugal continue to show performance below the EU average. The recent "Innovation Union 2014" report, drawn up by the European Commission, draws an assessment framework that once again underlines the backwardness of the two countries on research and development.

All of us know that in the middle of the period 2007-2013 there was the global crisis that hits the “PIGS” OF Europe and public and private investment in research and innovation have been caring for the businesses of their respective countries with a drive towards "Innovation Activities", concerning innovative business-level activities, divided into three dimensions: investing in R & D, collaborations and intellectual activists.

We will start from R & D expenditure right away and we will look at the effects of company’s innovation activities.

The expenditure in R&D, as a percentage of GDP, may give us the measure of the research volume of an economy. This indicator shows the correlation between R&D and a competitive and innovative economy.

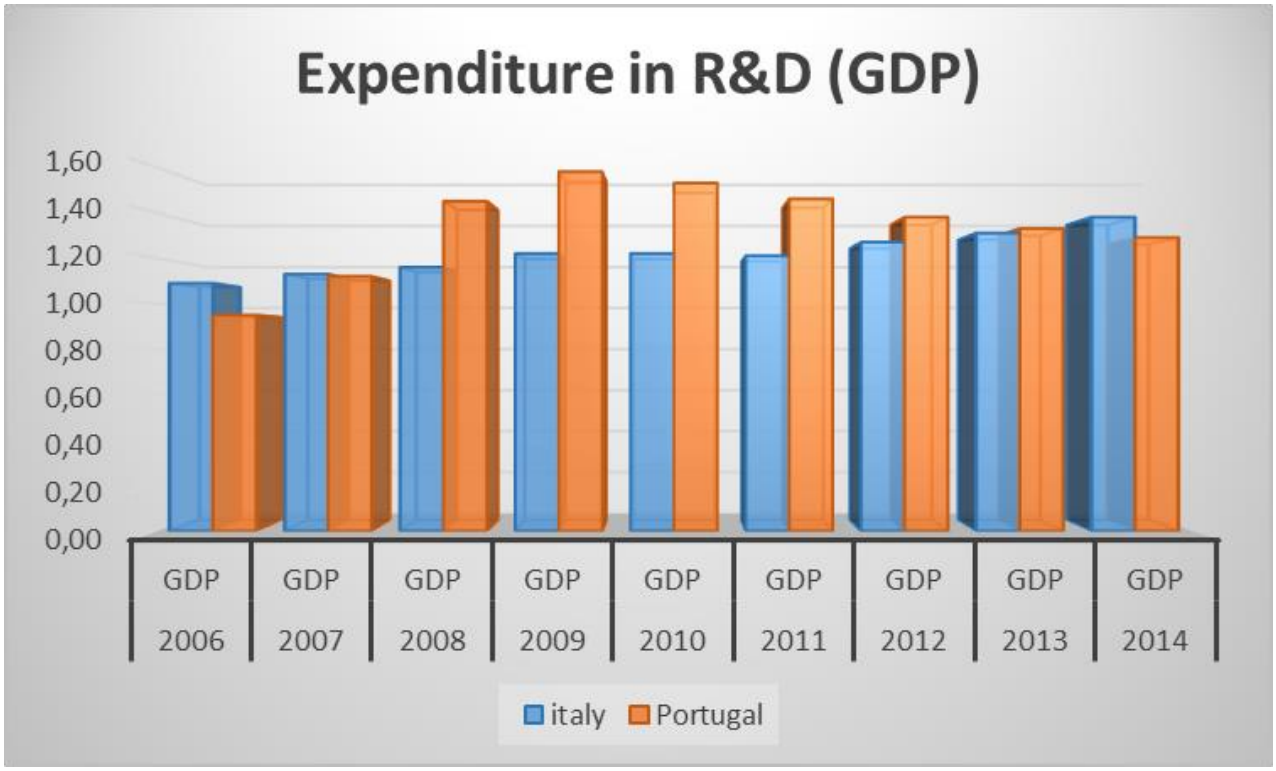


Figure 8 Elaboration by the author, data by Euristat

Tracking these trends, based on data by the total Intramural R&D expenditure, Portugal has important values higher than Italy reaching 1,58 GDP in 2009, while Italy was at 1,22GDP, becoming almost equal in 2014 (1,38 Italy and 1,29 Portugal) when Horizon 2020 starts with the goal of 3%.

Already In 2002, the EU set itself the goal to increase research expenditure to 3% of GDP.

This target reflected the need for the European economy to increase significantly its knowledge-intensive activities. The lack of visible progress between 2007 and 2009 is largely due to the fact that business research expenditure depends on the structure of industry, which evolves slowly.

Italy encounters some difficulties to keep up with the rest of Europe. Italians invest less than the others. they had adhered to a "development without research" model. It's recognized that, since the Lisbon European Strategy was launched (2000) and since its relaunch (2005), Italy has not achieved significant progress towards the objective of 3 percent of GDP for use in R&D spending by 2010, with two-thirds to come from the private sector. Many are the causes that have contributed to slow down the entry of Italy into the knowledge society. But it is certain that the failed increase of R&D expenditure had a negative impact of economic growth and that, in the absence of a clear turning point, it will be hard to succeed in avoiding the decline of the country.

The GDP of Portugal, instead, is 230 billion dollars, 16 times smaller than the German one, 12 smaller than the English one, 9 of the Italian and 6 of the Spanish one. Lisbon will never be like London, Berlin or Paris but the distance between Portugal and Italy is going to reduce thanks to the better management of innovation in terms of R&D already during the 7th framework programme.

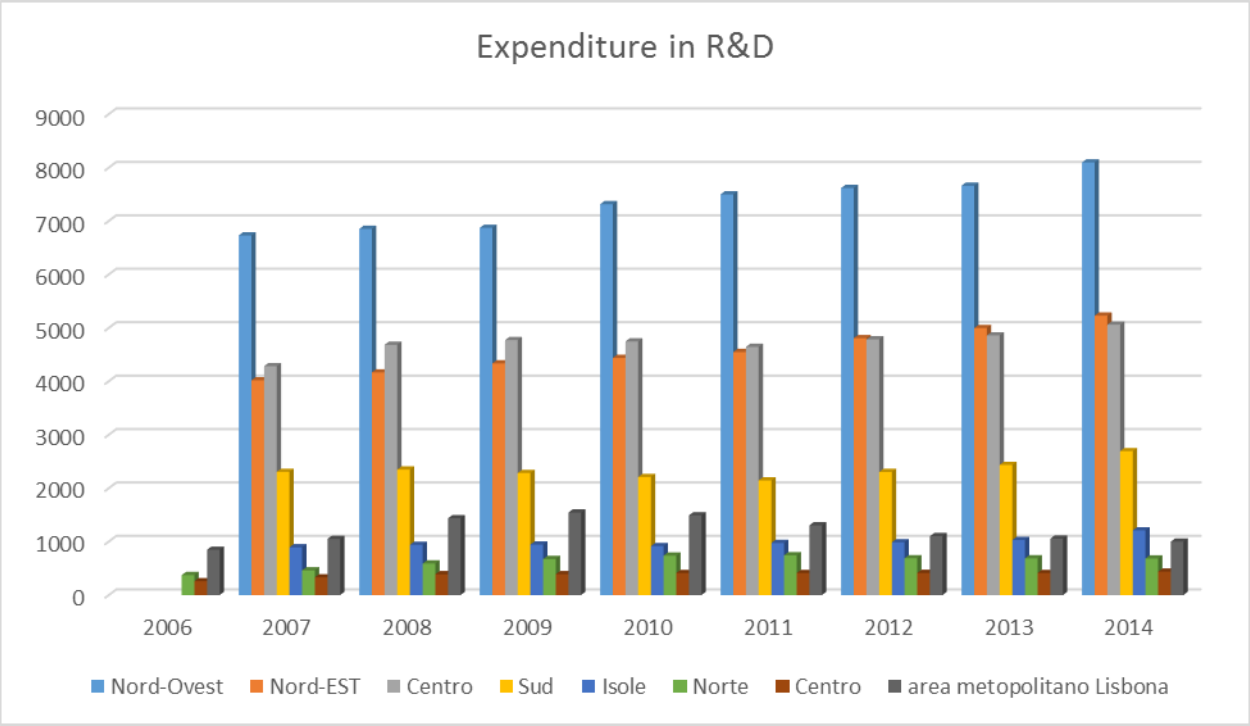


Figure 9 Data by Eurostat

In the graph above, there is the expenditure in R&D divided by regions. The data used are more precise thanks to the EUROSTAT STATISTICS in which there are values for every Italian Regions Friuli-Venezia Giulia Veneto Trentino-Alto Adige Umbria Lombardia (north est) Piemonte Valle d'Aosta Liguria

Basilicata Calabria Campania Molise Puglia (South) Sardegna Sicilia (Isole) Toscana Abruzzo Lazio Marche Emilia-Romagna (centro) and for every Portugal regions: Norte, Centro and Area metropolitana de Lisbona.

Italy's R & D spending on GDP, which provides a measure of the intensity of the sector investment, is among the lowest in the industrialized countries and, at 3.20%, puts Italy below the European average (1.87%). According to what has been said before, Italy places itself in the last places behind Portugal, which spent R & D spending 1.35% of GDP on average in 2006-2014.We should remember that the major proportion of expenditure is made by enterprises with 250+ employees and Italy is characterized by a pattern of SME'S which, therefore, contribute to the increase in spending in this sector.

The main indicator for interpreting the evolution of the sector is therefore that of the

R & D spending, which in Italy is characterized by a low volume of investment but also,

in parallel, by an extraordinary territorial concentration.

much of Italian public spending is concentrated in Lombardy with an average of 4236.76 million eur and, remaining in the North, also in Piedmont and Veneto and, in the centre, in the Lazio area.

Portugal, by contrast, has managed to address a growing GDP expenditure and also winning the speed with which the start-up number, concentrated in the Lisbon metropolitan area, reaches the highest peak with a budget of 1833.0 Mln in the year 2009 (expenditure in GDP).

The regional aspect is particularly evident in the specific analysis of individual European regions, also developed by the European Commission, which enables us to understand the real structural obstacles that Italian SMEs face when it comes to innovation.

"There is a particular emphasis on Italy's poor pragmatism in this regard: Lazio and Umbria are the only two Italian regions with a high degree of participation in the European FP7 program, which for the period 2007-2013 had allocated some 50 billion for research and technological development in the EU. Puglia, Sardinia and Liguria showed instead a modest use of the Union's structural funds, principally for business-related activities. All the others belong to that vast group of European regions (71% of those analysed) who have made little use of these funds and which, by logical consequence, have moderate or even null.

Yet getting European funds does not automatically mean innovating: only 3 Italian regions (Friuli-Venezia Giulia, Piedmont and Emilia-Romagna) are able to keep pace with the European ones that are leaders in innovation." (data from article Repubblica.it 11 aprile 2014)

As mentioned earlier, the negative impact of this gap is particularly affecting small and medium-sized Italian companies that, without innovation horizons, run the risk of losing ground from European competitors. Considering that, as is clear from the report, lack of investment is one of the

main obstacles to innovative processes, strong adherence to development programs developed by the EU and an efficient system of financial support by the state constitute the only possible incentive to finally orient SMEs towards innovation.

5 Conclusion

Analysed and verified access to public funding, research and development spending, reasons that have led companies not to innovate, product innovations and process and the functioning of the European structural funds, we now try to synthesize and deliver the economic impact used in Italy and Portugal

Some of the next information of this section come from “Research and Innovation performance in EU member states”[15] written by European Commission.

Currently, Italy and Portugal have the objective set out in the Horizon 2020 program, which we have repeatedly mentioned.

The three dimensions that need to be combined to reach the finish line are reforms, investments and transformations.

Between 2007 and 2014, the most difficult time has been the period of the great crisis that has highlighted the weaknesses of the European economy.

For this reason, the main need is the ability to transform the European economic structure: Italy and Portugal have succeeded in the intent?

In Europe, the impact of the economic downturn on innovation was lower than expected. The differences between European countries have been reduced in recent years, albeit at a modest pace, but Italy continues to show performance below the EU average. The recent "Innovation Union 2014" report, drawn up by the European Commission, draws an assessment framework that, if necessary, once again underlines the backwardness of our country on research and development.

In general, the gap between European countries in terms of innovation, despite being reduced in recent years, continues to be dictated by the same factors of the past, which in our country are particularly evident: on the one hand, the low level of international competitiveness and business cooperation in research and development programs, and, on the other hand, a contraction in business investment in innovation, often accompanied by a lack of strong financial support.

In the second section of this chapter there will be more general conclusions.

[15] Research and innovation performance in EU member states and associated countries 2014

5.1 Italy and Portugal in five points

1) Performance in research and innovation

- Italy

As we have seen in the previous analysis, in the period 2007-2014, Italy has never resent a real growth if we take a look at the indicators. The innovation output indicator is 84.3 against a European average of 101.6 considering that with the 7th framework program Italy received 193% more public funding.

- Portugal

Between 2007-2014, as we have seen, Portugal increased its investments in innovation reaching the innovation output indicator at 70,1 respect to the Eu average of 101,6. A relevant indicator to look carefully is the R&D expenditure that increased during the period.

2) Investing in R&D

- Italy

In the period 2007-2014 it's registered the highest intensity of R&D in 2012 equal to 1,27%, a very small improvement considering the 1,25% of the previous year. But as we have supposed the fault of this slowly increase is due to the fall in GDP registered in this period -1,9%.

"*The R&D expenditure is increased at a modest rate still below of the EU average due to lower business R&D. Indeed, business R&D intensity in Italy was 0.69 % in 2012, as opposed to the EU average of 1.31 %. Nevertheless, public sector R&D intensity also remains at a lower level than the EU average* " (iuc_progress_report_2014)

This could be explain doing a reference to the Italian economic structure based on an almost low high-tech industry in total manufacturing and is dominated by small and micro-firms. "*Those companies, often characterised by a family ownership structure, do not usually carry out R&D because they are unable to attract financial resources or highly skilled human capital.*" (iuc_progress_report_2014)

Structural fund : 27 billions. So Italy has been included with a good response in participation to the 7th framework programme.

- Portugal

As in the first point, Knowledge-intensity of the economy is +2,3% thanks to the progress observed in recent years in R&D expenditure in the business sector but unfortunately it *remains below the EU average in terms of public-private cooperation, knowledge transfer and employment in knowledge-intensive activities.*

Private and public R&D investment also receives support via co-funding from the European budget, in particular through the Structural Funds and from successful applications to the Seventh Framework Programme (FP7). (iuc_progress_report_2014). These structural funds allocated to Portugal have been essential and indispensable to face the contraction of domestic demand due to the crisis and the difficult business environment.

3) Strengths and weakness of Italian R&I

- Italy

Weakness: "*a low proportion of people with tertiary education and insufficient orientation of the education system towards technology intensive specialisations*" (iuc_progress_report_2014) and complex bureaucratic procedures that is a big problem of business' environment that makes difficult the advantages of innovations in an open market competitions. Finally, the low presence of venture capital.

Strengths: capacity or potential innovation of small and medium-sized enterprises (SMEs) and the excellent quality of scientific outputs

Public funding from local authorities should be devoted to innovation in all sectors considered first and perhaps with an increase in the amount, and in turn, the acquisitions must make good use of all the funding so that they do not risk giving them back to missed use.

- Portugal

According to our study, the weakness more evident is the SMEs introducing product or process innovations as % of total SMEs (-3.7 %) because of an openness towards external markets, thank to some specific policies and reforms explained later, that guaranteed economic activities for services rather than goods.

The strengths are the right exploitation of public funding and the structural funds and the geographic position (in particular Lisbon) as a meeting point between America and Europe.

Therefore a study from the Startup Europe Partnership, Microsoft and Avitar Portugal Startup have identified 40 scale-up: they are start-ups that have already attracted more than one million of euro; another 24 were able to secure funds between one million and 500 thousand euros and nine are the so-called exit (companies acquired by larger foreign companies). 67% of buyers are US, such as Digisfera and Best Tables bought by Google and Tripadvisor. The report compares Portuguese numbers with those of other European countries such as Great Britain, Italy, France, Germany and Spain. Small digits. But not so much if we take into account the size of the Portuguese economy.

The GDP of Portugal is 230 billion dollars, 16 times smaller than the German one, 12 smaller than the English one, 9 of the Italian and 6 of the Spanish one. Lisbon will never be like London, Berlin or Paris but the distance between Portugal, Italy and Spain is shrinking. Since the founding, the 40 scale ups have raised more than €166 million. Italian ones (only) 400 million. On average, every Portuguese scale-up has raised 4.2 million €, each Italian scale-up 5.5 million. Most of them, 65%, have been born in the last two years. 75% after 2010 and 48% after 2012. The Lisbon companies have reached 60% of the total.

4) Policies and reform for R&I

- Italy

Italy is one of the participants to the new objective Horizon 2020 in order to face the challenges of innovation. The idea of reforms goes toward policies that delate the obstacles trying to change the weakness in opportunity to improve the competitiveness for a new great growth.

The best reform has to find the way to improve the working condition to attract new foreign investors and foreign workers and obviously to remain Italians.

- Portugal

Reasuming the work indicated in the previous point, surely, the openness to foreign investment in start up has been launched by specific reforms as *the National strategy for Smart Spetializations, the operational competitiveness programme COMPETE and incentive schemes in dialogue with stakeholders (universities and technological centres), the link between new generation of students from university and companies, a basic tax incentive, corresponding to 32.5 % of eligible R&D expenditure undertaken in the relevant fiscal year, and an incremental incentive, corresponding to 50 % of the increase in R&D expenditure compared to an average of the two previous years.* (iuc_progress_report_2014)

5) Sector of specialization

- Italy

From Eurostat, Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies, we have the overview on the economic sectors by NACE rev2 to understand the impact of Public funding and R&D expenditure analysed previously. The most important sector is Manufacturing (NACE2: C) that show a decline *reflecting the shift towards a more service-oriented economy, similar to that observed at EU level, and the higher competition of emerging economies in traditional sectors experienced by the country in recent years*. (iuc_progress_report_2014)

But this does not mean that manufacturing has not its weight in Italian economy anymore as the same for construction sector.

The serious problem of Italian economy is that, even if Italy have a strategic position in some high-tech sector, Italy has a lack of specializations. Public Funding and R&D expenditure could help but actually they are still insufficient.

- Portugal

Six top companies in the list of Scoreboard 2014 are Portuguese following sectors: banking (two), electricity, telecommunication, pharmaceuticals and biotechnology, and software and computer services.

Its economy is based its innovation on the services rather than product or process innovation remembering a decreasing of 3,7%. An interesting data is from the last ten years of Construction sector that had a a record low of -19.90 percent of Portugal Construction Output in February of 2013 and the role of public funding in this sector supporting the economic recovery till today, 10% of output.

Towards an Innovation Union

This section describes the main criticisms in public offering analysis of innovation processes, details the minimum requirements to ensure its success and, through analysing the experiences of central and regional administrations, provides some guidance for the 2020 Programming and successive. In the final box, there are also the most important issues related to the mechanisms of appropriation of the benefits of the innovative process.

The typologies of innovation policies are: business subsidies and capital subsidies in start-ups, what we have called public funding; tax credits for innovation; direct support of the public body; venture capital and publicly owned companies; reduction of tax rates; deduction of R & D expenses.

An intersecting element emerged in the part of the impact of investments, financing and more is the need of Venture Capital in countries with a slow growth, as Portugal have already done. Venture capital is a high-risk investment, but it can also give exceptional economic returns. It's the kind of alternative finance that start-up companies are doing, which by their very nature have a high percentage of bankruptcy (3 out of 4), but when they succeed, they guarantee their exit investors who pay them back abundantly even as they have lost in failed businesses. VCs when they are formed must in turn raise capital, referring to so-called institutional funds, such as bank foundations, social security institutions, local government agencies, insurance companies and banks. Venture Capital also helps start up at an operational level by providing management skills, techniques, and reports that improve it; or simply expect it to grow to make its exit from the investment. Generally, Venture Capital requires its presence in the company's management.

Another critical point of the European Union is the bureaucracy which slows down potential innovation

Horizon 2020 is under way and we will see the results that will make us happy. But beyond Horizon 2020 we understand that there is a biosphere in building an EU innovation policy that creates future markets as said Martin Brudermüller, Vice President of the Board of Executive Directors, BAS Technology Officer. Europe lacks market-creating innovations and company scale up. Over the next 20 years, there could be 1 million new jobs of the proportion of scale-up matches that of the USA. The EU'S high-tech sectors are an average of 40% smaller than its competitors.

The EU is world-leading in generating knowledge but we need to become much faster and more successful in turning knowledge into innovation and this is the weakness in the European Innovation system. Addressing this means more than just public or private money.

Innovation needs an efficient ecosystem stimulated by a coherent EU innovation policy that cuts across all policy domains and to go hand in hand with a smart regulation.

Eu research and innovation programmes should therefore put a stronger focus on overarching, comprehensive topics.

This means mission orientation as well as breakthrough innovation that creates new markets than incremental innovation. (from the Brudermüller speech)

Maybe the right direction is already taken with the creation of a new European innovation council between 2018 and 2020.

It should have the responsibility of developing pragmatic framework conditions in order to create growth and value for EU citizens.

The best imagination could be the Innovation Union of the European Union after reaching the scope of public funding: reduce almost to 0 the differences between countries.

The thesis is born on the fact of being an EU citizen and to give an hope for the future.

In the past, the dream of our previous generation managed to turn a region, Western Europe devastated by war for the past centauries in a peaceful union and today we are still enjoying the longest period (except the terroristic attack in the world) of peace in the history.

Making a war was so easy: with steel and coal. They decide to put steel and coal under supervision of a superpartes entity, the European Union. Making the production of steel and coal more competitive.

What about our generation?

Of course, we are not in the same situation but we have a lot of challenges to face as we have seen from the weakness of Italy and Portugal, two countries really important for European economy;

The need to create employment, to stop global warming and protect the environment, to try to find new form of energy, improve human rights. All of these challenges are part of innovation or part of a combination between economic and social innovation.

So our dream of Europe, our hope, the next step is an union of innovation[16].

Today it' s not steel and coal our input elements but It's knowledge and means to transform this knowledge into innovation.

This is what innovation union is about, turning Europe into innovation from the environment.

The goal are new investments in education, R&D because, as we see in our analysis, the country that invests in R&D is the one that are getting out of the crisis faster. There is the need of People with the right skills.

A free EU research area to leave researcher collaborate between them having free access to patent.

Other point to improve and have the same regulation between countries about applying for public fundings, a barrier for innovation, or when capital ventures want to invest in a country.

[16] ec.europa.eu/research/innovation-union/index_en.cfm

The need of public funding not only for fundamental research but also research of activities closer to the market like demonstration prototypes.

The last thing is change mentality in order to create the Innovation Union, changing the way we work, where the end-users or companies ask what they need to research, which kind of data they need. Consumers, entrepreneurs, researchers, governments have to communicate and collaborate.

It’s called demand driven research and demand driven innovation in every sector.

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