



UNIVERSITY OF ALGARVE
FACULTY OF ECONOMICS

**ARE STRUCTURAL FUNDS HELPING REGIONAL DEVELOPMENT IN ITALY?
REGIONAL COMPARISONS AND SMART SPECIALISATIONS**

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Professor Hugo Pinto

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**ARE STRUCTURAL FUNDS HELPING REGIONAL DEVELOPMENT IN ITALY?
REGIONAL COMPARISONS AND SMART SPECIALISATIONS**

Work authorship declaration

I declare to be the author of this work, which is unique and unprecedented. Authors and works consulted are properly cited in the text and are in the listing of references included.

Giacomo Favaretto

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Abstract

The European regions are diverse and have faced many challenges. One of the critical aspects of European Union policy is its attempt to mitigate regional development differences by stimulating economic and social cohesion. The aim of this Dissertation is to contribute for the comprehension of the effectiveness of the European Structural and Investment Funds (ESIF) within Italy. These funds are the main tool of European Union to accomplish the aim of a full socio-economic cohesion. Italy is a particularly interesting member-state as it has experienced many phases of European integration and encompasses a variety of types of regions, with a large range of socio-economic levels.

The first three chapters of the Dissertation are a literature review of main concepts needed to reflect on the Dissertation topic. After the chapter number one, that introduces the reader to the project, chapter number two, is dedicated to the Smart Specialisation concept. Smart Specialisation regards the Research and Innovation Strategies for Smart Specialisation. Here are also evaluated some key elements for a successful Smart Specialisation Strategy (RIS3) a characterising one is the hybrid top-down approach with bottom-up elements through which the RIS3 should be build. Afterward the chapter looks upon this concept and strategies in Italy providing some examples of projects implemented. The chapter number three describes the European Policy related to the Structural funds, it clarifies the European framework for funding and the Europe 2020 strategy. A general overview is made on the implementation of the funds in Italy. Some examples of successful projects implemented in Italy are displayed and a peculiar focus is given to the *OpenCoesione* portal. Chapter number four deals with the description of the Italian economic context. The Italian economic structure is outlined, sector by sector, with a special attention to Tourism and the Tertiary sector which are the main forces of the Italian economy. The case of the Italian *Mezzogiorno* is considered and a spotlight is given to the *Patti per il Sud* programme. This chapter concludes with a review of specific studies on the impacts of Structural funds. The chapter number five is committed to an original analysis of Structural funds and relevant indicators, especially in the 2007-2013 programming period. Data and methodologies of the analysis are explained then a descriptive analysis of the Indicators is defined. Following, the view is on the growth of the Indicators in the range of years taken into account, from year 2007 to 2016. Finally, some indices are created and used in the following part aimed to a statistical analysis including Cluster analysis. The last chapter is the chapter number six. It is a summary of reflections to be made and conclusions to be drawn after the whole work of Dissertation project and after the done analysis. European Structural funds are certainly helping the Regional development in Europe and in Italy but there is still space for a substantial improvement in the direction of a coordinate regional development which aims to a deeper socio-economic cohesion.

Resumo

As regiões europeias são diversas e enfrentam muitos desafios. Um dos aspetos críticos na política da União Europeia é a sua tentativa de atenuar as diferenças de desenvolvimento regional, estimulando a coesão económica e social. O objetivo desta dissertação é contribuir para a compreensão da eficácia dos Fundos Europeus Estruturais e de Investimento (FEEI) em Itália. Estes fundos são o principal instrumento da União Europeia para realizar o objetivo de uma plena coesão socioeconómica. Itália é um estado-membro particularmente interessante, pois experimentou muitas fases de integração europeia e abrange uma variedade de tipos de regiões, com uma grande variedade de níveis socioeconómicos.

Os três primeiros capítulos da dissertação são uma revisão de literatura dos principais conceitos necessários para refletir sobre o tema da dissertação. Após o capítulo número um, que introduz o leitor ao projeto, o capítulo número dois, é dedicado ao conceito de "especialização inteligente". A especialização inteligente esteve na origem das Estratégias de Investigação e Inovação para a Especialização Inteligente (RIS3). Aqui são também avaliados alguns elementos-chave para uma RIS3 ser bem-sucedida. Uma característica essencial é a sua abordagem híbrida, misturando um enfoque *top-down* com elementos *bottom-up* através dos quais o RIS3 deve ser construída. Seguidamente, o capítulo analisa esse conceito e estas estratégias em Itália, fornecendo exemplos de projetos implementados. O capítulo número três descreve a política europeia relacionada com os fundos estruturais, clarifica o quadro europeu para o financiamento e a estratégia Europa 2020. É apresentada uma visão geral sobre a implementação dos fundos em Itália. Alguns exemplos de projetos de sucesso implementados em Itália são discutidos e uma atenção especial é dada ao portal *OpenCoesione*. O capítulo número quatro trata da descrição do contexto económico italiano. A estrutura económica italiana é delineada, setor a setor, com uma atenção especial ao turismo e ao setor terciário, que são as principais forças da economia italiana. O caso do *Mezzogiorno* italiano é considerado e um destaque particular é dado ao programa *Patti per il Sud*. Este capítulo conclui com uma revisão de estudos específicos sobre os impactos dos fundos estruturais. O capítulo cinco concretiza uma análise empírica sobre fundos estruturais e alguns indicadores relevantes, especialmente no período de programação de 2007-2013. Dados e metodologias da análise são explicados, em seguida, uma análise descritiva dos indicadores é definida. A seguir, apresenta-se a evolução dos indicadores na faixa de anos levada em consideração, do ano de 2007 a 2016. Por fim, alguns índices são criados visando uma análise estatística, incluindo análise de Clusters. O último capítulo é o capítulo número seis. É um resumo das reflexões a serem feitas e as conclusões após o trabalho realizado. Os fundos estruturais europeus contribuem certamente para o desenvolvimento regional na Europa e em Itália, mas ainda há espaço para uma melhoria substancial com o objetivo de um desenvolvimento regional coordenado que tenha por meta uma coesão socioeconómica mais profunda.

Riassunto

Le regioni europee sono varie ed hanno affrontato diverse sfide. Uno degli aspetti critici delle politiche dell'Unione europea è il tentativo di attenuare le differenze di sviluppo tra le regioni stimolando la coesione economica e sociale. Scopo della tesi è quello di contribuire alla comprensione dell'efficacia dei fondi strutturali e di investimento europei (fondi SIE) in Italia. Questi fondi sono il principale strumento dell'Unione europea per raggiungere il traguardo di una piena coesione socioeconomica. L'Italia è uno stato membro particolarmente interessante in quanto ha vissuto varie fasi dell'integrazione europea e comprende un'ampia varietà di regioni, con una vasta gamma di livelli socio-economici.

I primi tre capitoli della tesi sono una revisione letteraria dei concetti necessari a riflettere sulla tesi. Dopo il capitolo numero uno, che introduce il lettore alla tesi, il capitolo numero due, è dedicato al concetto di Specializzazione Intelligente (*Smart Specialisation*). La *Smart Specialization* riguarda le *Research and Innovation Strategies for Smart Specialisation*. Vengono valutati alcuni elementi chiave per una *Smart Specialisation Strategy (RIS3)* di successo uno dei più caratterizzanti è l'approccio *top-down* con elementi *bottom-up* attraverso il quale una *RIS3* dovrebbe sempre essere costruita. Di seguito si esamina concetto e strategie nel contesto italiano fornendo alcuni esempi di progetti implementati. Il capitolo numero tre descrive le politiche europee relative ai fondi strutturali, chiarisce il quadro europeo dei finanziamenti e la strategia Europa 2020. Viene svolta una panoramica generale sull'utilizzo dei fondi in Italia. Vengono citati alcuni esempi di progetti di successo implementati in Italia ed un focus particolare viene dato al portale OpenCoesione. Il capitolo numero quattro descrive il contesto economico italiano. La struttura economica italiana è definita, settore per settore, con un'attenzione particolare al turismo e al settore terziario, le principali forze dell'economia italiana. Si prende in considerazione il caso del Mezzogiorno e si dà risalto al programma Patti per il Sud. Questo capitolo si conclude con una revisione letteraria di studi relativi all'impatto dei fondi strutturali. Il capitolo numero cinque è un'analisi originale dei fondi strutturali, in particolare del periodo di programmazione 2007-2013, e degli indicatori utilizzati. Sono spiegati dati e metodologie d'analisi, quindi viene svolta un'analisi descrittiva degli Indicatori. In seguito, l'attenzione viene posta sulla crescita degli Indicatori nell'arco degli anni presi in considerazione dalla tesi, dal 2007 al 2016. Infine, sono creati alcuni numeri indice che vengono utilizzati per un'analisi statistica comprendente l'analisi dei Cluster. L'ultimo capitolo è il numero sei. È un estratto di riflessioni da fare e conclusioni da trarre dopo l'intero lavoro del progetto di tesi e l'analisi svolta. I fondi strutturali europei stanno sicuramente aiutando lo sviluppo regionale in Europa e in Italia ma c'è ancora spazio per un sostanziale miglioramento verso uno sviluppo regionale coordinato che miri ad una più profonda coesione socio-economica.

Contents

WORK AUTHORSHIP DECLARATION	2
COPYRIGHT	3
ACKNOWLEDGMENTS	4
ABSTRACT	5
RESUMO	6
RIASSUNTO	7
CONTENTS	8
FIGURE INDEX	10
TABLE INDEX	11
LIST OF ACRONYMS	12
CHAPTER 1 – INTRODUCTION	13
CHAPTER 2 – THE SMART SPECIALISATION	16
THE SMART SPECIALISATION CONCEPT	16
THE RESEARCH AND INNOVATION STRATEGIES FOR SMART SPECIALISATION (RIS3)	17
THE SMART SPECIALISATION STRATEGIES	19
THE KEY ELEMENTS FOR A SUCCESSFUL SMART SPECIALISATION STRATEGY	21
THE SMART SPECIALISATION IN ITALY	22
SOME STORIES OF SMART SPECIALISATION IN ITALY	25
CHAPTER 3 – EUROPEAN POLICY TODAY AND ITS IMPLEMENTATION IN ITALY	28
THE EUROPEAN FUNDS AND EUROPE 2020	28
THE EUROPEAN FUND FOR REGIONAL DEVELOPMENT (ERDF)	31
THE EUROPEAN SOCIAL FUND (ESF)	32
THE ERDF AND ESF IN THE ITALIAN REGIONS	33
THE “<i>OPENCOESIONE</i>” PORTAL	41
SOME SUCCESSFUL PROJECTS IMPLEMENTED IN ITALY	43
CHAPTER 4 – ITALIAN ECONOMIC STRUCTURE	45
THE ITALIAN ECONOMY	45
PRIMARY SECTOR IN ITALY	45
SECONDARY SECTOR IN ITALY	46
TERTIARY SECTOR IN ITALY	48
THE SPECIAL CASE OF THE ITALIAN “<i>MEZZOGIORNO</i>”	49
IMPACTS OF ESIF ON REGIONAL DEVELOPMENT	51

CHAPTER 5 –EFFECTIVENESS OF THE STRUCTURAL FUNDS FOR REGIONAL DEVELOPMENT	56
METHODOLOGY	56
ESIF DISTRIBUTION BY ITALY REGIONS	60
EVOLUTION OF THE SELECTED INDICATORS IN ITALY	64
INDICATORS’ EVOLUTION	73
CORRELATION ANALYSIS	77
PERFORMANCE IN ITALY REGIONS	79
TYPES OF ITALIAN REGIONS	84
CHAPTER 6 – REFLECTIONS AND CONCLUSIONS	94
BIBLIOGRAPHY	98
SITOGRAPHY	104
ANNEX 1	105
ANNEX 2	113

Figure Index

Figure 1 – Stages for preparing a RIS3	19
Figure 2 – Definition of Smart Specialisation Strategy	19
Figure 3 – Priorities of Italian Smart Specialisation Strategies	22
Figure 4 – European map of innovation scoreboard	23
Figure 5 – Italian map for innovation and Smart Specialisation	24
Figure 6– The ESIF.....	29
Figure 7 – The Other funds.....	29
Figure 8 – Thematic objectives of the ESIF.....	30
Figure 9 – ERDF keys priorities	31
Figure 10 – ESF keys priorities.....	32
Figure 11 – Categories of Italian regions.....	34
Figure 12 – Percentage of each fund in the context of the Italian ESIF	39
Figure 13 – Goal of the Italian ESIF	40
Figure 14 – Funding for Italian regions.....	42
Figure 15 - Ratio 2007-2013 Community funding and population	63
Figure 16 - Ratio 2014-2020 Community funding and population	63
Figure 17 – GDP per capita € Evolution.....	67
Figure 18 – Agglomeration Schedule Coefficients Graph.....	87
Figure 19 – Case Output.....	88
Figure 20 – Dendogram of the Cluster analysis.	90
Figure 21 – Typologies of Italian Regions	91
Figure A1 – Means Plot, GDP per capita Index and Community Funding 2007-2013.....	106
Figure A2 – Means Plot, Employment rate and Community Funding 2007-2013.....	107
Figure A3 – Means Plot R&D and Community funding 2007-2013.....	108
Figure A4 – Means Plot Population at risk of poverty or social exclusion and Community funding 2007-2013.....	109
Figure A5 – Means Plot Tourism Intensity and Community Funding.....	110

Table Index

Table 1 – ESIF for UE and Italy	33
Table 2 – Italian ESIF divided by objective regions	35
Table 3 – Financial allocation divided by thematic objective for Italy	36
Table 4 Financial allocation of the Regional OPs divided by Italian Regions	37
Table 5 – Financial allocation of the National OPs for Italy	38
Table 6 – Total resources for Italy	39
Table 7 – Nights stays in 2016 (unit)	49
Table 8 – Patti per il Sud sharing	51
Table 9 – Division of the Community funding	61
Table 10 – Community Funding Ratio	62
Table 11 - GDP per capita Indicator	65
Table 12 – Employment rate Indicator	69
Table 13 - % of R&D personnel and researchers Indicator	70
Table 14 - % of Population at risk of poverty or social exclusion Indicator	71
Table 15 - Tourism Intensity Indicator	72
Table 16 – GDP per capita Growth	73
Table 17 - Employment rate Growth	74
Table 18 - % of R&D personnel and researchers Growth	75
Table 19 - % Population at risk of poverty or social exclusion Growth	76
Table 20 - Tourism Intensity Growth	77
Table 21 - Correlation Panel Database	78
Table 22 - 2007-2013 Community funding Index	79
Table 23 - GDP per capita Index	80
Table 24 - Employment Rate Index	81
Table 25 - Research and Development personnel and researchers Index	82
Table 26 - Population at risk of poverty or social exclusion Index	83
Table 27 - Tourism Intensity Index	84
Table 28 - Case Processing Summary	85
Table 29 - Agglomeration Schedule	86
Table 30 - Cluster Membership	87
Table A1 - ANOVA test	105
Table A2 - Ranks of K related samples	111
Table A3 - Test Statistics	111
Table A4 - ESF Community Funding	114
Table A5 - ERDF Community Funding	115
Table A6 - Gross domestic product (GDP) at current market prices	116
Table A7 - Average annual population thousands	117
Table A8 - Employees (thousands)(K)	118
Table A9 - R&D personnel and reserachers (unit)	119
Table A10 - % People at risk of poverty or social exclusion	120
Table A11 - Nights stays	121

List of Acronyms

B	Billion
BRR	Bolzano Richest Region
CIPE	<i>Comitato Interministeriale per la Programmazione Economica</i>
CF	Cohesion Fund
CR	Central Regions
DITENAVE	Naval and Yachting Technology District
EAFRD	European Agricultural Fund for Rural Development
EDP	Entrepreneurial Discovery Process
EMFF	European Maritime and Fisheries Fund
ERDF	European Regional Development Fund
ESF	European Social Fund
ESIF	European Structural and Investments Funds
EU	European Union
FEEI	<i>Fundos Europeus Estruturais e de Investimento</i>
FESR	<i>Fondo Europeo di Sviluppo Regionale</i>
FSE	<i>Fondo Sociale Europeo</i>
FSIE	Fondi Strutturali e di Investimento Europei
GDP	Gross Domestic Product
GNI	Gross National Income
HDNR	High Developed Norther Regions
ICT	Information and Communication Technologies
ISTAT	<i>Istituto Nazionale di Statistica</i>
ICT	Information and Communication Technologies
K	Thousands
KET	Key Enabling Technologies
KW	Kilo Watt
M	Million
MTC FVG	Maritime Technology Cluster Friuli-Venezia Giulia
NOP	National Operational Programme
NUTS	Nomenclature of Statistic Territorial Units
OP	Operational Programme
POR	<i>Programma Operativo Regionale</i>
PMI	<i>Piccole e Medie Imprese</i>
PRO	Public Research Organisations
RDP	Rural Development Programme
R&D	Research and Development
ROP	Regional Operational Programme
RIS3	Research and Innovation Strategies for Smart Specialisation
S3	Smart Specialisation Strategies
SME	Small and Medium Enterprise
SNMR	Strong Northern and Middle Regions
SNR	Strong Northern Regions
S&T+I	Science and Technology and Innovation
SR	Southern Regions
TRR	Trento Research Region
YEI	Youth Employment Initiative
UAA	Italian Utilized Agricultural Area
UR	Unusual Regions

Chapter 1 – Introduction

The Structural and Investment Funds (ESIF) are the main tool of the European Union to reinforce its regions and to accomplish the aim of a total socio-economic cohesion within the European context. This type of investments and funding have plenty of facets and are addressing many objectives improving aspects which, directly or in turn, influence economic sectors, such as tourism, and the development of the European regions.

This chapter, the first chapter, is an overview of the whole Dissertation project outlining the sections of paper and gathering them in a defined framework. However, I wanted to start this part explaining my interest on the topic and the reasons that brought me to investigate and write about this thematic. The ideas standing behind this Dissertation project comes from many sources. First of all, the interest I have in the topic of the European funds and the European Community in general. The European regions are daily involved into the processes of funding from the European Union itself which shares the Community budget investing in many fields. In the last two years, thanks to the courses here at the University of Algarve and some work experience I had previously, my interest increased, and also the interest about the tourism and regional development dynamics have followed the same trend.

I tried to go deeper on this direction and then it came the idea of analysing the effectiveness of the Structural funds on the regional development of the Italian regions. The effectiveness can be defined as the degree to which something is successful in producing a result. Applied to the study how and how much the ESIF are helping the objectives of the specific programmes, in general domains such as the growth, cohesion and development of the Italian regions. I believe that these funds are an opportunity not a burden for European regions. The choice of Italy has been made because it is my home country, so I have a special attention for it as well as a better knowledge compared to other European countries. At the same time, Italy includes a variety of regional profiles, with high-income territories and lower level development regions. A special consideration in this Dissertation was given to Tourism, aspect which has been a characterising topic during the Master course and a relevant element in the Italian Economy. The country considered in the Dissertation project is so Italy, looking from the point of view of its 21 regions at NUTS2 level following the common European Classification for Territorial Units for Statistics.

The first three chapter of the Dissertation are dedicated to a literature review of the main concepts needed to better understand the analysis that will run in the chapter number five. The concepts being treated are the pillars notions to fully understand the logic of investments and the objectives of the European Union funding strategies.

This is why the next chapter, chapter number two, is totally dedicated to the Smart Specialisation. This is one of the main concepts of the European framework, which addresses the sharing and funding of the European budget as well as the regional development strategies of the regions in the last and future years. This concept drives the decision of innovation, funding and investing of every European Region and it has in itself many facets to analyse. The Smart Specialisation evolves to the Research and Innovation Strategies for Smart Specialisation (RIS3). In this chapter are also evaluated some key elements for a successful Smart Specialisation Strategy. A characterising one is its mixing elements of a top-down approach with bottom-up elements based in an Entrepreneurial Discovery Process (EDP). The Smart Specialisation is then framed into the context of the Italian Regions, looking upon this concept and strategies in the Italian country, providing some examples of projects successfully implemented.

The third chapter is directed to describe the European Policy related to the funds, in a way which explains the meaning of each fund including them within a specific framework. The chapter clarifies the European programme for funding and the Europe 2020 strategy which gives the objectives for the 2014-2020 programming period. A particular attention has been given to the Structural funds especially the ones related to the regional development dynamics such as the European Social Fund (ESF) and the European Regional Development Fund (ERDF). An additional view has been made on the implementation of these funds in the context of the Italian regions. Some examples of successful projects implemented in Italy are displayed in the chapter and a specific focus is given to the *OpenCoesione* portal, a very useful tool introduced by the Italian government to follow and check the European projects implementation in Italy.

The chapter number four deals with the description of the Italian economic context. The Italian economic structure is outlined, sector by sector, with a special attention to Tourism and the Tertiary sector which are the main forces of the Italian economy. During the writing process, the need of considering the case of the Italian *Mezzogiorno* have born. This particular part of the country is explained to better perceive the Italian economic situation. This is why, in the chapter a spotlight is given to the *Patti per il Sud* programme which can be consider as a sub-funding system coming from the Italian Government and the European Union aiming at the regional development and innovation of the Southern regions. The chapter concludes with a literature review from authors who have studied the impact of Structural funds within the regional development and the socio-economic cohesion at regional level.

The chapter number five is committed to the analysis of the effectiveness of the Structural funds especially the ones belonging to the 2007-2013 programming period. This period has been selected as the programmes and initiatives are already close. In the Dissertation project's process were also analysed many figures regarding the 2014-2020 period, but for the sake of clarity, coherence and length of the document it was preferred to omit these more recent but not final analysis. It was felt that has the current programming period is not yet completed, any analysis is necessarily intermediate and incomplete. Data and Methodologies of the analysis are explained and structured. Details from where the data have been taken and the formulas used for the analysis are presented. Afterwards, the specific analysis takes place. First there is a descriptive analysis of the Indicators and data used. A Ratio showing the amount of Community funding received by each region in relation to their population is displayed. Following, the Indicators are transformed, and the analysis focuses on their Growth in the range of year taken into account which goes from year 2007 to 2016. These years were selected taking in attention the first year of the programming period and the year when the interventions have necessarily to be closed (the European rule N+2). Then, some indices are created, and they are used in the following part aimed to a statistical comparison of Italian regions, including a Cluster analysis. Finally, a map showing the founded Cluster is designed.

The last chapter is the chapter number six. It is summary of main reflections to be made and conclusions to be drawn after the work developed within this Dissertation project and their analysis done. It tries to conclude the whole work from a wide perspective trying to summarise the effectiveness of the Structural funds on the Italian regions development, their specificities, offering alternative solutions and a couple of personal points of view on the topic.

Chapter 2 – The Smart Specialisation

The Smart Specialisation Concept

This chapter introduces a crucial concept for the understanding of the dynamics behind the socio-economic cohesion and development within the European Region, the Smart Specialisation concept. Conceived with the reformed cohesion policy of the European Commission, Smart Specialisation is a place-based approach characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy in the area and on an entrepreneurial process of discovery, with wide stakeholder involvement.

Foray, David & Hall (2009), the “founding fathers” of the Smart Specialisation concept, define Smart Specialisation as an entrepreneurial process of discovery that can reveal what a country or region does best in terms of science and technology. They suggest a learning process to discover the research and innovation domains in which a region can hope to excel.

In this learning process, entrepreneurial actors are likely to play leading roles in discovering promising areas of future specialisations, not least because the needed adaptations to local skills, materials, environmental conditions, and market access conditions are unlikely to be able to draw on codified, publicly shared knowledge, and instead will entail gathering localized information and the formation of social capital assets.

This vision is also underlined by Pinto (2017). To this author, Smart Specialisation refers to the economic structure based on a selection of domains where the region can excel in comparison to other territories. These domains are considered strategic in terms of development. They are territorially embedded and simultaneously inserted in global value chains, conveniently matching the local knowledge base with market opportunities.

Smart Specialisation, involves first the discovery of what makes a local knowledge base original, then has not to be associated with a strategy of simple industrial specialisation for a particular region; instead, Smart Specialisation should be about research, development and innovation and it might support innovation processes by aligning knowledge dynamics and the specific socio-economic, institutional and geographical conditions encountered in each region (McCann & Ortega-Argilés 2013; Morgan 2013; Foray et al. 2011; Nogueira et al. 2017).

The European Union has adopted the Smart Specialization concept as an approach for policy prioritisation. At this time, it is considered as one of the key conditions, an *ex-ante* conditionality for regions accessing Structural funds, non-negotiable elements, in the policy agenda in order to reconcile the potentially conflicting pressures between local tailoring and consistency with the overall policy

logic and architecture (McCann & Ortega-Argilés 2016). The Smart Specialisation approach offers a policy-prioritisation framework to think about resource allocation issues, logic and a way forward for regions making policy choices in difficult and challenging budgetary environments. At the same time, the discipline involved in Smart Specialisation helps to foster policy learning and institutional capacity building for good governance (Rodrik 1999; MC Cann & Ortega-Argilés 2016).

The Research and Innovation Strategies for Smart Specialisation (RIS3)

Smart Specialisation can be achieved spontaneously, but such a situation is unlikely and uncertain (Pinto 2017). Instead of leaving a region's future to the events, having control over the structural change process, preparing and implementing a Research and Innovation Strategies for Smart Specialisation (RIS3) is more effective. The implementation of an innovation strategy anchored in the principles of Smart Specialisation is an important catalyst for regional development (Foray et al. 2011).

The term RIS3 can be somewhat confusing, covering as it does what is also called S3 or Smart Specialisation Strategies. It refers to Regional Innovations Strategies which invoke the key elements of Smart Specialisation. Therefore, RIS3 or S3 is itself a short acronym telling us that regional development is going to take place in a manner that builds on location, regional research and production strengths, that it will involve all of the key actors from business, research, government and other civil bodies, that building on research and production strengths is important and that clustering and entrepreneurship are both priorities as important objectives.

But what are in particular the national and regional research and innovation strategies for Smart Specialisation? They are defined, with reference to the "Guide to research and Innovation Strategies for Smart Specialisation" (Foray et al. 2012) as integrated, place-based economic transformation agendas. The strategies focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development. They build on each country's or region's strengths, competitive advantages and potential for excellence. They support technological as well as practice-based innovation and they aim to stimulate private sector investment. The strategies aim to get the stakeholders fully involved and encourage innovation and experimentation. They are evidence-based and include sound monitoring and evaluation systems. Gianelle, Guzzo & Mieszkowski (2017) underline how the existence of national and regional innovation strategies for Smart Specialisation (S3) is a condition of accessing resources for research and innovation for the current programming period (2014-2020) of the EU Cohesion policy.

As one of the founding fathers of Smart Specialisation, Dominique Foray claims, RIS3 is largely about the policy process to select and prioritize fields or areas where a cluster of activities should be

developed, and to let entrepreneurs discover the right domain of future specialization (Foray et al. 2011). This is a vision that is constantly underlined by other experts involved in RIS3 debate (Capello & Kroll 2016). The RIS3 points to an effective use of the potential in the region for its development, through a combination of policies involving investments in infrastructures and in soft capital, such as support for internationalisation and collaborative activities (Foray 2015; Pinto 2017). It is based on several stages, from developing a vision, identifying competitive advantages, to defining strategic priorities and implementing policies to promote the potential of development based on Science and Technology and Innovation (S&T+I) (Pinto 2017).

The main novelty in the formulation of RIS3 is the entrepreneurial discovery process (EDP) (Del Castillo et al. 2015; Pinto 2017). This process directly considers the discovery of new areas that can transform the region. It is a process that is always present in the evolution of territories. The difference in RIS3 is that now the EDP is assumed as part of the strategy, a targeted process, trying to instigate the combination of top-down prioritisation with bottom-up approaches and stakeholder engagement in policymaking and governance (Pinto 2017). It assumes that the decision makers cannot obtain all relevant knowledge to decide the desirable future of the region and therefore need to listen the actors of innovation in the territory (Pinto et al. 2018).

A second interesting aspect of the RIS3 formulation is the so-called granularity principle (Richardson et al. 2014; Pinto 2017), suggesting that policy focus should not be on specific sectors or clusters but on concrete activities in the interconnection between related variety domains. These specific activities can be discovered through the internalisation of EDP in the RIS3 project and the creation of new “ideas-partnerships” ideas (Boden et al. 2015; Pinto 2017).

The RIS3 emphasises that, in parallel with the S & T+I dimension, it is important to pay attention to tacit and practical knowledge, highlighting the modes of learning that are usually associated with doing-using-interacting (Jensen et al. 2007; Pinto 2017). These modes of learning are particularly crucial in regional innovation systems in emerging phases, which are still not well developed, with intermediate institutionalisation of S & T+I practice. The vision of a quadruple helix is commonly assumed to be a structuring dimension of RIS3, as referred by Pinto (2017), suggesting the relevance of the university and other public research organisations (PROs), of public government agencies at different levels, of the business fabric, but also of users and other S & T+I (Science and Technology and Innovation policies), both for regional innovation dynamics and for the system's own governance. A true RIS3 needs to be considered as a continuous and unfinished process to guide the region towards a desirable structural change. Even if this assumption is constantly emphasised, in practice many regions continue to adopt a “traditional” perspective, with RIS3 becoming a mere planning document

that is developed and closed at a given time, facilitating the selection of projects in thematic areas to be supported by public funds.

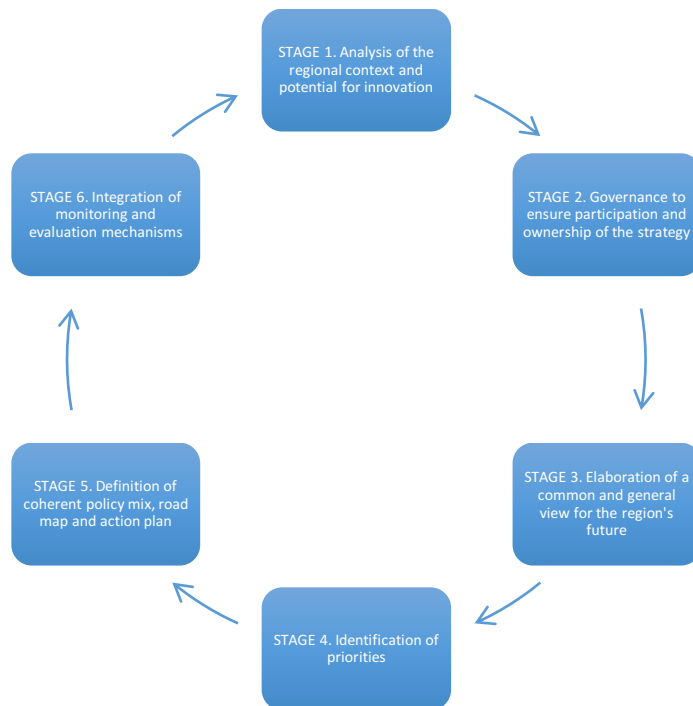


Figure 1 – Stages for preparing a RIS3
Source: Pinto (2017)

The Smart Specialisation Strategies

RIS3 is an innovative strategic approach that aims to boost growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages. Through its partnership and bottom-up approach, the Smart Specialisation strategy brings together stakeholder, local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds.

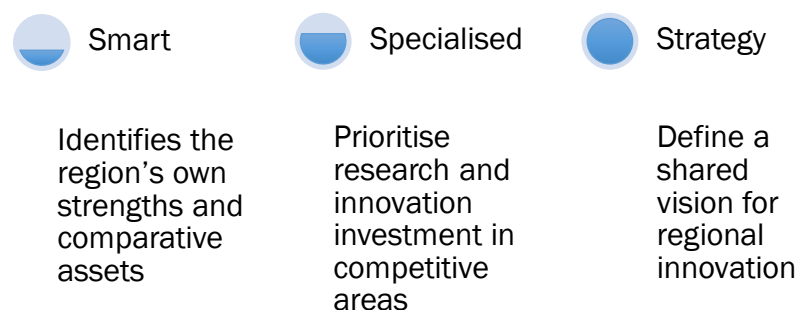


Figure 2 – Definition of Smart Specialisation Strategy
Source: S3 platform (2017)

Thus, according to Richardson, Healy & Morgan (2014), RIS3 is based in the region's need to differentiate themselves, through specialisation in sectors where they have a comparative advantage,

if they wish to reach economies of scale and scope. From the RIS3 perspective, regions are seen as essential for the development of specialised measures (Nogueira et al. 2017).

Smart Specialisation strategies adopt a systemic view of regional innovation to structure policy formulation. The existence of an innovation system assumes that different actors play diverse roles in the system, which are interconnected by different types of linkages, share a common goal of developing innovative activities and thereby promote regional development (Pinto 2017).

For Capello & Kroll (2016) a radical change introduced by the Smart Specialization strategy is that it rejects the culture of “picking the winners” on an industrial basis. The strategy often calls for public–private partnership processes of “entrepreneurial discovery” and learning, and therefore runs around a bottom-up approach based on the self-discovery of entrepreneurial capability. The latter requires for the identification, through an endogenous process, of local potentials and local needs. The Smart Specialization strategy advocates a consistent match between investments in knowledge and human capital and the present industrial and technological “vocation” and competences of territories. (Richardson, Healy & Morgan 2014).

This new design supersedes the old policy style calling for centralized planning methods to identify industrial development priorities and ensuring that the logic and design of the policy are appropriate for and relevant to the local context, and not imposed by an external (supra-regional) body, as a place-based policy as Barca advocates (Barca 2009).

Foray (2016), associate the concept of RIS3 to two fundamental ideas. First a region should concentrate investments for research and innovation in a few technology domains, in which they can have a significant impact. Secondly, these domains must be chosen as they integrate or reinforce the research and innovation capacities already present in the region. The assumptions basically are that the achievement of a critical mass of resources is essential to obtain results in research and development. Furthermore, Foray, David & Hall (2009), reports how regional specialisation shows a high degree of path dependency for which diversification can be achieved in areas that are closely linked to the existing knowledge base.

Since 2011, the European Commission provides advice to regional and national authorities on how to develop, implement their Smart Specialisation strategies. Accordingly, it has been developed a mechanism called “Smart Specialisation Platform”. The Platform, operating in Seville (Spain) as part of the European Commission Joint Research Centre infrastructure, facilitates mutual learning, analysis and gathering data, networking opportunities for around 170 European regions and 18 national governments. Thematic Smart Specialisation platforms have also been created. Regions join forces and pool resources on the basis of matching Smart Specialisation priorities in high valued added sectors.

The Key Elements for a Successful Smart Specialisation Strategy

First of all, Foray in a recent summarising article (Foray 2016) defined Smart Specialisation as a place-based approach, meaning that it builds on the assets and resources available to regions and member-states and on their specific socio-economic challenges in order to identify unique opportunities for development and growth.

For Cadil (2013), to have a strategy means to make choices of investment. Member-states and regions ought to support only a limited number of well identified priorities for knowledge-based investments and/or clusters. Specialisation means focusing on competitive strengths and realistic growth potentials supported by a critical mass of activity and entrepreneurial resources.

Important for McCann & Ortega (2014) is setting priorities while doing a strategy. For the authors this should not be a top-down, picking-the-winner process. It should be an inclusive process of stakeholders' involvement centred on "entrepreneurial discovery", understood as an interactive process in which market forces and the private sector are discovering and producing information about new activities, and the government assesses the outcomes and empowers those actors most capable of realizing this potential.

Foray (2016) points out how the strategy should embrace a broad view of innovation, supporting technological as well as practice-based and social innovation. This would allow each region and member-state to shape policy choices according to their unique socio-economic conditions. A good strategy must include a sound monitoring and evaluation system as well as a revision mechanism for updating the strategic choices.

McCann & Ortega-Argilés (2016) express the view of how a Smart Specialisation Strategy should prioritise domains, areas and economic activities where regions or countries have a competitive advantage or have the potential to generate knowledge-driven growth and to bring about the economic transformation needed to tackle the major and most urgent challenges for the society and the natural and built environment. Priorities could be framed in terms of knowledge fields or activities, sub-systems within a sector or cutting across sectors and corresponding to specific market niches, clusters, technologies, or ranges of application of technologies to specific societal and environmental challenges or health and security of citizens (Cadil 2013; McCann & Ortega-Argilés 2016, Foray 2016).

While some regions or countries may prioritize one or more Key Enabling Technologies (KET), others will focus on applications of such technologies to specific purposes or defined fields. Social, organisational, market and service innovation, or practice-based innovation, play as important a role in RIS3 as technological innovation based on scientific research. This is especially relevant for

regions with comparatively weaker technological and science basis. RIS3 involves not only radical innovation but also exploiting niches by innovating in traditional fields, through developing and applying new business or organizational models, and adapting/exploiting innovations deriving from tacit knowledge and experience in these areas. Most often, prioritised choices of domains, areas or specific economic activities will be complemented by horizontal measures. These aim at realizing adequate framework conditions for entrepreneurship, supporting the operation of all types of firms both in domestic and international markets, and for developing inter-firm, inter-cluster, and cross-border collaborations.

The Smart Specialisation in Italy

The country we are going to analyse during this Dissertation, and particularly the regions we are going to treat, is Italy and its regions. Following the Nomenclature of Territorial Units for Statistics, at NUTS 2 level in Italy is composed by 21 regions (Trentino-Alto Adige split into two: Trento Autonomous Province and Bolzano Autonomous Province).

With reference to a recent European Commission report (2017), Italian regions are focusing their investments mainly on five priority areas which are:

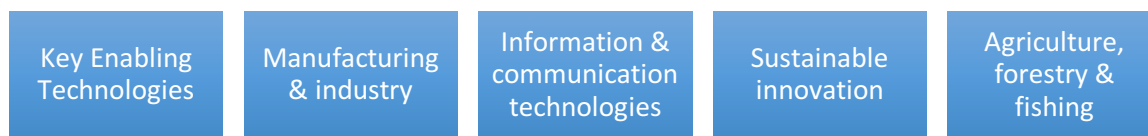


Figure 3 – Priorities of Italian Smart Specialisation Strategies
Source: European Commission (2017)

The country has been considered by the European Commission (2017) as a moderate Innovator in terms of Smart Specialisation Strategy.

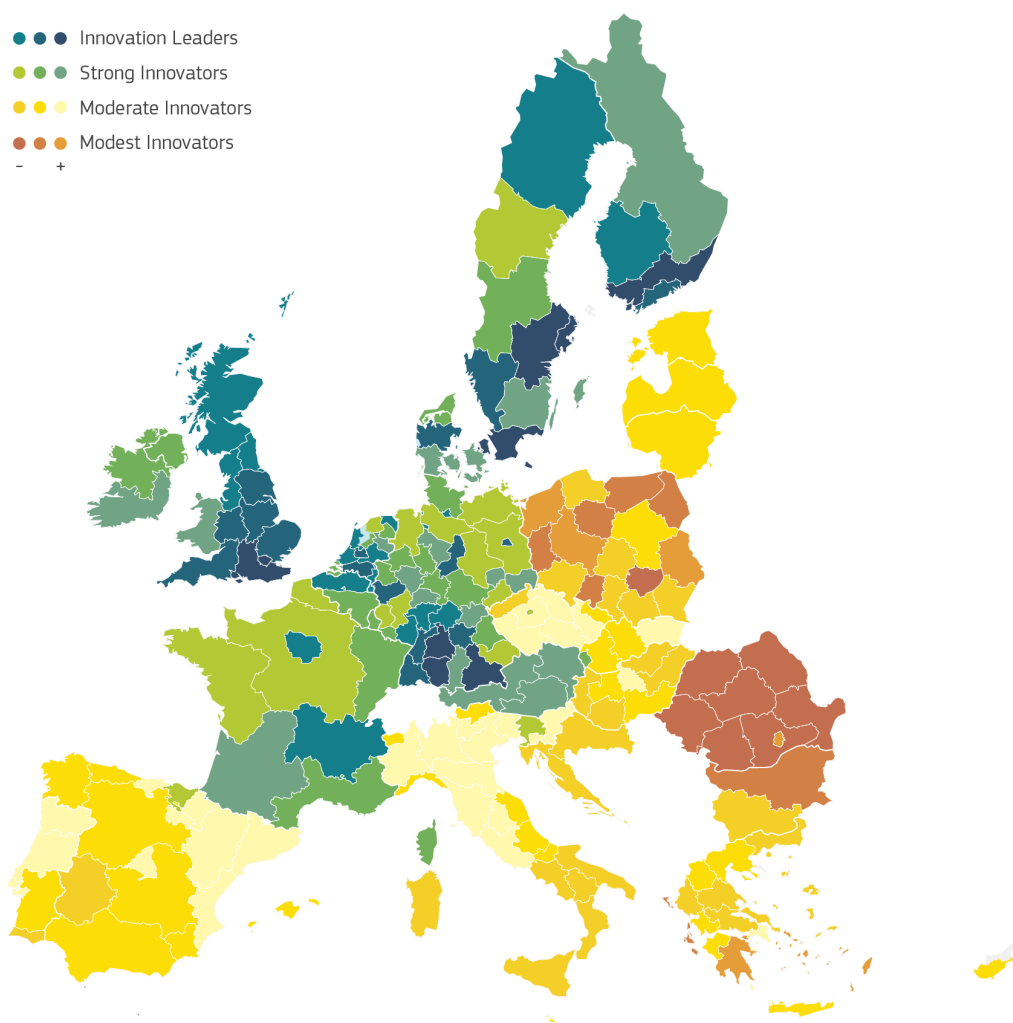


Figure 4 – European map of innovation scoreboard
Source: European Commission (2017)

In Italy, the regions which are innovating the most are the northern and the middle regions with the exceptions of Valle d'Aosta, Liguria, Bolzano, Marche and Abruzzo. In the South and the Islands, the situation is different. The regions have been considered as modest innovators, in this case it is important to specify that these regions were classified as less developed region based on the European classifications frame of Regional Development as we are going to see further. The country has a budget of 6,7 billion Euro allocated in the national Structural funds especially aimed to research and innovation. 2,7 billion are coming from European Union and 4,0 billion is the value of the national contribution. This follows the strategy of the national effort compared to the funds received already threatened.



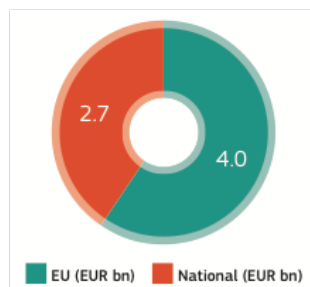
► *Strengthening innovation in Italy*

Italy is a Moderate Innovator

► Smart specialisation priority areas:

1. Key Enabling Technologies
2. Manufacturing & industry
3. Sustainable innovation
4. Agriculture, forestry & fishing
5. Information & communication technologies

ESI Funds total budget for Research and Innovation: Italy - EUR 6,7 Billion



Neurotechnology

WISE, a Milan- and Berlin-based biomedical company, is developing a new generation of implantable leads for neuromodulation and neuromonitoring. This helps the treatment of chronic pain and Parkinson's disease.

Regional and Urban Policy

Figure 5 – Italian map for innovation and Smart Specialisation
Source: European Commission (2017)

In disadvantaged regions, public policies need to overcome several challenges to be successful in designing and implementing a RIS3 (McCann & Ortega-Argilés 2016). The disadvantaged regions face an apparent contradiction. They need more innovation, but they have fewer opportunities to promote innovation. Innovation is a highly cumulative phenomenon associated with processes of spatial agglomeration, where more innovative places tend to attract more and more innovation. The regions with the greatest need for innovation have greater difficulties in absorbing resources for innovation, even when these resources are made available by governments. Innovation actors in disadvantaged regions, particularly firms, have a limited capacity to understand the potential benefits of innovation investment (Fernández-Esquinas et al. 2017).

Some Stories of Smart Specialisation in Italy

The stories of Smart Specialisation Strategies treated and described in this section, have been taken from European Commission (2016) “SMART STORIES” booklet. The S3 Platform two years ago promoted an initiative named “Let your success story be seen!” where the Platform was asking to countries and regions to share their stories of S3 in a perspective of increase their visibility and the S3 and ESIF one. The initiative had a high response and it was very successful, so they were created booklets and a section in the Platform titled “Smart Stories” telling the experiences of S3 implementation from the regions and institutions point of view. These stories reflect how managing authorities have used the S3 concept to develop their own innovation-driven strategy.

In Friuli-Venezia-Giulia the Smart Specialisation Strategies has resulted in a more positive engagement between the authorities and innovation actors. In particular, links with the local universities and business communities have been strengthened. The University of Trieste mapped the skills and enabling technologies within its departments against the regional RIS3 priorities. Similarly, the University of Udine has produced an overview of the skills existing within the institution and its potential contribution to training, research and technology transfer. Finally, the International School for Advanced Studies has offered support with a focus on "Strategic supply chains" and "Smart health". The efforts to foster cooperation between research and business and align government intervention with territorial dynamics have resulted in the identification of five new regional clusters. One regards the field of Maritime Technologies. Actors related to the Marine topic where the most active in the entrepreneurial process of discovery. This is explained by the characteristic of this region which is linked to the Adriatic Sea. Also, this was based on the institutional environment built by previous programmes, especially the establishment of the Naval and Yachting Technology District (DITENAVE) and the related Sea Training Centre, both focused on maritime technologies and the

related human capital development. Cooperation with the regional government has triggered an enlargement of the role of the District to other areas such as offshore and specialized supply chains, transport, logistics, and services for navigation and yachting. Its mission has also become more externally orientated, renaming the District as the Maritime Technology Cluster FVG (MTC FVG), and this has already attracted new companies and representatives from research and industry associations.

In Lombardy the vision and primary objective of the Smart Specialisation was to transform traditional and mature industries into emerging ones. To achieve that, the actors needed to analyse trends understanding how markets are reacting to new societal challenges and then build competitive advantages to respond. The region involved a wide array of actors in the process, not only the most relevant technological clusters, but also the needs and opinions of the civil society at large. Through this they also raised awareness among many stakeholders of the challenge presented by Smart Specialisation. The region launched an EDP. Researchers collected statistical data on high-growth companies supported by a collaborative platform of innovation actors. This aimed to create an enabling environment for innovation, encouraging discussion and nurturing ideas for action, which was seen as a meeting place of demand and supply for innovation in Lombardy. The hope was that these efforts help the economic actors to get closer to the needs of the end user, namely the citizen, since they represent market opportunities. Citizens should contribute more to administer public funds, deciding on which enterprises of the future can best improve their quality of life. In summary, regional economic transformation to address societal challenges is both the means and the end of this strategy.

In Sicily the RIS3 process began with a competition to describe a shared vision for the region. Researchers have actively engaged with the territory since starting the RIS3, looking for new players, trying to understand social innovation, and uncovering a rich fabric of innovators ready to meet the challenges of change. Young people and their ideas, motivation and activism have emerged. The different ideas have been enlightening: from responding to vulnerable groups and social needs that are normally ignored by the market to institutional change and transformation in relationships between stakeholders. Testimonies showed that “Social innovation in Sicily already exists, and young people are already working to reinvent their future”. However, innovators have pointed out that most ideas have often failed to get off the ground because they did not pass funding eligibility thresholds. On these and other aspects we have recognised the need for a different governance model. A new cross-departmental structure will coordinate analysis, planning, guidance, and monitoring of RIS3. This is complemented by permanent thematic groupings that include international partners. The

Government of Region of Sicily has approved Sicily's Smart Specialisation Strategy on February 2015.

The core of Tuscany RIS3 is based on two elements of regional identity: on one hand a popular image of Tuscany as rich in natural and cultural heritage; on the other a strong manufacturing base with world leading brands, cutting edge research and hi-tech solutions. The vision enhanced by the Tuscany RIS3 is that both identities not only live together, but feed and enhance one another.

The EDP has been conducted in the region. This process, supported by a team of 12 external experts, involved the participation of 450 institutions, the elaboration of strategic roadmaps by 13 technological districts, 10 thematic workshops attracting over 2000 participants and an intensive communications campaign. Three technological priorities have been selected and oriented to place-based applications, such as Optronics for cultural heritage, Bio robotics for medical devices, Nanotechnology for environment protection. In terms of tools the Tuscany RIS3 has led to important changes in the regional innovation policies. A new strategic approach aims to foster "backward linkages", between more internationally competitive firms and those less successful, but still crucial to regional cohesion. A smart policy mix has been introduced, addressing different types of innovations and their levels of technological intensity. Finally, focused on integrated approaches to territorial needs, such as the requalification of the steel industry to adopt alternative technological solutions, while improving the environment and reducing energy consumption.

In these regions, the RIS3 have been produced with positive effects. Bottom-up strategies have been built with a cooperation between stakeholders and institutions, especially in the Lombardy case where many actors were involved in the EDP. To notice how Tuscany and Friuli-Venezia Giulia have found their stronger clusters and potentials thanks to the RIS3. The founding in Tuscany of 13 technological districts and the reinforcement in Friuli-Venezia Giulia of the Maritime and Sea centres is also worth of mention. Sicily region have had the peculiarity of involving youth into RIS3 in a perspective of them as the ones who should decide for the future.

After the knowledge acquired by the chapter it could be summarised how the Smart Specialisation and the RIS3 are essential in the current and probably post-2020 agenda and becoming the best way to build a development strategy. Not a merely industrial plan but a cooperation between all the actors involved in the region.

Chapter 3 – European Policy Today and its Implementation in Italy

The European Funds and Europe 2020

As European funds we are talking about funding coming from the European Union (EU). These funds are the main financial tool whereby the EU pursues the goal of economic and social integration between the member-states (Cappello 2014). They are part of the EU cohesion policy considered by McCann & Ortega-Argilés (2016) as one of the western world's largest, if not the largest, local and regional development policy operating under broadly one overall legal and institutional framework. The funds consist in funding assigned by the EU council to the operational programmes (OPs) presented by each country within the financial framework of the EU. The operational programmes, constitute the point of arrival of the Structural funds, having a specific amount at national (NOPs) and regional level (ROPs).

The current period of interest for the funds goes from 1st January 2014 to the 31th December 2020, where the European Union will invest around € 1 trillion in growth and employment. The set of contributions make up the EU budget. The contributions making the budget, come by direct investment from the EU member countries (Cappello 2014). The budget and its use is part of the Europe 2020 strategy. Europe 2020 is highly associated with the Smart Specialisation concept. From the foundation of the Europe 2020 strategy, three mutually reinforcing priorities were formed: smart growth, developing an economy based on knowledge and innovation; sustainable growth, promoting a more resource efficient, greener and more competitive economy; and inclusive growth, fostering a high-employment economy delivering social and territorial cohesion (European Commission 2010, 2017; Balcerzak 2015; Bachtler et al. 2017). The European Union provides funding for a broad range of projects and programmes covering areas such as: regional and urban development, employment and social inclusion, agriculture and rural development, maritime and fisheries policies, research and innovation, or humanitarian aid. (European Commission 2010, 2017).

Two types of European funds can be distinguished: funds managed directly by the European Commission and funds managed directly by the member-states through their administrations (national, regional or local) (European Commission, 2010, 2017; Bachtler et al. 2017).

Over 76% of the EU budget is managed in partnership with national and regional authorities through a system of "shared management", through 5 funds named "Structural and Investment Funds" (ESIF).

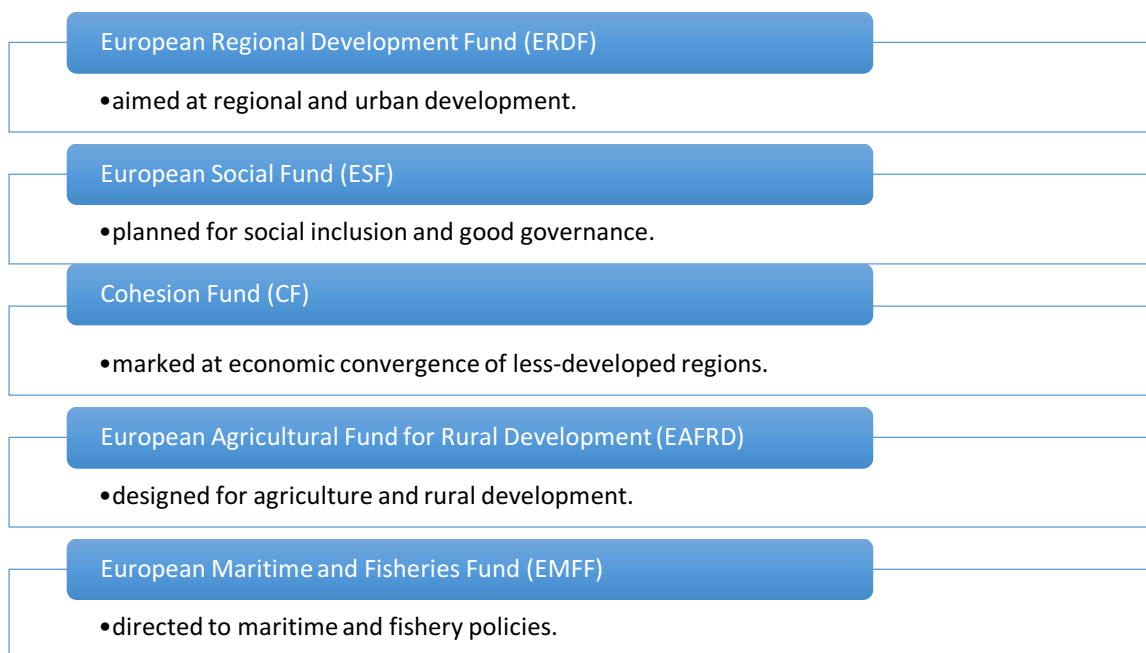


Figure 6– The ESIF
Source: European Commission website (2017)

Moreover, there are other funding managed directly by the EU provided in two different forms:



Figure 7 – The Other funds
Source: European Commission website (2017)

As previously said, collectively these funding help to implement the Europe 2020 strategy. Cappello (2014), in his book points out how this strategy is considered to be the European’s agenda for jobs and growth. The strategy emphasises a smart, sustainable and inclusive growth as a way to overcome the structural weaknesses in Europe’s economy, improving its competitiveness and productivity and underpin a sustainable social market economy.

Pasimeni (2015) identifies Europe 2020 as the main development strategy for the current decade in the European Union, result of a political consensus among the governments of the 27 member-states, addressing the main structural challenges in the EU. For the author, when Europe 2020 was conceived, the ambition was to help the EU on moving out of the crisis, to avoid “the reflex to try to return to the pre-crisis situation” and changing the model of development, in order to overcome the

structural weaknesses in Europe's economy, improve its competitiveness and productivity and underpin a sustainable social market economy.

Officially, in the 2014-2020 programming period, the ESIF, in particular the ERDF, the ESF and the CF, will support 11 investment priorities, also known as thematic objectives (TO) as following:

Thematic Objective 1.	• Strengthening research, technological development and innovation
Thematic Objective 2.	• Enhancing access, use and quality of information and communication technologies (ICT)
Thematic Objective 3.	• Enhancing the competitiveness of small and medium-sized enterprises (SMEs)
Thematic Objective 4.	• Supporting the shift towards a low-carbon economy in all sectors
Thematic Objective 5	• Promoting climate change adaptation, risk prevention and management
Thematic Objective 6	• Preserving and protecting the environment and promoting resource efficiency
Thematic Objective 7	• Promoting sustainable transport and removing bottlenecks in key network infrastructures
Thematic Objective 8	• Promoting sustainable and quality employment and supporting labour mobility
Thematic Objective 9	• Promoting social inclusion, combating poverty and any discrimination
Thematic Objective 10	• Investing in education, training and vocational training for skills and lifelong learning
Thematic Objective 11	• Enhancing institutional capacity of public authorities and stakeholders and efficient public administration

Figure 8 – Thematic objectives of the ESIF
Source: European Commission website (2017)

The ESIF are used to finance projects and interventions in European regions. They do not replace national and regional actions and funding, but they are associated with them to improve their results (additionality principle). The total amount of the funding is the sum of EU budget and a contribution from the beneficiary member, country or region. This concept is underlined in Pasimeni (2015) paper, reporting how the main characteristic of the funding is to involve, national and regional actors, in their management and use.

Cappello (2014) and Pasimeni (2015) stressed how the cohesion policy implemented through the ESIF is based on a broad strategic vision. It adopts the objectives and priorities of the Europe 2020 Strategy and it is one of the main engine and tool for implementation. The programmatic and operational guidelines are declined, implemented and monitored through a process of collective consultation that involves, in addition to the Community institutions, also the national, regional and

local administrations, as well as the social partners and civil society organizations, to better reflect the local and regional needs and priorities (Cappello 2017; Pasimeni 2015).

As regard the topic of this Dissertation, the most relevant ESIF are the funds dealing with the regional development dynamics. This is the reason why the paper is going to focus on the European Fund for Regional Development (ERDF), the European Social Fund (ESF) and the Cohesion Fund (CF).

Besides, it must be said that Italian regions are not eligible for funding coming from the CF. The reason is simply given by the definition of the Cohesion Fund from the European Commission “CF is aimed at member-states whose Gross National Income (GNI) per inhabitant is less than 90% of the EU average” and this is not the case of Italian regions. That is why this paper is focusing more specifically on ERDF and ESF, analysing their impact within the Italian regions.

The European Fund for Regional Development (ERDF)

The European Regional Development Fund (ERDF) is a fund allocated by the European Union. Its purpose is to transfer money from richer regions and invest it in the infrastructure and services of underdeveloped regions. This will allow those regions to start attracting private sector investment and create jobs on their own (European Commission 2014).

The ERDF focuses its investments on several key priority areas known as “thematic concentration” which are:



Figure 9 – ERDF keys priorities

Source: European commission website (2017)

The resources allocated to these priorities depend on the category of region. In the most developed regions, 80 % of fund at minimum must be focused on at least two of these priorities. In transition regions, the focus is at 60 % of funds, 50 % for less developed regions. Furthermore, some ERDF resources must be channelled specifically towards low-carbon economy projects with the focuses of 20% of fund for most developed regions, 15% for transition regions and 12% for less developed regions.

The ERDF also gives particular attention to specific territorial characteristics. Areas that are naturally disadvantaged from a geographical viewpoint (remote, mountainous or sparsely populated areas)

benefit from special treatment. The outermost areas also benefit from specific assistance from the ERDF to address possible disadvantages due to their remoteness.

For the implementation of the aforementioned objectives, the ERDF finances a wide range of interventions. They have been made productive investments in favour of companies, in particular for SMEs, in strategic areas of intervention. It has been invested in infrastructure related to energy, environment, transports, Information and Communication Technologies (ICT), research and innovation as well as in infrastructure connected to social, health and education. Also, other investments have been made in equipment and infrastructures for sustainable, culture, tourism, networking and cooperation.

The ERDF projects are defined and launched at regional level within a specific Regional Operational Programme, the ROP ERDF (in Italian POR FESR) which contains axes, measures and specific details on the interventions that are financed. Also, National Operational Programmes (NOP) exist. This are projects defined and launched at national level within their specific Operational Programmes.

The European Social Fund (ESF)

The European Social Fund is a fund allocated by the European Union. It is focused on improving employment and education opportunities across the European Union as well as improving the situation of the most vulnerable people at risk of poverty (European Commission 2015).

For the 2014-2020 period, the ESF is focusing on four of the cohesion policy's thematic objectives which are:



Figure 10 – ESF keys priorities
Source: European commission website (2017)

The ESF investments covers all EU regions. More than 80 billion euros have been available for human capital investment in member-states between 2014 and 2020, with 3,2 billion euros allocated to the Youth Employment Initiative. The 20 % of ESF investments are committed to activities improving social inclusion and combating poverty. This is known as thematic concentration. The main beneficiaries are unemployed, entrepreneurs, operators in education, students and persons undergoing training or professional training, workers in need of professional retraining, persons belonging to disadvantaged or vulnerable groups and people at risk of poverty.

The ERDF and ESF in the Italian Regions

The European Union currently has 28 member-states. Its territory covers 4.475.757 km² and has a total population of 510 million inhabitants. Such a variety and extension involves the existence of significant geographical, cultural and historical differences, as well as economic and social development within the regions. These differences are found not only between member-states, but also within the States themselves: this is the case of the Regions and territories of Italy.

Hence, there is the need for a solidarity policy aimed to reduce the gap between the European regions, to achieve balanced economic, social and territorial development in all countries and regions of the Union. This policy is therefore defined as regional policy or cohesion policy (Bachtler et al. 2017).

As mentioned, cohesion policy is achieved through the allocation of specific funds, defined European Structural and Investments Funds (ESIF). With a budget of EUR 454 billion for 2014-2020, the ESIF are the European Union's main investment policy tool (European Commission 2017; Bachtler et al. 2017).

The ESIF combine five Funds: European Regional Development Fund (ERDF); European Social Fund (ESF); Cohesion Fund (CF); European Agricultural Fund for Rural Development (EAFRD); and the European Maritime and Fisheries Fund (EMFF). Italy, together with 19 other member-states, will also benefit from the Youth Employment Initiative (YEI).

As previously said, Italian regions are not eligible for funding coming from the Cohesion Fund. That is the reason why the related data are not appearing in the following tables.

In the first table the ESIF are listed, divided by single fund and relative financial allocation for Italy in its entirety. The data are in billions of euro.

Table 1 – ESIF for UE and Italy

		UE	Italy
ERDF	European Regional Development Fund B€	187,4	20,750
ESF	European Social Fund B€	86,4	10,470
	+ Initiative for Youth Employment B€	3,2	0,567
CF	Cohesion Fund B€	63,2	---
EAFRD	European Agricultural Fund for Rural Development B€	95,0	10,440
EMFF	European Maritime and Fisheries Fund B€	5,7	0,537

Source: Eurostat

To these allocations is added a part of co-financing to be borne by the individual states and regions (respectively 25,5 and 5,4 billion euros for Italy).

The distinction between European regions in the cohesion policy is based on the ratio between the GDP per capita in the region and the EU GDP per capita average.

This distinction divides European regions, and so Italian regions, into:

1. Less developed regions
2. Transition regions
3. More developed regions

The below figure shows this distinction within the Italian regions.

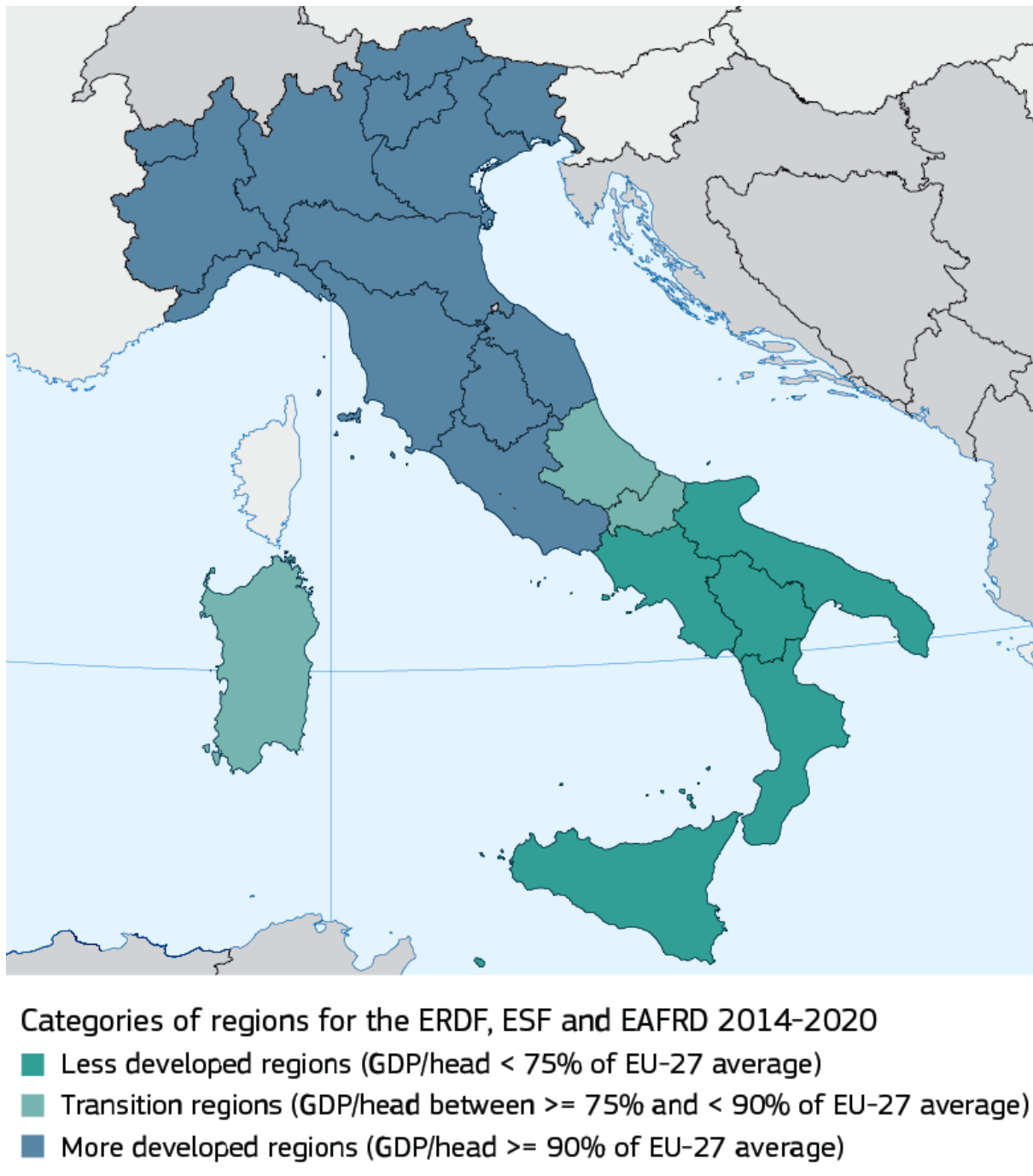


Figure 11 – Categories of Italian regions
Source: European Commission (2017)

Table 2 – Italian ESIF divided by objective regions

Less developed regions (GDP per capita less than 75% of UE average) B€	182,2
In Italy (Campania, Puglia, Basilicata, Calabria e Sicily)	22,2
Transition regions (GDP per capita between 75% and 90% of UE average) B€	35,4
In Italy (Sardinia, Abruzzo, Molise)	1,3
More developed regions (GDP per capita more than 90 % of UE average) B€	54,3
In Italy (All the other Italian regions)	7,6

Source: Eurostat

The reported financial allocations refer to the main funds (ERDF, ESF). The data are expressed in billions of euros and relative only to the share of Community funding. It is foreseen, that the largest part of these funds is concentrated on the less developed regions ($GDP \leq 75\%$ or 90% of the EU average).

Another aspect that must be taken into account are the investment priorities. As previously mentioned, the ESIF are detailed into 11 thematic objectives (OT) related to these priorities. The allocated funding from the ESIF are divided following these thematic objectives and investment priorities. The following table defines these thematic objectives, as well as their financial allocation within the ESIF. The data refer to Italy and are expressed in millions of euros, they refer to the single share of Community funding.

Table 3 – Financial allocation divided by thematic objective for Italy

Thematic Objectives (OT)	ERDF M€	ESF M€	EAFRD M€	EMFF M€	Total M€
1) Research, Technological development and innovation	3.352,7	---	441,9	---	3.794,7
2) Enhancing access, use and quality of information and communication technologies (ICT)	1.184,5	---	257,9	---	2.103,4
3) Enhancing the competitiveness of small and medium-sized enterprises (SMEs)	3.575,3	---	4.103,9	218,7	7.897,9
4) Supporting the shift towards a low carbon economy in all sectors	3.138,6	---	797,7	12,7	3.948,9
5) Promoting climate change adaptation, risk prevention and management	811,9	---	1.546,7	---	2.358,6
6) Preserving and protecting the environment and promoting resource efficiency	2.341	---	1.894,6	215,5	4.451,7
7) Promoting sustainable transport and removing bottleneck in key network infrastructures	2.473,5	---	---	---	2.473,5
8) Promoting sustainable and quality employment and supporting labour mobility	---	4.086,6	224,1	58,1	4.368,7
9) Promoting social inclusion, combating poverty and any discrimination	1.032,9	2.268,9	789,2	---	4.091,0
10) Investing in education, training and vocational training for skills and lifelong learning	959,6	3.156,4	79,4	---	4.195,3
11) Enhancing institutional capacity of public authorities and stakeholders and efficient public administration	410,2	593,8	---	---	1.004,0
Total 11 OT	19.941,09	10.105,7	10.135,3	505,0	40.687,8
Technical Assistance	709,6	361,6	294,4	32,2	1.397,9
General Total	20.651,5	10.467,2	10.429,7	537,3	42.085,7

Source: Eurostat

Data refers to the single share of Community funding, to these amounts must be added 567 million euros provided for the Youth Employment Initiative (Youth Guarantee Plan).

The following tables instead, define the allocation of the ESIF for 2014-2020 within the various Italian Operational Programmes, respectively at the regional (ROPs) and national (NOPs) levels. In both tables the data are expressed in millions of euro and are relative only to the Community funding.

Table 4 Financial allocation of the Regional OPs divided by Italian Regions

	Regions / Operational Programmes	ERDF Operational Programmes M€	ESF Operational Programmes M€	EAFRD Operational Programmes M€	TOTAL Operational Programmes M€
More developed Regions	Piedmont	483	436	471	1390
	Valle d'Aosta	32	28	60	120
	Lombardy	485	485	499	1470
	Liguria	196	177	135	508
	A.P. Bolzano	68	68	158	295
	A.P. Trento	54	55	130	239
	Friuli-Venezia Giulia	115	138	128	381
	Emilia Romagna	241	393	513	1.147
	Tuscany	396	366	415	1.177
	Umbria	178	119	378	675
	Marche	169	144	232	545
	Lazio	457	451	336	1.244
	Veneto	300	382	511	1.193

Transit Regions	Abruzzo	116	71	208	395
	Molise	53	24	101	178
	Sardinia	467	221	628	1.316

Less Developed Regions	Campania	3.085	628	1.111	4.824
	Puglia	2.788	772	991	4.551
	Basilicata	413	145	411	969
	Calabria	1530	254	668	2.452
	Sicily	3.418	615	1339	5.372

TOTAL Operational Programmes	15.045	5.974	9.422	30.441
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Source: Eurostat

The RDPs (rural development programmes) corresponds the ROP for EAFRD. The Molise, Puglia and Calabria Regions have a single multi-dimensional ROP, not distinguished between ROP ERDF and ROP ESF.

Table 5 – Financial allocation of the National OPs for Italy

National Operational Programmes	Funds	Open to
NOP Infrastructure and nets	1.383	Less developed regions
NOP Culture	368	
NOP Legality	283	
NOP Enterprise and competitive	1.776	Less developed or transit regions
NOP Research and Innovation	926	
NOP Metropolis	588	All regions
NOP Governance and institutional capacity	584	
NOP Social Inclusion	827	
NOP Youth Employment	1.135	
NOP for School	1.615	
NOP Active policy for employment	1.181	
NOP rural net	45	
NOP rural development	963	
NOP EMFF	537	
TOTAL NOP	12.212	

Source: Eurostat

The data shown in the previous tables do not represent the total financial allocation available for the execution of projects within the Structural funds. As explained, in fact, in addition to the share of Community funding, they provide for a share of funding from national and regional authorities. The amount of this co-financing is defined by specific national guidelines, drawn up in compliance with Community legislation. They establish: the total sum made available by the State for the programming period (called Rotation Fund); the ceilings allocated for each group of Regions (less developed Regions, Regions in transition and more developed Regions); the percentages of financing of the shares divided between the community quota for each group of regions and for each type of ROPs and NOPs.

While considering that there may be greater variability, the share of national co-financing is roughly between 25 and 50% of the total resources made available. The total amount of the Rotation Fund for the period 2014-2020 is equal to 25.5 billion euro, to which are added 5.4 billion euro co-financed by the regions.

As the European Commission reports, through 75 national and regional programmes, Italy has been allocated EUR 42.77 billion from ESIF over the period 2014-2020. With a national contribution of EUR 30.96 billion divided by regional contributions and revolving fund, Italy has a total budget of EUR 73.73 billion to be invested in various areas, from jobs and growth to boosting research and innovation as well as protecting the environment and increasing labour market participation

The total resources available for Italy under the ESIF are therefore as follows (data in billions of euros):

Table 6 – Total resources for Italy

Structural funds (Community Funding) B€	42,77
Revolving Fund B€	25,5
Regional Contributions B€	5,4
Structural fund Total B€	73,73

Source: Eurostat

In the pie chart below are shown the percentages related to each fund within the ESIF.

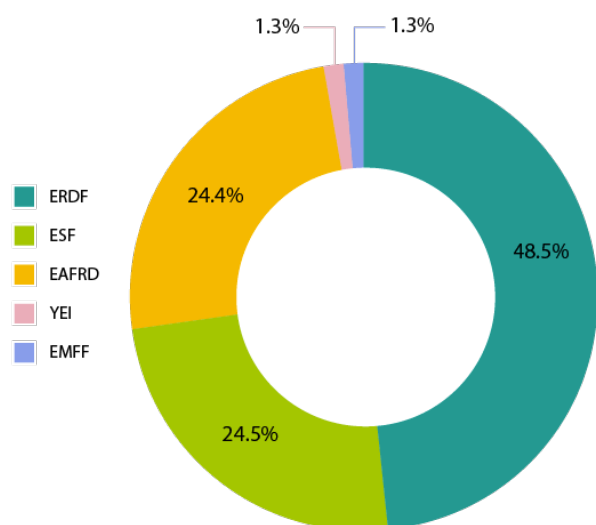


Figure 12 – Percentage of each fund in the context of the Italian ESIF

Source: European Commission (2017)

The European Commission has established that the ESIF in Italy will:

1. Develop an innovation-friendly business environment to boost companies' innovation and competitiveness, in particular SMEs.
2. Put in place efficient infrastructures and management of natural resources, supporting the shift towards a low-carbon economy.
3. Increase labour market participation and tackle youth unemployment, through investments in education, training and interventions in the labour market.
4. Promote social inclusion, reduce poverty, and improve and adapt education to labour market needs.
5. Improve administrative capacity, the justice system and the management of programmes.

All funds are designed to support Italy's socio-economic development.

The expected results (targets) showed in the below picture give an overall view of where Italy should

be on key parameters by 2020.

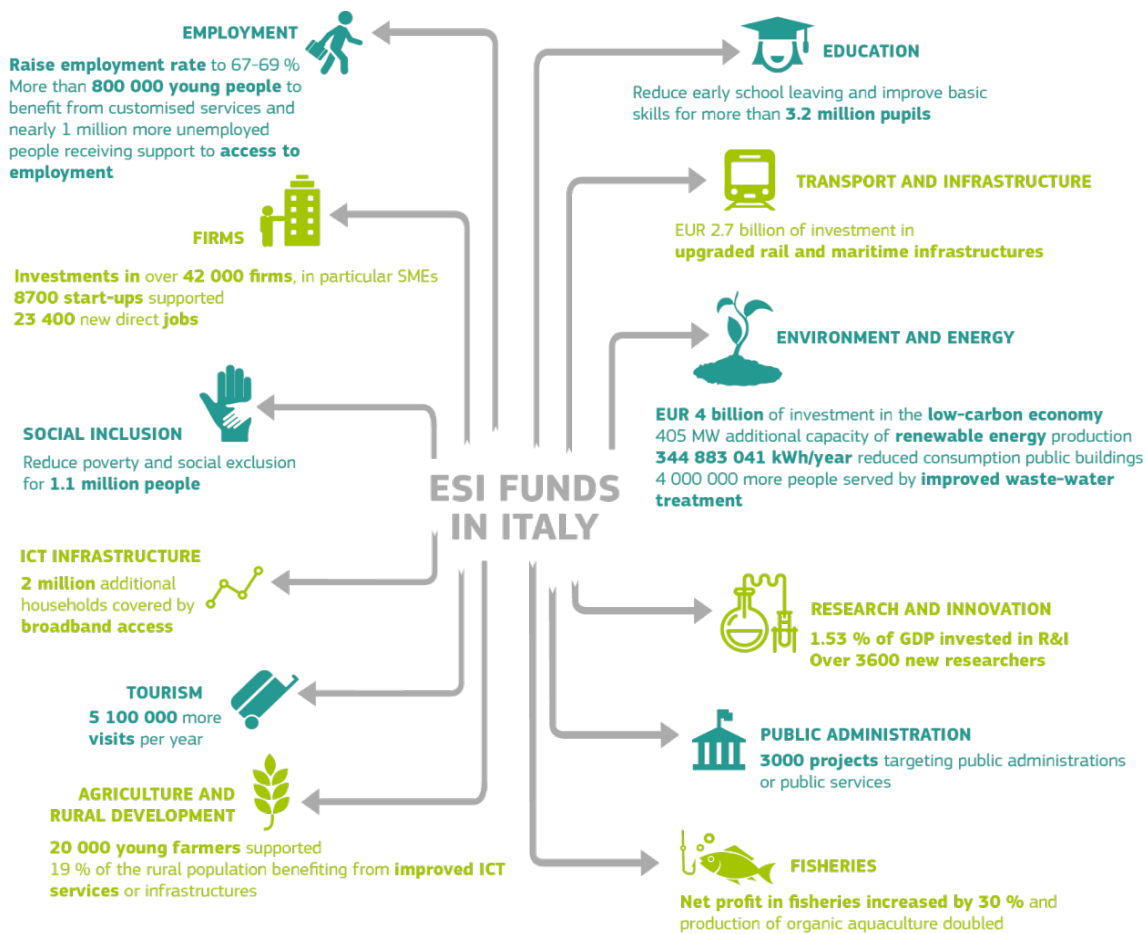


Figure 13 – Goal of the Italian ESIF
Source: European Commission (2017)

The “OpenCoesione” Portal

In 2013, the Italian government supported an initiative coming from the former Minister of Territorial Cohesion, Fabrizio Barca, introducing a very useful tool to discover, follow, check and evaluate the process of the European projects implemented in the country.

This tool is the open-data portal called “OpenCoesione”. It is considered the open government initiative on cohesion policies in Italy. On the portal there are navigable data on programmed resources and expenses, locations, thematic areas, programmers and actuators, implementation times and payments of individual projects. Everyone can evaluate how the resources are used in relation to the needs of the territories.

There are open data available for both 2007-2013 and 2014-2020 programming periods. At the moment, for both programming period, the monitored funding has been 96,3 billion and the monitored payment 62,7 billion, for the quantity of 948.416 projects. On the whole set of projects, the 40% percent have been already concluded, 41% are in progress and the rest already started. The intervention sectors of the funded projects are, 26% for transports, 14 % for R&D, 11% environment, 9% for measures aimed to employment, 9% instruction, 7% for tourism and culture, 6% for social inclusion, 4% to firm competitiveness, 4% to cities and rural areas, 3% for digital agenda, 3% for energy, 2% for public administration, 1% aimed to elderly and childhood. Another division made by the portal is the nature of investment, 52 billion have been invested in infrastructures, 26 billion in goods and services, 13 billion in business incentives, 4 in people contribution, 1,5 in capital injection, In Italy, the three highly funded projects have been:

1. The project completing the metropolitan line 1 of Naples, with 1.474.000.000 euros.
2. The project for the technological modernisation of the railway line *Palermo Centrale/ Brancaccio Palermo* and the node *Palermo – Fiumetorto*, with 1.077.252.563 euros.
3. The project completing and adjusting the motorway line *Salerno - Reggio Calabria*, with 1.022.682.096 euros.

The figure below shows the distributions of the funding within the Italian regions (Trento and Bolzano together). As darker is the colour as more billion have been invested in the region. It is evident as the less developed regions have received most of the funding, Campania at first place with 23 billion for 50.645 projects financed.

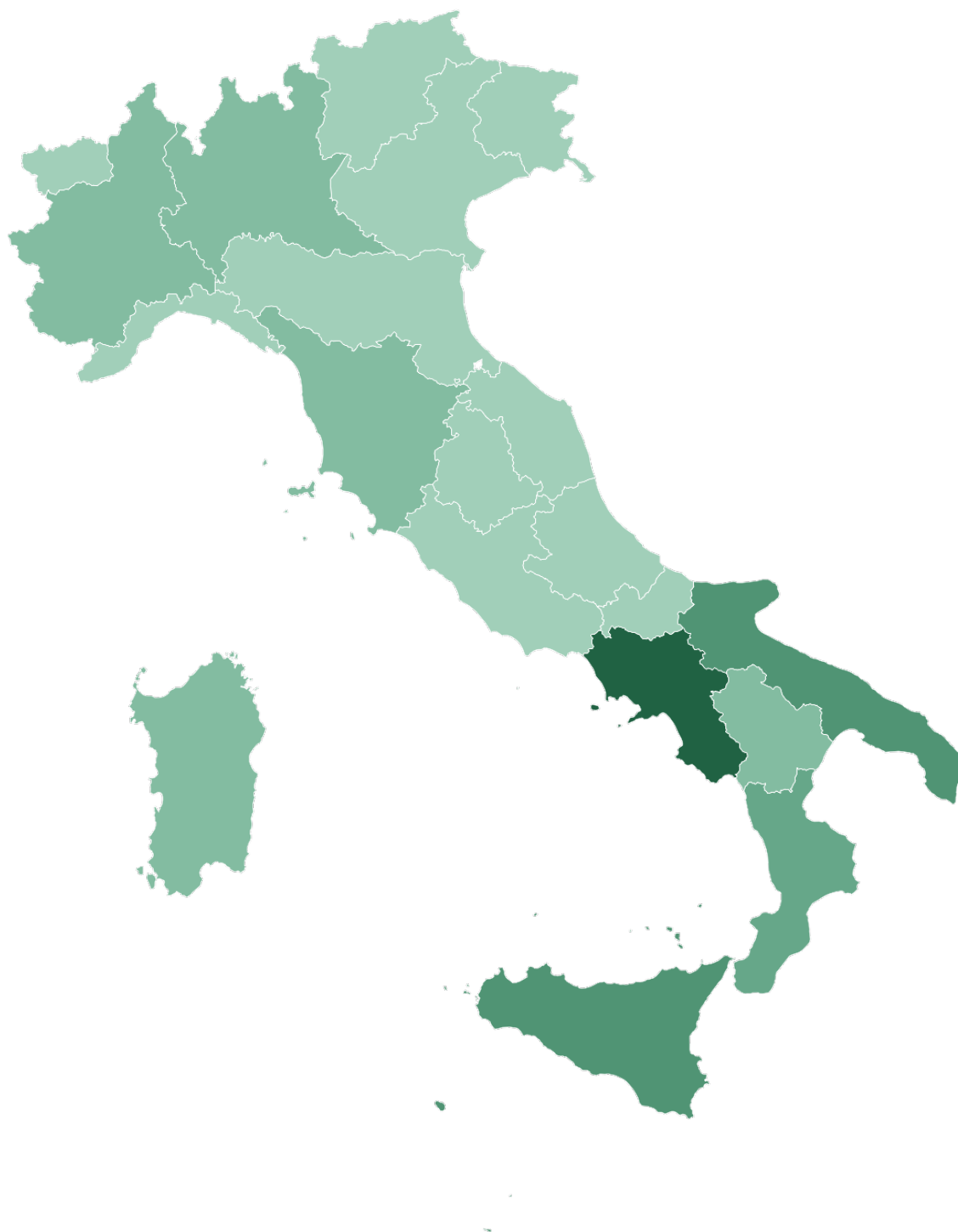


Figure 14 – Funding for Italian regions
Source: “*Opencoesione*” portal (2018)

Some Successful Projects implemented in Italy

In the 2017-2013 programming period in Italy have been implemented plenty of projects within the ESIF. These projects have involved all the actors into the dynamics of development. Here some interesting initiatives in the intersection of ESIF with Smart Specialisation are identified.

The project “*Technopoles* as hubs of innovation” comprises a network of 10 research sites for technological transfer in the Emilia-Romagna region. It incorporates six universities and four research institutes with 34 industrial research laboratories and 11 innovation centres, these 10 “*technopoles*” are hubs of industrial innovation and launch pads for high-tech enterprises. The project focuses on sectors and areas of business linked to the districts, using the production chains most typical of the region. The *technopoles* employs 1600 researchers, 560 of whom are newly employed young researchers. In total, they operate 132 research programmes and are making 520 solutions available for companies. The total budget has been of 241 million euros with an EU budget contribution to the project from ERDF of 94 million euros

The project called *Prestito d'onore* (Loan of honour) is also of interest. The Marche region backs ideas, using microcredit and entrepreneurship as tools to combat unemployment by offering individuals without a job the resources and training necessary to set up a business. Unemployed people aged from 18 to 60 or women aged over 35 who are in employment but wish to set up their own business are granted medium-term microcredit loans of between 25.000 and 50.000 euros and are provided with tailored guidance for the first year of business. Over the course of the three cycles, some 1300 new businesses have been established, half of them by people under the age of 35, and a third by women. The total budget has been 37.900.000 euros, EU budget contribution to the project from ESF 7.900.000 euros.

Biogas plant at *iasi* agrizoo farm is a project that supported the establishment of a small biogas plant in the Basilicata region, producing heat and electricity from the fermentation of livestock manure. Processing manure is an opportunity for income diversification by producing renewable clean energy. The project financed a 130 KW plant comprising an electronically controlled anaerobic digester system that produces biogas to feed a heat/electric power generator. The heat is used on farm and excess electricity is sold to the local utility company. The total budget has been 602.512 euros with Community contribution to the project from EAFRD of 199.953 euros

The fish farm enterprise “*Onda blu*” obtained support under Axis II of the EFF to improve quality and hygienic sanitary conditions of its premises and employees' safety. Equipment renovation included cold stores, tanks, building work, installation of purification system as well as a small boat purchase with the purpose of managing enterprise's aquaculture facilities at sea. The enterprise achieved its modernisation objectives and in a time of strong economic constraints managed to

increase employment by 2 units, one of which female.

The total budget has been 666.523 euros with an EU budget contribution from EFF of 379.918 euros. It is foreseen how the ESIF helped the implementation of these projects always with an eye on innovation facets.

Summarising, it is relevant to underline that the description of the funds and especially of these projects in Italy shows clearly that the ESIF are still the main European tool to bring innovation, helping RIS3 and implementing innovative projects in European regions, such as Italian regions.

Some more steps through the monitoring of the use of the financing should probably be done, where the *OpenCoesione* portal is a good example. Nonetheless funding coming from ESIF is always important for the regional development.

Chapter 4 – Italian Economic Structure

The Italian Economy

The Italian economy is one of the largest in the World by size. According to the World Bank (2016), Italy is 8th in the World for Gross Domestic Product (GDP) having 1.859.383,61 US\$ million and 30th for GDP per capita with a value of 30.669,00 US\$ per capita. Italy is a country strongly oriented to foreign trade, being the 9th in the world for merchandise export with 461,662.31 US\$ millions and 11th for merchandise imports with 404,659.51 US\$ millions.

Since the end of the World War II, Italy experienced deep economic changes. In that period, the country was mainly orientated towards the primary sector then it moved progressively towards an industrialisation. This happened especially during the years of the so called “*Boom Economico*” between the fifties and the sixties of the XX century (Daniele & Malanima 2007).

The economic growth has been constantly increasing until the beginning of the nineties of the XX century. Across the new millennium the Italian economy has suffered an impasse, at the same time the country progressively expands the service industries and a consequent enlargement of the tertiary sector (Daniele & Malanima 2007; Felice 2015).

From 2008, Italy experienced an economic crisis as most of the major World economies, suffering between the 2012 and 2013 of a real recession ending in 2014 with a slight growth in GDP of 0,1%. At this moment, the country is moderately growing with an annual GDP rate of growth of 0,90 in year 2016 (World Bank 2016).

The Italian economic system is characterized by some peculiarities. First, according to the Italian National Institute of Statistics (ISTAT) the public debt in proportion to the GDP in 2017 was to 132.6%, that means very high. Secondly, the tax burden in 2017 was attested to 44% also a very high figure. Finally, the presence of a vast shadow economy linked in part to political corruption and organized crime with a yearly value of 110 billion euro according to Organised Crime Portfolio (2016).

Primary Sector in Italy

The general census of agriculture ISTAT in 2014 established that, in Italy, there result active 1.620.844 firms that manage 12.856.048 hectares of agricultural surface of an estimated total surface of 17.8 million hectares. From 1970 to 2010 the Italian Utilized Agricultural Area (UAA) decreased by almost 5 million hectares (Pagnotta et al. 2014). The Utilized Agricultural Area is concentrated mainly in the South (45.7%).

According to CREA (2017) and ISTAT, the total value of agricultural production in year 2015 was € 54.438 million. As regard as crop production, the value is € 28.376 million (CREA, 2017). The largest products in terms of value are wine (€ 1.803 million), maize (1.434), oil (1.398) and tomatoes (910). For quantities produced, however, the main products of Italian agriculture are maize (84 million quintals), tomatoes (66), durum wheat (38) and wine grapes (35).

Also according to CREA (2017) and ISTAT, in 2015, the animal production generated € 16.290 million. Cow's and buffalo's milk production stands out (€ 4.040 million for 11.200 thousand tonnes) but meet production, if considered all together, places certainly at first with values as: beef (€ 3.109 million and 1.409 thousand tonnes), pig meat (2.459 and 2.058) and poultry (2.229 and 1.645).

The total production of sea and lagoon fishing, including crustaceans and molluscs, amounted to € 2.247 million in 2015. The catch covers only 30% of domestic consumption. (CREA 2017)

Italy has scarce mineral resources and is also a strong importer of energy. According to ISTAT and the report from the Italian Ministry of Economic Development (2017), there are no important iron deposits estimated at 40 and 100 million tons, coal with reserves of 500 million tons and oil with about barrels 1.4 billion. In Basilicata there is the largest oil deposit on land in Europe, with its 104.000 barrels per day covers about 7% of the national needs.

Secondary Sector in Italy

The secondary sector in Italy weights around the 30% of the National GDP (ISTAT 2016). The most relevant industries are mechanical, chemical, electronics, fashion, textile, leather, furniture, shipbuilding and metallurgy industries. The specificity of the Italian industry consists in the manufacture and production of manufactured articles, mainly in small and medium-sized companies (SMEs) which are the peculiar characteristic of the whole sector. Historically, a considerable weight, in the Italian economy, has the industry of construction and related processing.

The major industrial productions are located in the northern regions of Lombardy, Piedmont, Veneto and Emilia-Romagna. The North has traditionally constituted the core of Italian industry having key benefits such as the ease of trade with the rest of Europe, the production of hydroelectric energy thanks to the presence of the Alps, and large flat land.

Industrial activities in the form of SMEs sometimes are set up in industrial districts, this feature is common especially in the North-East of the country and along the Adriatic backbone. Paying specific attention to the Italian case, the scientific literature (Pyke et al. 1992) underlined the relevance of the industrial districts as productive systems, characterised by a large number of firms involved at various stages, and in various ways, in the production of a homogeneous product.

As said, most of the districts are settled in North Italy, with different ones specialising in different products of various types of complexity. From Pyke, Becattini & Sengenberger (1992) some examples are: Sassuolo, in Emilia Romagna, specialised in ceramic tiles; Prato, in Toscana, known for textiles; shoes are made at Montegranaro in Marche; mechanical engineering is carried out in Cento, in Emilia Romagna; Nogara, in Veneto, specialises in wooden furniture; whilst Caimeto sull'Oglio, in Lombardia, focuses in the toy industry.

The secondary sector in Italy has recently experienced a deep crisis. For Lucchese, Nascia & Pianta (2016) the World crisis started in 2008 has accelerated the decline of Italian industry. For the authors the industrial policy instruments introduced in recent years have not allowed a turnaround because a clear strategy able to revive the production system and reduce the technological gap with the main European countries was lacking. The measures taken were fragmented, little, selective and financed with resources that have proved modest results compared to severity of the crisis.

Data show as the crisis has profoundly affected the Italian Industry. Eurostat data reports for 2015, the manufacturing industry index was below the pre-crisis level of over 22% (Eurostat 2015).

For Lucchese, Nascia & Pianta (2016), the weak recovery in production suggests a risk of "hysteresis" - an industrial system that has reached a state of "normality" and is not able to return to pre-crisis levels. Since 2008, the Italian manufacturing system has lost position compared to the main European countries. Eurostat data shows as the production index grew in Poland, as in other Eastern European countries, and is higher than pre-crisis levels in Germany. Italy has instead experienced a dramatic reduction in production levels. Eurostat data report that overall, production EU28 manufacturing industry is below the levels of eight years ago.

Italy suffers from the competition of the emerging European and Worldwide economies which, thanks to the low cost of labour, manage to be very competitive. In fact, despite the great peaks of excellence of the Italian economy, this is largely made up of a production that does not require large human capital or has a large expense in research and development, and therefore suffers more than others.

Lucchese, Nascia & Pianta (2016), sustain that the decline in industrial production in Italy went hand in hand with a fall in industrial investment, stronger than in the rest of Europe.

In 2014, total investments at constant prices in the manufacturing sector were 21% lower than the pre-crisis level; their value at current prices fell from over 60 billion euro in 2007 to 49 billion euro in 2014. In 2013 and 2014 the fall in investments at constant prices compared to the previous year was 5,2%, respectively. and 3,4%, higher than that observed for added value. Eurostat National Accounts report that in 2015, there was a modest recovery in Italy, first sign of a recovery of investments, which took place two years later than in the main European countries.

Cozza & Zanfei (2014), write that Italy today has few leading companies in global markets, while in recent years some important Italian companies have been sold to foreign investors, whose commitment to maintain production, employment and spending on research and development (R&D) in Italy is uncertain. In recent years, foreign multinationals have also reduced R&D spending in Italy. To aggravate the economic situation, there is a lack of recovery in domestic demand. The collapse in domestic demand, hit companies that operated mainly on the domestic market, leading to a dramatic drop in production levels.

It is evident that this combination of industrial decline and stagnation can have far-reaching consequences on the demand for work and on the type of skills required by the economic system. In this context, the challenge for Italian industry is the very possibility of surviving as an industrial player at an international level; the thesis of this article is that in order to defend and reconstruct Italy's technological and productive capabilities, it is required a more active role of industrial policy.

Tertiary Sector in Italy

The tertiary sector in Italy represents the most important sector of the economy, both for the number of employed (67% of the total) and for weight in the GDP (68%) (ISTAT 2016). The sector is by far the most dynamic. *Confcommercio* (the Italian Company Federation) reports in 2016, that over 51% of the five million companies operating in Italy today belong to the services sector. Important activities in Italy are tourism, commerce, services to people and businesses (advanced tertiary).

As pointed out by Ferri, Murro & Rotondi (2015) from the first decade of 2000, the banking sector experienced a decrease in the number of employees, due to the diffusion of new information technologies. The financial sector, however, retains a central role in Italy, as banking groups often own important industries, insurance companies, real estate and publishing groups.

Tourism is, as referred, one of the main economic sectors of Italy. The country was, in 2017, the fifth most visited in the world with more than 60 million international tourists arriving, a figure growing compared to previous years. According to estimates by the World Travel and Tourism Council, in 2017 the tourism industry as a whole (national and international tourism) would have contributed, with 147 billion euros, 9,4% to the country's GDP formation, employing approximately 2,5 million people, accounting for 10,9% of national employment.

From the hospitality point of view, the yearly ISTAT report (2017) noticed 33.163 hotels and 178.443 non-hotel accommodation. The structures register 403 million presences, an increase of 2,6 % compared to 2015, with an average stay of 3,4 nights. In the same year the revenue index in the hospitality register an increase of 0.7 % compared to the previous year. The tourist flows in hotels and non-hotels accommodation has been positive, both for residents and non-residents of tourism

demand. Within the EU frame, Italy is places in third position for presences, with an average foreign presence higher than the EU average (49.5 % against 45.5%). In 2016 the Italian tourism demand is composed by 66 million travels and 356 million stays. Compared to the previous year, the travels increase of 13,7 %, mostly leaded by short stays (1-3 nights), on the other side the average stays lightly reduce settling at 5,4 nights.

The decrease of tourism flows, which between 2012 and 2015 have caused the loss of almost 28 million travels and more than 166 million nights, stopped in 2016 when the tourism demand expressed by residents increase of almost 8 million.

In 2016 the leisure travels are almost nine times more numerous then business travels with similar quotes between short stays (1-3 nights) and long stays (4 or more nights). These long stays are more concentrate in the summer trimester (63%). In general, Italian residents compared to the other European citizens, travel much less (an average of 0,8 travel per year compared to the 2,4 of Europeans).

Italy is considered one of the main tourism countries in the European context, placing at the third place in 2016 for nights stays after France and Spain according to Eurostat, (2016). On the line of the night stays values, according to ISTAT database, the 5 main tourist region in Italy, have been:

Table 7 – Nights stays in 2016 (unit)

Veneto	65.392.359
Tuscany	44.216.503
Emilia Romagna	37.836.805
Lazio	37.194.096
Lombardy	32.148.774

Source: ISTAT data

This is an important data we are going to take into account in the next chapter while doing the analysis.

The Special Case of the Italian “*Mezzogiorno*”

The so-called “*Mezzogiorno*” is identified as an Italian macro-region comprising the Italian Southern part and the Italian Islands. Generally, the definition includes the NUTS2 regions of Abruzzo, Puglia, Basilicata, Campania, Calabria, Molise, Sicily, and sometimes Sardinia.

Some interpretations also include the southern and eastern parts of Lazio, since they were once part of the Two Sicily’s Kingdom and southern dialects are still spoken. The island of Sardinia, for cultural, linguistic and historical reasons has less in common with the aforementioned regions, however it is frequently included within “*Mezzogiorno*” for statistical and economical purposes.

The “*Mezzogiorno*” have always been addressed by financial aid from both the Italian government and the European Union. This is because these regions have always been considered lagging, both from a socio-economic point of view and a socio-economic point of view, compared to the Centre-North regions of Italy. The funding so, is aimed to recover the disparities between North and South in line with the cohesion policy of European Union and Italy as well.

In the last decades, due to the financial crisis and as well as to other socio-economic reasons, the resources invested through financial aid in the *Mezzogiorno* have been reduced. Scalera & Zazzaro (2010) pointed out how that, from the year 2001, in a context of decreasing public expenses, the quote of financial aid to the *Mezzogiorno* went significantly down. For these authors, this trend has been even stronger in 2007-2009 because of the crisis and the end of the 2000-2006 EU programming period.

For Armao (2016), in the last years because of the aforementioned trend, the Italian government from one side have substantially reduced the ordinary expenses for infrastructures and cohesion, on the other side have tried to compensate the effects of this financial arrangement by using Structural funds. According to the report of *Banca d'Italia* (2014), between 2000 and 2008, the distributions of financial aid towards the “*Mezzogiorno*” have been around 56 billion euros per year (3,9% of the national GDP), with light yearly variation.

In the 2009-2011 biennium, the sharp decline in output and the growth in net distributive flows, have even raised the incidence to 4,4% of GDP. These flows subsequently significantly reduced, up to around 44 billion in 2012 (3,2% of GDP).

In Italy, a specific fund is aimed to underdeveloped areas. It is the Fund for Development and Cohesion (FSC), financing instrument of the Italian government for underutilized areas of the country. The financial flows coming from this fund has been gathered in a plan called the *Mezzogiorno* Masterplan. The Masterplan also called “*Patti per il Sud*” constitutes the reference framework within the governments operational choices are set. It has been defined during an intense interlocation of the government with the regional administrations and metropolitan cities of *Mezzogiorno*, for the purpose of preparing specific strategic and operational plans by appropriate inter-institutional agreements.

The financial resources allocated to the “*Patti per il Sud*” under the Development and Cohesion Fund for the 2014-2020 programme were assigned by the Cipe (*Comitato Interministeriale per la Programmazione Economica* - Inter-Ministerial Committee for the Economic Planning), for a total of € 13.412 billion. There are 15 Masterplans, one for each of the 8 Regions (Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicily, Sardinia) and one for each of the 7 Metropolitan Cities (Naples, Bari, Reggio Calabria, Palermo, Catania, Cagliari and Messina)

The following table illustrate the sharing between the fund.

Table 8 – *Patti per il Sud* sharing

Regions	FSC Resources 2014-2020 €	FSC Resource until 2017 €
Campania	2.780.000.000	511.040.000
Calabria	1.198.700.000	220.400.000
Basilicata	565.200.000	103.900.00
Abruzzo	753.100.000	138.500.000
Molise	378.000.000	69.500.000
Sardegna	1.509.600.000	277.600.000
Puglia	2.071.500.000	380.800.000
Sicily	2.320.000.000	n.d
Metropolitan cities		
Reggio Calabria	133.000.000	24.500.000
Catania	332.000.000	61.000.000
Palermo	332.000.000	61.000.000
Bari	230.000.000	41.800.000
Napoli	308.000.000	56.800.000
Messina	332.000.000	61.000.000
Cagliari	168.000.000	30.900.000

Source: ServizioStudi/camera.it (2016)

Impacts of ESIF on Regional Development

A great number of researchers investigated about the impact of the ESIF on the Regional Development and the convergence processes within the European Regions. A large quantity of literature and empirical verifications about these impacts has been produced in last decades. The empirical evidence has often provided mixed results, sometimes even contradictory. Definitely, there is not a common vision among the researchers about the impact of ESIF on the economic growth and the regional convergence process. Some studies do not find a relevant impact of the ESIF on the economic growth and the convergence process.

In the study of Boldrin & Canova (2001) the author underlines that every economic indicator they have checked suggest that the initial relative positions remain largely unaltered in the long run, and that the process of economic growth affects all regions in an almost proportional way. Anyway, it must be mentioned that they observed a light change, in labour productivity and Total Factor Productivity indices, change toward convergence.

For Boldrin & Canova (2001) explicit divergence is never present saying “very poor regions do not “fall off the cliff”, on the contrary some of them becomes richer than average (one example is Ireland) when markets are allowed to operate” concluding that “massive convergence in level is not present either.”

Ederveen, Gorter, de Mooj & Nahuis (2002) confirm that there is no consensus about the impacts of cohesion policy on convergence. A large number of case studies, model simulations and some econometric analyses do not paint a consistent picture. Researchers draw different conclusions from different studies, ranging from a dismal negative impact of cohesion policy on economic growth of lagging regions to wildly positive assessments of projects, yielding rates of return that are unheard of in the private sector. For these authors, their model simulations measure the potential impact of cohesion policy, whereas econometric analyses measure the actual impact so the estimates from the first type of study are expected to be higher than the estimates of the second. The differences are not necessarily inconsistent. Rather, the various results are complementary: the potential impact can be set against the actual impact. To bridge the gap is of course the challenge of future reform of cohesion policy.

Dall’erba & Le gallo (2008) analyse the impact from a spatial point of view bearing that, since the majority of these funds finance transportation infrastructures (especially in the past funding), this induce industry relocation effects, their impact on regional development is not clear yet but surely needs to be seen in the light of the spill-over effects that their spatial allocation implies. In other words, estimating the impact of ESIF on regional growth without including the presence of significant spatial effects would lead to unreliable results. In addition, because of the way ESIF are allocated, we paid attention to the potential risk of endogeneity of the funds.

Those two points had never been addressed in the literature before the Dall’erba and Le gallo (2008) survey. Based on the spatial diffusion properties of the spatial lag model, they evaluate the impact of shocks proportional to the average amount of funds distributed during the period for all the regions (equal shock) and the impact of shocks proportional to the real value of funds as a ratio of GDP for each region (differentiated shocks). In the first case, the extent of the impact on the targeted region’s growth does not varies much from one region to another. In the second case, the extent of the impact on most peripheral regions increases since they are the main beneficiaries of these funds.

Other authors do find a clear empirical evidence for a positive impact of European Structural funds. For example, very optimistic results are obtained in the studies of De la Fuente (2002) using data from the Spanish regions. The author quantifies the contribution of the 1994-99 Cohesion and Structural Funds (CSF) to output and employment growth in the Objective 1 regions of Spain using a regional production function and an employment equation estimated with Spanish regional data.

The results do suggest that the contribution of Structural and Cohesion Funds, to the growth of employment and to the convergence of assisted regions with the rest of the country, has been considerable. For the Objective 1 regions as a whole, the CSF has added around one percentage point per year to output growth, and 0.4 points per year to employment growth (or 27,000 new jobs). In the medium run, the accumulated impact on employment exceeds 300,000 new jobs, and the contribution to the growth of output in the less favoured regions exceeds six percentage points. This amounts to 20% of the initial gap in income per capita between the Objective 1 regions and the rest of Spain.

De la Fuente (2002) results suggest that the return on public CSF expenditure has been quite high. The author points out how, the so called, “social” rate of return on this expenditure has been around 30%. Although this figure does not take private costs into account and should therefore not be compared with more standard rates of return, it does suggest that productive public spending has been an important source of productivity gains in assisted regions. Overall, the estimates presented by De la Fuente (2002) indicate that structural policies have worked quite well in Spain in terms of their stated objectives. They have, in particular, contributed significantly to the growth of the poorer regions and to the reduction of regional disparities.

Finally, the last aspect taken in consideration by this author is the fact that, the estimated returns on public investment are much higher in some of the richest Spanish regions than in most of the territories that are eligible for assistance under Objective 1. It follows that the overall impact of EU aid would have been considerably higher (and Spain's convergence toward average EU income correspondingly faster) if efficiency considerations had been given greater weight in the allocation of these funds.

Percoco (2005) estimated a supply-side model using a panel of regional data over the period 1970-94. The author finds a high volatility in the level of growth rates induced by Structural funds expenditure allocated in six Italian Southern regions (Molise, Campania, Puglia, Basilicata, Calabria and Sardinia) over the period 1994-1999. Such differences, for the author, are attributed to the different behaviour of regional administrations in allocating the resources among the productive factors: the regions (Puglia, Basilicata and Sardinia) that have allocated the funds in favour of production inputs with a high marginal productivity are those that have obtained the best performance in terms of increase of output.

Esposti and Bussoletti (2008), do find positive impact of the Funds on Economic growth and convergence. In their paper, first they confirm as the convergence rate may significantly vary across alternative specifications and estimators. Secondly, they sustain as this variability seems less evident, as estimates of the conditional convergence rate have ranged between 1,9% and 4,9%, not so different

from what usually obtained in cross-sectional studies (2-3%). Regarding to conditioning variables, a positive impact of ESIF on Objective 1 regions is confirmed over the whole EU space, although its statistical significance and magnitude may vary across alternative estimators.

Rodrigues and Novak (2013) analysis has been aimed at testing whether successive changes in how European Cohesion policy has been implemented across regions of Europe have led to improvements in the impact of Structural funds expenditure on economic growth. The results indicate that this has been the case, there has been a marked improvement in the returns of investment in Structural funds between the second and third programming periods. For Rodrigues and Novak (2013) the constant scrutiny and feedback which are at the heart of the policy making process since the 1989 reform of the Structural funds has created a learning process which has contributed to an improvement in the effectiveness of intervention. Learning processes have also resulted in a more appropriate expenditure of the ESIF, due to a progressive shift in their expenditure priorities. For these authors, the gradual move from direct support of firms and transport infrastructure which yielded limited returns in previous programming periods towards other forms of infrastructure and human resources may have also contributed to this greater effectiveness.

There are many reasons for these mixed results. The conflicting results which the literature reaches can partly depend on some problems linked to the nature of the data used in the analyses. The low quality of Structural funds data at the regional level and a number of methodological problems.

For Aiello & Pupo (2009), it is necessary to underline that there is not a complete dataset of EU funds at a regional level neither from the territorial point of view (because of the changes of the regional administrative borders of some countries and the various enlargements of the EU) nor from the financial point of view (the data related to EU spending are classified on a regional base and for typology of intervention only from the mid-1990s).

For De la Fuente (2002) there are no study using the amount of ESIF spent by each region but all in many of the literature the programmed or committed amounts are not differentiated. Basically, some studies do not distinguish between payments and commitments. Also for Mohl & Hagen (2009) the time lag of the implementation and related effectiveness has not yet been analysed and may even vary from case to case.

Other critical aspects of these results concern the methodology used to face the problems of the limited size of the sample, the potential endogenous nature of the regressor, the non-observable heterogeneity across regions as well as the effects of the business cycle.

The presence of these issues could have influenced the measurement of the impact of the ESIF and explain the conflicting results reached by the different researches.

In the end, it can be said that the Italian economy have experienced a deep crisis in the last years. The

primary and secondary sector are still in a trend of loss which started years ago. Nevertheless, Italy can still be considered one of the main economies in the world. Tourism industry and some parts of the tertiary sector are still growing constantly against the trend of other economic sectors. The *Mezzogiorno* suffered and still suffers, but small steps have been made through the cohesion with the other regions.

In the last section, the attention was on cohesion and regional development facets showing how effectiveness may exist in ESIF implementation.

Chapter 5 –Effectiveness of the Structural funds for Regional Development

Methodology

In this chapter we present the main empirical exercise of this Dissertation. The study uses a variegated analysis which aims to cover as many aspects as possible to better investigate the various dynamics of regional development, from the effectiveness of the European Structural funds to the economic development of the Italian regions up to the internal social development in the regional context, of tourism development, also through the use of the above-mentioned funds.

The data used for the analysis have been taken from different sources, mainly the following:

- Eurostat database: the main database from European's data at national, regional or even more specific level.
- ISTAT database: the database from Italian National Institute of Statistics.
- OECD database: The Organisation for Economic co-operation and development database.
- *OpenCoesione* database: the database from, previously treated, open data website made by the Italian government in 2013.

The figures compare many recent figures but for the statistical analysis, it was preferred to pay attention to the period 2007-2013 as it coincides with the implementation of a complete and closed programming period whose results can easily be understood.

Below are illustrated the starting data, meaning the data used to derivate the Indicators used afterwards in the analysis.

The variables are:

- The ESF Community Funding received by each of the 21th Italian regions NUTS2 in the 2007-2013 programming period and also in the 2014-2020 programming period.
- The ERDF Community Funding received by each of the 21th Italian regions NUTS2 in the 2007-2013 programming period and also in the 2014-2020 programming period.
- The Gross domestic product (GDP) at current market prices, in euros, per each Italian regions NUTS2 in a range of 10 years, from 2007 to 2016
- The Average annual population per each Italian regions NUTS2, in thousands, in a range of 10 years, from 2007 to 2016.
- The number of employed per each Italian regions NUTS2, in thousands, in a range of 10 years, from 2007 to 2016.
- The Research and Development (R&D) personnel and researchers per each Italian regions

NUTS2, in units, in a range of 10 years, from 2007 to 2016.

- People at risk of poverty or social exclusion per each Italian regions NUTS2, in percentage, in a range of 10 years, from 2007 to 2016.
- Nights spent at tourist accommodation establishments per each Italian regions NUTS2, in units in a range of 10 years, from 2007 to 2016.

The methodology therefore, have taken into consideration this variety of data and have been aimed at a statistical analysis, to see the internal correlation between specific indicators and also, the correlation of these with the European Structural funds, trying to highlight an effectiveness of this last.

The main software used for the analysis have been:

- SketchBook, a design software used to build the maps
- MS Excel, the Microsoft tool to manage data
- SPSS statistics, version 24th the one available from University of Algarve.

Using the previously illustrated data, the analysis started with a transformation and processing of data into more meaningful indicators, which are more congenial and more useful to explain the effectiveness of the European Structural funds in the Italic context.

The transformation was carried out by crossing the data and relating them to the context where they are inserted. Concretely, most of the transformations were in the direction of weighing the data by size, population and economic situation of the region and then relate them to the Structural funds received by the same region.

In fact, the first data been elaborated and transformed was precisely the Structural funds related figures. By relating the funding received by each region by the regional average population, it was created a ratio between the funds received and the population of the region.

The ratio allowed to identify various classes of regions based on the funds obtained and, following these values, two different maps were created using the design software SketchBook, highlighting the above-mentioned ratio. The maps refer to the two programming periods 2007-2013 and 2014-2020; showing in a grey-scale, the regions which received less of the Structural funds per capita, represented in clear and those that received most of the funds, highlighted in darker.

This process of data presentation is very useful to have a clear and immediate visual impact of the regions which have received more or less subsidies.

After this step, the empirical exercise of the Dissertation started with the second part of the analysis on the evolution of indicators. In this section, as previously mentioned, original variables were transformed and processed to derive indicators that are more congenial to the analysis. We derived GDP per capita, per region, per year, by relating the yearly average annual population by region to the regional GDP of the same year. This allowed to easily derive the GDP per capita, also through Excel, the software used to build the dataset, then derived a line chart showing the evolution of the given GDP per capita by region and by year.

This chart is extremely useful by providing a direct visual impact of evolution, or inversion, of GDP per capita within the Italian context.

At this point, many other variables followed a similar process. The Employment rate was derived by the ratio between the population resident and the number of employed in the Region. The data relating the number of employees in research and development sector, the unit has been transformed into a percentage. The Indicator refers to personnel and researchers of these sectors within the total region, simply by calculating the relationship between workers employed in this sector and the population of the region. This data is crucial because overlook the value a region gives to innovation.

On the same percentage perspective, it is the Indicator referred to population at risk of poverty. This indicator is important to identify and highlight the most disadvantaged regions within the Italian context.

Last indicator, but not less important, indeed, is a variable that looks at the tourism sector. This is because tourism is one of the main economic sectors in Italy and it is therefore important to analyse this aspect. So, through a relationship between nights stays and population residing within the region, it was possible to calculate a data known as ‘tourism intensity’. The data reflects the tourist potential of a region more directly than the night stays as it relates to the size of the region.

The excel dataset was then constructed with the result of the six indicators.

At this point, we started the analysis with the aim of individuating the correlation among the variables and with the European funding.

First of all, another dataset showing the growth of the indicators in the range of years taken into account (2007-2016) was built. The Indicator’s growth is useful to see the trend of every indicator, understanding into the whole context how the trend is behaving.

To do that it was used a simple growth formula showed below:

$$GrI = \frac{I^{2016} - I^{2007}}{I^{2007}} \quad (1)$$

Where:

Gr: is growth.

I: is the selected Indicator.

2016 and 2008: are the years taken in account.

The formula was applied to every value building a new dataset called Indicator's growth dataset.

From this dataset is possible, even from a first look, to see the Indicator's trend.

This is the reason way a further was made. The use of MS Excel Correlation function to investigate about the relation between the 2007-2013 Community funding and the set of indicators.

This function permits the creation of a correlation coefficient from 1 to -1. 1 is a total positive correlation and -1 is a full negative correlation.

The equation for the correlation coefficient:

$$\text{Correl}(\text{CF}, \text{I}) = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}} \quad (2)$$

Where:

CF: stays for Community Funding.

I: stays for Indicators.

\bar{x} and \bar{y} : are the Funding and Indicators means.

The analysis went deeper but still there was the need of going further. To do so, it was built another dataset which, starting from the growth data, shows Indices for each indicator.

These Index scores are between 0 and 1 where 0 is the lowest value and 1 the highest.

The formula used to build the Index is the following:

$$I^i = \frac{(V^i - V^{\min})}{(V^{\max} - V^{\min})} \quad (3)$$

Where:

I: stays for the Index

i: is the region i

V: is the variable

This Index dataset was the starting point for the SPSS Statistic analysis.

A Cluster analysis was done to individuate the various clusters among the data, in this sense a very important figure is the Dendrogram graph which gives a direct impression of the Clusters made.

A map showing this clusters have been created, using SketchBook,

After having gathered the data, a dataset was built, and it is the starting point for the SPSS Statistic

analysis. The SPSS analysis focused mainly the Cluster analysis, done to create the homogeneous groups of regions in the defined indicators.

ESIF Distribution by Italy Regions

The starting point of the analysis was collecting the data about the Community funding received by each region in the two programming periods taken into account 2007-2013 and 2014-2020 (the current one). As previously explained, in the analysis are considered only the Community funding coming from ERDF and ESF funds because of their strong relation with the Regional Development dynamics.

In the below table is shown this distribution per regions, by single fund and the whole funding per programming period.

Table 9 – Division of the Community funding

	2007-2013 ESF Community Funding €	2007-2013 ERDF Community Funding €	2007-2013 Community funding (ESF & ERDF) €	2014-2020 ESF Community funding (Euro)	2014-2020 ERDF Community funding €	2014-2020 Community Funding (ESF & ERDF) €
Piemonte	397.283.869	426.119.322	823.403.191	436.145.000	482.922.370	919.067.370
Valle d'Aosta /Vallée d'Aoste	32.911.544	19.524.245	52.435.789	27.786.275	32.175.475	59.961.750
Liguria	147.619.048	168.145.488	315.764.536	177.272.384	196.272.620	373.545.004
Lombardia	338.017.613	210.887.281	548.904.894	485.237.258	485.237.258	970.474.516
Provincia Autonoma di Bolzano/Bozen	60.745.159	26.021.981	86.767.140	68.310.599	68.310.599	136.621.198
Provincia Autonoma di Trento	61.198.969	19.286.428	80.485.397	54.989.992	54.334.047	109.324.039
Veneto	349.019.589	207.939.920	556.959.509	382.015.911	300.155.358	682.171.269
Friuli-Venezia Giulia	120.355.589	74.069.764	195.425.263	138.213.907	115.389.592	253.603.499
Emilia-Romagna	295.929.210	128.107.883	424.037.093	393.125.091	240.947.636	634.072.727
Toscana	313.045.574	338.466.574	651.512.148	366.481.608	396.227.254	762.708.862
Umbria	98.984.087	149.975.890	248.959.977	118.764.401	206.146.602	324.911.003
Marche	111.554.330	112.906.728	224.461.058	143.989.809	168.691.644	312.681.453
Lazio	368.038.775	371.756.338	739.795.113	451.267.357	484.532.597	935.799.954
Abruzzo	127.719.591	139.760.495	267.480.086	71.251.575	115.754.890	187.006.465
Molise	37.665.371	70.765.241	108.430.612	23.853.230	52.950.497	76.803.727
Campania	559.000.000	3.432.397.599	3.991.397.599	627.882.260	3.085.159.382	3.713.041.642
Puglia	639.600.000	2.619.021.978	3.258.621.978	772.409.449	2.788.070.047	3.560.479.496
Basilicata	128.946.235	300.874.549	429.820.784	144.812.084	413.015.666	557.827.750
Calabria	430.249.377	1.499.120.026	1.929.369.403	254.339.876	1.529.877.755	1.784.217.631
Sicilia	1.049.619.576	3.269.802.550	4.319.422.126	615.072.321	3.418.431.018	4.033.503.339
Sardegna	291.716.470	680.671.765	972.388.235	143.989.809	465.489.541	609.479.350

Source: Own elaboration

From the data collected in the dataset, has been derivate a Ratio showing the relation between resident population in the regions and the amount of Community funding received by each region for both the programming periods 2007-2013 and 2014-2020.

Table 10 – Community Funding Ratio

-	Ratio 2007-2013 Community funding (ESF & ERDF)	Ratio 2014-2020 Community funding (ESF & ERDF)
Piemonte	0,2	0,2
Valle d'Aosta/Vallée d'Aoste	0,4	0,5
Liguria	0,2	0,2
Lombardia	0,1	0,1
Provincia Autonoma di Bolzano/Bozen	0,2	0,3
Provincia Autonoma di Trento	0,2	0,2
Veneto	0,1	0,1
Friuli-Venezia Giulia	0,2	0,2
Emilia-Romagna	0,1	0,1
Toscana	0,2	0,2
Umbria	0,3	0,4
Marche	0,1	0,2
Lazio	0,1	0,2
Abruzzo	0,2	0,1
Molise	0,3	0,2
Campania	0,7	0,6
Puglia	0,8	0,9
Basilicata	0,7	1,0
Calabria	1	0,9
Sicilia	0,9	0,8
Sardegna	0,6	0,4

Source: Own elaboration

Following the Ratio, it was possible to draw, two maps showing the dispersion of the data. The maps are in grey-scale, the lightest grey regions are the regions which received less funding per inhabitant, they get darker as more funding *per capita*.

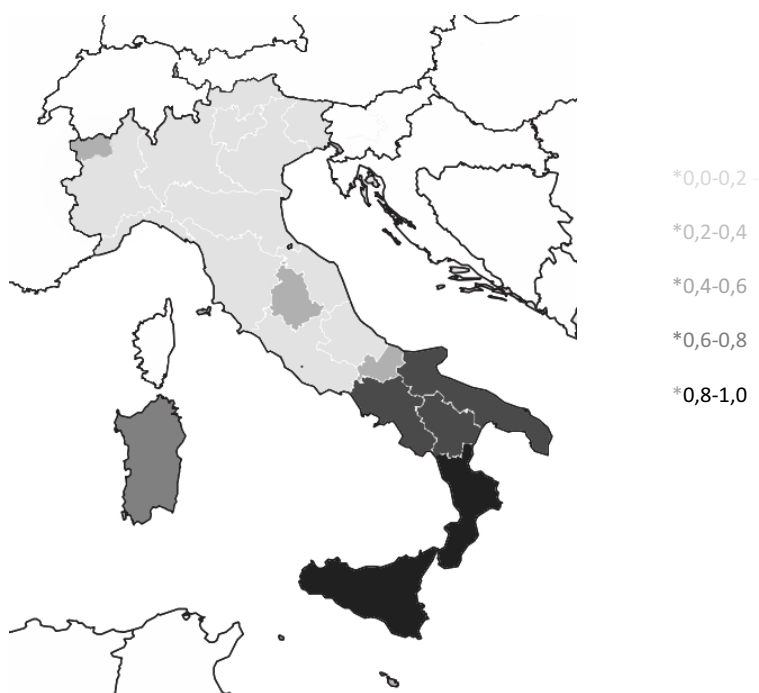


Figure 15 - Ratio 2007-2013 Community funding and population

Source: Own elaboration

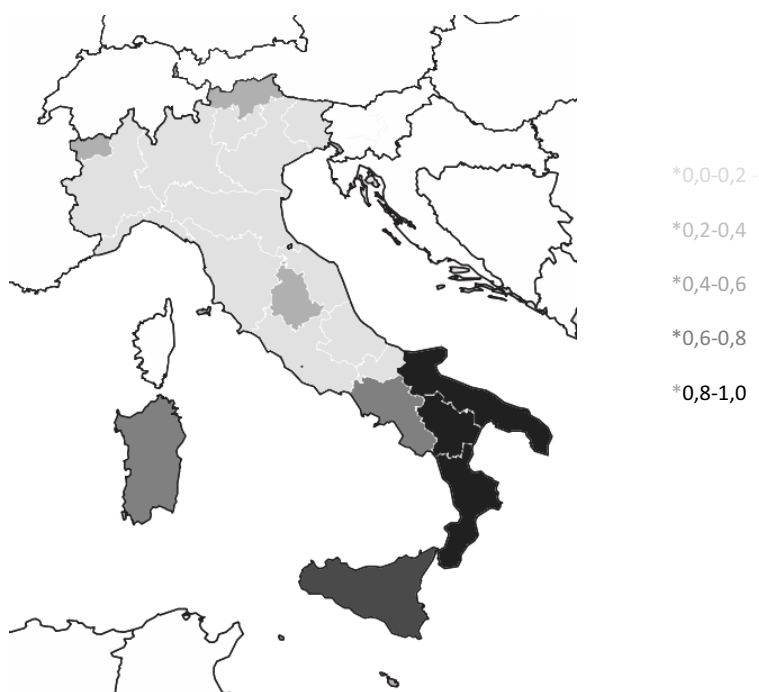


Figure 16 - Ratio 2014-2020 Community funding and population

Source: Own elaboration

From both figures the first impression is that the Ratio, and so on the funding, somehow is related with the development classifications previously treated which ranks the European regions in more, transitory and less developed regions. The southern regions have a higher ratio because they received

most of the funds, even related to the population. Calabria region, in both maps, is the one that received the most. Sicily region improved this Ratio between the first and second programming periods analysed, on the other side Basilicata and Puglia regions have had less ESIF funds per inhabitant.

A peculiar aspect in this Ratio analysis is that Val d'Aosta, and Bolzano regions in the second programming period, have a higher ratio compared to the other northern regions, even if they are in pretty much the same economic condition. This could be given to their small proportion or also to their border position.

Evolution of the Selected Indicators in Italy

In this section the main Indicators used for the analysis are build. First, the GDP data, the Indicator used is the GDP per capita, relation between GDP at current market prices and average resident population in the region.

The following table shows this distribution of GDP in the Italian Regions.

Table 11 - GDP per capita Indicator

-	GDP per capita 2007 €	GDP per capita 2008 €	GDP per capita 2009 €	GDP per capita 2010 €	GDP per capita 2011 €	GDP per capita 2012 €	GDP per capita 2013 €	GDP per capita 2014 €	GDP per capita 2015 €	GDP per capita 2016 €
Piemonte	29.699,7 92	29.509,7 10	27.437,2 44	28.434,9 90	29.015,6 29	28.004,9 71	28.264,4 87	28.318,6 64	28.968,2 83	29.404,7 29
Valle d'Aosta/Vallée d'Aoste	34.768,0 00	35.611,1 11	33.771,6 54	35.330,7 09	35.897,6 38	35.882,8 13	34.398,4 38	34.453,1 25	34.406,2 50	34.929,1 34
Liguria	30.431,1 87	30.996,8 53	29.513,8 19	29.308,2 23	29.918,3 42	29.379,1 59	29.094,1 62	29.752,5 19	30.410,9 07	30.795,2 81
Lombardia	35.127,8 35	36.189,5 25	34.286,8 70	35.585,3 16	36.068,3 84	35.196,9 97	34.662,5 40	35.201,1 41	35.916,9 42	36.602,8 56
Provincia Autonoma di Bolzano/Bozen	36.695,2 97	37.532,3 89	36.969,9 40	37.934,3 94	38.978,2 61	40.182,3 53	40.433,8 52	40.717,6 02	41.544,2 31	42.585,0 86
Provincia Autonoma di Trento	33.956,6 93	34.036,9 65	33.117,3 08	33.591,6 03	34.117,4 24	33.887,0 06	34.386,9 16	34.549,3 48	34.587,3 61	35.003,7 17
Veneto	30.788,4 37	30.505,5 95	29.233,9 99	29.689,8 46	30.524,0 34	29.923,1 40	29.876,6 51	30.347,0 67	31.021,3 37	31.666,6 67
Friuli-Venezia Giulia	29.873,7 62	29.445,9 02	27.751,6 34	28.709,3 88	29.284,3 14	28.364,8 98	28.587,9 48	28.812,7 04	29.793,3 01	30.274,5 90
Emilia-Romagna	33.354,4 87	33.382,0 99	31.340,9 62	31.839,1 46	32.940,9 22	32.320,1 81	32.422,9 99	33.012,5 90	33.646,4 37	34.613,8 46
Toscana	28.901,4 59	28.916,8 71	28.138,7 61	28.289,4 81	28.859,5 93	28.658,7 39	28.395,8 39	28.977,8 78	29.389,7 04	29.986,3 75
Umbria	26.200,0 00	26.248,0 00	24.471,6 55	24.742,9 54	24.840,6 29	24.098,5 44	23.628,3 48	23.257,8 13	24.038,0 74	23.978,6 52
Marche	27.147,5 63	26.710,5 61	25.796,7 64	25.772,1 11	26.103,1 59	25.497,1 02	25.181,4 67	25.936,2 11	26.126,6 97	26.598,3 13
Lazio	34.473,2 23	34.106,6 30	33.246,8 57	33.244,4 48	33.556,6 88	32.078,2 07	31.092,3 47	30.911,7 50	31.069,6 10	31.551,8 41
Abruzzo	23.054,4 06	23.416,5 40	22.450,5 66	23.027,8 61	23.957,9 26	23.846,9 62	23.500,0 00	23.585,8 96	23.848,7 58	24.138,2 18
Molise	21.729,5 60	21.245,2 83	20.779,1 80	20.800,0 00	20.780,9 52	20.283,4 39	18.923,8 10	18.799,3 63	19.284,3 45	20.041,8 01
Campania	18.194,1 85	18.224,3 14	17.700,0 52	17.439,8 21	17.366,6 78	17.240,8 01	16.925,7 81	17.037,6 75	17.490,0 96	18.263,9 86
Puglia	17.501,1 07	17.297,8 41	16.838,4 33	17.087,4 02	17.373,7 20	17.488,2 93	17.130,4 67	17.267,7 26	17.670,6 66	17.785,8 02
Basilicata	19.783,2 76	19.779,4 87	18.727,7 40	18.553,2 65	19.187,9 31	19.138,1 69	19.696,0 28	19.044,9 83	20.871,3 04	20.597,9 02
Calabria	16.828,4 41	17.087,4 18	16.746,9 64	16.713,1 27	16.909,1 83	16.590,9 78	16.306,8 76	16.219,8 08	16.433,6 37	16.795,7 32
Sicilia	17.975,8 34	18.136,9 43	17.621,7 50	17.610,0 55	17.521,6 27	17.352,9 76	17.044,4 18	16.681,7 82	17.049,1 84	17.172,9 17
Sardegna	20.017,0 11	20.548,7 58	20.006,0 46	20.030,2 11	20.153,9 86	20.120,0 24	19.558,3 63	19.585,3 37	20.296,2 07	20.263,2 85

Source: Own elaboration

In 2007, the first year in the range the analysis is dealing with, Bolzano autonomous province was settled at first place with a GDP per capita of 36.695 euros. Right behind they were Lombardy with 35.127; Val d'Aosta: 34.768 and Lazio: 34.473.

On the other side, the worst regions were Calabria: 16.828,44 euros; Puglia: 17.501 and Sicily: 17.975. The range of years is going from 2007 to 2016. In these year especially from 2008 the Global economic crisis was going, and this facet is reflected by the data from an immediate impact.

However, in 2016 almost every Italian region recovers their losses in GDP terms and in the first places we found still Bolzano with 42.585 euros; Lombardy: 36.602 and Trento: 35.003. On the other side the “poorest” went poorer, Calabria decreased to 16.795 euros; Puglia 17.785 and Sicily 17.171. Thanks to this GDP per capita dataset, it was possible to derivate a line graph showing the trends of the single regional GDP per capita in the range of years taken into account by the analysis.

Also from here, it is immediate at a first look how the crisis of 2008 have affected this trend.

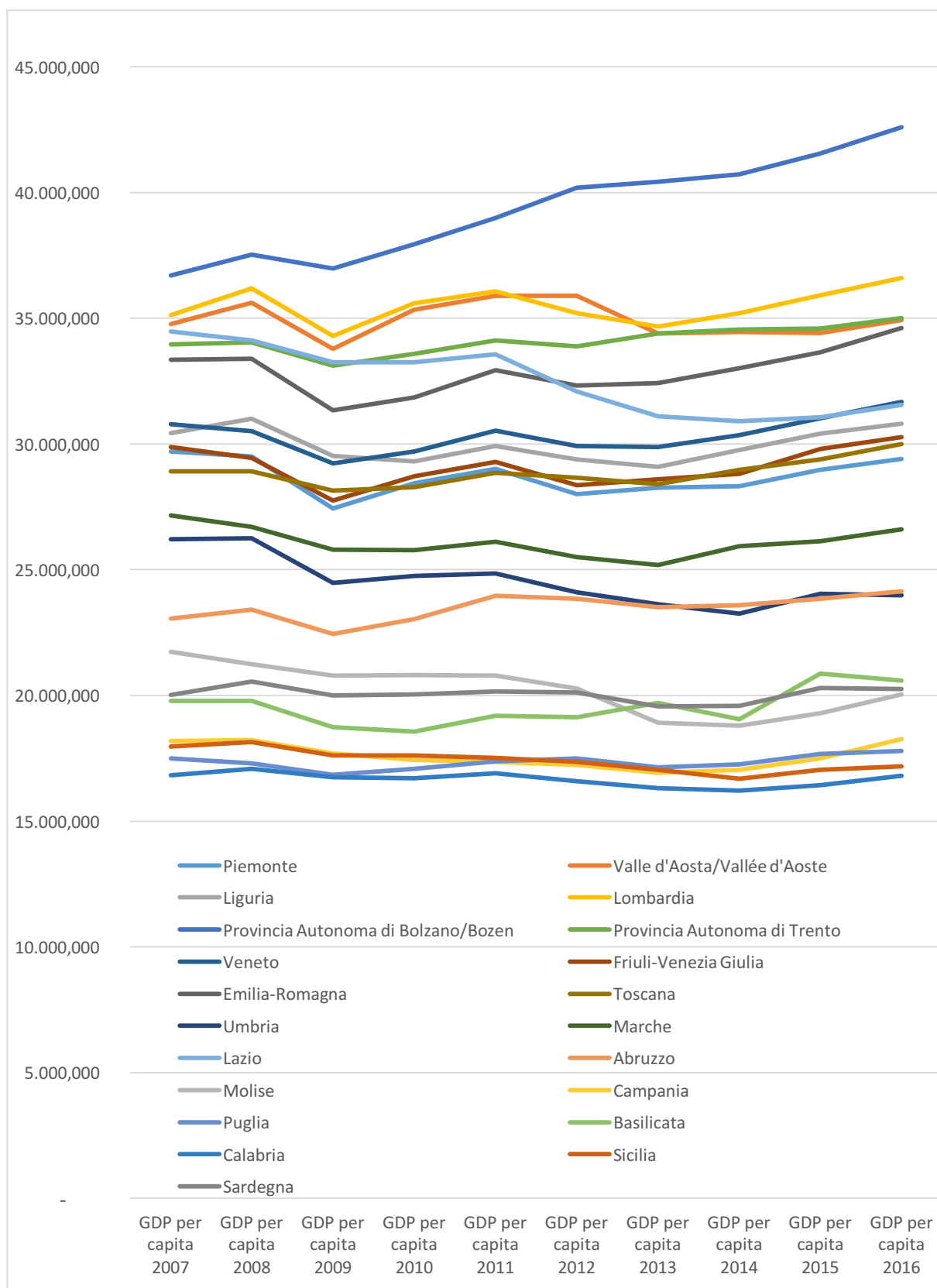


Figure 17 – GDP per capita € Evolution

Source: Own elaboration

Regarding the Employment level in the regions, a useful data to evaluate occupancy and development of a region is the Indicator Employment rate. The indicator is a ratio between population in age of work resident in the region and people employed in the same context.

As it is possible to see from the below table, in 2007, the region with the highest Employment rate were Bolzano with 0,454; Val d'Aosta 0,449 and Emilia Romagna 0,446. The less employed regions were Sicily with 0,293; Calabria 0,297 and Puglia 0,310.

Ten years after in 2016 the best regions in terms of employing were still the same, as well as the worst, but in general the crisis affects them all. All the values except for a few regions are less than the starting year. This is also given to the economic situation of Italy in that years of crisis.

Generally, the worst year have been 2013 with the lowest values of the whole dataset.

Table 12 – Employment rate Indicator

Source: Own elaboration

	2007 Emplo yment rate	2008 Emplo yment rate	2009 Emplo yment rate	2010 Emplo yment rate	2011 Emplo yment rate	2012 Emplo yment rate	2013 Emplo yment rate	2014 Emplo yment rate	2015 Emplo yment rate	2016 Emplo yment rate
Piemonte	0,416	0,417	0,409	0,405	0,408	0,402	0,391	0,391	0,398	0,401
Valle d'Aosta/Vall ée d'Aoste	0,449	0,444	0,434	0,436	0,433	0,424	0,420	0,423	0,420	0,420
Liguria	0,390	0,390	0,387	0,384	0,385	0,377	0,368	0,367	0,377	0,378
Lombardia	0,439	0,439	0,429	0,423	0,419	0,417	0,416	0,416	0,417	0,423
Provincia Autonoma di Bolzano/Boz en	0,454	0,458	0,456	0,460	0,460	0,464	0,461	0,457	0,460	0,467
Provincia Autonoma di Trento	0,431	0,432	0,430	0,426	0,426	0,421	0,420	0,422	0,422	0,421
Veneto	0,433	0,437	0,424	0,421	0,423	0,421	0,407	0,410	0,408	0,414
Friuli- Venezia Giulia	0,421	0,418	0,406	0,405	0,408	0,401	0,394	0,394	0,396	0,400
Emilia- Romagna	0,446	0,445	0,434	0,429	0,432	0,427	0,418	0,417	0,419	0,429
Toscana	0,412	0,415	0,411	0,404	0,403	0,401	0,399	0,398	0,403	0,406
Umbria	0,408	0,413	0,398	0,396	0,393	0,387	0,382	0,381	0,393	0,389
Marche	0,418	0,418	0,411	0,407	0,398	0,397	0,387	0,394	0,391	0,391
Lazio	0,392	0,396	0,391	0,389	0,386	0,383	0,376	0,383	0,384	0,389
Abruzzo	0,375	0,382	0,363	0,362	0,370	0,369	0,356	0,348	0,351	0,358
Molise	0,346	0,351	0,339	0,333	0,328	0,330	0,309	0,315	0,319	0,334
Campania	0,293	0,285	0,274	0,268	0,265	0,268	0,266	0,263	0,265	0,275
Puglia	0,310	0,310	0,299	0,295	0,297	0,297	0,279	0,276	0,283	0,289
Basilicata	0,325	0,327	0,319	0,311	0,315	0,310	0,304	0,310	0,323	0,330
Calabria	0,297	0,293	0,286	0,281	0,283	0,276	0,258	0,260	0,256	0,260
Sicilia	0,293	0,291	0,288	0,282	0,280	0,272	0,259	0,256	0,262	0,262
Sardegna	0,363	0,359	0,347	0,347	0,351	0,349	0,324	0,323	0,332	0,332

An important data showing the innovation level of the regions is the percentage of R&D personnel. This data has been derivate from the relation between personnel and researchers in R&D and the region's resident population.

In 2016 the Regions with the highest values were Trento 0,8 %; Emilia Romagna 0,7% and Piedmont 0,6%. The last two regions have considerable size Universities such as the Bologna alma mater university and the Torino university which helped the good output of this data.

In this sense the worst output comes from Calabria and the other southern regions. Probably this data

is given by the reason that most people coming from Southern regions use to go studying, researching so on, in northern Universities or abroad.

In the below table is possible to see the distribution of this data

Table 13 - % of R&D personnel and researchers Indicator

Source: Own elaboration

	2007 R&D %	2008 R&D %	2009 R&D %	2010 R&D %	2011 R&D %	2012 R&D %	2013 R&D %	2014 R&D %	2015 R&D %	2016 R&D %
Piemonte	0,5	0,5	0,5	0,5	0,5	0,5	0,6	0,6	0,6	0,6
Valle d'Aosta/Vallée d'Aoste	0,2	0,2	0,3	0,2	0,3	0,3	0,2	0,3	0,2	0,2
Liguria	0,4	0,4	0,4	0,5	0,5	0,5	0,5	0,4	0,5	0,5
Lombardia	0,4	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Provincia Autonoma di Bolzano/Bozen	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,4	0,3	0,3
Provincia Autonoma di Trento	0,5	0,6	0,6	0,6	0,7	0,7	0,7	0,7	0,8	0,8
Veneto	0,4	0,5	0,4	0,4	0,4	0,5	0,5	0,5	0,5	0,5
Friuli-Venezia Giulia	0,4	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Emilia-Romagna	0,5	0,5	0,5	0,6	0,6	0,6	0,7	0,7	0,7	0,7
Toscana	0,4	0,4	0,4	0,4	0,4	0,4	0,5	0,5	0,5	0,5
Umbria	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Marche	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,4	0,4	0,4
Lazio	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,5	0,6	0,6
Abruzzo	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3
Molise	0,2	0,1	0,2	0,1	0,1	0,1	0,2	0,2	0,2	0,2
Campania	0,2	0,2	0,2	0,2	0,2	0,3	0,2	0,3	0,3	0,3
Puglia	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Basilicata	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Calabria	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Sicilia	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Sardegna	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3

An Indicator which is looking at the social dimension of a region is the population at risk of poverty or social exclusion Indicator. This data is a percentage between People at risk of poverty in a region and the same region's total population. It is clear as a high value of this data is reflecting some social illnesses. In this sense the worst Region in 2016 have been Sicily and Campania with a shocking data of half percent of population affected. The others southern regions also are not in a very good position.

The “black year” have been exactly the 2016 with the worst values possible in almost all the regions.

Table 14 - % of Population at risk of poverty or social exclusion Indicator

	2007 Pop at risk of poverty %	2008 Pop at risk of poverty %	2009 Pop at risk of poverty %	2010 Pop at risk of poverty %	2011 Pop at risk of poverty %	2012 Pop at risk of poverty %	2013 Pop at risk of poverty %	2014 Pop at risk of poverty %	2015 Pop at risk of poverty %	2016 Pop at risk of poverty %
Piemonte	17,9	17,0	16,8	18,2	21,8	20,3	16,5	18,8	18,0	22,9
Valle d'Aosta/V allée d'Aoste	11,7	11,2	12,1	14,5	13,6	15,0	21,3	17,5	17,9	20,5
Liguria	21,3	19,8	15,8	16,4	19,4	21,4	23,4	26,5	25,8	23,9
Lombardi a	15,8	14,7	15,3	15,2	15,9	19,3	17,7	18,1	17,6	19,7
Provincia Autonom a di Bolzano/ Bozen	12,3	11,8	11,9	10,6	11,1	12,2	12,4	9,7	13,7	9,6
Provincia Autonom a di Trento	7,5	8,3	10,1	10,8	14,4	19,2	13,2	13,6	15,8	23,5
Veneto	16,3	15,2	14,6	16,1	16,2	17,1	16,1	16,9	16,8	17,9
Friuli- Venezia Giulia	16,6	17,7	16,7	14,6	16,3	18,0	16,1	16,3	14,5	17,7
Emilia- Romagna	13,3	13,2	14,3	12,7	15,7	16,0	17,8	16,4	15,4	16,1
Toscana	14,5	15,2	14,9	17,5	20,0	21,2	18,4	19,2	18,6	16,9
Umbria	18,0	17,8	17,1	17,7	20,7	22,0	22,7	21,9	28,5	23,5
Marche	16,7	16,5	16,3	18,4	21,9	23,2	21,8	19,6	23,0	24,4
Lazio	22,5	21,7	21,9	22,4	24,1	28,3	26,1	24,7	27,0	30,8
Abruzzo	25,5	24,5	27,2	27,4	34,3	27,7	26,1	29,5	30,1	31,5
Molise	33,0	30,4	33,7	32,0	33,8	36,1	44,7	40,7	31,7	37,0
Campania	45,5	47,6	44,0	45,1	48,3	50,1	49,8	49,0	46,1	49,9
Puglia	40,6	38,2	36,4	36,3	42,0	49,0	43,6	40,6	47,8	42,2
Basilicata	37,3	39,4	41,7	35,2	47,6	46,9	48,5	39,6	41,5	40,0
Calabria	44,1	44,4	42,9	41,5	47,1	46,4	45,6	43,5	44,2	46,7
Sicilia	50,5	48,2	48,2	47,4	54,3	56,9	55,0	54,4	55,4	55,6
Sardegna	30,3	35,0	30,5	26,2	32,4	28,4	32,2	37,7	36,6	38,0

Source: Own elaboration

The last figures are related to Tourism sector. The inclusion of this indicator intends to analyse the impact of the Structural funds on Tourism dynamics. The indicator is a data called ‘tourism intensity’, it is a ratio between Night stays and the resident population of a region.

One interesting issue we recognize is that the data changed deeply from the Nights stays output. I.e.

considering the Nights stay in 2016, but even in the past year, Veneto region would be at first place. This is not the case of Tourism Intensity. Given that the Tourism intensity is related to the demographic dimension of the region, in 2016 the first region is considered to be Bolzano with 59u followed by Trento 31u and Val d'Aosta 27u.

This is easily explained by the fact that these regions have a small dimension and so on small population but being visited mainly for mountain Tourism reasons, they still have a relevant number of tourists visiting yearly. The regions with the worst values is Molise with just 1u of Tourism intensity. The data are showed in the below table.

Table 15 - Tourism Intensity Indicator

	2007 Tourism intensity	2008 Tourism intensity	2009 Tourism intensity	2010 Tourism intensity	2011 Tourism intensity	2012 Tourism intensity	2013 Tourism intensity	2014 Tourism intensity	2015 Tourism intensity	2016 Tourism intensity
Piemonte	2,379	2,641	2,636	2,806	2,909	2,805	2,861	2,948	3,100	3,186
Valle d'Aosta/Vallée d'Aoste	24,853	24,709	24,677	24,471	24,615	24,737	23,289	23,331	25,301	27,310
Liguria	8,946	8,893	8,764	8,634	8,832	8,413	8,255	8,485	9,086	9,600
Lombardia	3,022	2,959	3,055	3,205	3,386	3,385	3,418	3,433	3,784	3,714
Provincia Autonoma di Bolzano/Bozen	55,815	56,072	56,248	56,796	57,060	57,645	56,453	54,988	56,615	59,882
Provincia Autonoma di Trento	28,943	28,936	29,298	28,991	28,954	29,168	28,939	28,622	29,871	31,470
Veneto	12,888	12,558	12,440	12,476	12,968	12,712	12,505	12,556	12,855	13,315
Friuli-Venezia Giulia	7,206	7,278	7,217	7,074	7,312	7,186	6,386	6,195	6,467	6,807
Emilia-Romagna	9,040	8,965	8,828	8,645	8,809	8,477	8,219	7,955	8,216	8,505
Toscana	11,477	11,246	11,082	11,308	11,705	11,398	11,389	11,501	11,838	11,813
Umbria	7,228	6,870	6,331	6,344	6,776	6,524	6,346	6,539	6,619	6,726
Marche	8,949	7,483	6,926	6,967	7,108	7,035	7,090	7,316	7,850	7,850
Lazio	5,991	5,834	5,551	5,542	5,487	5,392	5,276	5,239	5,379	5,455
Abruzzo	5,651	5,736	5,022	5,502	5,577	5,441	5,201	4,713	4,572	4,622
Molise	2,051	2,073	1,901	1,775	2,160	1,720	1,433	1,336	1,572	1,407
Campania	3,422	3,233	3,093	3,191	3,355	3,151	3,024	3,079	3,220	3,400
Puglia	2,825	2,989	3,062	3,170	3,292	3,242	3,264	3,246	3,312	3,546
Basilicata	3,169	3,184	3,234	3,248	3,385	3,250	3,366	3,633	4,005	4,101
Calabria	4,419	4,292	4,279	4,129	4,337	4,236	4,046	3,923	4,129	4,325
Sicilia	2,916	2,774	2,732	2,673	2,777	2,813	2,848	2,919	2,855	2,703
Sardegna	7,200	7,446	7,443	7,355	6,913	6,540	6,426	6,829	7,461	8,144

Source: Own elaboration

Indicators' Evolution

This part of the analysis is looking at the evolution of the designed indicators. This is important to notice the Indicator's increase or decrease in the range of year taken in account. The reference year is 2007.

The first indicator to be analysed is GDP per capita.

Its growth's rate has been directly affected by the 2008 economic crisis. In the end, the regions which growth most have been Bolzano autonomous province followed with distance by Lombardy and Abruzzo. The regions less growth have been Umbria, Toscana and Abruzzo which experienced a decrease in growth between 0,085 and 0,079.

Table 16 – GDP per capita Growth

	2007 Gr GDP	2008 Gr GDP	2009 Gr GDP	2010 Gr GDP	2011 Gr GDP	2012 Gr GDP	2013 Gr GDP	2014 Gr GDP	2015 Gr GDP	2016 Gr GDP
Piemonte	-	-0,006	-0,076	-0,043	-0,023	-0,057	-0,048	-0,047	-0,025	-0,010
Valle d'Aosta/Vallée d'Aoste	-	0,024	-0,029	0,016	0,032	0,032	-0,011	-0,009	-0,010	0,005
Liguria	-	0,019	-0,030	-0,037	-0,017	-0,035	-0,044	-0,022	-0,001	0,012
Lombardia	-	0,030	-0,024	0,013	0,027	0,002	-0,013	0,002	0,022	0,042
Provincia Autonoma di Bolzano/Bozen	-	0,023	0,007	0,034	0,062	0,095	0,102	0,110	0,132	0,161
Provincia Autonoma di Trento	-	0,002	-0,025	-0,011	0,005	-0,002	0,013	0,017	0,019	0,031
Veneto	-	-0,009	-0,050	-0,036	-0,009	-0,028	-0,030	-0,014	0,008	0,029
Friuli-Venezia Giulia	-	-0,014	-0,071	-0,039	-0,020	-0,051	-0,043	-0,036	-0,003	0,013
Emilia-Romagna	-	0,001	-0,060	-0,045	-0,012	-0,031	-0,028	-0,010	0,009	0,038
Toscana	-	0,001	-0,026	-0,021	-0,001	-0,008	-0,017	0,003	0,017	0,038
Umbria	-	0,002	-0,066	-0,056	-0,052	-0,080	-0,098	-0,112	-0,083	-0,085
Marche	-	-0,016	-0,050	-0,051	-0,038	-0,061	-0,072	-0,045	-0,038	-0,020
Lazio	-	-0,011	-0,036	-0,036	-0,027	-0,069	-0,098	-0,103	-0,099	-0,085
Abruzzo	-	0,016	-0,026	-0,001	0,039	0,034	0,019	0,023	0,034	0,047
Molise	-	-0,022	-0,044	-0,043	-0,044	-0,067	-0,129	-0,135	-0,113	-0,078
Campania	-	0,002	-0,027	-0,041	-0,045	-0,052	-0,070	-0,064	-0,039	0,004
Puglia	-	-0,012	-0,038	-0,024	-0,007	-0,001	-0,021	-0,013	0,010	0,016
Basilicata	-	-0,000	-0,053	-0,062	-0,030	-0,033	-0,004	-0,037	0,055	0,041
Calabria	-	0,015	-0,005	-0,007	0,005	-0,014	-0,031	-0,036	-0,023	-0,002
Sicilia	-	0,009	-0,020	-0,020	-0,025	-0,035	-0,052	-0,072	-0,052	-0,045
Sardegna	-	0,027	-0,001	0,001	0,007	0,005	-0,023	-0,022	0,014	0,012

Source: Own elaboration

The second indicator is the Employment rate. From this point of view, the Italian regions have had a general negative trend. The only ones out from this situation are Lombardy, because it is one of strongest Region in the Italian Economy and Basilicata because the starting point was very low hard to beat. The worst value was for Calabria -0,124; Sicily -0,105 and Sardinia -0,087.

Table 17 - Employment rate Growth

	2007 Gr EmplR	2008 Gr EmplR	2009 Gr EmplR	2010 Gr EmplR	2011 Gr EmplR	2012 Gr EmplR	2013 Gr EmplR	2014 Gr EmplR	2015 Gr EmplR	2016 Gr EmplR
Piemonte	-	0,004	-0,016	-0,026	-0,018	-0,032	-0,058	-0,059	-0,043	-0,035
Valle d'Aosta/Vallée d'Aoste	-	-0,011	-0,033	-0,028	-0,035	-0,055	-0,065	-0,058	-0,065	-0,065
Liguria	-	-0,001	-0,008	-0,017	-0,013	-0,034	-0,058	-0,059	-0,035	-0,033
Lombardia	-	-0,001	-0,022	-0,037	-0,045	-0,051	-0,051	-0,053	-0,051	-0,037
Provincia Autonoma di Bolzano/Bozen	-	0,009	0,004	0,012	0,013	0,022	0,016	0,007	0,012	0,028
Provincia Autonoma di Trento	-	0,005	-0,001	-0,011	-0,011	-0,023	-0,025	-0,020	-0,019	-0,021
Veneto	-	0,009	-0,021	-0,027	-0,022	-0,028	-0,059	-0,052	-0,056	-0,043
Friuli-Venezia Giulia	-	-0,007	-0,035	-0,038	-0,031	-0,048	-0,063	-0,064	-0,060	-0,049
Emilia-Romagna	-	-0,003	-0,027	-0,039	-0,033	-0,042	-0,063	-0,065	-0,061	-0,038
Toscana	-	0,008	-0,001	-0,018	-0,022	-0,025	-0,031	-0,034	-0,021	-0,014
Umbria	-	0,012	-0,025	-0,030	-0,036	-0,051	-0,064	-0,065	-0,036	-0,045
Marche	-	-0,001	-0,016	-0,027	-0,048	-0,050	-0,075	-0,058	-0,064	-0,066
Lazio	-	0,011	-0,001	-0,008	-0,015	-0,022	-0,041	-0,023	-0,020	-0,008
Abruzzo	-	0,018	-0,032	-0,037	-0,016	-0,018	-0,051	-0,072	-0,065	-0,047
Molise	-	0,015	-0,018	-0,035	-0,052	-0,044	-0,106	-0,090	-0,076	-0,032
Campania	-	-0,027	-0,064	-0,085	-0,095	-0,085	-0,091	-0,104	-0,095	-0,061
Puglia	-	-0,000	-0,036	-0,050	-0,043	-0,043	-0,101	-0,110	-0,088	-0,069
Basilicata	-	0,005	-0,018	-0,043	-0,030	-0,047	-0,063	-0,045	-0,006	0,015
Calabria	-	-0,015	-0,035	-0,054	-0,047	-0,072	-0,131	-0,125	-0,137	-0,124
Sicilia	-	-0,006	-0,017	-0,037	-0,043	-0,069	-0,116	-0,125	-0,105	-0,105
Sardegna	-	-0,011	-0,044	-0,045	-0,035	-0,041	-0,109	-0,111	-0,086	-0,087

Source: Own elaboration

Regarding the Research and Development sector, the trend is peculiar. The personnel employed has positively increased in every region with Trento province leading with 0,632. The only over-trend regions are Lazio and Basilicata which register a light negative decrease however not so strong of -0,080 and -0,047.

Table 18 - % of R&D personnel and researchers Growth

	2007 Gr R&D	2008 Gr R&D	2009 Gr R&D	2010 Gr R&D	2011 Gr R&D	2012 Gr R&D	2013 Gr R&D	2014 Gr R&D	2015 Gr R&D	2016 Gr R&D
Piemonte	-	0,024	0,072	0,054	0,052	0,106	0,180	0,189	0,297	0,304
Valle d'Aosta/Vallée d'Aoste		0,113	0,261	0,183	0,261	0,244	0,173	0,188	0,121	0,171
Liguria		0,117	0,234	0,254	0,296	0,292	0,261	0,207	0,314	0,324
Lombardia		0,087	0,139	0,169	0,174	0,217	0,202	0,205	0,207	0,208
Provincia Autonoma di Bolzano/Bozen		0,084	0,141	0,159	0,226	0,251	0,379	0,421	0,298	0,235
Provincia Autonoma di Trento		0,315	0,350	0,273	0,396	0,541	0,517	0,476	0,599	0,632
Veneto		0,319	0,267	0,245	0,277	0,322	0,343	0,304	0,355	0,359
Friuli-Venezia Giulia		0,155	0,159	0,141	0,206	0,285	0,182	0,193	0,246	0,253
Emilia-Romagna		-0,055	-0,019	0,036	0,028	0,118	0,221	0,252	0,316	0,322
Toscana		0,024	0,039	0,026	0,054	0,134	0,209	0,261	0,266	0,274
Umbria		-0,058	-0,071	-0,076	-0,094	-0,058	-0,047	-0,003	0,015	0,041
Marche		-0,007	-0,049	-0,053	-0,080	0,008	0,039	0,155	0,142	0,153
Lazio		-0,026	-0,024	-0,050	-0,076	-0,059	-0,095	-0,110	-0,080	-0,080
Abruzzo		-0,018	-0,039	-0,039	-0,076	-0,131	-0,058	-0,029	0,069	0,086
Molise		-0,078	0,007	-0,141	-0,131	-0,114	0,190	0,069	0,052	0,039
Campania		0,067	0,095	-0,016	-0,003	0,117	0,109	0,121	0,187	0,190
Puglia		-0,037	-0,048	-0,119	-0,123	-0,092	-0,035	0,026	0,054	0,067
Basilicata		0,027	-0,125	-0,147	-0,188	-0,229	-0,199	-0,254	-0,121	-0,047
Calabria		0,055	0,011	-0,018	-0,051	0,033	0,277	0,333	0,483	0,536
Sicilia		0,032	0,005	-0,038	-0,034	-0,048	0,039	0,063	0,033	0,031
Sardegna		0,044	0,068	0,067	0,264	0,318	0,285	0,306	0,489	0,503

Source: Own elaboration

The social indicator of Population at risk of poverty or social exclusion follows, without doubt, a trend of growth. This is a worrying trend. In this case, given that the Indicator is considered as negative, the growth has not a positive effect for the Italian Context. The only region who fights this trend is the Bolzano province which had a negative value of -0,220.

Table 19 - % Population at risk of poverty or social exclusion Growth

	2007 Gr Pop at risk of poverty	2008 Gr Pop at risk of poverty	2009 Gr Pop at risk of poverty	2010 Gr Pop at risk of poverty	2011 Gr Pop at risk of poverty	2012 Gr Pop at risk of poverty	2013 Gr Pop at risk of poverty	2014 Gr Pop at risk of poverty	2015 Gr Pop at risk of poverty	2016 Gr Pop at risk of poverty
Piemonte	-	-0,050	-0,061	0,017	0,218	0,134	-0,078	0,050	0,006	0,279
Valle d'Aosta/V allée d'Aoste	-	-0,043	0,034	0,239	0,162	0,282	0,821	0,496	0,530	0,752
Liguria	-	-0,070	-0,258	-0,230	-0,089	0,005	0,099	0,244	0,211	0,122
Lombardi a	-	-0,070	-0,032	-0,038	0,006	0,222	0,120	0,146	0,114	0,247
Provincia Autonom a di Bolzano/ Bozen	-	-0,041	-0,033	-0,138	-0,098	-0,008	0,008	-0,211	0,114	-0,220
Provincia Autonom a di Trento	-	0,107	0,347	0,440	0,920	1,560	0,760	0,813	1,107	2,133
Veneto	-	-0,067	-0,104	-0,012	-0,006	0,049	-0,012	0,037	0,031	0,098
Friuli- Venezia Giulia	-	0,066	0,006	-0,120	-0,018	0,084	-0,030	-0,018	-0,127	0,066
Emilia- Romagna	-	-0,008	0,075	-0,045	0,180	0,203	0,338	0,233	0,158	0,211
Toscana	-	0,048	0,028	0,207	0,379	0,462	0,269	0,324	0,283	0,166
Umbria	-	-0,011	-0,050	-0,017	0,150	0,222	0,261	0,217	0,583	0,306
Marche	-	-0,012	-0,024	0,102	0,311	0,389	0,305	0,174	0,377	0,461
Lazio	-	-0,036	-0,027	-0,004	0,071	0,258	0,160	0,098	0,200	0,369
Abruzzo	-	-0,039	0,067	0,075	0,345	0,086	0,024	0,157	0,180	0,235
Molise	-	-0,079	0,021	-0,030	0,024	0,094	0,355	0,233	-0,039	0,121
Campania	-	0,046	-0,033	-0,009	0,062	0,101	0,095	0,077	0,013	0,097
Puglia	-	-0,059	-0,103	-0,106	0,034	0,207	0,074	-	0,177	0,039
Basilicata	-	0,056	0,118	-0,056	0,276	0,257	0,300	0,062	0,113	0,072
Calabria	-	0,007	-0,027	-0,059	0,068	0,052	0,034	-0,014	0,002	0,059
Sicilia	-	-0,046	-0,046	-0,061	0,075	0,127	0,089	0,077	0,097	0,101
Sardegna	-	0,155	0,007	-0,135	0,069	-0,063	0,063	0,244	0,208	0,254

Source: Own elaboration

The indicator Tourism Intensity generally shows a positive trend exception made for Molise and Abruzzo respectively -0,314 and -0,182. The region leading this trend is Piedmont with an increase of 0,339.

Table 20 - Tourism Intensity Growth

	2007 Gr Tintens ity	2008 Gr Tintens ity	2009 Gr Tintens ity	2010 Gr Tintens ity	2011 Gr Tintens ity	2012 Gr Tintens ity	2013 Gr Tintens ity	2014 Gr Tintens ity	2015 Gr Tintens ity	2016 Gr Tintens ity
Piemonte	-	0,110	0,108	0,179	0,223	0,179	0,203	0,239	0,303	0,339
Valle d'Aosta/Vallée d'Aoste		-0,006	-0,007	-0,015	-0,010	-0,005	-0,063	-0,061	0,018	0,099
Liguria		-0,006	-0,020	-0,035	-0,013	-0,060	-0,077	-0,052	0,016	0,073
Lombardia		-0,021	0,011	0,061	0,121	0,120	0,131	0,136	0,252	0,229
Provincia Autonoma di Bolzano/Boze n		0,005	0,008	0,018	0,022	0,033	0,011	-0,015	0,014	0,073
Provincia Autonoma di Trento		-0,000	0,012	0,002	0,000	0,008	-0,000	-0,011	0,032	0,087
Veneto		-0,026	-0,035	-0,032	0,006	-0,014	-0,030	-0,026	-0,003	0,033
Friuli-Venezia Giulia		0,010	0,002	-0,018	0,015	-0,003	-0,114	-0,140	-0,103	-0,055
Emilia- Romagna		-0,008	-0,023	-0,044	-0,025	-0,062	-0,091	-0,120	-0,091	-0,059
Toscana		-0,020	-0,034	-0,015	0,020	-0,007	-0,008	0,002	0,031	0,029
Umbria		-0,049	-0,124	-0,122	-0,063	-0,097	-0,122	-0,095	-0,084	-0,069
Marche		-0,164	-0,226	-0,221	-0,206	-0,214	-0,208	-0,182	-0,123	-0,123
Lazio		-0,026	-0,073	-0,075	-0,084	-0,100	-0,119	-0,126	-0,102	-0,089
Abruzzo		0,015	-0,111	-0,026	-0,013	-0,037	-0,080	-0,166	-0,191	-0,182
Molise		0,011	-0,073	-0,134	0,053	-0,161	-0,301	-0,348	-0,234	-0,314
Campania		-0,055	-0,096	-0,068	-0,020	-0,079	-0,116	-0,100	-0,059	-0,007
Puglia		0,058	0,084	0,122	0,166	0,148	0,156	0,149	0,173	0,255
Basilicata		0,005	0,021	0,025	0,068	0,026	0,062	0,147	0,264	0,294
Calabria		-0,029	-0,032	-0,065	-0,018	-0,041	-0,084	-0,112	-0,065	-0,021
Sicilia		-0,049	-0,063	-0,083	-0,048	-0,035	-0,023	0,001	-0,021	-0,073
Sardegna		0,034	0,034	0,022	-0,040	-0,092	-0,107	-0,052	0,036	0,131

Source: Own elaboration

Correlation Analysis

In this section, using MS Excel, a correlation between the indicator's growths and the 2007-2013 Community funding have been made. Correlation analysis does not imply a causality between the two analysed variables but is evidence of the association between them.

Basically, the meaning of the correlation is that: if the value is close to 1 the variables are well

correlated, if it is close to -1 they have negative correlation. The below table shows the Correlation's coefficients by each Indicators to the 2007-2013 Community funding.

Table 21 - Correlation Panel Database

2007 CRRL GDPpc/ Eu07-13	2008 CRRL GDPpc/ Eu07-13	2009 CRRL GDPpc/ Eu07-13	2010 CRRL GDPpc/ Eu07-13	2011 CRRL GDPpc/ Eu07-13	2012 CRRL GDPpc/ Eu07-13	2013 CRRL GDPpc/ Eu07-13	2014 CRRL GDPpc/ Eu07-13	2015 CRRL GDPpc/ Eu07-13	2016 CRRL GDPpc/ Eu07-13
	-0,023	0,229	-0,051	-0,256	-0,124	-0,163	-0,214	-0,200	-0,176
2007 CRRL EmpR/E u07-13	2008 CRRL EmpR/E u07-13	2009 CRRL EmpR/E u07-13	2010 CRRL EmpR/E u07-13	2011 CRRL EmpR/E u07-13	2012 CRRL EmpR/E u07-13	2013 CRRL EmpR/E u07-13	2014 CRRL EmpR/E u07-13	2015 CRRL EmpR/E u07-13	2016 CRRL EmpR/E u07-13
	-0,555	-0,468	-0,608	-0,586	-0,568	-0,575	-0,682	-0,615	-0,547
2007 CRRL R&D/Eu 07-13	2008 CRRL R&D/Eu 07-13	2009 CRRL R&D/Eu 07-13	2010 CRRL R&D/Eu 07-13	2011 CRRL R&D/Eu 07-13	2012 CRRL R&D/Eu 07-13	2013 CRRL R&D/Eu 07-13	2014 CRRL R&D/Eu 07-13	2015 CRRL R&D/Eu 07-13	2016 CRRL R&D/Eu 07-13
	-0,146	-0,223	-0,340	-0,314	-0,258	-0,227	-0,161	-0,138	-0,142
2007 CRRL RiskPov/ Eu07-13	2008 CRRL RiskPov/ Eu07-13	2009 CRRL RiskPov/ Eu07-13	2010 CRRL RiskPov/ Eu07-13	2011 CRRL RiskPov/ Eu07-13	2012 CRRL RiskPov/ Eu07-13	2013 CRRL RiskPov/ Eu07-13	2014 CRRL RiskPov/ Eu07-13	2015 CRRL RiskPov/ Eu07-13	2016 CRRL RiskPov/ Eu07-13
	-0,015	-0,249	-0,224	-0,214	-0,187	-0,312	-0,297	-0,279	-0,251
2007 CRRL Tint/Eu0 7-13	2008 CRRL Tint/Eu0 7-13	2009 CRRL Tint/Eu0 7-13	2010 CRRL Tint/Eu0 7-13	2011 CRRL Tint/Eu0 7-13	2012 CRRL Tint/Eu0 7-13	2013 CRRL Tint/Eu0 7-13	2014 CRRL Tint/Eu0 7-13	2015 CRRL Tint/Eu0 7-13	2016 CRRL Tint/Eu0 7-13
	-0,055	0,041	0,065	0,085	0,130	0,183	0,205	0,096	0,080

Source: Own elaboration

Looking at the output and at the indicators one by one, a general negative trend is clear. This could be interpreted in a positive way when the growth had negative value. Concretely, as regard as the GDP per capita growth we have seen in the previous part how much this Indicator has decreased during the years taken into the analysis.

The correlation between this GDP per capita decrease and the Structural funds funding is negative for all the years from 0,023, which is light and almost not to be taken in account, but in the long term – 0,176. That means to reject the null hypothesis that the funds are related to the decrease in the GDP per capita.

Similar conclusion for Employment rate growth. The decrease of this indicator has a strong negative correlation with the Structural funds from – 0,555 in 2008 to -0,547 in 2016, basically the decrease of employment is not correlated to the funding.

As regard as R&D personnel and researchers, as well a negative correlation is on. This is not a positive result because the normal trend of the Indicator was growing, it means that this increase could not be correlated to Community Funding. On the other side, the correlation is just slightly negative.

Dealing with the population at risk of poverty or social exclusion Indicator, the trend was strongly negative. In this case the correlation output shows negative correlation which means that for sure the Community Funding is not correlated to the growth of people at risk of poverty or social exclusion. The last Indicator, Tourism Intensity have had a positive general trend in correlation terms. In here is possible to see how the funding have help, in fact the output shows at the beginning a light negative correlation but in the end a positive correlation meaning: to accept the hypothesis that funding and growth of ‘tourism intensity’ are correlated.

Performance in Italy Regions

This section is dedicated to the creation of an index between 0 and 1 showing the behaviour of the regions in the selected indicators. When the region’s index is close to 1 the regions have had a strong performance, when it is close to 0 the regions have had a weak performance.

The first indicator to be analysed is the amount of Community funding received by the regions focusing on the 2007 2013 programming period. The below table shows this relation.

Table 22 - 2007-2013 Community funding Index

	INDEX Community Funding 07-13
Piemonte	0,181
Valle d'Aosta/Vallée d'Aoste	-
Liguria	0,062
Lombardia	0,116
Provincia Autonoma di Bolzano/Bozen	0,008
Provincia Autonoma di Trento	0,007
Veneto	0,118
Friuli-Venezia Giulia	0,034
Emilia-Romagna	0,087
Toscana	0,140
Umbria	0,046
Marche	0,040
Lazio	0,161
Abruzzo	0,050
Molise	0,013
Campania	0,923
Puglia	0,751
Basilicata	0,088
Calabria	0,440
Sicilia	1,000
Sardegna	0,216

Source: Own elaboration

The region with the lowest value is Val d'Aosta, on the other side the one with the highest is Sicily region. Also, Campania and Puglia have a good Index respectively 0,923 and 0,751. On the other side Bolzano and Trento have the worst values almost 0 with 0,08 and 0,07.

The GDP per capita index is showing an opposite trend. The best region in GDP terms have been Bolzano autonomous province, almost every year, and Lombardy in the beginning. The worst values are for Umbria and Molise with values of 0 during different years and generally stacking at low level for the whole period taken in account. The below table shows the distribution.

Table 23 - GDP per capita Index

	2008 GDP	2009 GDP	2010 GDP	2011 GDP	2012 GDP	2013 GDP	2014 GDP	2015 GDP	2016 GDP
Piemonte	0,303	-	0,204	0,253	0,132	0,350	0,361	0,359	0,305
Valle d'Aosta/Vallée d'Aoste	0,886	0,568	0,817	0,739	0,641	0,513	0,515	0,417	0,364
Liguria	0,778	0,550	0,263	0,307	0,260	0,369	0,460	0,457	0,394
Lombardia	1,000	0,624	0,784	0,689	0,469	0,502	0,560	0,552	0,517
Provincia Autonoma di Bolzano/Bozen	0,859	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Provincia Autonoma di Trento	0,469	0,615	0,536	0,496	0,446	0,614	0,623	0,536	0,471
Veneto	0,249	0,307	0,276	0,379	0,297	0,431	0,493	0,491	0,462
Friuli-Venezia Giulia	0,152	0,061	0,242	0,282	0,169	0,373	0,406	0,449	0,400
Emilia-Romagna	0,440	0,189	0,175	0,346	0,281	0,438	0,510	0,496	0,499
Toscana	0,435	0,595	0,427	0,442	0,410	0,483	0,562	0,529	0,499
Umbria	0,459	0,122	0,068	-	-	0,134	0,092	0,123	-0,000
Marche	0,118	0,316	0,120	0,118	0,111	0,245	0,369	0,306	0,263
Lazio	0,222	0,485	0,277	0,222	0,061	0,134	0,129	0,056	-
Abruzzo	0,724	0,597	0,636	0,798	0,654	0,643	0,646	0,601	0,537
Molise	-	0,388	0,202	0,072	0,078	-	-	-	0,029
Campania	0,456	0,586	0,216	0,056	0,159	0,257	0,292	0,302	0,361
Puglia	0,203	0,458	0,402	0,391	0,454	0,467	0,497	0,500	0,412
Basilicata	0,421	0,273	-	0,191	0,272	0,540	0,399	0,685	0,513
Calabria	0,717	0,853	0,577	0,497	0,377	0,425	0,404	0,364	0,338
Sicilia	0,595	0,675	0,436	0,233	0,260	0,335	0,257	0,249	0,163
Sardegna	0,930	0,904	0,655	0,515	0,487	0,460	0,463	0,517	0,396

Source: Own elaboration

The Employment Rate Index outlines a different aspect. The worst regions have been Campania until the year 2012 then Calabria from year 2013 to 2016. They are southern regions and we have already seen how they're affected by this employment issue. The best values are for Bolzano A.P. followed by Trento A.P. and Abruzzo in year 2008.

Table 24 - Employment Rate Index

	2008 EMPL OYED	2009 EMPL OYED	2010 EMPL OYED	2011 EMPL OYED	2012 EMPL OYED	2013 EMPL OYED	2014 EMPL OYED	2015 EMPL OYED	2016 EMPL OYED
Piemonte	0,699	0,701	0,613	0,715	0,496	0,498	0,499	0,630	0,587
Valle d'Aosta/Vallée d'Aoste	0,347	0,451	0,588	0,556	0,283	0,450	0,505	0,480	0,389
Liguria	0,581	0,827	0,706	0,759	0,480	0,497	0,499	0,683	0,599
Lombardia	0,580	0,614	0,498	0,463	0,319	0,544	0,544	0,577	0,571
Provincia Autonoma di Bolzano/Bozen	0,791	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Provincia Autonoma di Trento	0,703	0,933	0,768	0,774	0,583	0,725	0,792	0,788	0,677
Veneto	0,798	0,628	0,594	0,674	0,535	0,490	0,550	0,540	0,536
Friuli-Venezia Giulia	0,451	0,428	0,490	0,590	0,350	0,464	0,457	0,518	0,491
Emilia-Romagna	0,545	0,544	0,477	0,580	0,404	0,463	0,452	0,509	0,565
Toscana	0,788	0,930	0,694	0,675	0,559	0,686	0,686	0,776	0,723
Umbria	0,869	0,576	0,573	0,547	0,320	0,461	0,452	0,675	0,519
Marche	0,584	0,701	0,598	0,434	0,330	0,382	0,509	0,489	0,385
Lazio	0,841	0,925	0,795	0,744	0,587	0,613	0,774	0,783	0,765
Abruzzo	1,000	0,465	0,496	0,735	0,629	0,549	0,398	0,481	0,508
Molise	0,943	0,680	0,511	0,399	0,380	0,171	0,268	0,404	0,604
Campania	-	-	-	-	-	0,275	0,162	0,278	0,417
Puglia	0,597	0,404	0,361	0,485	0,397	0,206	0,112	0,326	0,359
Basilicata	0,720	0,675	0,436	0,603	0,357	0,466	0,603	0,879	0,919
Calabria	0,273	0,424	0,318	0,449	0,125	-	-	-	-
Sicilia	0,460	0,685	0,501	0,482	0,147	0,103	-0,004	0,210	0,124
Sardegna	0,349	0,296	0,419	0,559	0,414	0,151	0,107	0,343	0,244

Source: Own elaboration

The Research & Development personnel and researchers Index is following kind of the same trend as before. The region with the best values are Trento A.P. and the Veneto at the first place only in 2008. On the other side Basilicata Molise and Umbria have had null or almost null values in the years.

Table 25 - Research and Development personnel and researchers Index

	2008 R&D	2009 R&D	2010 R&D	2011 R&D	2012 R&D	2013 R&D	2014 R&D	2015 R&D	2016 R&D
Piemonte	0,257	0,415	0,479	0,410	0,435	0,529	0,607	0,581	0,539
Valle d'Aosta/Vallée d'Aoste	0,480	0,814	0,785	0,769	0,614	0,520	0,606	0,337	0,353
Liguria	0,491	0,756	0,954	0,829	0,677	0,642	0,632	0,604	0,566
Lombardia	0,415	0,557	0,753	0,620	0,579	0,559	0,629	0,455	0,404
Provincia Autonoma di Bolzano/Bozen	0,407	0,561	0,728	0,708	0,624	0,806	0,924	0,582	0,442
Provincia Autonoma di Trento	0,989	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Veneto	1,000	0,826	0,934	0,796	0,715	0,757	0,764	0,661	0,616
Friuli-Venezia Giulia	0,586	0,599	0,685	0,675	0,667	0,531	0,613	0,510	0,467
Emilia-Romagna	0,057	0,225	0,435	0,369	0,451	0,587	0,693	0,607	0,564
Toscana	0,255	0,346	0,412	0,414	0,471	0,569	0,706	0,537	0,497
Umbria	0,050	0,115	0,169	0,161	0,222	0,212	0,343	0,189	0,169
Marche	0,177	0,160	0,223	0,185	0,308	0,332	0,561	0,366	0,326
Lazio	0,129	0,214	0,231	0,192	0,221	0,146	0,197	0,057	-
Abruzzo	0,149	0,182	0,257	0,191	0,127	0,197	0,309	0,264	0,232
Molise	-	0,279	0,014	0,097	0,149	0,543	0,443	0,241	0,166
Campania	0,364	0,465	0,313	0,317	0,450	0,430	0,514	0,428	0,378
Puglia	0,101	0,163	0,067	0,111	0,178	0,229	0,383	0,243	0,206
Basilicata	0,264	-	-	-	-	-	-	-	0,045
Calabria	0,334	0,287	0,307	0,234	0,340	0,665	0,804	0,839	0,864
Sicilia	0,276	0,274	0,260	0,264	0,234	0,332	0,434	0,214	0,155
Sardegna	0,305	0,407	0,510	0,774	0,710	0,676	0,767	0,847	0,818

Source: Own elaboration

The social indicator of population at risk of poverty or social exclusion shows a more variegated output. In 2008 Molise have had a null value but in the following year also Liguria, Bolzano, Piedmont and Friuli shared this negative trend. The highest value on the other side have been for Trento in almost the whole period.

Table 26 - Population at risk of poverty or social exclusion Index

	2008 PP risk	2009 PP risk	2010 PP risk	2011 PP risk	2012 PP risk	2013 PP risk	2014 PP risk	2015 PP risk	2016 PP risk
Piemonte	0,122	0,325	0,368	0,310	0,121	-	0,255	0,186	0,212
Valle d'Aosta/Vallée d'Aoste	0,154	0,483	0,700	0,255	0,212	1,000	0,690	0,925	0,413
Liguria	0,036	-	-	0,008	0,042	0,197	0,445	0,476	0,145
Lombardia	0,039	0,375	0,287	0,102	0,175	0,221	0,348	0,339	0,198
Provincia Autonoma di Bolzano/Bozen	0,163	0,373	0,137	-	0,034	0,096	-	0,339	-
Provincia Autonoma di Trento	0,793	1,000	1,000	1,000	1,000	0,933	1,000	1,737	1,000
Veneto	0,048	0,254	0,325	0,090	0,069	0,073	0,242	0,221	0,135
Friuli-Venezia Giulia	0,620	0,437	0,164	0,078	0,091	0,054	0,189	-	0,121
Emilia-Romagna	0,305	0,551	0,276	0,273	0,164	0,463	0,434	0,401	0,183
Toscana	0,543	0,472	0,652	0,469	0,323	0,386	0,523	0,577	0,164
Umbria	0,289	0,344	0,318	0,243	0,176	0,378	0,418	1,000	0,223
Marche	0,286	0,387	0,495	0,402	0,279	0,427	0,376	0,710	0,289
Lazio	0,185	0,383	0,337	0,166	0,197	0,265	0,302	0,460	0,250
Abruzzo	0,169	0,537	0,455	0,435	0,092	0,113	0,359	0,432	0,193
Molise	-	0,462	0,298	0,120	0,097	0,482	0,434	0,123	0,145
Campania	0,534	0,372	0,330	0,156	0,101	0,192	0,281	0,197	0,134
Puglia	0,084	0,256	0,185	0,130	0,166	0,169	0,206	0,428	0,110
Basilicata	0,578	0,622	0,259	0,367	0,197	0,421	0,266	0,337	0,124
Calabria	0,366	0,382	0,255	0,163	0,071	0,125	0,193	0,181	0,118
Sicilia	0,142	0,352	0,252	0,170	0,117	0,186	0,282	0,315	0,136
Sardegna	1,000	0,438	0,141	0,164	-	0,157	0,445	0,471	0,201

Source: Own elaboration

From the Tourism point of view, the Tourism Intensity shows a leading role of Piedmont, for the whole range of year the index's value is 1. The worst results are for Marche and Molise regions, as previously explained small region not so well valorised in terms of Tourism.

Table 27 - Tourism Intensity Index

	2008 Tintensit y	2009 Tintensit y	2010 Tintensit y	2011 Tintensit y	2012 Tintensit y	2013 Tintensit y	2014 Tintensit y	2015 Tintensit y
Piemonte	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Valle d'Aosta/Vallée d'Aoste	0,577	0,655	0,514	0,458	0,532	0,473	0,489	0,469
Liguria	0,576	0,616	0,465	0,450	0,393	0,444	0,505	0,464
Lombardia	0,522	0,709	0,704	0,761	0,850	0,858	0,825	0,905
Provincia Autonoma di Bolzano/Bozen	0,615	0,700	0,596	0,532	0,628	0,620	0,568	0,462
Provincia Autonoma di Trento	0,597	0,713	0,556	0,481	0,564	0,597	0,574	0,495
Veneto	0,505	0,572	0,473	0,494	0,509	0,539	0,549	0,430
Friuli-Venezia Giulia	0,634	0,681	0,507	0,514	0,537	0,372	0,354	0,244
Emilia-Romagna	0,568	0,606	0,443	0,420	0,386	0,417	0,389	0,265
Toscana	0,525	0,573	0,516	0,526	0,527	0,582	0,597	0,494
Umbria	0,417	0,305	0,247	0,334	0,296	0,356	0,431	0,278
Marche	-	-	-	-	-	0,186	0,282	0,206
Lazio	0,502	0,457	0,365	0,283	0,290	0,361	0,379	0,245
Abruzzo	0,653	0,343	0,487	0,449	0,450	0,440	0,311	0,080
Molise	0,638	0,457	0,217	0,604	0,134	-	-	-
Campania	0,396	0,388	0,383	0,434	0,342	0,367	0,422	0,325
Puglia	0,811	0,928	0,857	0,866	0,920	0,906	0,847	0,757
Basilicata	0,615	0,738	0,615	0,639	0,610	0,721	0,843	0,927
Calabria	0,493	0,582	0,389	0,437	0,439	0,430	0,402	0,313
Sicilia	0,420	0,487	0,344	0,368	0,454	0,551	0,594	0,396
Sardegna	0,723	0,777	0,606	0,387	0,311	0,384	0,505	0,503

Source: Own elaboration

Typologies of Italian Regions

The first part in this section is dedicated to the Cluster analysis made through the use of SPSS statistic software, in particular the 24th version, the one available in the University of Algarve.

The dataset used to run the analysis, which have been loaded in SPSS statistics, is the Indices dataset. This dataset is gathering the growth indices related to every Indicator previously described and the Indices regarding the amount of Community Funding received by each region in the 2007-2013 programming period.

Basically, cluster analysis is an exploratory analysis that tries to identify structures within the data. More specifically, it tries to identify homogenous groups of cases if the grouping is not previously

known. Because it is exploratory, it does not make any distinction between dependent and independent variables. The different cluster analysis methods that SPSS statistics offers, can handle binary, nominal, ordinal and scale data.

The Cluster analysis done here is a Hierarchical Cluster analysis. This analysis attempts to identify relatively homogeneous groups of regions based on the selected characteristics. The selected characteristics are the growth Indicators: GDP per capita, Employment rate, % of R&D personnel, % of Population at risk of poverty, Tourism intensity and finally, the amount of Community Funding received by the regions.

Hierarchical clustering is the most common method. It generates a series of models with cluster solutions from 1 (all cases in one cluster) to N (each case is an individual cluster). Hierarchical clustering also works with variables as opposed to cases; it can cluster variables together in a manner somewhat similar to factor analysis. Furthermore, in the analysis done here, cluster solution (or stage) 3 to 5 have been taken into account to run the Cluster membership but regarding the following Cluster labelling, the clustering range have been wider, with the aim of having a wider view, analysing from cluster 1 to 7.

In this specific Cluster analysis, Square Euclidian Distance has been used. It is based on the Euclidian Distance between two observations, which is the square root of the sum of squared distances. Since the Euclidian Distance is squared, it increases the importance of large distances, while weakening the importance of small distances. Another input given have been the Ward linkage. After having done the Cluster analysis the first output obtained is the Case Processing Summary

Table 28 - Case Processing Summary

Valid		Missing		Total	
N	Percent	N	Percent	N	Percent
21	100,0	0	,0	21	100,0
a. Squared Euclidean Distance used					
b. Ward Linkage					

Source: Own elaboration

It is an easy reading output, showing the number of cases taken into account (the 21 Italian regions) and the percent of the ones correctly analysed. The output was successful because it reached to analyse all the variables.

The second output table is the Agglomeration Schedule. This table identifies the amount of error created at each clustering stage of cases. A large jump in the value of the error term indicates that two different things have been brought together and there is a significant typology at that level of fusion. When the agglomeration schedule of coefficients is descending in values, the distance matrix has similarities. Also, the Agglomeration Schedule shows the step by step clustering process and gives a

numerical synthesis.

Table 29 - Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	11	13	,536	0	0	7
2	3	7	1,083	0	0	5
3	9	10	1,729	0	0	11
4	19	21	2,608	0	0	13
5	3	8	3,531	2	0	15
6	16	20	4,524	0	0	13
7	11	12	5,576	1	0	10
8	2	4	6,677	0	0	14
9	1	17	7,917	0	0	12
10	11	15	9,188	7	0	20
11	9	14	10,520	3	0	14
12	1	18	12,424	9	0	17
13	16	19	14,659	6	4	18
14	2	9	17,046	8	11	15
15	2	3	19,779	14	5	16
16	2	5	23,917	15	0	17
17	1	2	29,987	12	16	18
18	1	16	36,441	17	13	19
19	1	6	44,073	18	0	20
20	1	11	53,376	19	10	0

Source: Own elaboration

In this case the output is quite positive, with the coefficients showing how the clusters have distance between each other, however in a very gradual way. Looking at the output we can notice how the clustering process started harder from 10th and 14th stages with higher differences in coefficient (i.e. pair to three thousand between 14th and 15th stages'). As much the Schedule goes closer to the end as much the cluster's coefficient differences gets higher and higher.

About the S Coefficient, a good manner to see the coefficient distance and evolution is to derivate a line graph from it. This graph, reported below, is showing the behaviour of the coefficient during the clustering stages.

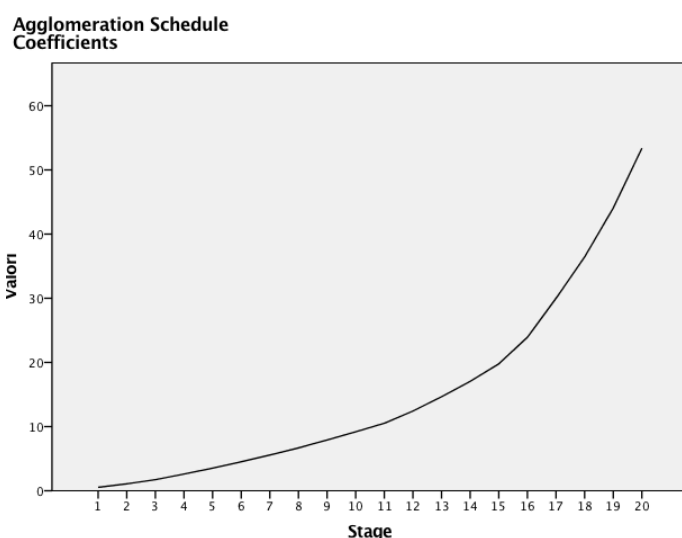


Figure 18 – Agglomeration Schedule Coefficients Graph

Source: Own elaboration

In this case the graph shows how the coefficient increases in a very gradual way even if goes further up from the 10th stage on. This is given by the difference between the coefficients already seen in the previous output.

The next output coming from the Cluster analysis is the Cluster Memberships. The output shows when the division between clusters have happened including it within the related Cluster stage. Following the clues given by the previous output, investigating in the supposed middle Clustering stages, the Cluster stage selected have been from 3 to 5.

Table 30 - Cluster Membership

Case	5 Clusters	4 Clusters	3 Clusters
1:Piemonte	1	1	1
2:Valle d'Aosta/Vallée d'Aoste	2	1	1
3:Liguria	2	1	1
4:Lombardia	2	1	1
5:Provincia Autonoma di Bolzano/Bozen	2	1	1
6:Provincia Autonoma di Trento	3	2	2
7:Veneto	2	1	1
8:Friuli-Venezia Giulia	2	1	1
9:Emilia-Romagna	2	1	1
10:Toscana	2	1	1
11:Umbria	4	3	3
12:Marche	4	3	3
13:Lazio	4	3	3
14:Abruzzo	2	1	1
15:Molise	4	3	3
16:Campania	5	4	1
17:Puglia	1	1	1
18:Basilicata	1	1	1
19:Calabria	5	4	1
20:Sicilia	5	4	1
21:Sardegna	5	4	1

Source: Own elaboration

Looking at the table is possible to see the moment when the clusters have been created. At the 3th clustering stage, the clusters are: Trento autonomous province, which came out at cluster's stage 2; Umbria, Marche, Lazio and Molise, came out here at cluster's stage 3; all the other regions as cluster 1. At the 4th stage, Calabria, Sardinia, Sicily and Calabria, the Southern main regions came out. At the 5th stage, the cluster gathering Piedmont, Puglia and Basilicata came out from the others in the sample.

The clusters are gathering regions with similar characteristic, similar growth's indices of the selected indicators: GDP per capita, Employment rate, % of R&D personnel, % of Population at risk of poverty, Tourism intensity and the amount of 2007- 2013 Community funding received.

The clustering process results reported can also be shown in the Dendogram tree. Before that, still another output must be discussed. It is the below output called the Case output. It is simply showing the relation between the amount of clusters to which a region belongs to and the regions themselves. The number of clusters is shown on the left side; the Italian regions in the top part.

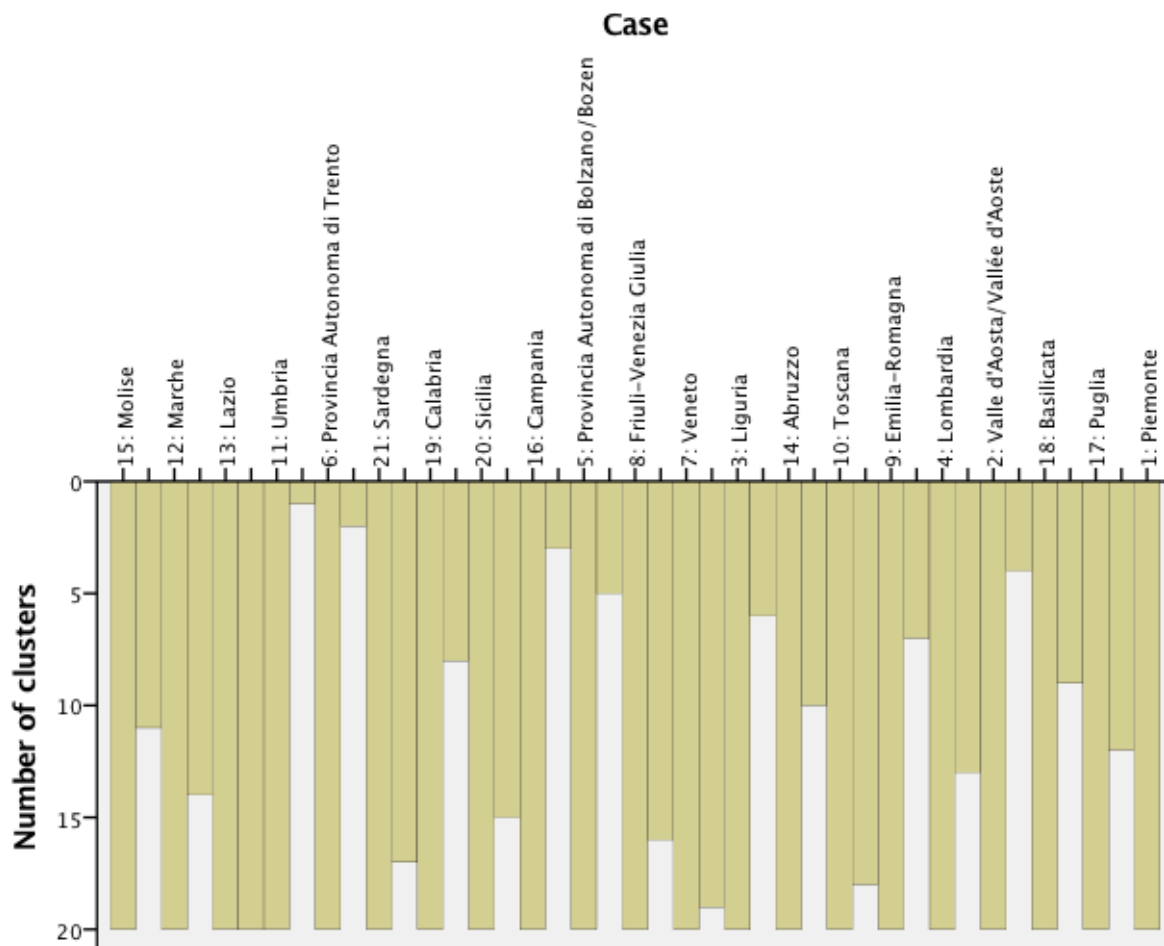


Figure 19 – Case Output

Source: Own elaboration

Looking at the Output it is possible to notice how the Autonomous province Bolzano and Trento

belong just to respectively to 3 and 1 cluster. This is because their characteristics are very different from the others in the dataset, so they came out quite early during the clustering process. On the other side Toscana and Emilia have a high number of clusters. It means that, during the clustering process they came out later and also, they belong to more clusters.

The next output is probably the most useful of all, the above-refereed Dendrogram. It can be expressed as the graphical representation of the Cluster analysis. The observation of the Dendrogram is easy and immediate. In the left vertical axis, we read the objects present in the analysis, the Italian regions. The horizontal axis shows the distance between the clusters when they are joined.

The “Dendrogram tree” provides various levels of aggregation: the choice of level at which to "cut" the tree must represent a fair compromise between the number of groups and their homogeneity. Generally, the cut must be done before aggregations corresponding to very big jumps between the values of the index. The branching-type nature of the Dendrogram allows to trace backward or forward to any individual case or cluster at any level. This Dendrogram has been built using Ward Linkage method and is shown below.

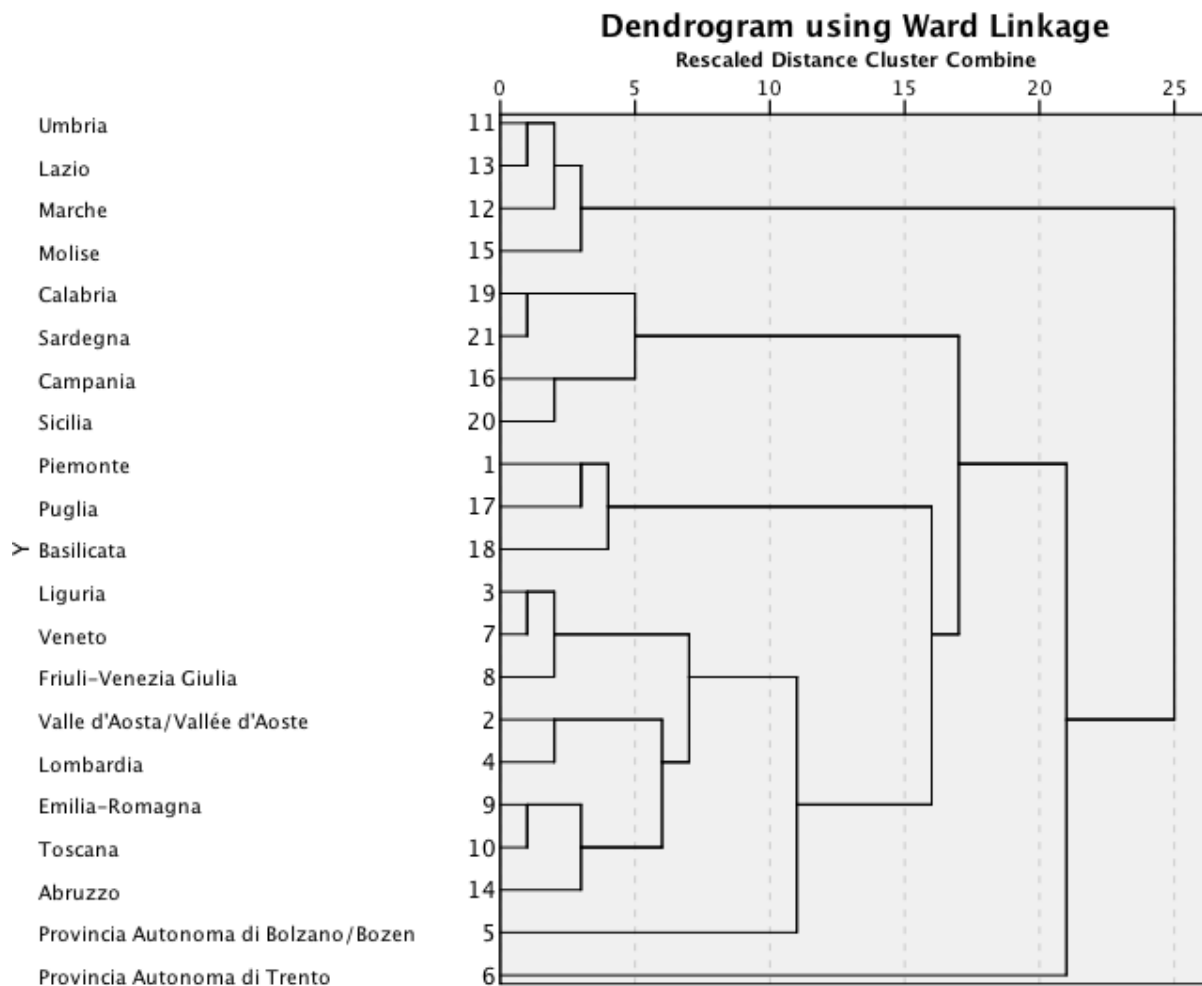


Figure 20 – Dendrogram of the Cluster analysis.

Source: Own elaboration

Following the Dendrogram and with the aim of better explain the given output, using the previously cited software SketchBook, it was possible to build a map which shows the regions clusters labelled on some specific characteristics found. The “cut” on the Dendrogram tree made to find these Clusters have been at the 7th clustering stage.

The map is showed below.

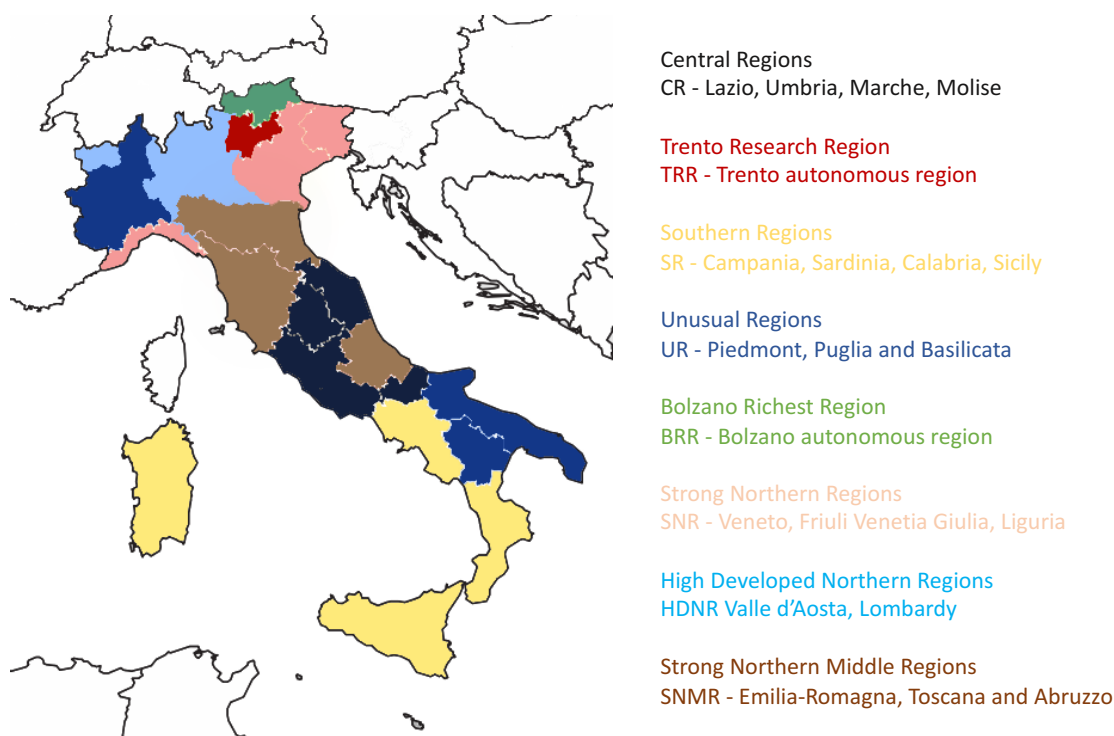


Figure 21 – Typologies of Italian Regions
Source: Own elaboration

The first group coming out from the sample at 1st clustering stage have been the CR. CR stands for “**Central Regions**”; these are the regions settled in the central part of the country. Looking at their indicators, growth values and indices express many similarities especially in terms of amounts of Community funds received, Employment rate which is very similar respectively, and GDP per capita and Employment rate negative growth, all of them with negative value between

In the next clustering stage, the 2nd, Trento autonomous regions comes out. This region is an outlier and does a cluster by itself, the reason is especially for its unique values regarding Research & Development personnel and researchers Index. The growth of R&D starts with a positive growth value of 0,319 and finishes with a 0,632. This data is reflected in the R&D index which is the highest among all regions from 2009 until 2016. This means that is the region which grows the most in this context and also the one with the highest value, that is the reason why this cluster was labelled TRR, “**Trento Research Region**”. Another reason why this region came out at 2nd stage of clustering and does a cluster by itself is because of its peculiar value of the Indicator: Population at risk of poverty or social exclusion. The Indicator is pair to the 7% of the population at 2007 reaching the 23% at 2016. The region can still be considered a “rich region” in the Italian context but it is probably the one which decreased and suffered the most this facet.

The third group, came out at the 3rd clustering stage, have been the SR. This acronym stands for “**Southern Regions**” because these are the main Southern regions in terms of dimension and

population. They have many similarities, similar values regarding Community funding ratio, from 0,6 to 1, similar values regarding GDP per capita Index, Employment rate Index but especially they have the same behaviour regarding the Population at risk of poverty Index. The growth Index behaves in the same way for the four regions which are starting from an already bad situation and are constantly getting worst with Index values in 2016 from 0,118 to 0,201. These regions with their characteristics reflect a good sample of the *Mezzogiorno* area.

At the 4th clustering stage the UR came out. It was labelled UR standing for “**Unusual Regions**”, because at a first look is an unusual cluster. Normally Piedmont, a northern region, have not so many characteristics in common with Puglia and Basilicata. On the other side Puglia and Basilicata have almost the same values regarding indicators, growth and indices under every aspect. Probably, what makes them joint in one unique Cluster is the similarities they have regarding the Indicator Tourism Intensity. In this context, they are all in the first positions with respectively 1; 0,927 and 0,757 Indices levels. Notice that Piedmont is the leading region under this aspect. Their growth in Tourism index have had almost the same behaviour. Also, in terms of population and economic dimension they have many similarities. The GDP per capita index of growth have been quite similar with values from 0,305 of Piedmont to 0,513 of Basilicata. One more thing, regarding the Index of Community funding, Basilicata and Piedmont are very similar with respectively 0,088 and 0,181.

At the fifth level there is BRR which stays for “**Bolzano Richest Region**”. This cluster comes out only at the 5th clustering stage because has many similarities with the others northern regions. It is composed by the single autonomous province of Bolzano. The aspect which distinguish this region from the others Nordic is that in term of “richness values” is the best. As regard as GDP per capita is the highest of the country and have had the best growth for the whole range of years taken into account. Employment rate behaves in the same way, having had most of the population employed and the best Indicator’s growth. As regard as percent of R&D personnel, the growth behaves in the average and it is one of the regions with the lowest value of population at risk of poverty or social exclusion. Also, the Tourism Intensity Index behaves quite high.

The next cluster stage, the 6th, has found the group of SNR – “**Strong Northern Regions**”. This group gathering Veneto, Friuli Venetia Giulia and Liguria came out because they all have similar characteristic average on the Country’s values. None of them have nor a leading nor a bad role in the Italian context having per each indicator used in the analysis a sort of "normal" values. Their main similarities regard the growth of population at risk of poverty or social exclusion, where they have

almost identical values of respectively 0,121, 0,135 and 0, 145 at year 2016 and furthermore regarding percent of R&D personnel and researchers, Indices from 0,467 to 0,616 at year 2016, Employment rate Indices from 0,491 to 0,599 at 2016 and GDP per capita Indices from 0,400 to 0,471 at 2016.

Almost the last clustering stage came out at 7th level, is the HDNR cluster, acronym standing for **“High Developed Northern Regions”**. This Cluster joints Val d’Aosta and Lombardy together, from the characteristic analysed they have some of the best values in the whole country however, no leading role which is owned by the previously analysed cluster of Bolzano autonomous region. They have similar GDP per capita Indices at year 2016 is 0,364 and 0,517 respectively; Employment rate 0,389 and 0,571; % of R&D personnel 0,353 and 0,404. They are both northern regions and a similarity is evident even from a first look at their indicators. Each one with its weight in relation to its population, Val’ d’Aosta the smallest and Lombardy one of the biggest, they appear to be the most developed regions.

Finally, the last cluster remaining is the SNMR **“Strong Northern and Middle Regions”** gathering Emilia-Romagna, Toscana and Abruzzo. These regions, belonging to northern and middle part of the country, have quite similar values and a discussion comparable to the one made for GNR should be done. Their value for Community Funding Indices is very close respectively 0,087; 0,140 and 0,050. Their Index behaves in the same way regarding GDP per capita where in the year 2016 is identical between Emilia-Romagna and Toscana both at 0,499 and Abruzzo very close with 0,537; Population at risk of poverty at 2016 is also almost identical with 0,183; 0,164 and 0,193. Moreover, these regions are very close in physical terms especially Toscana and Emilia Romagna.

Seven cluster have been founded with the analysis. They reflect the difference among regions have in terms of the selected characteristics. The distinction is clearly visible showing that the analysis worked well evidencing different typologies of regions in the Italian context.

Chapter 6 – Reflections and Conclusions

The Dissertation project reports the effects of the Structural funds, mainly the ones coming from the 2007-2013 programming period, on the socio-economic situation and the Regional Development of the Italian Regions. After having analysed the concepts pillars of regional development such as the Smart Specialisation, given some policy features of the European funds system, done some literature reviews on these notions, it was possible to start an analysis which investigates on the effectiveness of the Structural funds on the Italian regions

In the past years, many studies have been made regarding the effectiveness of Structural funds on regional development and socio-economic cohesion, not so many have been centred on a single country, even if some of them have been analysed during this Dissertation project (i.e.: De la Fuente, 2002; Aiello ,2009) but comprehending the effectiveness of the funds within the Italian region was one of the objectives of this work.

The main conclusion is that, in the end, the Structural funds are still a very important tool to develop projects and strategies within the European regions, strategies and project which generate, without any doubt, benefits for the regions receiving the funding.

From the statistical analysis made, a concrete positive effect of these funds certainly came out by analysing the Indicator's value, their Growths, their growth Indices and their correlation to the 2007-2013 Community Funding. For sure, Structural funds are helping the Regional development and socio-economic cohesion of the Italian Regions as much as in the other European regions. The reasons why this conclusion is drawn are various and they look at many facets.

First of all, it is evident how the Smart Specialisation Strategies implemented in Italy are helping the Structural funds to focus in many projects and investment in the Region's specialisation sectors. This is clear in the project's cases been analysed during the Dissertation process as much as in the results of the Cluster analysis reported. In the Cluster analysis the percentage of R&D personnel and researchers have been one of the characteristic which most glue the factors to each other, gathering the clusters. The regions having a high percentage of R&D personnel and researchers result to be the more developed and have been gather together. Also, the regions having similar sectors of specialisation and running similar Smart Specialisation Strategies have been jointed together. The Regional policy is moving towards the Smart Specialisation Strategy rationale for the planning and the implementations of plans and the share of funding between the stakeholders.

A reflection that should be done is regarding the European Cohesion Policy, applied to Italy and in

general to Europe. The Cohesion Policy aims to bring all the European regions to the same socio-economic conditions, improving the cohesion between them.

Overall, the analysis made here reports how this cohesion to be fully realised needs still some effort, even if many good steps have been made. The case of the Italian regions is well inserted in this summary. They still have some way to go to achieve a total cohesion within the Country's regions. The Southern regions, for almost every single indicator taken during the analysis been made, have had worst values compared to the northern ones.

Regarding GDP per capita, at year 2016 the difference between the highest values Southern region which is Molise and a medium value northern region such as Friuli Venetia Giulia is roughly ten thousand euro, respectively 20.004 euros and 30.274 euros. This difference is still too high for a country like Italy which should be united, standing on the European context as a leading country, being one of the founder members of the European Union. The same discussion in terms of negative socio-economic cohesion can be made for almost every indicator from the Employment rate which sees, Molise at 0,334 and Friuli Venetia Giulia at 0,400 to the Population at risk of poverty or social exclusion, in Molise the 37% while in Friuli Venetia Giulia the 17%, both at year 2016.

The reasons of that, as previously investigated, are cultural and historical. However, from the analysis comes out how the European funding is already aiming at this direction addressing most of the Italian funding to these regions. The region which received most of the funding have been Sicily with around 4 billion euros followed by Campania Puglia and Calabria. Seems to be this is not enough and that brings to the next conclusion to be drawn, the monitoring of the funds.

This massive funding is certainly helping these regions but also is not enough nor to achieve a total cohesion neither to fully coordinate their regional development. The monitoring of these funds should be improved, the open data access and the open view of the processes for funds reaching, of which a good example is the *OpenCoesione* website, are extraordinary tools in this sense. In this way it may be avoid the waste of some amount of funding received by these regions which also have the peculiar socio-cultural issue of bad governance.

It seems clear, from the indicator's analysis, how the World economic crisis, also called Great Recession, which afflicted most of the Western Countries, starting 2007 from the USA to European regions, have deeply affected Europe and its region's economy. This is why some indicators, GDP per capita and Employment rate at first, have been negatively stirred from the year 2008th. Also, the growth, almost in every region, of the population at risk of poverty or risk of social exclusion, even if related with the decrease of GDP per capita and Employment rate, is a proper evidence of the effects of this crisis. This fact has taken out some positive effectiveness to the European funding which,

without the Great Recession effects, would have helped much more the socio-economic growth and the development of the Italian regions and European regions in general. The European countries tried to recover this affliction also by R&D investments as seen in the analysis but the effects of this expenditure will probably be better seen in a long term perspective

As regard to the Tourism dimension analysed in the Dissertation, some reflections need to be done. From the exercises made during the Dissertation project, the Tourism Intensity indicator seems to be associated with the funds allocation. The Tourism Intensity, the night stay and every Tourism factor normally have had a growth trend in the last years. In general, it is possible to say that any kind of people movement and people share between the member-states helps this indicator. This is explained by the simple definition of Tourist given by the UNWTO, the World Tourism Organisation, which defines a tourist as “a visitor (domestic, inbound or outbound), whose trip includes an overnight stay”. Given that, the sharing of funding between the regions clearly generates a sharing of “people flows” within the same context, consequentially tourism. This is one way how the Structural funds are improving Tourism that I will call “indirect way”.

Still there is another way how Structural funds are impacting in Tourism directly. Concretely, any project implemented in the infrastructure sector improves the capacity of movement of people within the Country and Tourism so on. Also, from a view done through the *OpenCoesione* website tools, plenty of projects directly related to Tourism can be found. Some of them have been financed already, from projects of valorisation and renovation of cultural heritage to projects aimed at landscapes, parks and environment.

However, the Dissertation, especially in the empirical analysis have had some limitations and problems. The availability of data at the time while this Dissertation was made was quite limitation having for almost every variable the year 2016 as the most recent. As previously said this is strong enough for the longer-term analysis of the 2007-2013 Community funding but not fairly for the 2014-2020 period. Also, the difficulties on finding data about the funding received by the regions which have been taken from Eurostat but also one by one from every single ROP and the NOP. Other variables at regional level taken also from Eurostat but quite hard to find and manage. Data on public funds, such as ESIF, must be more accessible and easy to understand, and friendly to use, for the purpose of scientific analysis but also to the citizen’s information in general.

With the hope that this Dissertation could help other researchers to better understand the ESIF dynamics and their effectiveness, from a personal point of view my future research direction and interests will be the regional development within the European context. Future research may be looking for empirical evidence of how Europe unite is generating more net benefits for all member-states than costs and should not be considered a burden for any country. An opportunity and not an

obstacle for the development. To close I would like to cite part of the declaration of Schuman, one of the European Union's fathers, made the 9th May 1950 saying "Europe will not be made all at once or through overall integration; it will arise through concrete achievements which first create a *de facto* solidarity".

The European Structural funds are certainly helping the Regional development in Italy but there is still space for a substantial improvement in the direction of a coordinate regional development which aims to a total cohesion within the whole Italian context and the European Regions as well.

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ANNEX 1

ANOVA test is a way to find out if the results are significant. In other words, it helps to figure out if to reject the null hypothesis or accept the alternate hypothesis of significance. In this case we are testing the Italian regions characteristics to see if there are strong differences between them.

While doing ANOVA One-way or two-way refers to the number of independent variables. In this case one-way has been chosen having one independent variable the Community Funding. Only the latest year (2016) have been selected to proceed with a better analysis. The decision was made because of the lengths of the dataset and also because the results already presented statistical significant variance between the means.

Table 31 - ANOVA test

		Sum of Squares	df	Mean Square	F	Sig.
2016 IGDP	Between Groups	,972	20	,049	.	.
	Within Groups	,000	0	.		
	Total	,972	20			
2016 IEMr	Between Groups	1,114	20	,056	.	.
	Within Groups	,000	0	.		
	Total	1,114	20			
2016 IR&D	Between Groups	1,406	20	,070	.	.
	Within Groups	,000	0	.		
	Total	1,406	20			
2016 IPR	Between Groups	,779	20	,039	.	.
	Within Groups	,000	0	.		
	Total	,779	20			
2016 ITI	Between Groups	1,215	20	,061	.	.
	Within Groups	,000	0	.		
	Total	1,215	20			

Source: Own elaboration

From the ANOVA test table output is possible to see a significant difference.

The variability among the means appears clear. The significance value for the whole sample is 0.000, below 0.05 level. Therefore, there is a statistically significant difference, we have to accept the hypothesis of a difference between the means. This means, has been previously analysed during the cluster analysis and shows there are differences in the characteristics between the Italian Regions as some of them excel in some values others in another. The highest Mean Squares regards to R&D Indices followed by Tourism Intensity Indices and Employment Rate Indices meaning that these are

the values varying the most in the 21th regions sample range.

To better analyse this aspect of Indices variation it's good to derivate some more graphs for each of our indicator related to Italian Regions.

This graph is called the Means Plot and it shows the Indices variation having on the left side the indicators and on the bottom part the reference indicator which have been selected as the amount of Community funding received by the regions.

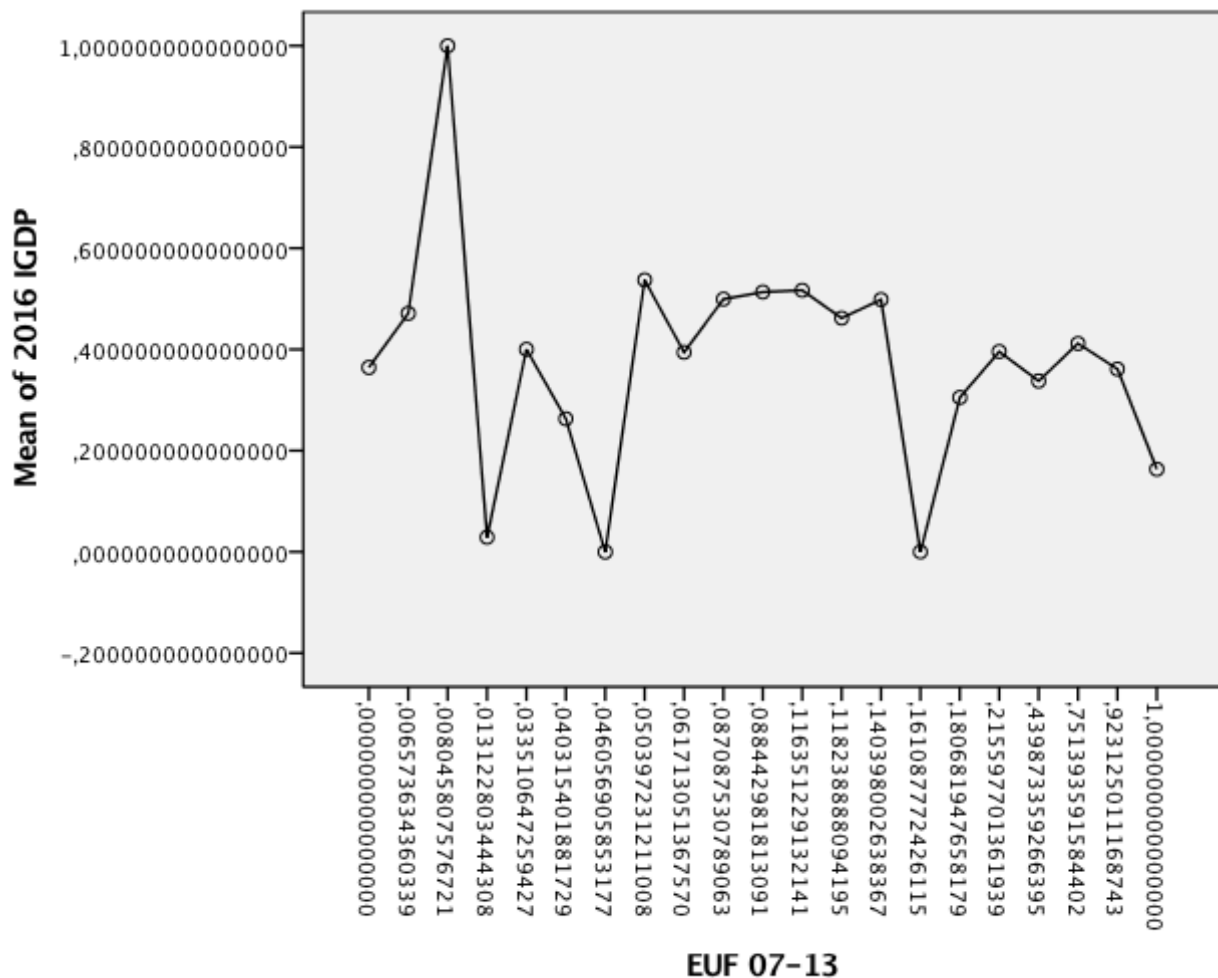


Figure A1 – Means Plot, GDP per capita Index and Community Funding 2007-2013.

The first Means Plot shows how the region's Indices behave in a very various way with top down pick at 3rd, 6th, and 14th point and then a behaviour in line with the average.

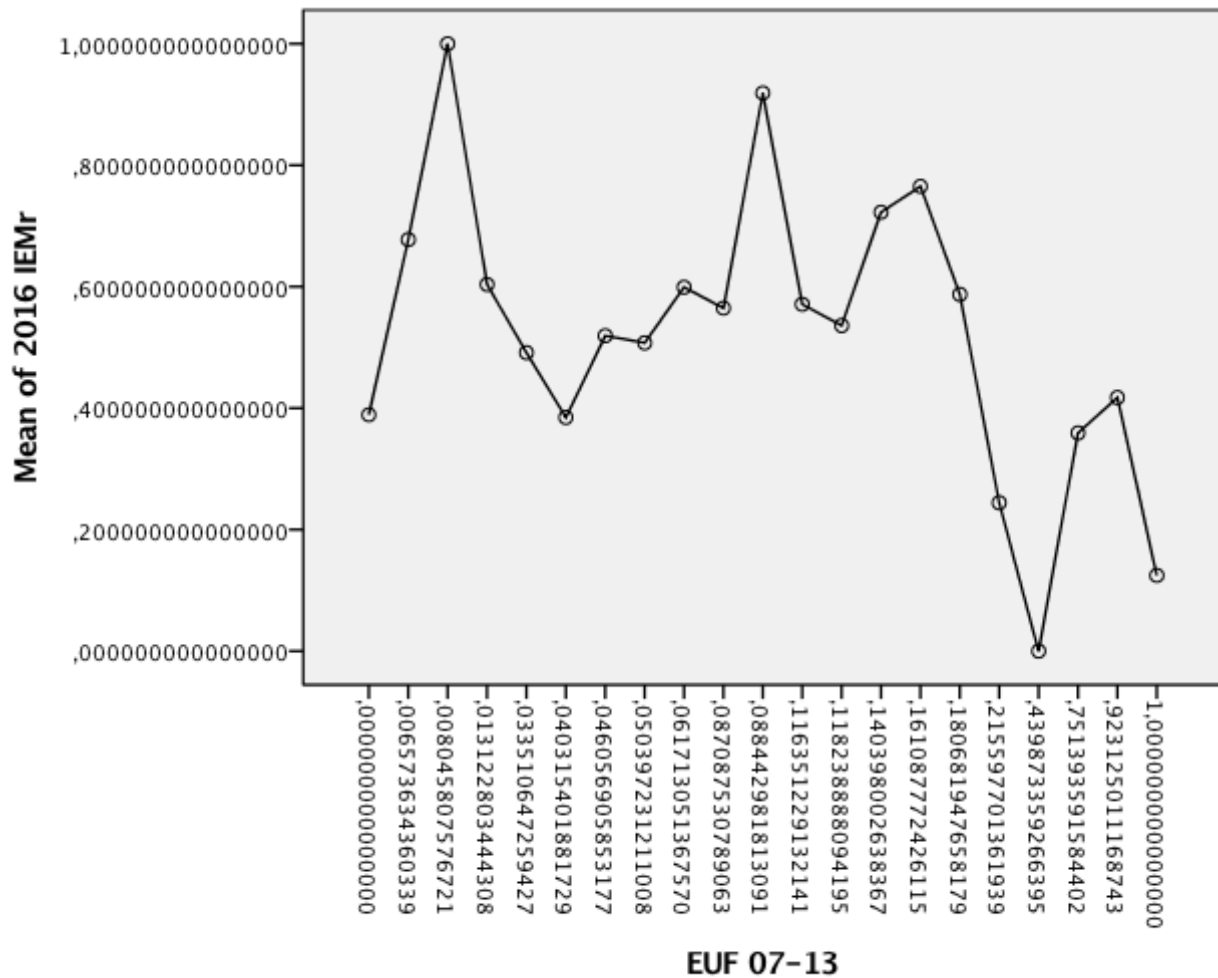


Figure A2 – Means Plot, Employment rate and Community Funding 2007-2013.

This Plot is different showing the variance between the Employment Rate and the Community funding. The variance between the regions is very wide. It is possible to see that from the trend of the line which reaches top picks at the 3th, 11th almost 16th and the top down at 19th.

These are the Italian regions where the variance has been bigger in sense of decrease or increase

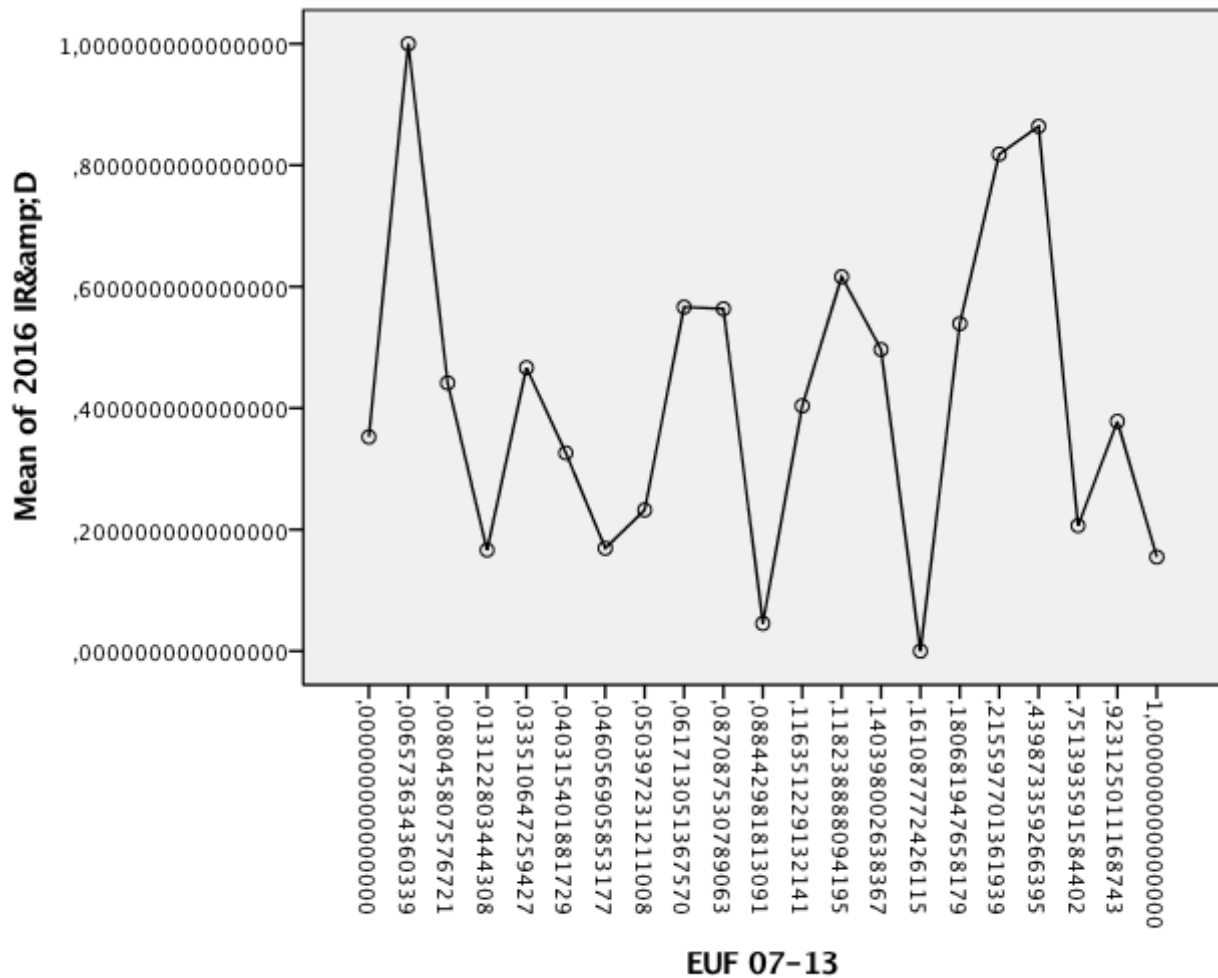


Figure A3 – Means Plot R&D and Community funding 2007-2013.

This is the Means Plot where the variance between the Italian regions appears clearest.

There are at least 3 top picks at 2nd 17th and 18th point as well as four down picks at 4th 7th 14th and 16th points.

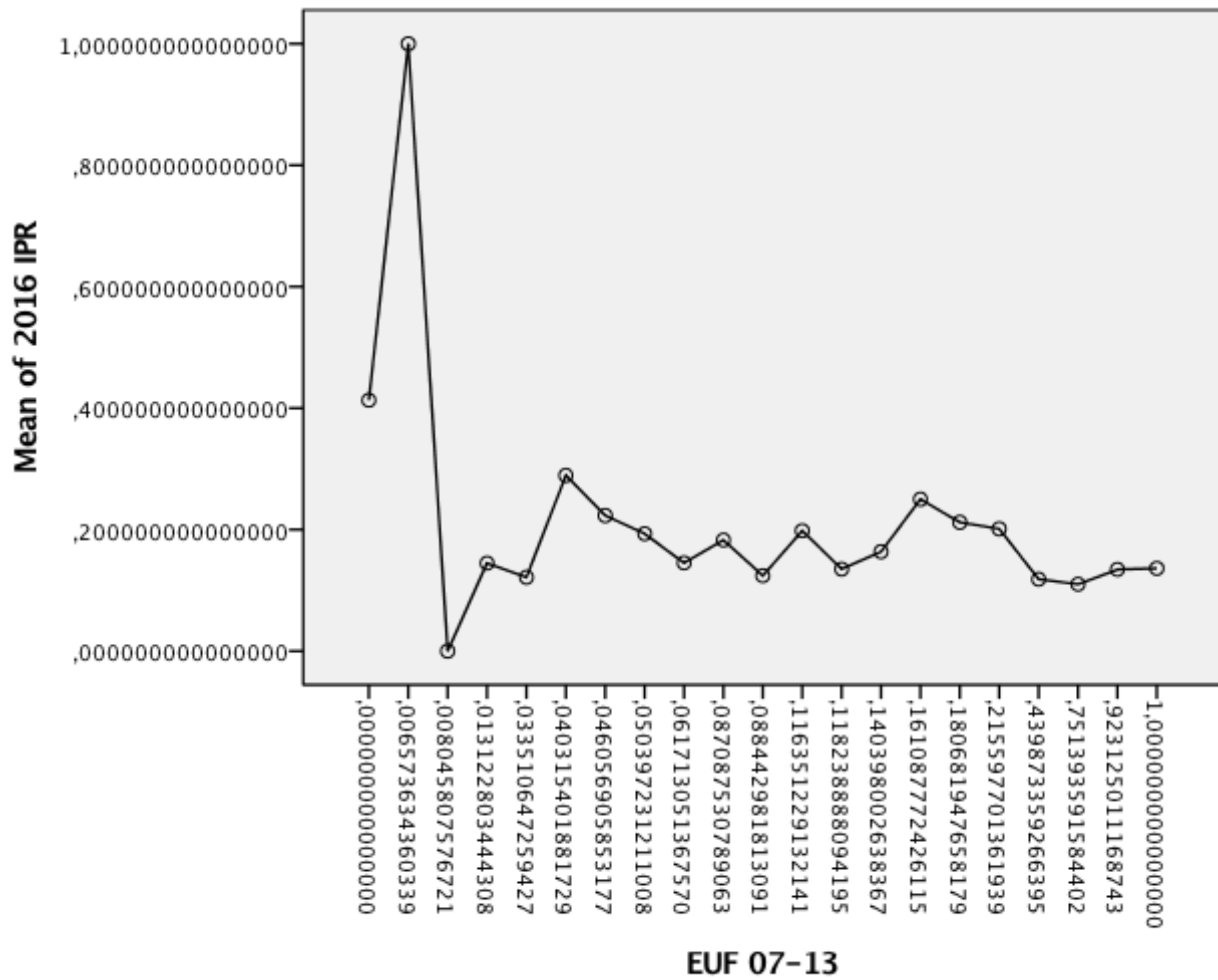


Figure A4 – Means Plot Population at risk of poverty or social exclusion and Community funding 2007-2013.

This Means Plot behave normally with only one pick at the 2nd point, a down pick at 3rd and then staying in the average line.

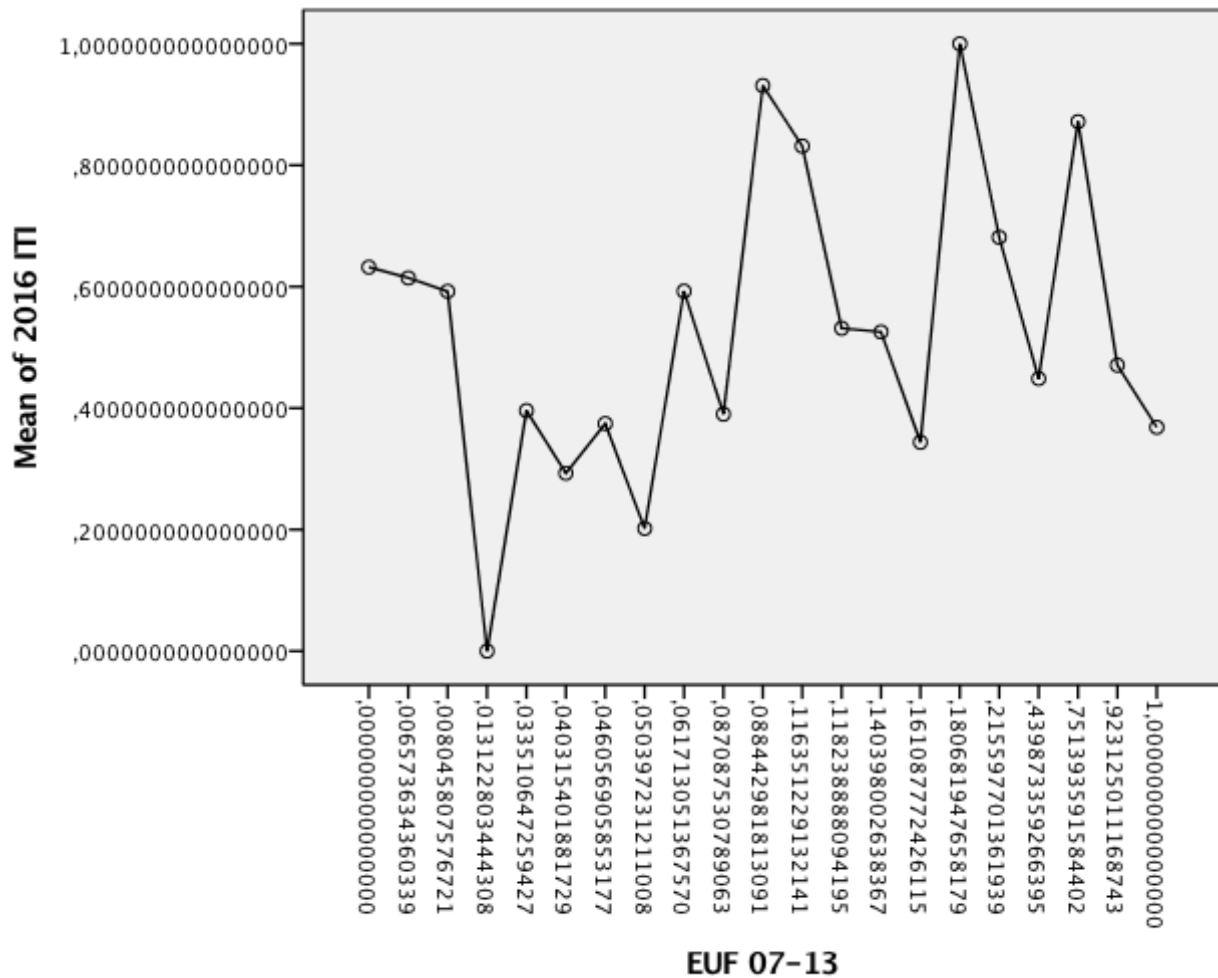


Figure A5 – Means Plot Tourism Intensity and Community Funding.

Finally, the Means Plot regarding the Tourism Intensity again shows a high variance between the relations of the Italian regions. After a 4th point down pick, the other reflects at least three top picks for a relation of variances between the groups.

A similar to ANOVA test to see the variance between the sample and the characteristics of the analyses is the K related samples test. In particular, in this analysis have been used the Friedman test which is the non-parametric alternative to the one-way ANOVA with repeated measures. It is used to test for differences between groups when the dependent variable being measured is ordinal.

It is analysing the means looking at their distances between each other in the context of the Italian regions.

The first output given by the test is the Ranks. In here every variable is showed with his values for coefficient. Is good to notice when there is a high value of variance between coefficients.

Table 32 - Ranks of K related samples

Ranks			
	Mean Rank		
EUFI 07-13	11,67	2008 IR&D	15,83
2008 IGDP	26,36	2009 IR&D	22,02
2009 IGDP	27,29	2010 IR&D	24,12
2010 IGDP	21,19	2011 IR&D	23,07
2011 IGDP	19,67	2012 IR&D	24,98
2012 IGDP	16,76	2013 IR&D	28,60
2013 IGDP	20,86	2014 IR&D	33,31
2014 IGDP	23,48	2015 IR&D	25,45
2015 IGDP	22,10	2016 IR&D	22,79
2016 IGDP	18,38	2008 IPR	16,69
2008 IEMr	32,00	2009 IPR	24,45
2009 IEMr	33,07	2010 IPR	20,12
2010 IEMr	30,98	2011 IPR	12,86
2011 IEMr	33,93	2012 IPR	8,71
2012 IEMr	21,40	2013 IPR	16,74
2013 IEMr	23,57	2014 IPR	20,90
2014 IEMr	24,38	2015 IPR	14,90
2015 IEMr	29,86	2016 IPR	11,05
2016 IEMr	28,76	2008 ITI	31,43
		2009 ITI	33,81
		2010 ITI	26,33
		2011 ITI	26,38
		2012 ITI	26,00
		2013 ITI	26,64
		2014 ITI	27,88
		2015 ITI	21,26
		2016 ITI	28,98

Table 33 - Test Statistics

N	21
Chi-Square	208,835
df	45
Sig.	,000
a. Friedman Test	

The Test statistics outlines the results of the test.

N is the number of variables been analysed.

The Chi-Square is the variance over the mean ranks: it is 0 when the mean ranks are exactly equal and becomes larger as they move further apart. The Chi Square for the test made is 208,835 meaning that the variance between the samples means, the region's characterising indicators growth, have been wide and relevant.

The P-value is $> 0,05$. The P-value is the probability of finding differences if the population distributions are equal. They contradict our hypothesis of equal population distributions. There are so without any doubt differences within the Italian Regions in term of the characteristic analyse in both cases related to the Community founding or not.

ANNEX 2

In these Annex are shown the tables related to the starting data of the analysis done.

To remind, the variables are:

- The ESF Community Funding received by each of the 21th Italian regions NUTS2 in the 2007-2013 programming period and also in the 2014-2020 programming period.
- The ERDF Community Funding received by each of the 21th Italian regions NUTS2 in the 2007-2013 programming period and also in the 2014-2020 programming period.
- The Gross domestic product (GDP) at current market prices, in euros, per each Italian regions NUTS2 in a range of 10 years, from 2007 to 2016
- The Average annual population per each Italian regions NUTS2, in thousands, in a range of 10 years, from 2007 to 2016.
- The number of employed per each Italian regions NUTS2, in thousands, in a range of 10 years, from 2007 to 2016.
- The Research and Development (R&D) personnel and researchers per each Italian regions NUTS2, in units, in a range of 10 years, from 2007 to 2016.
- People at risk of poverty or social exclusion per each Italian regions NUTS2, in percentage, in a range of 10 years, from 2007 to 2016.
- Nights spent at tourist accommodation establishments per each Italian regions NUTS2, in units in a range of 10 years, from 2007 to 2016

Table 34 - ESF Community Funding

	2007-2013 ESF Community funding €	2014-2020 ESF Community funding €
Piemonte	397.283.869	436.145.000
Valle d'Aosta/Vallée d'Aoste	32.911.544	27.786.275
Liguria	147.619.048	177.272.384
Lombardia	338.017.613	485.237.258
Provincia Autonoma di Bolzano/Bozen	60.745.159	68.310.599
Provincia Autonoma di Trento	61.198.969	54.989.992
Veneto	349.019.589	382.015.911
Friuli-Venezia Giulia	120.355.589	138.213.907
Emilia-Romagna	295.929.210	393.125.091
Toscana	313.045.574	366.481.608
Umbria	98.984.087	118.764.401
Marche	111.554.330	143.989.809
Lazio	368.038.775	451.267.357
Abruzzo	127.719.591	71.251.575
Molise	37.665.371	23.853.230
Campania	559.000.000	627.882.260
Puglia	639.600.000	772.409.449
Basilicata	128.946.235	144.812.084
Calabria	430.249.377	254.339.876
Sicilia	1.049.619.576	615.072.321
Sardegna	291.716.470	143.989.809

Source: Eurostat

Table 35 - ERDF Community Funding

	2007-2013 ERDF Community funding €	2014-2020 ERDF Community funding €
Piemonte	426.119.322	482.922.370
Valle d'Aosta/Vallée d'Aoste	19.524.245	32.175.475
Liguria	168.145.488	196.272.620
Lombardia	210.887.281	485.237.258
Provincia Autonoma di Bolzano/Bozen	26.021.981	68.310.599
Provincia Autonoma di Trento	19.286.428	54.334.047
Veneto	207.939.920	300.155.358
Friuli-Venezia Giulia	74.069.764	115.389.592
Emilia-Romagna	128.107.883	240.947.636
Toscana	338.466.574	396.227.254
Umbria	149.975.890	206.146.602
Marche	112.906.728	168.691.644
Lazio	371.756.338	484.532.597
Abruzzo	139.760.495	115.754.890
Molise	70.765.241	52.950.497
Campania	3.432.397.599	3.085.159.382
Puglia	2.619.021.978	2.788.070.047
Basilicata	300.874.549	413.015.666
Calabria	1.499.120.026	1.529.877.755
Sicilia	3.269.802.550	3.418.431.018
Sardegna	680.671.765	465.489.541

Source: Eurostat

Table 36 - Gross domestic product (GDP) at current market prices

-	2007 GDP at current market prices K€	2008 GDP at current market prices K€	2009 GDP at current market prices K€	2010 GDP at current market prices K€	2011 GDP at current market prices K€	2012 GDP at current market prices K€	2013 GDP at current market prices K€	2014 GDP at current market prices K€	2015 GDP at current market prices K€	2016 GDP at current market prices K€
Piemont e	128.808	129.164	120.669	125.313	128.104	123.950	125.353	125.480	127.866	129.322
Valle d'Aosta/ Vallée d'Aoste	4.346	4.487	4.289	4.487	4.559	4.593	4.403	4.410	4.404	4.436
Liguria	48.203	49.254	46.986	46.688	47.630	46.801	46.347	47.247	47.958	48.287
Lombar dia	333.047	346.189	330.594	345.569	352.857	346.972	344.407	351.589	359.349	366.541
Provinci a Autono ma di Bolzano/ Bozen	17.944	18.541	18.448	19.081	19.723	20.493	20.783	21.051	21.603	22.272
Provinci a Autono ma di Trento	17.250	17.495	17.221	17.602	18.014	17.994	18.397	18.553	18.608	18.832
Veneto	146.984	147.220	142.048	144.738	149.232	146.773	147.023	149.520	152.656	155.515
Friuli- Venezia Giulia	36.207	35.924	33.968	35.169	35.844	34.747	35.106	35.382	36.467	36.935
Emilia- Romagn a	140.856	142.842	135.581	138.755	144.413	142.532	143.796	146.840	149.693	153.997
Toscana	104.999	106.096	104.029	105.152	107.704	107.241	106.456	108.725	110.182	112.239
Umbria	22.663	22.967	21.584	21.947	22.133	21.520	21.171	20.839	21.466	21.341
Marche	41.210	40.974	39.856	39.921	40.486	39.597	39.132	40.253	40.418	40.988
Lazio	184.742	185.199	182.492	184.141	187.649	182.525	180.802	181.792	183.000	185.935
Abruzzo	30.086	30.863	29.747	30.581	31.888	31.788	31.349	31.440	31.695	31.959
Molise	6.910	6.756	6.587	6.552	6.546	6.369	5.961	5.903	6.036	6.233
Campani a	105.126	105.537	102.678	101.430	101.213	100.738	99.202	99.943	102.422	106.753
Puglia	71.142	70.506	68.785	69.990	71.267	71.702	70.115	70.625	72.167	72.406
Basilicat a	11.593	11.571	10.937	10.798	11.129	11.081	11.404	11.008	12.001	11.782
Calabria	33.253	33.816	33.092	32.975	33.328	32.734	32.255	32.099	32.440	33.054
Sicilia	90.005	91.120	88.796	88.966	88.712	88.049	86.722	84.977	86.661	86.998
Sardegna	32.948	33.926	33.090	33.150	33.375	33.359	32.506	32.590	33.712	33.556

Source: Eurostat

Table 37 - Average annual population thousands

	2007 Averag e annual populat ion K	2008 Averag e annual populat ion K	2009 Averag e annual populat ion K	2010 Averag e annual populat ion K	2011 Averag e annual populat ion K	2012 Averag e annual populat ion K	2013 Averag e annual populat ion K	2014 Averag e annual populat ion K	2015 Averag e annual populat ion K	2016 Averag e annual populat ion K
Piemont e	4.337	4.377	4.398	4.407	4.415	4.426	4.435	4.431	4.414	4.398
Valle d'Aosta/ Vallée d'Aoste	125	126	127	127	127	128	128	128	128	127
Liguria	1.584	1.589	1.592	1.593	1.592	1.593	1.593	1.588	1.577	1.568
Lombar dia	9.481	9.566	9.642	9.711	9.783	9.858	9.936	9.988	10.005	10.014
Provinci a Autono ma di Bolzano/ Bozen	489	494	499	503	506	510	514	517	520	523
Provinci a Autono ma di Trento	508	514	520	524	528	531	535	537	538	538
Veneto	4.774	4.826	4.859	4.875	4.889	4.905	4.921	4.927	4.921	4.911
Friuli- Venezia Giulia	1.212	1.220	1.224	1.225	1.224	1.225	1.228	1.228	1.224	1.220
Emilia- Romagn a	4.223	4.279	4.326	4.358	4.384	4.410	4.435	4.448	4.449	4.449
Toscana	3.633	3.669	3.697	3.717	3.732	3.742	3.749	3.752	3.749	3.743
Umbria	865	875	882	887	891	893	896	896	893	890
Marche	1.518	1.534	1.545	1.549	1.551	1.553	1.554	1.552	1.547	1.541
Lazio	5.359	5.430	5.489	5.539	5.592	5.690	5.815	5.881	5.890	5.893
Abruzzo	1.305	1.318	1.325	1.328	1.331	1.333	1.334	1.333	1.329	1.324
Molise	318	318	317	315	315	314	315	314	313	311
Campani a	5.778	5.791	5.801	5.816	5.828	5.843	5.861	5.866	5.856	5.845
Puglia	4.065	4.076	4.085	4.096	4.102	4.100	4.093	4.090	4.084	4.071
Basilicat a	586	585	584	582	580	579	579	578	575	572
Calabria	1.976	1.979	1.976	1.973	1.971	1.973	1.978	1.979	1.974	1.968
Sicilia	5.007	5.024	5.039	5.052	5.063	5.074	5.088	5.094	5.083	5.066
Sardegna	1.646	1.651	1.654	1.655	1.656	1.658	1.662	1.664	1.661	1.656

Source: Eurostat

Table 38 - Employees (thousands)(K)

-	2007 Emplo yment K	2008 Emplo yment K	2009 Emplo yment K	2010 Emplo yment K	2011 Emplo yment K	2012 Emplo yment K	2013 Emplo yment K	2014 Emplo yment K	2015 Emplo yment K	2016 Emplo yment K
Piemonte	1.802,4	1.827,1	1.797,7	1.784,6	1.802,1	1.780,5	1.736,1	1.732,8	1.755,5	1.764,0
Valle d'Aosta/Vallée d'Aoste	56,1	55,9	55,1	55,4	55,0	54,3	53,7	54,1	53,7	53,3
Liguria	618,5	619,9	616,7	611,7	613,5	601,0	585,8	583,5	594,1	592,0
Lombardia	4.162,6	4.196,0	4.138,9	4.106,9	4.101,2	4.107,8	4.138,0	4.152,4	4.169,0	4.232,5
Provincia Autonoma di Bolzano/Bozen	222,1	226,3	227,5	231,2	232,8	236,7	237,1	236,5	239,0	244,1
Provincia Autonoma di Trento	218,7	222,3	223,7	223,2	224,7	223,4	224,6	226,5	227,1	226,7
Veneto	2.066,2	2.107,3	2.058,1	2.051,9	2.068,8	2.063,8	2.003,5	2.020,9	2.009,9	2.034,9
Friuli- Venezia Giulia	510,2	510,1	497,3	496,3	499,1	491,1	484,3	483,6	484,5	488,2
Emilia- Romagna	1.883,5	1.903,7	1.877,3	1.868,2	1.891,7	1.884,6	1.853,0	1.854,5	1.863,4	1.908,3
Toscana	1.496,1	1.523,7	1.521,0	1.503,5	1.502,8	1.502,0	1.496,7	1.492,2	1.511,0	1.519,2
Umbria	352,6	361,0	350,6	350,9	350,1	345,5	342,0	341,4	350,8	346,4
Marche	634,6	640,8	635,3	630,0	617,1	616,9	600,8	611,4	605,4	602,0
Lazio	2.099,8	2.150,7	2.148,0	2.153,1	2.158,9	2.179,7	2.184,5	2.252,2	2.261,1	2.290,7
Abruzzo	490,0	503,8	481,4	480,2	491,9	491,6	475,5	464,3	466,5	473,8
Molise	109,9	111,6	107,6	105,0	103,2	103,7	97,3	98,8	99,9	104,0
Campania	1.692,2	1.650,0	1.590,6	1.558,2	1.544,3	1.565,7	1.560,4	1.540,1	1.551,6	1.608,1
Puglia	1.261,3	1.264,5	1.221,3	1.207,2	1.218,4	1.218,0	1.141,7	1.129,3	1.155,5	1.175,5
Basilicata	190,4	191,1	186,3	181,0	182,8	179,3	176,3	179,3	185,7	188,7
Calabria	586,7	578,9	566,1	554,0	557,9	543,8	510,2	514,2	506,1	512,0
Sicilia	1.465,3	1.460,9	1.448,9	1.424,5	1.417,9	1.381,9	1.316,0	1.303,8	1.330,9	1.327,0
Sardegna	598,1	593,1	574,7	574,6	580,8	577,9	538,0	537,7	551,9	549,5

Source: Eurostat

Table 39 - R&D personnel and researchers (unit)

	2007 R&D personnel and researchers	2008 R&D personnel and researchers	2009 R&D personnel and researchers	2010 R&D personnel and researchers	2011 R&D personnel and researchers	2012 R&D personnel and researchers	2013 R&D personnel and researchers	2014 R&D personnel and researchers	2015 R&D personnel and researchers	2016 R&D personnel and researchers
Piemonte	21.395	22.119	23.257	22.920	22.906	24.158	25.809	25.992	28.247	28.298
Valle d'Aosta/ Vallée d'Aoste	263	295	337	316	337	335	316	320	302	313
Liguria	5.688	6.375	7.052	7.171	7.411	7.392	7.214	6.883	7.441	7.453
Lombardia	39.635	43.479	45.921	47.467	48.034	50.154	49.912	50.325	50.472	50.564
Provincia Autonoma di Bolzano /Bozen	1.229	1.346	1.431	1.465	1.559	1.604	1.781	1.846	1.696	1.623
Provincia Autonoma di Trento	2.430	3.233	3.357	3.191	3.526	3.915	3.883	3.791	4.115	4.201
Veneto	16.772	22.369	21.626	21.326	21.935	22.783	23.226	22.569	23.418	23.450
Friuli- Venezia Giulia	5.153	5.991	6.031	5.941	6.278	6.692	6.169	6.229	6.486	6.497
Emilia- Romagna	23.033	22.061	23.156	24.615	24.576	26.901	29.543	30.372	31.939	32.070
Toscana	13.977	14.452	14.778	14.674	15.136	16.328	17.435	18.207	18.254	18.345
Umbria	2.789	2.658	2.643	2.643	2.604	2.713	2.753	2.879	2923	2987
Marche	4.703	4.717	4.551	4.543	4.423	4.850	5.002	5.555	5.475	5.503
Lazio	32.682	32.245	32.687	32.084	31.518	32.670	32.104	31.920	33.039	33.076
Abruzzo	3.289	3.261	3.209	3.216	3.100	2.920	3.167	3.263	3.580	3.623
Molise	503	464	505	428	433	440	593	531	521	511
Campania	13.001	13.902	14.297	12.882	13.076	14.692	14.629	14.792	15.638	15.645
Puglia	7.370	7.114	7.052	6.543	6.523	6.752	7.160	7.606	7.805	7.878
Basilicata	1.184	1.214	1.032	1.003	952	902	937	871	1.021	1.101
Calabria	1.838	1.942	1.858	1.802	1.740	1.895	2.350	2.453	2.723	2.811
Sicilia	8.555	8.858	8.651	8.304	8.359	8.250	9.033	9.251	8.973	8.921
Sardegna	2.888	3.023	3.099	3.099	3.673	3.833	3.747	3.812	4.339	4.367

Source: Eurostat

Table 40 - % People at risk of poverty or social exclusion

	2007 % People at risk of poverty	2008 % People at risk of poverty	2009 % People at risk of poverty	2010 % People at risk of poverty	2011 % People at risk of poverty	2012 % People at risk of poverty	2013 % People at risk of poverty	2014 % People at risk of poverty	2015 % People at risk of poverty	2016 % People at risk of poverty
Piemonte	17,9	17,0	16,8	18,2	21,8	20,3	16,5	18,8	18,0	22,9
Valle d'Aosta/ Vallée d'Aoste	11,7	11,2	12,1	14,5	13,6	15,0	21,3	17,5	17,9	20,5
Liguria	21,3	19,8	15,8	16,4	19,4	21,4	23,4	26,5	25,8	23,9
Lombard ia	15,8	14,7	15,3	15,2	15,9	19,3	17,7	18,1	17,6	19,7
Provincia Autonom a di Bolzano/ Bozen	12,3	11,8	11,9	10,6	11,1	12,2	12,4	9,7	13,7	9,6
Provincia Autonom a di Trento	7,5	8,3	10,1	10,8	14,4	19,2	13,2	13,6	15,8	23,5
Veneto	16,3	15,2	14,6	16,1	16,2	17,1	16,1	16,9	16,8	17,9
Friuli- Venezia Giulia	16,6	17,7	16,7	14,6	16,3	18,0	16,1	16,3	14,5	17,7
Emilia- Romagna	13,3	13,2	14,3	12,7	15,7	16,0	17,8	16,4	15,4	16,1
Toscana	14,5	15,2	14,9	17,5	20,0	21,2	18,4	19,2	18,6	16,9
Umbria	18,0	17,8	17,1	17,7	20,7	22,0	22,7	21,9	28,5	23,5
Marche	16,7	16,5	16,3	18,4	21,9	23,2	21,8	19,6	23,0	24,4
Lazio	22,5	21,7	21,9	22,4	24,1	28,3	26,1	24,7	27,0	30,8
Abruzzo	25,5	24,5	27,2	27,4	34,3	27,7	26,1	29,5	30,1	31,5
Molise	33,0	30,4	33,7	32,0	33,8	36,1	44,7	40,7	31,7	37,0
Campani a	45,5	47,6	44,0	45,1	48,3	50,1	49,8	49,0	46,1	49,9
Puglia	40,6	38,2	36,4	36,3	42,0	49,0	43,6	40,6	47,8	42,2
Basilicat a	37,3	39,4	41,7	35,2	47,6	46,9	48,5	39,6	41,5	40,0
Calabria	44,1	44,4	42,9	41,5	47,1	46,4	45,6	43,5	44,2	46,7
Sicilia	50,5	48,2	48,2	47,4	54,3	56,9	55,0	54,4	55,4	55,6
Sardegna	30,3	35,0	30,5	26,2	32,4	28,4	32,2	37,7	36,6	38,0

Source: Eurostat

Table 41 - Nights stays

	2007 Nights stays	2008 Nights stays	2009 Nights stays	2010 Nights stays	2011 Nights stays	2012 Nights stays	2013 Nights stays	2014 Nights stays	2015 Nights stays	2016 Nights stays
Piemonte	10.317 .171	11.558 .330	11.593 .822	12.365 .022	12.845 .074	12.415 .037	12.690 .568	13.061 .306	13.681 .316	14.011 .200
Valle d'Aosta/Vallée d'Aoste	3.106. 584	3.113. 340	3.133. 921	3.107. 827	3.126. 165	3.166. 295	2.981. 002	2.986. 319	3.238. 559	3.468. 379
Liguria	14.170 .265	14.130 .514	13.952 .944	13.754 .235	14.060 .622	13.401 .547	13.149 .699	13.474 .247	14.328 .278	15.052 .324
Lombardia	28.648 .519	28.303 .505	29.456 .808	31.126 .864	33.123 .562	33.366 .636	33.960 .641	34.293 .526	37.857 .240	37.194 .096
Provincia Autonoma di Bolzano/Bozen	27.293 .308	27.699 .447	28.067 .592	28.568 .205	28.872 .461	29.398 .900	29.017 .046	28.428 .922	29.439 .988	31.318 .441
Provincia Autonoma di Trento	14.703 .083	14.873 .012	15.235 .186	15.191 .244	15.287 .619	15.488 .347	15.482 .582	15.369 .920	16.070 .571	16.930 .768
Veneto	61.529 .573	60.607 .073	60.444 .395	60.820 .311	63.401 .304	62.352 .831	61.536 .258	61.863 .257	63.257 .174	65.392 .359
Friuli-Venezia Giulia	8.734. 021	8.878. 927	8.833. 753	8.665. 896	8.949. 565	8.802. 721	7.842. 377	7.606. 911	7.915. 817	8.304. 550
Emilia- Romagna	38.174 .466	38.361 .397	38.188 .724	37.674 .889	38.619 .332	37.383 .182	36.449 .540	35.384 .389	36.551 .788	37.836 .805
Toscana	41.695 .840	41.261 .956	40.971 .354	42.031 .975	43.684 .791	42.651 .126	42.696 .395	43.150 .721	44.379 .574	44.216 .503
Umbria	6.252. 102	6.011. 326	5.584. 081	5.626. 727	6.037. 002	5.825. 889	5.685. 954	5.858. 979	5.910. 632	5.986. 392
Marche	13.584 .582	11.478 .362	10.701 .166	10.792 .486	11.024 .248	10.925 .958	11.017 .961	11.354 .343	12.144 .715	12.097 .530
Lazio	32.107 .593	31.676 .127	30.470 .858	30.696 .554	30.680 .979	30.680 .979	30.680 .979	30.808 .575	31.679 .914	32.148 .774
Abruzzo	7.374. 646	7.560. 476	6.653. 927	7.306. 951	7.422. 437	7.252. 826	6.938. 239	6.282. 674	6.076. 797	6.119. 103
Molise	652.17 1	659.20 5	602.52 6	559.24 5	680.52 3	540.05 0	451.40 0	419.59 7	492.01 8	437.46 7
Campania	19.774 .742	18.722 .386	17.942 .458	18.556 .993	19.554 .988	18.410 .150	17.722 .308	18.060 .075	18.855 .907	19.872 .576
Puglia	11.481 .603	12.183 .376	12.509 .693	12.982 .987	13.505 .731	13.291 .863	13.359 .216	13.274 .254	13.526 .151	14.436 .278
Basilicata	1.856. 789	1.862. 373	1.888. 718	1.890. 108	1.963. 474	1.881. 814	1.949. 123	2.100. 083	2.302. 678	2.345. 626
Calabria	8.731. 335	8.493. 339	8.454. 728	8.147. 269	8.548. 275	8.358. 186	8.002. 838	7.762. 931	8.151. 234	8.512. 415
Sicilia	14.602 .145	13.938 .319	13.765 .339	13.503 .839	14.057 .897	14.273 .969	14.490 .861	14.866 .938	14.510 .708	13.690 .967
Sardegna	11.851 .213	12.293 .922	12.310 .384	12.172 .923	11.448 .683	10.843 .177	10.680 .628	11.362 .839	12.392 .827	13.485 .744

Source: Eurostat