Innovation policies and SMEs development

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Abstract:

Small and medium-sized enterprises are the backbone of the European economy, states create policies to foster research. These mentioned policies changed in the time and it is possible to observe that the national policies of the European Union (EU) member states are interconnected at an EU level. In the science field, the European Union is generally moving towards a multilevel governance. The central issue of this paper is to show the systematic importance of an effective government policies and institutional interaction in the field of R&D. The article will show that a well framed policy is essential and furthermore it fosters a better cooperation between the private and public sector.

Keywords: internationalisation; EU; innovation; innovation policy
JEL codes: O3, K33

1. INTRODUCTION

This paper will show the importance of public policies and institutional interaction in the field of R&D public finance. Such policies are also significant for the small and medium-sized enterprises (SMEs).

This article takes into consideration three countries: France, Spain and Italy. They have similar legal systems based on almost identical civil codes and constitutions, clearly influenced by the French one. About the constitutional aspects, the main characteristics in common are: a strong central power and regional entities which are gaining in the time a stronger position in the state structures.

The European Union is heading to a multilevel-governance which has repercussion in the R&D field as well. The study aims to demonstrate that even in the presence of a strong regionalisation of R&D public funding, it is still crucial an effective national coordination. I will argue that the relation between state and regional R&D funding policies can be expressed in the Latin phrase *divide et impera*. The process of weakening state's direct control of the R&D activities (*divide*) needs to be followed by a stronger coordination (*et impera*), in order to control the R&D by other means, so as to avoid the effects of an uncontrolled "law anomie".

The article's main criteria is to examine the macro-law aspects connected with public innovation policies; i.e. why and how a given government has enacted a specific policy and the macro-effects produced by such policies on the main G.E.R.D. statistics; in the belief that political choices strongly influence the R&D environment. For the above mentioned reasons the methodology contains the analysis of the main pieces of institutions/legislation of France, Spain and Italy and observation of the main consequences on the fundamental G.E.R.D. statistics.

The paper is so divided: it is given to every state a section of the paper. The analysis of the countries systems starts with France, being France the country with the strongest state control; then Spain and Italy. Spain presents the most interesting approach to R&D considered the percent of GDP dedicated to R&D and the obtained results. Spain deserves the main part of the paper because thanks to the Inter ministerial Commission on Science and Technology, in the opinion of the author, Spain is an example of good practice in an R&D environment characterized by means deficiency. Italy instead lacks of any comparable system dedicated to R&D. This does not mean that there is a total absence of a national strategy, but it means that the Italian system lacks of unity and strong coordination as in France or Spain. In such a sense the Italian experience can be used as *litmus test.* In fact it shows that the absence of an effective state coordination gravely influences R&D macro results; because the *Distretti Produttivi* system produced excellent results in some R&D sectors, but the national R&D results stayed below expectations. The time lapse object of this research is the same for the three countries. The analysis is focused on the R&D policies between the 90's and 2000's, except for some aspects of the French experience.

2. LITERATURE REVIEW AND METHODOLOGICAL APPROACH

Historically, R&D projects were a direct emanation of governments' projects or policies. The state directly decided which project to implement or carry out. For example the nuclear projects or the concorde project in France (Laredo & Mustar, 2001). This demonstrates that the general theory of law defines the "state supreme power"(Kelsen, 1991) or "state imperium". The state used its unconditioned power (imperium) to determine the most profitable decisions in the R&D field. Currently, states tend less to directly exercising this sort of supreme decisional power and leave more "self-determination" to R&D players. A collateral effects of uncontrolled freedom of choice in the R&D field poses a threat. For example a proliferation of similar projects which subsequently risk being under financed (in such a case I would use the aforementioned Latin word *divide*).

The state may find a remedy to this perilous proliferation through the implementation of its "coercive power". The state's authority determines R&D policies in a more subtle way. For this reason the phrase *divide et impera* is still a valid description of the state's coercive power. The state cedes power of choice to individual institutional actors. At the same time, the coercive power allows the state to balance the proliferation and preserve its authority over the R&D field.

This paper will focus on the analysis of French, Spanish and Italian experiences in the R&D field. More specifically this article will focus on the Spanish experience because in the opinion of the author, the evolution of the Spanish R&D system is an example of positive achievements produced by an excellent capacity of adaptation.

It is common knowledge that the European Union is gradually implementing a certain kind of multilevel governance. Although this concept mainly concerns political-administrative aspects, nevertheless it influences a vast amount of different fields, among them the R&D field. Multi-level governance is a concept with more than two decades of history (Draetta, 2015), it is a notion very popular in many fields. To better understand this specific concept and its relevance in the R&D field, a short discussion of its major components is needed.

The idea of multilevel governance was created in regard to the European integration process (Adam, 2014). It starts from the consideration that the "state imperium" i.e. authority is shifting not only from states up to the European Union, but also down to sub-national authorities . Multilevel theory is strongly connected to polycentrism, as a way to stay closer to the real need of the society (Piattoni, 2009). Multilevel governance is generally understood as sharing responsibilities and co-operating between the various levels of governance and it is often associated with the principle of subsidiarity (Draetta, 2015). It is not possible to completely understand multilevel governance without introducing the subsidiarity concept.

Subsidiarity is based on the belief that the decision chain should be as short as possible in the meaning that the decision making process should be as close as possible to the citizens, so that the implementation of the decision process could be the utmost effective, and related to the real needs of citizens. For example, if a given social policy is to be implemented, it should be decided, thought and implemented from a decisional entity as close as possible to the beneficiaries (i.e. a construction of a school should be decided by a regional government and not by a ministerial meeting). In practice, multilevel governance is based on the idea that the best policies are chosen and implemented when decisions are taken with the participation of the final beneficiaries of such a policy.

An effective multi-level governance has to contain a quantity of subsidiarity, but at the same time coordination cannot be missing. In fact, the policy results depend on good coordination between all levels of government, both in the decision making process and in the implementation process. In such a sense, "mutatis mudandis" an efficient plan for financing R&D has to be based on a previous deep knowledge of the current condition of R&D sector in a particular state.

France, Italy and Spain have dealt with developing an R&D public funding system. All three of those states had a slightly different approach which hugely effected the characteristic of public policies implemented in their respective countries. The analysis is concentrated on these three states because they share a very similar constitutional/administrative systems and civil codes all based on the French one. Moreover these three states have similar social structures, languages and a shared history.

History influences the future, hence Spain and France had a system definable as very centralistic. Both countries have been, for a period, the centre of vast empires; those empires were characterized by a strong centralisation and control over possessions. Phrases as *L'État c'est moi* allegedly mentioned by king Luis XIV or the phrase, *el imperio en el que nunca se pone el sol* related to the vast amount of the dominions of the Spanish empire. Those phrases are much more than simple expressions; these phrases are a representation of an immaterial concept which transcend the words and explain what kind of political and administrative systems they represent. These systems were mainly hierarchical, i.e. decisions came from the political centre and were implemented by local authorities. Therefore, taking into account all the aforementioned, it is true (as we will see) that French and Spanish system shifted from a state centric system to a more "shared system". Nevertheless in this new system there are visible traces of "centralised control" (Reppy, 2000).

An efficient plan for financing R&D has to be based on a previous deep knowledge of the R&D situation in the State. Taking inspiration from architectural jargon, it is possible to affirm that architectural and components knowledge are key elements for understanding the organisational capabilities of the system to create.

The article is based on the analysis of the pieces of legislation and the analysis of the main R&D institutions in France Italy and Spain, in the belief that political choices directly influence the R&D field and not vice-versa. The research results will show that French and Spain, except of Italy, had and have a better R&D system. This superiority is given by the stronger supervision and control that France and Spain have on R&D policies. Nowadays this control consists in a soft control, but nevertheless it is still a mechanism crafted to direct R&D efforts. Italy in this paper is used as *litmus test a contrario*. In fact Italy is missing a comparable R&D national control system. The Italian R&D financing system is based on two main pillars: *Distretti Produttivi* and an irregular funding based on historical data disconnected from any analysis of efficiency. This divergence in managing R&D funding affects the quality of the R&D efforts and results. Italy has less important results than France and Spain on the R&D field, even if Spain has a lower GDP than Italy. Hence this disproportion of results demonstrate that state control on R&D truly matters and it is a *condicio sine qua non*, whose the comparison between Italy and Spain is an example. The article is based on examination of the main pieces of legislation and comparison with economic results obtained.

3. ANALYSIS OF THE MAIN INSTITUTIONAL
ASPECTS OF R&D SYSTEM IN SELECTED COUNTRIES

France

France with "Colbertism" was the first state to codify state intervention in the economy. "Colbertism" was an economic and political doctrine of the seventeenth century, created by Jean-Baptiste Colbert[1]. Colbert's central principle was that the wealth and the economy of France should serve the state. Hence today France with other European countries is an example in the field of state intervention in crucial national fields (Rich & Cole, 1964).

In France, during the 1960's a new vogue for "Colbertism" started in every field of economic activities. This "neo Colbertinism" did not remained without pronounced effects on the French R&D sector too[2](Laredo & Mustar, 2001). The French government often directed public policies to promote R&D among the so called "champion national"[3]. Moreover it is worth noting that the national defense and military sector is still today considered a key field in R&D policy and the national defense expenses are used as a lever for growth (Guichard, 2005). In other words, the French R&D system is based on strong state coordination, which is expressed by the construction of the French national innovation system (NIS). This concept emerged over the past decades as a response to the recognition that innovation within a national economy needs a plan so to increase positive R&D outcomes (Piettre, 1986).

Traditionally, French technology and innovation relied on the targets of the central state, performed and implemented in the framework of grand programmes (Piettre, 1986)[4]. The main industrial actors have been the national champions[5]. However, this general pattern has changed over the last years. Technology transfer nowadays focuses on the validation and transfer of research results generated in universities, public scientific and technological research organisations, and research organisations. A national innovation system is based on the assumption that the better planned the system is, the better results will be reached (OECD, 1997). R&D stakeholders, are part of the same system, and as part of a same system they are equally needed altogether as no part of the body can live separated. In such a sense it is the French national innovation system, which has to connect the R&D stakeholders so to underline the interdependence between the national R&D stakeholders; moreover the stakeholders play the main role thanks to their linkage, mu-

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[1] French Minister of Finance under Louis XIV.

[2] In such a sense it is possible to use the term "technological Colbertism" (Laredo & Mustar, 2001).

[3] A national champion is a firm chosen by the state to become the dominant producer or service provider on the national market and overtake or hinder foreign competitors in this market.

[4] It is admissible to consider that the grand programmes spirit is still present in the nowadays in the so called "La stratégie nationale de la recherche".

[5] In French: "champions nationaux".

tual commitment and their own interactions. France had set a national R&D intensity in 2012 of about 2.29[6] percent of gross domestic product , which conferred a top position within the EU states.

As expressed above French technology and innovation relied on the targets of the central state, performed and implemented in the framework of "grands programmes". These programs were mainly concentrated in and implemented by the national champions (Laredo & Mustar, 2001). The state created a mechanism which had to support the national champions in an effort to maintain or gain an international leadership role in the given field of activity[7]. During the last decades of the 20th century the aimed result was to some extent reached. In fact France has always had a gross domestic product intensity proportionally higher than other direct competitors (European Commission, 2014a), and the fields on which French R&D sector was the utmost significant were those fields whose national champions companies were operating in (European Commission, 2014c)[8].

France reached such positive results during the last two decades of the 20th century thanks to the fact that two main changes occurred: the political side created new agencies, entities devoted to fostering an increment in R&D[9] (Figure 1). France, keeping a centralised form of power, opened the way to a feeble regionalisation[10] (Boudon, 2014).
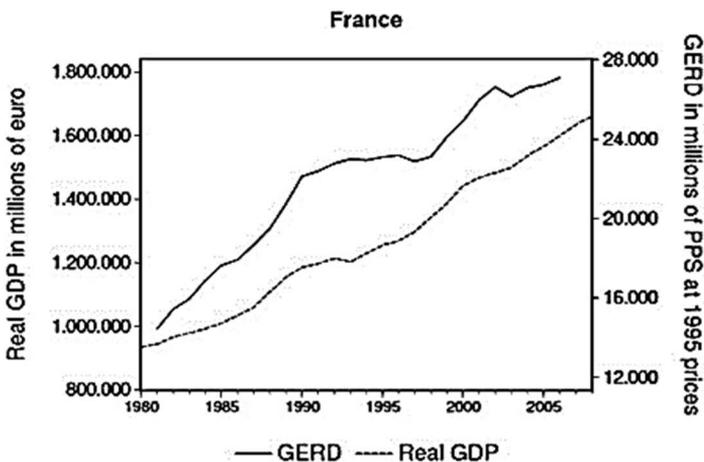

Figure 1. The real GDP and GERD in France
Source: National Institute of Statistics and Economic Studies (INSEE).

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[6] Research and Innovation performance in the EU Innovation Union progress at country level 2014 edited by Directorate-General for Research and Innovation.

[7] The Government set special legislative and financial aid in order to defend the national champions against the international concurrence.

[8] E.g.: Aeronautics, energy ,transport and defence.

[9] E.g.: Agence Nationale de la Recherche, Agence d'Evaluation de la Recherche et de l'Enseignement Supérieur, Pôles de Recherche et d'Enseignement Supérieur.

[10] Please notice that regionalisation doesn't have to be understood as a federalisation of the state.

The second occurrence which significantly changed French R&D "modus operandi" was the importance the regional level acquired in the French political system, the so called "regionalisation"[11]. The 26 French regions (which do not have legislative power), receive part of the national tax income and have a budget to bestow in their priority areas. Regions negotiate their priority fields with representatives of the state and they have an elected council (conseil régional) which is responsible for the regional administration. Regions are competent for social questions, transport, education, culture, local development, for this reason, to a certain extent Regions have competence for R&D (Office of the Prime Minister, 2012)[12].

Nowadays French R&D is characterised by an unequal dichotomy between central government and regional government. France passed from a *dirigiste* form of R&D to a new form of governance where the function of the state is to facilitate[13] the R&D development. In this cooperation between central and regional authority the so called "contrat de plan État-région" (CPER) has a salient importance. CPER is in a state-region plan contract, a document in which the state and region are committed to a multi-year programming and funding major projects (among which R&D projects as well)[14].

In this path of regionalisation via state-region plan contract, many centers for scientific research[15] were created. The fundamental idea of such a policy was to create over the country a fertile soil for R&D, so those centres were established not in a single city or in the capital, but in different cities of the country. It is quite interesting that although these national centres had to spread R&D over the state so to foster a diffused pro R&D environment,

The obtained results of this regionalisation were not adequate to the central government's expectations; important differences in results within regions were observed (Beatson, 2007). In 2005 a shift in French R&D *modus agendi* occurred. Previously there was the so called principle of regional equality (it consisted in sharing the same quantity of funds to all the regions). Nevertheless this drive for equality brought extreme differences in results. Therefore, the central government shifted towards rewarding networks and clusters of scientific excellence. It was set as an R&D System, which had as common base the fact that to the regions were given an equality of opportunity to compete for scientific resources, and not a simple equality in resources. The regions were given the possibility to compete for obtaining higher financial means. This reflected a more gradual evolution in French policy towards equity rather than equality as a precondition for competitiveness. In

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[11] It is important to clearly express that regionalisation is something different from the so called devolution federalisation or power devolution. Federalisation has never been in the French political agenda.

[12] It may be of some interest that in 2014, the French Parliament passed a law that will reduce the number of regions in Metropolitan France from 22 to 13. The new regions will take effect on 1 January 2016.

[13] Also known as Etat facilitateur "State facilitator". In such a sense iti s possible to affirm that from the 70's definition l'Etat entrepreneur" we passed to "l'Etat facilitateur".

[14] Along with the CPER are there other different project where regions have a key role in the R&D implementation, nevertheless due to unity matters this paper concentrates on the CPER importance.

[15] In French: Centre National de la Recherche Scientifique.

such a sense the system drifted towards the so called "Pôle de compétitivité" technology clusters characterised by the presence of a given zone of highly qualified R&D players (i.e. research centres, universities, highly specialised factories.

Spain

Despite the low gross domestic product percentage on R&D, Spain concentrated its financial means on specific technological fields, obtaining among others important results in the field of new sustainable sources of energy. The Spanish R&D's incentive system is composed of two major elements:

−   national plan (which changed consistently in time);
−   incentives tools which we may define as a group of combined law provisions.

The national plan is a direct expression of the government's guidelines, instead the group of combined provisions of law, is an instrument orientated forward creating a common ground which is created to foster R&D financing, beyond the limits set by government guidelines. In Such a sense Spain created two parallel systems for financing R&D, which under different paths had to provide the same result; augmenting R&D quality and quantity (Muñoz, 2006). The 1986 science act set the base for a very important institutional reform aimed at modernising the Spanish Science and Technology system: the creation of the Inter-ministerial Commission for Science and Technology (CICYT), with a mandate to define national plans for research and technological development, and a redefinition of public research bodies looking at strengthening their scientific competitiveness and bonds (Muñoz, 2006).

The "Plan Nacional de Investigación Científica y Desarrollo Tecnológico (National Plan of Scientific Research and Technological Development) has to be considered as the main instrument used by the Spanish government to coordinate and encourage scientific and technical research.

The 1986 science act, created a better coordination among the different R&D players. The Spanish government, developed science and technology policies; these policies were and still are carried out in accordance with the national scientific research plan. In order to reach the desired results many important administrative bodies were set out by the Science Act. The inter ministerial commission on science and technology (CICYT) is the leading national agency for scientific and technological policy and the angular stone on which the national plan system is based. The CICYT is responsible for planning, drafting, coordination and follow-up. The CICYT is presided by the office of the prime minister and includes the ministries [16]involved in scientific and technological policy (Muñoz, 2006). The CICYT is assisted by the following bodies:

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[16] Minister of Economic Affairs and Competitiveness; Minister of the Treasury and Public Administrations; Minister of Foreign Affairs and Cooperation; Minister of Defense; Minister of Public Works; Minister of Education and Culture; Minister of Employment and Social Security; Minister of Agriculture, Food and Environmental Affairs; Minister of Industry, Energy and Tourism; Minister of Health, Social Services and Equality.

– a general council for science and technology, which is the CICYT's consultative body devoted to promote coordination among the different Autonomous Communities and the central administration;

– a support and monitoring committee which is led by the prime minister's Economic Office and it is responsible body for inter-ministerial coordination in planning the follow-up policy on R&D;

– the Spanish Foundation for Science and Technology (FECYT), which part of the ministry of science and innovation, it is the responsible body for providing technical support to the scientific and technological decision-making bodies in Spain.

The 1990`s mark a turning point in the R&D System in Spain. The pursued idea by the Spanish government was to strength a set of laws to promote R&D activities outside the National Plan. It is possible to affirm that with this reform the Spanish government tried to implement in Spain what in France is defined as *etat facilitateur*[17] in the meaning that the state had to maintain a role, but this role had to be less evident. The state had to prepare fertile conditions allowing an independent but at the same time controlled "R&D blossom". The main idea was that the state showed the path to succeed but at the same time the state left more freedom on how to implement R&D activities.

The Spanish system during the 1990s appeared well framed, with pieces of legislation, providing a system on research more reliable; this system was based on a strong legal basis (Gutiérrez Lousa, 2008).

It is worthy of attention the combined provision of Law 43/1995 after modified with the law 55/1999 on corporate tax.

It is extremely significant that Spain shifted to a science financing system characterised by vigorous tax incentives; in such a sense the Spanish government tried to limit its direct "imperium", desisting from imposing government central will as occurred before. It is possible to affirm that the choice carried by the Spanish government was to leave more decisional space to the R&D player and to the market (Navarro, 2009).

The reform was based on the principle that the state had mainly to set the R&D framework but the national plan tool had to be to some extent less invasive; for this reason R&D tax incentives were implemented as well through a broadening of fiscal incentives in accordance with the mentioned laws (Gutiérrez Lousa, 2008). The base principles applied to this regulation, deserve to be mentioned:

– the deduction application had to be neutral, it could not radically modify the conditions of the company subject to incentive, unless it contributed to overtake market inefficiencies;

– tax deduction had the main intent to increase the competitiveness of the Spanish Economic System;

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[17] State with a "facilitating role".

−   the main fiscal ease concerning the R&D consisted in what was generally known as "Amortization freedom" (Libertad de Amortization).

The difference between tax reduction and amortisation freedom lies in the slight distinction that tax reduction reduces tax debt settlement. Instead amortisation affects tax base, allowing a "tax deferral", but not a reduction. It entails that it was possible to amortise the R&D expenses qualified as intangible assets; but it is important to notice that it was not possible to extent such ease to expenses relating to innovation matters. Tax reduction had a very large extent, depending on the investigation activity set. According to corporate law, development may be defined as follows: application of the research results in order to produce new materials or commodities.

It is important to underline the words "application of the research results". This affirmation implicates a strong connection with the research result, which had to be classifiable as positive. Hence it was obligatory that the antecedent research, gained a positive result so that the new product or material could be defined as a direct consequence of research. Because it was not clearly defined, if a development process consisted in something that could be defined as new; a closer contact was set between the research institution and the ministry for research and the tax administration (Muñoz, 2006).

The Law 55/1999 set a change in the Spanish R&D panorama, it surly represented a turnaround compared to the Law 43/1995. Before 1999, technological development was quite peculiarly not considered a part of R&D activities. It was connected to industrial activities more than R&D activities. In this regard, only from the beginning of this century, the words *investigación* (research), *desarrollo* (development) *y innovación* (innovation) were used together to express the Spanish R&D policy, earlier the words *Investigación, desarrollo* were used and the so called *innovación tecnológica* was a concept treated separately.

It is possible to define technological innovation as the activities whose result is a step forward in the technological field, which help in obtaining new products, new productive procedure or consistent improvements in the existing ones.

Discerning simple R&D activities from activities involving technological innovation is not always possible; it may occur that technological innovation is a positive final step of an R&D process.

Under the earlier Spanish law provision, research activities, were not conditioned by the result reached. This means the research could even not reach a positive result but still the activity carried out would be qualified as "research".

Instead technological innovation required new products or innovative procedures or consistent improvements in the existing ones, and reaching a positive result was obligatory (Muñoz, 2006).

The R&D activities, producing a positive result, can be defined as an objective innovation, instead the TI (technological innovation) activities may produce a result which may be defined as a "subjective Innovation". The innovation has to be new in regard to the subject which has promoted and supported the TI research. Incentives on technological innovation activities are a further implementation of what

was already set throughout the R&D legislation. Technological innovation activities are now compared to all other R&D activities with no additional distinction provided, reaching a positive result is not anymore a *condicio sine qua non*.

The Parliamentary strongly believing in the *État facilitateur[18]* against the concept of *État dirigiste* characterised by a strong economic planning (Miguel & Galindo, 2003), increased the size of the tax deduction percentage. However this decision did not produce the expected results. It did not reached a concrete improvement in the Spanish gross domestic product percent dedicated to R&D (Figure 2). Unfortunately the expectations before set, were not entirely met.
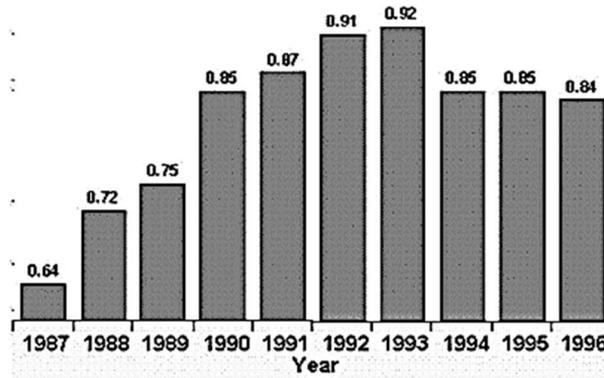

Figure 2. Evolution of R&D expenditure (% GERD) in Spain
Source: National Institute of Statistics and Economic Studies (INSEE).

In 2006, the Spanish government started to make relevant change on Spanish R&D policies. The change was as vast that it is possible to define it as revolutionary. It was decided to leave the deduction system, which was characterised by large freedom given to the R&D players. The government created a new R&D policy once again based on National Programs set by the government itself. The emanation of this new Law 35/2006 represents a fundamental change in the R&D field. This is very well explained in the law preamble which in few words explain the limits of the previous R&D policy. Citing the exact words is due to the semantic significance of the text "*en muchos casos, los estímulos fiscales a la inversión son poco efi caces, presentan un elevado coste recaudatorio, complican la liquidación y generan una falta de neutralidad en el tratamiento fiscal de distintos proyectos de inversión*" (BOE, 2015), which says "*In many cases the fiscal stimulus to investments is not cost effective; high collecting costs complicate settlements and generate a lack of neutrality in the fiscal treatment of different investment projects*".

This new policy consisted in leaving "the incentives era". The government focused on developing a system based again on national and regional programs (Buesa, 2006). There are great differences between the two approaches. The incentives form is more market respectful, creating new national and regional programs

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[18] Please see the note above.

allows the government to address the efforts in financing R&D activities. In such a sense the government decided, through national plans, which R&D fields were worth to be financed. This new policy was generated by the government belief that a R&D system, more based on national plans, is capable of reaching far better results. Through this new national plan the government set the goals to be achieved and the priorities to be followed in the R&D field.

The 2008/2011 R&D National Plan introduced a new structure and new way in managing the R&D issue. It was decided to create a new version of the Comisión Interministerial de Ciencia y Tecnología (CICYT), which is possible to define as a reinforced CICYT. This new version of CICYT entered into service in 2006. The pyramidal structure of the commission, formed by the R&D key actors, allowed to set a better performing national plan, the commission was formed as follows: a chairing body responsible for the elaboration processing of the plan. This sub commission had the key role to supervise all the procedure, and a group responsible about the concrete elaboration of the plan. The first group is a group formed by experts of administration having the main task of policy coordination. The second group formed by science and technology experts.

− three consulting sub commission designed to analyze specific problems;
− a commission for institutional and budgetary matters;
− a commission on financial instruments.

This commission is responsible for finding the financial means to be used in order to implement the national plan. That group has a core function; it is designed to discover and analyze if what set in the previous 20 years in Spain was successful and to which extent a commission on key topics, devoted to determine the main topics to be discussed.

The purposes of the National R&D&I Plan (2008-2011), which was set up in line with the provisions of the National Strategy for Science and Technology, were: placing Spain at the European cutting edge of knowledge, and creating a favourable environment for investment in R&D&I (European Commission, 2013). This new form of national plan for R&D has a structure based on three areas directly related to the plan's general objectives and linked to instrumental programs which pursue specific objectives:

− generating knowledge;
− fostering cooperation in R&D;
− strategic actions.

Italy

Although Italy is trespassing a period of economic austerity, the Country is still among the ten most developed Countries in the world for gross domestic product and it is the third market for magnitude in the Euro Area, this makes it possible for Italy to have a discreet R&D national system which needs to be improved (European Commission, 2014b).

The Italian R&D legal system is based on two main pillars, the national research plan (Piano Nazionale per la Ricerca now on PNR) and productive clusters (distretti produttivi) (Italian government, 2014). The PNR is set by the Parliament and the Council of Ministries. Its coordination within the government is under the responsibility of inter-ministerial committee for economic planning. The Ministry for Education, University and Research (MIUR) coordinate national and international scientific activities, distributes funding to universities and research agencies, and establishes the means for supporting R&D. The Ministry of Economic Development supports and manages industrial innovation (Italian government, 2014).

The PNR[19] defines the objectives and modes of implementation of specific interventions in priority areas, disciplinary sectors, actors involved, and projects which qualify for funding. The goal is to ensure the coordination of research with other national policies, bringing Italian research into alignment with the strategic vision defined at European level and creating the conditions necessary for a progressive integration of public and private research. The PNR is formulated by the Ministry of Education, Universities and Research (MIUR), after extensive consultation with the actors of the innovation systems (e.g. scientific and academic communities, economic powers and competent administrations). It is implemented after approval by the Inter-ministerial Committee for Economic Planning. The first PNR was formulated during the period 2001-2003. Assessments have indicated that in order to obtain tangible effects on the country's R&D environment, simultaneous action on several levels were necessary. To achieve its objectives, the first PNR proposed a set of integrated actions, each of which involves various initiatives over the short, medium and long term. The main objective was to simplify funding mechanisms, rationalise the administration modus operandi, and identify forms of monitoring to ensure that funding is efficiently applied in pursuit of the stated objectives[20].

A weakness of the first Italian PNR was a lack of a permanent scheme or structure comparable to the Spanish or French ones, meaning for that, a general lack of a steady plan and continued in the time (Belussi, 2004). This fact does not mean that Italy was gravely lacking on R&D, but it means that Italian R&D was different in the approach, not based as much as French and Spanish on a national R&D plan[21]. For many years the PNR hugely changed in scopes and terms, moreover before 2014 The Italian national PNR was an instrument through which the government substantially performed a very light and inconsistent activity of fund distribution. Based on historical data the Government was distributing "R&D" funds for generic projects or studies[22]. Those funds quite often were used for covering personnel costs, which had very little in common with R&D.

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[19] The new PNR: http://www.istruzione.it/allegati/2014/PNR_online_21feb14.pdf.
[20] PNR aims too at encouraging technology transfer between the actors in the innovation system.
[21] The Italian PNR structure highly changed during the years, not allowing a consistence in the long run.
[22] Projects which often coincided with regular Universities programs and founds were used to support the universities.

Beside the national plan, the Italian R&D system is strongly based on the so called "Distretti Produttivi" productive districts (Bertamino, 2016). These Districts are characterised by a virtuous circle formed by the elements learning, linkage and investment. These districts are sort of self-sufficient system where, leading R&D players have a direct linkage within universities and schools established in the mentioned district. This represents a sort of virtuous linkage that fosters positive cooperation. Companies need research activities which are performed by universities/research centres in the districts with which the mentioned companies have a "trust linkage". At the same time companies take specialised labour work force from the territorial schools.

The so called productive districts for all intents and purposes are to be considered as public policy instruments to foster innovation (Coletti, 2007). Based on the theory "the closer it better" it implements competitiveness of local production systems by creating synergies between companies, universities, research centres and "local authorities"[23] located within limited territorial boundaries. A quite important characteristic is that often these districts are "self-created", in the meaning that R&D players located in the given zone, start a stronger cooperation and the local authority recognising such stronger cooperation try to assist through a better administrative cooperation (Italian Government, 2014)[24].

4. CONCLUSIONS

This article examined the main institutional aspects of the R&D systems in France, Spain and Italy, which determine R&D policies. It showed as in France and Spain, except of Italy, state control is present in a higher degree. This state control has nowadays a different form then in the past; some decades ago the state control was more direct, and to some extent absolute. Nowadays the mentioned control has the aspect of a soft power, in the meaning that it is more subtle and less evident.

An initial analysis could produce in the reader the sensation that the R&D French system is characterised by a multilevel governance, where R&D actors have to play in a multilevel system without a state control but under a more prudent analysis, it is perceptible how the central government's hand is still strong and powerful. In terms of forms of public interventionism; new modes of steering and management are noticeable. In such a direction the French government is creating frameworks leading to more selective action and leading to a resources concentration. In other words the central government still uses its steering, power (Imperium); this power is now put into use in a less *dirigiste* way, but still is visible a quite strong hint of *neo Colbertinism*. At the same time both in Spain and in Italy even if to a less degree than France, are going into the same path of a modern "Etat facilitator" where the state while letting freedom to the R&D players at the same

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[23] To be interpreted in lato sensu. Territorial administration is divided between, Regioni, Provincie and Comuni, and often they have a concurrent competence on R&D matters.
[24] Other times are regions that a priori propose the creation of productive districts so to foster investments in the territory.

time create a framework where is the state who directs the main line of the R&D policy through a "moral suasion" given by the national plan; because it is the national plan which encourages the R&D players to follow a determined path.

The evolution of the Spanish R&D system is remarkable. Even if exiting from a dictatorship, the Iberian country started a very interesting implementation of national plans which had as main function augmenting the R&D activity. No doubt the result was to some extent achieved. Afterwards the Spanish government in the 1990's, tried without the expected results, to swift to a system characterised by incentives. This incentives were planned to be sort of a neutral tool in the meaning that the market had, in the idea of the legislator, to determine the path on which proceed. At the beginning of the century Spain came back to a stronger implementation of the national plan demonstrating in this way that the state cannot completely dismiss its leadership in the R&D field.

Italy with its R&D financing system is an example a contrario. The Italian R&D polices lacked of consistency, hence the soft state power was and is still missing, expecially when compared with the French and Spanish experiences. Italy has a quite interesting system based on the "Distretti Produttivi" idea; nevertheless these cluster system is not enough to foster R&D policies on the entire country and it shows how in absence of a strong state coordination R&D is far less efficient. It may take different name or forms but state soft power is still very needed to better allocate the R&D efforts.

In conclusion, if a given state trespasses a period with limited R&D funds, this given state should craft a system similar to the Spanish one. In fact the Spanish system has two characteristics "information and direction" which are indeed useful and produce a better efficiency in the R&D system. The inter ministerial commission on science and technology (CICYT) has the power and competence to obtain and process the data on the ongoing and future research in the country, this amount of information are then used by the Spanish government to better direct and concentrate the R&D financial efforts. This would be a good approach for Italy, because the Italian R&D system is missing a central entity with a true power of coordination. Every region or national institute in Italy is formally disconnected from the other R&D players; R&D cooperation works thanks to personal contacts instead of a formalized info-system as in Spain. This situation has implication on the lower R&D results of Italy.

The limitations to the research which may had a potential impact were represented by the difficulties in finding the relevant pieces of legislation. The legislation often changed quite rapidly without leaving lasting traces. This problem created some jeopardy in the time frame analysed. Nevertheless the article examines the most important pieces of legislation which definitely influenced R&D activities. In fact when the pieces of legislation were not easily reachable, the research was based on articles covering the relevant topics written by national authors. The next step of the research would be to extend the comparative analysis to the regional level in

order to analyse the R&D regional policies and the R&D cooperation between regions of the same state and other states so to observe the main differences in the results and policies.

REFERENCES

Adam, R., & Tizzano, A. (2014). *Manuale di Diritto dell'Unione Europea*. Torino: Giappichelli.

Beatson, M. (2007). *CREST 3% OMC Third Cycle Policy Mix Peer Review*. Country Report France. Retrieved from: http://ec.europa.eu/invest-in-research/pdf/download_en/omc _fr_review_report.pdf (10.01.2016).

Belussi, F. (2004). *The Italian system of innovation: the gradual transition from a weak "mission-oriented" system to a regionalised learning system*. Padua: University of Padua.

Bertamino, F., Bronzini, R., De Maggio, M., & Revelli, D. (2016). *Local Policies for Innovation: the Case of Technology Districts in Italy*. Bank of Italy, Questioni di Economia e Finanza (Occasional Papers), No 313.

BOE (2015). *Ley 35/2006, de 28 de noviembre, del Impuesto sobre la Renta de las Personas Físicas y de modificación parcial de las leyes de los Impuestos sobre Sociedades, sobre la Renta de no Residentes y sobre el Patrimonio*. Texto consolidado, Última modificación: 30 de octubre de 2015. Retrieved from: https://www.boe.es/buscar/pdf/2006/BOE-A-2006-20764-consolidado.pdf (10.01.2016).

Boudon, J. (2014). *Manuel de droit constitutionnel: La Vème République*. Tome II. Presses Universitaires de France.

Buesa, M., Heijs, J., Pellitero, M.M., & Baumert, T. (2006). Regional System of Innovation and the knowledge production function: the Spanish case. *Technovation*, 26 (4), 463-472.

Coletti, R. (2007). *Italy and Innovation: Organisational Structure and Public Policies*. Rome: Centro Studi di Politica Internationale.

Draetta, U. (2015). Elementi di diritto dell'Unione Europea. Parte istituzionale. Ordinamento e struttura dell'Unione Europea. Milano: Giuffrè.

European Commission (2010). *Expert Evaluation Network Delivering Policy Analysis on the Performance of Cohesion Policy 2007-2013*. Task 1: Policy Paper on Innovation. Directorate-General Regional Policy.

European Commission (2013). Erawatch country reports 2011: SPAIN. Luxembourg: Publications Office of the European Union.

European Commission (2014a). *Research and Innovation performance in Country Profile France*. Retrieved from: https://rio.jrc.ec.europa.eu/en/country-analysis/France (10.01.2016).

European Commission (2014b). *Country Report Italy: regional aspects of KETs deployment*. Directorate-General Enterprise & Industry.

European Commission (2014c). *Innovation Union Scoreboard 2015*. Retrieved from: http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/?nl_id=104 1 (10.01.2016).

European Parliament (2015). *The Principle of Subsidiarity*. Retrieved from: http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuId=FTU_1.2.2.html (10.30.2015).

French Ministry for External Affairs (2010). *MAE Stratégie innovation v anglaise.indd*. Paris.

Guichard, R. (2005). Suggested repositioning of defence R&D within the French system of innovation. *Technovation*, 25 (3), 195-201. doi:10.1016/S0166-4972(03)00131-7.

Italian Government (2014). *Programma Nazionale per la Ricerca 2014-2020*. Roma.

Kelsen, H. (1991). *General Theory of Norms*. Oxford: Clarendon Press.

Laredo, P., & Mustar, P. (2001). *Research and Innovation Policies in the New Global Economy*. Cheltenham: Edward Elgar.

Miguel, A., & Galindo M.M. (2003). Algunas consideraciones sobre el crecimiento económico. *Clm. economía Revista económica de Castilla – La Manch*a, 2, 129-158.

Muñoz, E. (2006). *The Spanish system of research Research and innovation in Spain*. Working Paper 98-15. Madrid: Instituto de Estudios Sociales Avanzados (CSIC).

Navarro, M., & Gibaja J.J. (2009). *Typologies of Innovation based on Statistical analysis for European and Spanish Regions*. Working Papers INNOVA 2009-4. San Sebastian: Basque Institute of Competitiveness.

OECD (1997). *National Innovation Systems*. Paris.

Office of the Prime Minister (2012). *Summary of French regions' regional innovation strategies*. DATAR – Europe Department.

Piattoni, S. (2009). Multi-Level Governance in the EU. Does it Work? In: *Globalization and Politics: A Conference in Honor of Suzanne Berger*, 8-9 May 2009, MIT. Retrieved from: http://www.princeton.edu/~smeunier/Piattoni (04.01.2016).

Piettre, A. (1986). Colbertisme et dirigsme. *Revue des Deux Mondes*, Octobre 1986.

Reppy, J. (Ed.) (2000). *The Place of the Defense Industry in National Systems of Innovation*. Occasional Paper 25. Cornell: Cornell University Peace Studies Program.

Rich, E.E., & Cole, C.W. (1964). Colbert and a Century of French Mercantilism. *The Economic History Review* 10, 164. doi:10.2307/2590799.