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PROCUREMENT FOR INNOVATION

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Introduction:

The process of updating the Italian public administration is rarely perceived as an opportunity to give a new start to the entire national economic system. A particular role is surely covered by the transformation of the entire procurement of goods and services (so-called Public Procurement) which is instrumental in delivering the quantity and quality of public services defined by policy makers.

We can conceive it as an instrument whose potential, if fully exploited, is a solid contribution to achieving the objective function of any public administration: on the one hand, to offer the community goods and services of collective interest as efficiently as possible; On the other hand, the liveliness of entrepreneurial sector is encouraged and the exploration of new innovative realities is supported to tackle the growing challenges of development.

Public Procurement, in providing the needs of administrations, has the potential to stimulate innovation and the procedures associated with it are less subject to corrupt phenomena because they are challenging from a functional technical point of view, and therefore the quality aspect also prevails given the fact that it becomes more difficult to make a guided bid. Simply put, when in a procedure the technical content prevails, the subject trying to win the contract illegally makes it more difficult, because it must also produce a qualitatively high bid.

It should be noted, however, that the new tools, which are often, are often and are still very little practiced, and there is the impression that the reason is not to be attributed only to the fact that the novelties are recent. There are also issues of poor clarity and difficult applicability, and predisposition to practice by public bodies.

It was noted that PA's willingness to make innovative contracts has not changed, neither has it been influenced by the old nor the new code, because it is the public administration that must have the capacity and the desire to buy innovation. There is also a lack of knowledge of these tools, which penalizes their use and slows down the races. And perhaps here we are at the point: the goal to be pursued is to take off the tenders in innovation.

The aim of this thesis is therefore to illustrate the role played by the public procurement institute in stimulating innovation both in the business fabric and in the public administrations, also referring to the other instruments prepared for the same purpose by the legislator.

In the first two chapters, theoretical bases of public procurement are outlined, outlining the various forms and giving an account of the debate it generates at the European Union level.

It then goes into the specifics of Italian reality, taking into account the first steps taken by the Italian legislator in the direction of the goal of rationalizing expenditure in public procurement through the use of ICT tools. It goes from the establishment of Consip to the issuance of the Digital Agenda, which contains the pre-commercial procurement discipline. It then takes into account some cases of local application of the public procurement instrument.

In the third chapter, one looks at those who are at the same time protagonists and recipients of innovation policies, the enterprises. In particular, we focus on the problems they face in the process of change and adaptation to a technology-based economy. There is also an interesting focus on R & D investments made in the past year, from which we can draw attention to where our business class is directed.

The fourth chapter focuses on other institutes outlined by the legislator in order to support business development.

Then there is a description of the new Code of Public tenders: . The new system is founded on the quality of the services supplied, also allowing to delete the principal cause of increasing costs in public works implementation, that is represented by tenders on preliminary planning. The new technical and economic feasibility project will make stronger the technical and economic quality of the project. The new Code has introduced an essential change in the Italian legislation on the PPP as it expressly focuses a section to PPPs.

Significant financial support measures provided by the Enterprise Guarantee Fund and the so-called Sabatini Ter law are also underlined, which is intended to promote further investment in enterprise innovation.

There is also a general view of the startups phenomenon, with explanations and practical examples of how these small realities can be a flyer for innovation

Finally, it can be said that there are many ways in which the Italian legislature wanted to intercept the demand for innovation. The challenge of the future is to understand whether they are sufficient or whether they need to be rethought. However, we are talking about policies recently implemented and it is therefore necessary to wait for their full and desirable practical deployment.

Public Procurement for innovation:

When oriented towards innovative solutions and products, the public demand has the potential to amend delivery of public policy and services, generating gained innovative dynamics and benefits from the associated spillovers. However, the government neglected the public procurement as an innovation policy for many years.

In the 1970s, a number of empirical studies decided to begin the process of exploration of the meaning of procurement innovation. They have come to the point that, over longer time periods, state procurement primed greater innovation motivations in more areas than did R&D subsidies. Geroski also analyzed the quantitative and qualitative meaning of state demand for innovation and got the conclusion that procurement policy *“is a far more efficient instrument to use it in stimulating innovation than any of a wide range of frequently used R&D subsidies”*.

At European union level an innovative interest has been analyzed in the meaning of demand-side approaches to innovation and, in particular, in the utilization of public demand as an instrument for innovation. The involvement has been on the contact between procurement and perceived under-investment in R&D by business. Analyzing the work of group of experts, procurement for innovation was selected as an element of the European Commission’s Research Investment Action Plan to increment R&D expenditure to the 3% Barcelona Target.

The question obtained ulterior momentum within Europe when in 2004 3 governments decided to issue a position paper to the European Council that enclosed a possibility for using public procurement through Europe to simulate more innovation. Another push for demand-side innovation policies was given by the Aho Group Report “creating an innovative Europe” presented to European leaders at their Spring Summit in 2006. The panel that was previously mandated by the leaders to report some ways to increment the speed of the revised Lisbon Strategy, supported that an R&D as main strategy was not sufficient as advocated instead a four fronts approach focused on the creation of innovation-friendly markets, strengthening R&D resources, increasing structural mobility, and fostering culture which sustains innovation.

It’s possible to analyze how public procurement of innovation as a strategy in innovation policy can take different forms. Doing a distinction of the general procurement practice versus strategic procurement, direct public procurement versus catalytic procurement and, finally, commercial versus pre-commercial procurement.

In the state procurement two levels can be separated which, in the literature at least, are not distinguished. At the first level, government procurement is usually managed such that innovation becomes the main criterion in the call for tender and assessment of tender documents. As well as an approach is being attempted at present by the UK. The second level, strategic procurement, occurred when the demand for certain technologies, products or services is fostered with the aim of stimulating the market. Strategic procurement is like a rule linked with sectoral policy and thus to a big extent again is neither started nor coordinated by the ministries responsible for innovation. It's important to note the association of state procurement with the wider issue of innovation in public services itself linked to public sector reform with increased outsourcing from private suppliers. The interface with the customer is selected like one of the most important distinctive factors in public service innovation.

There are procurement strategies in which the state buys, not only to perform its own mission, but, it buys also give a support to private purchasers in the decision to buy. So-called co-operative procurement occurs when government agencies buy together with private purchasers and both use the purchased innovations. Catalytic procurement happens when the state is involved in the procurement, but the purchased innovations, , at the end, are used exclusively by the private end-user.

The main idea back to the public pre-commercial procurement is that it focuses innovative products and services for which further R&D needs to be developed. Hence, the technological risk is divided between procurers and potential suppliers. By definition, this means that potential producers are still in the pre-commercial phase, the products and services delivered are not "off the shelf". The procurement , however, is an R&D service contract, given to a new supplier in a multi-stage process, from exploration and feasibility to R&D up to prototyping, field tests with first batches and then, finally, commercialization. The most new innovation is, the more likely pre-commercial procurement had the possibility to be appropriately used. Within the pre-commercial stages and given that the benefits of the R&D contract are not just for the contracting authority and the contract is not totally paid for by the contracting authority , the WTO General Procurement Agreement (GPA) and the relevant European Directives do not apply. This is the most important difference from commercial procurement.

The benefit in terms of innovation generation is that it is going to give to the procurers more freedom of decision, definition and selection. The reason for this more flexible approach derives from the argument that R&D-intensive procurement needs more strong interaction and cannot be

judged on the basis of written specifications . To debar monopolistic structures resulting from pre-commercial procurement, at least two competitors could enter the field-test stage.

The reasons and logics for the utilization of public procurement to share innovation relate to three levels: 1) public procurement is one of the main parts of local demand, that represents a major factor in the location decision of MNEs and in the direction to generate innovations in a location selected. 2) there is a range of market and system lack which affect the link of needs into functioning markets for innovative products, and public procurement can demonstrate effective regressing this. 3) the purchase of innovative solutions represents a strong potential for improving public infrastructure and public services in general.

Lead markets and MNE location decisions: Domestic demand is a fundamental source for improving the competitiveness of locations and the enterprises in it. The situation of domestic demand play an important role in the innovation dynamic countries. The industrial structure and firm strategy , sophisticated and challenging demand is one of four main variables determining the performance of locations. In each nation and even region, the attribute of the demand for innovations and the will to adopt innovations is different. The inclination of populations and governments to take part at innovations at a certain location is affected by many factors, the discussion of which is outside the goal of this paper. There are locations where populations are more prepared to purchase and apply innovation than those from other regions. Hence, a lot of countries are more internationally competitive in the areas in which they take part to the challenging, future-oriented and international leading demand. A strong factor endowment alone, the supply side, is not sufficient for sustainable, leading edge development and production. This has been showed in the “lead user” concept of von Hippel. Clearly users take the risk of working with a technology that can be not totally optimized in return for access above of their competitors or for reach a desired solution to a problem more quickly.

The idea of main user may be extended to the concept of a lead market. This needs early acquisition of an innovation, by this way it becomes widespread across multiple users of this type or through a single user with sufficient purchasing power to build a market by itself. In this case, the learning benefits are supported by a decrease of risk in the investment needed to perform R&D and to innovate. Skills of a lead market include customers voluntary to pay a premium for the special characteristics of the innovation, also in some consumer markets for its novelty per se. However, there are risks in the lead market idea, it possible to note the dominant design requirement. If a market needs product or services aspects that are so particular that the possibility of extension to

other markets is really difficult, the production and diffusion of an innovation in a local market does not arrive in a lead market.

An important risk in this kind of approach is that in a narrow concept of lead markets, the suppliers of the innovation have the need to be positioned in the jurisdiction of the ministries that respond for the procurement policy. The role played by the state in creating lead markets mainly lies in the provision of a means to mix supply and demand-side measures. This insert provision of appropriate framework conditions that brings and allow innovative activity. The state has the possibility to give a support to lead user and lead adoptions of innovations that makes it certain to become a dominant design in the world markets. It's important for this discussion on public procurement that the state can across the size or the specific characteristics of public demand itself act as a lead user initiating lead markets.

We can affirm that there are market failures and system failures. The first set of failures is related to information problems. Purchasers, private and public are usually not aware, or fully conscious about what product and service innovation the market can offer to them. Public procurement may make up for those market and system failures and arrive to the generation and/or better diffusion of innovations. Public procurement can reach critical mass, across the sheer size of a single purchase or through bundling the demand of a lot of public entities. Also public demand creates incentives for manufacturers, achieving a decrease in their market risk, and allows early economies of scale and learning. This critical mass also represents the manufacturing branches linked with the innovation in question. Public procurement can also make a reduction in the transaction costs of adapting to new products, also by the timely and large-scale use of an innovation or by showing its use. The public comprehension of an innovation sends a signal to the private market; it demonstrates capabilities and hence raises awareness. At the end, the state assisted by its purchasing power can give a support to create meaningful standards, with convergence on a standard allowing firms to internalize spillovers and to increment the voluntary to invest in R&D.

Another solution for public procurement that asks for leading edge products and services falls in the improvement of state capabilities and in giving a contribute to reaching public missions. The procurement of innovation can be connected to a normative policy goal, like sustainability, and this goal can be achieved more effectively across innovation. The political aims are focused on social needs. The innovation lever of public procurement controls and measures to increase private demand that are aimed to meet societal targets which comes from the fact that most often societal goals underlying a procurement translate new needs into demand for which innovative solutions are called for, have demonstrated that in satisfying new societal needs and providing infrastructure and

public service, the state is more demanding than private consumers. In reaching its goal, in improving its function, that state usually acts as a lead user.

With the purpose of overcome the challenge and to collect the benefits of public procurement about innovation generation and distribution, a difficult implementation framework needs to be applied. It's not possible to be comprehensive in this article, but here focus on the 4 dimensions that seems to be of highest significance and address the issues increased.

The fundamental basis for such an innovation-friendly procurement framework is the easy comprehension through administrations that the public purse is able to make a difference in the marketplace due to an innovative culture. The basis to reach these principle obstacles is a strategic obligation to make a change In rationales through administrations, to apply the innovation rationale within sectoral policy rationales and subsequently a strong co-ordination of efforts to create inter-administrative win-win situations.

Another strategic and organizational challenge for integrated procurement strategies consists in the combination of public procurement and private demand measures. While in pure public procurement the needs are selected by the public bodies, in catalytic procurement the needs of private buyers need to be systematically confirmed and assessed.

Bringing public needs and supplier capacities into line: One of the others requirements for innovation procurement is the will to define which markets and technologies to tackle. In particular, to some extent the complaint of Gibbons and Gummett still holds true, in accordance with which it is very complex to individuate and select needs and to translate them into meaningful market demands. Anyway, like public procurement concentrate on public demand, governments can apply selective, limited discourses that describe mid and long term public needs that come from policy goals and administrative strategies. If potential suppliers are taken in consideration, the likelihood is high to describe demands concretely fairly that can be met by industry in the future. Public decision makers have the need to understand and to learn the readiness of industry to expand innovations. Public procurement can be seriously detrimental to a novel technology if the procurement sets in early in the cycle of innovation.

Innovations are usually more costly about their initial price, and they bring the risk of not delivering the service at all, or with delay, and with switching costs for citizens. The most radical innovation is, the more this is the case. Hence, stamina and sophisticated risk management are needed with the aim to cope with innovations in public services. A new cost-benefit rationale that traduce into life-cycle costing and the criteria of the so-called most economically advantageous tender "MEAT" is

necessary and fundamental to replace the lowest initial cost rationale. Further, Decision makers and procurers require more encompassing knowledge of future needs and of potential improvement as regards public service as well as of the market that offers new solutions. A structure in which procurers are near to or also involved in the daily business of their administrations increases their skill to understand needs of administrations and the related technologies. Particular procurers need close co-ordination with those responsible for the future development of public service and would have to mobilize competence on technologies and markets, if needed with the help of service providers.

It's clear that there is a potential danger that especially within Europe the national champion policy might make a comeback across public procurement giving an advantage to local companies. From the point of view of internal market and free trade, this is a problem in particular within the EU. Not to go against the rules of free trade and open competition on the one hand and still to clarify procurement about innovation is next to the institutional adaptation mentioned above the main challenge for procurement policies integrated in innovation policy strategies. There are two possible answers to this challenge, the first one is the description of benefit for the country that procures. This benefit not only consists in the direct production of a supplier, but in the accompanying services, the installation and maintenance that are needed and so on. Learning and technological improvements have the aim to spill over within the market in which the procurement happens. Second, in direction with the logic of technologically driven competition jointly with "demanding demand", advanced public procurement can increase the technological level of competition.

Public Procurement in Italy:

In Italy single individuals still handle the implementation of innovation-oriented public-procurement projects, since a detailed institutional order has been set. The multitude of Italian policy makers' efforts have focused on rationalizing public procurement activities; this goal has been pursued through the creation, in 1998, of Consip S.p.A., a public limited company owned by the Ministry for the Economy and Finance, to act as the central purchasing agency on behalf of the state. Among all the activities, Consip is committed with rationalizing public expenditure on goods and services through the extensive use of ICT instruments. As a matter of fact, no Italian agency has yet been awarded the task of tackling these objectives through public procurement.

Things are quickly evolving though, and the first step towards the inclusion of the European guidelines in the Italian legislative framework has been taken with the approval of the so-called

“DecretoCrescita 2.0” (Decree Law 179/2012, turned into Law n. 221/2012), introducing the “Digital Agenda”. The text of the law spans a heterogeneous array of policy interventions, but the most important (for our purposes) is Article 19, which is entitled *“Major research and innovation projects, and pre-commercial procurement”*. This article allows for the implementation of pre-commercial procurement projects within large-scale R&D initiatives, and describes the borders of application of these programs, dealing with the European framework outlined above. This initiative will be helped by the Italian Ministry for Education, Universities and Research (MIUR) and the Italian Ministry of Economic Development (MISE). The involvement of small and medium enterprises, the consolidation of the legal and administrative framework, and the development of a coordination mechanism across different territorial procurers are regarded as the most pressing requirements for a successful implementation of an innovation-oriented public procurement strategy in Italy. This kind of development will benefit a lot from the extensive preparatory work done by some ministries, regions and consultancy firms: during the last few years, these actors have started to ask what institutional architecture and functioning mechanisms should sustain a successful introduction of pre-commercial procurement in Italy, undertaking some pilot projects in some regions. The most complete normative is contained in the guidelines issued by the *“Dipartimento per la digitalizzazione della pubblica amministrazione e l’innovazione tecnologica”*. This document outlines the legal framework had already been included in the previous *“DecretoCrescita” (Article 60 of Decree Law 83/2012)* among the priorities of the Italian Digital Agenda. The structure of the process closely looks like that put forward in European Commission, but here it is dealt with in greater detail. The whole process is made up of **six phases**:

- 1) **Identification of the problem**: the public procurer unifies the users of the innovative advancement and encourages them to become active part in a debate, whose objective is to understand the needs and quantify the technological gap with respect to the solutions available in the market;
- 2) **inform the market**: providing the market with open information on the necessities to be fulfilled; this phase has a double function, on one hand it serves as a cross-check to be certain that no viable solutions are already present in the market, on the other as a situation of “technical dialogue” with the supply side, intended to make firms aware of the public procurer’s goals and to ensure that they will give a positive response, once the call has been published;
- 3) **issue an open and transparent call**: the procurer encourages firms in order to obtain the best possible project to solve the problem;

4)compare the strengths and weaknesses of the alternative solutions: The procurer's evaluate the projects and select the best between all, but it should not close a lot of doors, because it has to take in consideration the possibility of switching between alternative technologies during the development process.

5)evaluate prototypes: this phase consists in putting in comparison the performance of the proposed solutions and formulate a technically detailed profile of the preferred solutions, which could be the goal of a commercial tender;

6)pick out the best offer: The final phase is about issuing a tender and single out the producer that can offer the best technical solution at the optimal price.

The preparatory initiatives looking at a full-scale introduction of pre-commercial procurement in Italy have included pilot projects in some regions. The first properly-defined pre-commercial procurement experience in Italy was probably the one that was made in Valle d'Aosta. During this experience, this region has issued two calls, for a total value of more than €1.2 million, for the acquisition of R&D services in two policy domains, “Intelligent mobility” and “Smart energies”. This project's structure implied **two broad stages:**

A period of R&D managed according to the pre-commercial procurement principles, during the which, the participating firms have to present solutions to face the needs specified by the public administration;

A phase of real-life testing, which forecasts the participation of a chosen group of final users in at least one of the regions participating in the “*AlcotraInnovazione French/Italian project*”.

Analyzing the smart energy domain, the accepted offers pertain to **two fields:**

1)energy storage systems: whose goal is to achieve a local level balance between production from renewables and actual consumption;

2)advanced systems of monitoring and control, permitting remote management of energy production and consumption. In the intelligent mobility policy domain, two offers were prized a contract: 1) real-time systems of road monitoring; 2) innovative solutions for city parking, with the aim at including the management of parking facilities with information on public transport services.

The whole process lasted 10 months (6 months for the R&D phase and 4 for the testing one), and came to an end in October 2013. The second call focused mainly on the smart energy policy domain, and finished in January 2013. Two of the four offers received have been accepted to both the R&D and testing phases. A similar type of initiative has been launched by the Puglia region,

which issued a call in the “Independent living” policy domain, with the goal of finding innovative solutions to improve the quality of independent life for people who are not self-sufficient. The R&D services acquired in the “*Personal care and inclusion*” area have the aim to offer new solutions to people that suffer from invalidating pathologies, implying continuous personal-care assistance, so that it’s possible to guarantee them a satisfactory social, scholastic or working inclusion; the “*Safety and health*” area wants to address innovative solutions to allow people's safety and physical health. In order to detail the evaluation criteria for the projects in each area, the call determinates some characteristics that have to be met in both the fields of intervention, like the integration of a lot of functions in a single device, an easy interface, and the scalability/modularity of the project. By August 2013, the received offers were evaluated, and a maximum of 8 R&D services were selected for acquisition. The firms are now given 8 months to develop the purposed projects, at the end, another evaluation step will take place, and at the maximum 4 firms will be selected to take part in the final stage of testing and validation of prototypes. This last phase will last 4 months, during the which will be carried out in a real-life testing environment, looking like as the one adopted in Valle d’Aosta.Lombardia region, through its Department of Universities and and Research and with the support of The European House “Ambrosetti”, decided to launch a technical dialogue with the market, this new solution was intended to prepare the ground for the launch of a pre-commercial procurement start up in the health domain. The situation is expected to focus on three main points of intervention, decided in collaboration with the Niguarda Hospital, which was identified as the pilot public procurer: 1) *robotic systems for the automation of venous blood extraction*; 2) *universal interfaces for home-care medical equipment*; 3) *automated devices for the displacement of hospital beds*. An online forum was activated, with the aim of making easier the dialogue between governmental bodies and the market; moreover, the public stakeholders had the option of doing meetings with individual market operators. The technical dialogue phase had the aim to generate feedback on the technological state of the art in the 3 areas of intervention decided, by this way, it is possible to understand which procurement strategy was more suitable to fulfill the needs that emerged. Analyzing that the requested solutions were not deemed to be readily available on the market, was decided to issue a pre-commercial procurement tender 19 on March 2013. At the end of the procurement process, the prototypes that were obtained will start a phase of testing, analyzing the active participation of a group of final users.

The main actors in the process of innovations are firms and the activities of research acted out by them.

The world of the industries: research and development, opportunities and difficulties:

In this chapter we will consider the relation between the processes of innovation and the expenses in research and development and how policy is used to permit the collaboration between public research and firms.

In Italy, the production is represented principally by small and medium firms. Moody's, in its report on the health of European small and medium-sized enterprises, decided to underline the weaknesses in which the Italian ones are currently pouring. Confirmed by the sad record of the highest number of bankruptcies in the Old Continent from 2008 to date.

The main problem is that most of the firms of various sectors, lack a high knowledge of the technology of the product. There are some exceptions, but their output is not sufficient to fulfill the gap.

One of the causes to this problem is that many sectors in these years have been privatized, which before belonged to the state and permitted to have a direct access to all type of firms.

Such problem is due also to the limitations that the firms itself have, a low quantity of human capital and instruction and a familiar capital management.

Most firms lack quality of instruction and prefer to take individuals who learn on the job, in order to invest less on the learning of the workers. But this has an opposite reaction on their earning, due to the fact that more skills a worker has better and faster he will be able to work.: without increasing contractual wages, employee motivation to collaborate in increasing productivity or even suggesting the adoption of process and product innovations is too weak, as well as becoming impossible to acquire from the outside the rare skills needed .

In addition to this firms with a familiar management, view the entry of a partner, as a risk, as a limitation to their control and decisions and to less flexibility but on the other hand precludes innovation and being open to new frontiers.

Finally, another element needs to be considered, which is, there is a low level of use of factors which permit innovation in administration, organization and in the markets. The impact of the tax burden on SMEs exceeds 61%. On average, only local taxes cost more than 11,000 euros per year to SMEs. Bureaucratic obligations are a lot and need to be reduced in order to create a more favorable economic environment for businesses. Problems linked to legislative relations result in excessive administrative costs. Access to credit needs to be facilitated. To this end, instruments must be developed which can restore credit to the business system and make it a multiplier of the ECB's

The problem at the base, is that, independently from the various problems which each firm can have, in many territories, there is a lack of services, insufficient to provide a sufficient economical subsidy to permit innovation. With lack of services we refer to logistic services, human infrastructures and general services for institutions and formation for people.

One way to partially resolve this problem is to increase the investments in research and development of structural funds. The problem of the growth and of the innovation can be solved by these investments.

Italy should try to be present in competitive sectors, trying to reach a high level of competitiveness. This can be achieved through having a high level of innovation in all the products, in order to make it difficult for competitors to imitate products. Research and innovation are the only sectors of the economy where the increase in technology will not reduce the needs of people, but instead leads to an increase of qualification of human capital which increases work opportunities and an increase in investments.

It's possible to describe the main strategies for the firms about innovation.

There are a lot of political strategies which can be applied such as subsidies for the firms and for startups, tax credits for innovation, direct subsidy to the public entity and deduction of R&D expenses.

All this instruments need in any case to pursue determined conditions, which need to be fulfilled.

Such requirements are flexibility, administration and certainty of time.

Flexibility consists in being able to adapt to accept quick changes in the project and to control the contents of a contract with a change in the productive or economic conditions.

Administration consists in the fact that long procedure lead inevitably to an increase in the costs for the firm, which leads to loss in value for the activities of the firm.

Certainty of time, every day firms need to make decisions regarding research and innovation which regard multiyear horizon.

On the other hand, there are various types of mistakes which can be made, such as an excessive conditioning from the public research, an excessive fragmentation of the research and intermediation.

The excessive conditioning from the public research is due to the fact that most of the time the public administration is lead by an academic research to transfer all the research to academic activities, which are not so profitable for firms .

The excessive fragmentation of the research, if an excessive number of people are payed for their actions, in order to increase the number of beneficiaries the risk is that many actions are null.

Lastly, intermediation, can have a determining role in a transaction but on the other hand can lead also to more costs that the firm need to incur .

In 2014“intra-muros” R & D expenditure incurred by all executive sectors totaled more or less € 22.3 billion, that if we compare this data to the data of 2013 (about € 21 billion),it’s possible to determine that expenditure increases both in nominal terms (+ 6.2%) and in real terms (+ 5.3%). The percentage incidence of R & D intra-muros on the GDP is 1.38%, which increased respect to 2013 (+ 1.31%). Private sector expenditure (non-profit enterprises and institutions) amounted to about 13 billion euros in 2014, of which almost all (12.3 billion) is supported by businesses. The Universities sector spends 6.3 billion euros, while public institutions are close to 3 billion. Making a comparison to 2013, expenditure increases in all sectors, but with important differences between the business sector, where there is a significant increase (+ 7.5%) and that of public institutions characterized by a more modest increase (+0, 8%). The private sector's contribution goes up from 57.7% in 2013 to 58.3% in 2014.

In particular, the business sector, singly considered, gives a contribute of 55.4% to total spending (+0.7 percentage points compared to the previous year). The contribution attributed to the public institutions decreases (from 14.0% to 13.3%), instead of universities (from 28.3% to 28.4%) remain rather stationary. In 2014, R&D spending is principally supported by the private sector (non-profit enterprises and institutions) contributing 48.8% (approximately 10.9 billion). The sector of public institutions follows the 40.8% of spending (9.1 billion) and foreign financiers (businesses, public institutions or foreign universities) that account for 9.3% of spending (just under 2.1 billion). Making a comparison with 2013, the financing component of national enterprises increases, while the weight of public and foreign funding is reduced.

Developing an analysis of the cross-sectoral flows it possible to see that the self-financing is the main source. Companies obtain funding from other companies, accounting for 81.6% of total expenditure, the public sector is self-financing for 88.4%, on the contrary, the private non-profit sector contributes 57.4% to the expense sustained about it. Compared with 2013, the part of self-financing in enterprises and the public sector is growing, on the contrary it is reduced to non-profit than in the previous year, so it’s possible to affirm that public and private sector participation in R&D funding is growing.

Given the type of R & D developed, the applied research part, which amounts to 10.5 billion euros in 2014, continues to prevail. Experimental development activities amount to 6.3 billion euros, followed by basic research with 5.5 billion euros. Doing a comparison with 2013, experimental development is the activity with the highest increase in expenditure (+ 12.0%). Increases in content are found in basic research (+ 4.2%) and in applied research (+ 4.1%). In 2014, R & D spending in businesses grew by 7.5% compared to the previous year (from around 11.5 billion to 12.3 billion euros). Taking in consideration the dimensional structure of businesses, the increase in R & D expenditure is visible in all the size classes considered.

Increases in R & D spending are recorded in companies between 250 and 499 employees (+ 9.0%), those with 500 and more employees (+ 8.4%), small businesses (+ 5.6%) and in companies employing between 50 and 249 employees (+ 4.6%). In terms of percentage composition, the contribution to the expenditure of both enterprises with 500 employees and beyond (from 62.5% in 2013 to 63.0% in 2014) and those with 250-499 employees (from 10.8% to 10.9%), while the contribution of enterprises with 50-249 employees (from 16.4% to 16.0%) and smaller ones (from 10.3% to 10.1%) decreases. Compared to the funding source, relatively homogenous behaviors are observed between the different dimensional classes.

R & D spending is structurally concentrated in specific sectors: like Manufacture of motor vehicles and trailers (1,747 million euros); Manufacture of machinery and mechanical equipment (1,462 million euro); Manufacture of computers, electronics and optical products, electro medical and measuring equipment (1,310 million euro); Manufacture of other means of transport (€ 968 million) and Chemical and pharmaceutical industry (€ 897 million).

These sectors represent for 73.1% of R & D spending in the manufacturing sector. Services, R & D (919 million euros), software production, IT consultancy and related activities (860 million euros) and telecommunications (312 million euros) together determine the 66.7% of R & D expenditure of the sub-fund. In the manufacturing industry, expenditure grew by 5.5% compared to 2013. The areas where spending is increasing can be summarized in: Printing and reproduction of recorded media, Manufacture of rubber and plastic products, Manufacture of motor vehicles, trailers and semi-trailers , Textile Industries, and Manufacture of other non-metallic mineral processing products. The most sensitive spending reductions are registered in the sectors of Metallurgy, Manufacture of pharmaceuticals, metal products, other means of transport and electrical equipment.

Put in comparison with other industrial sectors, R & D expenditure decreases in Buildings (-10.6%), while it has remained unchanged in Mining Activities, Electricity, Gas and Water Activities and Waste Treatment and Disposal. In the services sector has been recorded an increase in R & D expenditure in Health and other services to households and businesses (+ 37.2%), Real Estate Assets (+ 28.4%), where R & D is (+ 24.9%), Financial and Insurance Assets (+ 20.2%) and Trade (+ 11.0%). On the contrary, there a decrease in Information and Communication Services (-5.4%) and Transport and Storage; accommodation and catering services (-5.1%).

Through the main automotive manufacturers (1,885 million euros), the chemical and pharmaceutical sector (1,115 million euros), textiles (1,034 million euros) were recorded as main users. Prevision estimates of R & D spending at current values, determined on the basis of forecasts given directly by businesses, demonstrate a decrease for 2015 (-1.9%) and an increase for 2016 (+ 5.2%). Across sectors with increased R & D spending, an increase in wood and cork and wood products (excluding furniture) is expected in 2015 (+ 6.3%), Manufacture of other non-metallic mineral products (+ 5.4%), Manufacture of computers, electronics and optical products; electro medical appliances, measuring devices and clocks (+ 5.4%).

Significant prices are predicted in the manufacture of leather goods and the like (-24.0%), telecommunications (-14.8%) and transport and storage sectors; accommodation and catering services (-10,6%)

A unique rate is fixed for start-ups, increased to 30%, independent from the type of start-up. The maximum limit of investments is increased to 1 million, on which to calculate the detraction for the *Irpef* "income tax". The exception from the imposition of the tax disc and that the constructive act is subscribed, and both the electronic and normal firm are required for major security.

In order to stimulate investments in start-ups, a disposal of losses is introduced, produced in the first 3 exercises of activities of new firms in favor of an listed firm, which holds a participation in the firm of at least 20%.

The goal is focusing on which are the main instruments used by the government and by the parliament to innovate the country and the public administration, analyzing strict rules and easy interpretations of the public financing , analyzing funds, industry 4.0, Sabatini ter, startup and the national operational program.

The Italian Government has decided to transpose into a single act more than 2.000 articles forming the Old Code, which have been reduced to 200 articles of the new Act – the public procurement and

concessions Directives, doing a reorganization of the current legislation on public contracts on works, services and supplies and concessions contracts, so performing the law delegated powers and transposing the European Directives in the period of time scheduled and in line with the other European Countries.

The new Public Procurement and Concession Contracts Code includes realization and simplification criteria, a decrease of the rules ensuring compliance with the prohibition of excessive regulatory additions (*so-called gold-plating*).

The Code shall automatically apply; the integration of the main implementation regulation is not required, as it was in the past, but rather the supplying of general guidelines to be approved by Decree of the Minister of Infrastructures and Transport over an offer of the National Anti-Corruption Authority (ANAC) after consulting the Parliamentary Committees. The guidelines, as instrument of soft law, will give a contribute to guarantee transparency, homogeneity and a quickly procedural process, providing simplified criteria. They will work as main guidelines ensuring a steady and strong updating of the legislation to the changes in the regulation of the sector. Where administrative implementation of decrees have been used for, which are not of regulatory normality, the temporary validity of certain rules of the Regulation during the temporary period relating accounting has been identified, during doing test and inspections, so as guarantee the immediate application of the new legislation.

The Governance aspect has also been regulated, through the role of ANAC (National Anti-corruption Authority) giving a support to legality, and also the fundamental role played by the High Council of the Ministry of Infrastructures and Transport, as well as the institution of a control booth under the Presidency of the Council of Ministers, as controlling and coordinating body.

The Code has been divided into processes following a linear and simple sequence: beginning from the decision to start with an awarding procedure up to the last stage of the contract achievement.

It puts in order the planning, programming activities, main stages for the tender station, the procedures for the prize of contracts, doing an identification of the common basic principles for everytypes of contract to be analyzed, such as: *transparency, cost efficiency, correctness, timing, free competition, non-discrimination, services and supplies contracts, the enforceability of Law No. 241/1990, the person responsible for procurement proceedings, the public award procedures control, the energy and environmental sustainability control.*

The Code pass over the Objective Law, across the development of infrastructure planning instruments, projects that have priority and the direct reference to the application of ordinary procedures. Has been decided to do a strongly restriction to the joint contract awards, which are strictly admitted only in exceptional cases such as the project financing or the General Contractor forms. The Code introduces another shorter trial procedure in Council chambers relating the acts of appeal, going against the cases of exclusion as well as regulating different remedies to judicial protection, like for administrative cases

The new system is founded on the quality of the services supplied, also allowing to delete the principal cause of increasing costs in public works implementation, that is represented by tenders on preliminary planning.

Three steps of planning stages are envisaged: 1) the new technical and economic feasibility project. 2)The final project and the working project. 3)The last being the object of tender.

The new technical and economic feasibility project will make stronger the technical and economic quality of the project. The planning stage has to go forward the general needs, the functional, technical and architectural design of the project, joint with offering a restricted use of land, in order to respect hydrogeological, seismic and forestry limits and energy efficiency. The new feasibility project will be designed on the main basis of geological and geo-gnostic investigations, preliminary assessment on the archaeological lay out, provided that it has to do an identification of the best cost-benefit average for the receiving people. A gradual and clear introduction of modelling electronic tools has been expected, which are possible to be used in the tenders initiated by the most qualified contracting authority like for the choice of contractor, the criteria about the main economically advantageous tender, which are based on the best quality-price average and that previously represented just one of the alternatives for tender stations, has become the preferred award criterion, as well a binding requirements for the provision of social goods and services and for the management of catering services in hospitals, for supporting and school catering services.

Both the economic operators required a professional qualification for whom a specific legislative provision is planned also adding legality rating and contracting authorities, which are based on predefined standards and reward systems that will qualify to award the most difficult and expensive works and services.

The Italian legislature is struggling hard on the road to innovation:

4.1 Procurement code:

The European Law requested that the new Code addresses for the first time ever the permission contracts in an organic manner. Just one code is implemented to rule the granting of public works, public supply and public service contracts, making it evident that concessions are contracts of limited duration, distinguished by the fact that the risk of operating is taken by the concession company, in case of a failed economic return from the investment.

The impact of the annulment of the concessions have been clarified through the economic and financial aspects to be charged to the parties in the event of annulment. Also the hypothesis of annulment for public interest reasons has been introduced

The Code provides for a new regulation of the system of financial guarantees. The first guarantee is abolished and replaced by two different guarantees, together issued: an optimal result Is guarantee, without any possibility that is eliminated and which lasts until the end of the project and the financial guarantee for the conclusion of the contract which covers the costs of the new achievement of the contract , which include all the cases in which the contractor does not fulfil his obligations along with the higher costs charged by the contractor who replaces the previous one.

Within the provisions adopted which aim at encouraging competition, a single European tender document has been introduced, which will guarantee European competition less complications for economic operators who will use a single tender document for self-certifying the absence of reasons for the exclusion which will be assessed by the contracting authority.

Taking in consideration the transparency measures, the use of electronic means in the area of information and communication is expected, the full advertising of the preliminary and following steps of the procurement procedures through with the publication of the news and the invitations to tenders. The Code also contemplates the use of measures with the goal of rationalizing databases which have been reduced to two lists, one of which is managed by ANAC, that performs its monitoring and supervision functions and the other one is governed by MIT through assessing the compliance to general requirements for economic operators in order to make them able to respond to the invitation to tender.

There is an increasing tendency and possibility for private institutions to participate to the financing and projecting of public works.

The new Code has introduced an essential change in the Italian legislation on the PPP as it expressly focuses a section to PPPs. Moreover, the new Code expressly implements the EU principles in the matter of PPP that were not recalled by the former legislation but nevertheless decided to apply because of the direct impact of the European legislation.

“The Code determines the PPP contracts as a contract for pecuniary interest concluded in writing by means of which one or more awarding authorities entrust a set of activities consisting of the realization, transformation, maintenance and operational management of a work, the consideration for which consists in the availability or in the right to exploit the works that are the subject of the contract or in the performance of a service connected to such works. “ The duration of a PPP contract will be set depending on the amortization period of the investment and on the financing modalities of the same to one or more economic operators. One of the main points of the new PPP regulation is the correct and perfect allocation of the risk on the contractor. Moreover, the definition of PPP clearly recalls the application of the Eurostat decisions.

The Code determines that the economic-financial balance is a fundamental point in PPP contracts as it is the assumption for a correct risk allocation. The awarding authority can determine for a public contribution consisting of payments or in the transfer of real estate assets.

To make sure the effectiveness of the PPP system, the Code contains provisions with the scope of ensuring the compliance of the PPP contracts with the needs of the financing entities. The PPP contract can be valued by the awarding authority only provided that the contractor shows the availability of a financing. The execution of the contract is subject to the financing of the works and the contract is finished in the case that the financing agreement is not entered into by the contractor within 12 months from the execution of the PPP contract. Moreover, the PPP contractors have the permission to issue project bonds also derogating from the provisions of the Italian Civil Code, and they also have the permission to strengthen the right of the financing entities to choose the project company destined to step-in the concession in order to avoid the termination of the concession caused by the default of the concessionaire .

The PPP scheme is issued by the Code also for involving private parties in the services and requalification of public areas and public buildings that are unused, (*“administrative exchange”*, *“baratto amministrativo”*), granting also tax benefits to the private parties taking part in such initiatives

The Code does not provide for any derogation from the use and application of the ordinary open public procedures, with the exception of the sectors which are clearly and explicitly excluded by the

Directive also including high urgency and civil protection cases, where the possibility is foreseen of deciding the immediate execution of works or the provision of necessary services to remove the detriment caused to public safety within fixed limits. The limits determined in the new Code amount to 200 thousand Euros or to the amount necessary to remove the damage with a coverage up to 300 thousand Euros for Cultural Heritage and for Civil protection in case of declaration of the state of emergency up to the works threshold.

With the elimination of the use of these special procedures, the overcoming of the Objective Law has been expected leading the planning and scheduling of infrastructures and priority settlements for the development of Italy to the determined instruments so that the three-year Italian General Plan for Transport and Logistics, and the Multi-Annual Planning Document contained in the Legislative Decree No. 228 of 2011. For the writing of the first Multi-Annual Planning Document the Minister of Infrastructures and Transport decided to carry out an assessment of all the projects included yet, in the planning that already exists and programming instruments, carrying out a project review on them. So as improve the planning and reprogramming of allocations for infrastructures of key national interest, the establishment of specific funds in the Ministry of Infrastructures and Transport has been expected.

The setting of the general contractor has been reviewed. In order to declare a general contractor, the contracting authority must express and provide sound reasons based on the complexity, quality, safety and profitability of the project. It is forbidden to The General Contractor model to play the role of project manager. The possibility of using restricted procedures has been eliminated. At the end, the call for tenders is going to be based on final projects.

It's possible to analyze that also the qualification system has been changed, which is now undertaken by ANAC. A regular and selected national register has been set up in the Ministry of Infrastructures and Transport on which the subjects which can play the role of Project Managers and Project Testers in the public procurements which are prized across the general contractor form must be registered. Their meeting in procurement procedures is chosen by public lot from a list of candidates that have been proposed to the contracting Authorities, whose number is at least three times the number necessary for each position. The Ministry of Infrastructures and Transport will have to role to manage the procedures for the inclusion and registration on the national register as well as those related to appointment. A lot of professional profiles are excluded from being selected as project testers, through which are included those performing monitoring and auditing and control activities.

To guarantee the cogency and the speeding of the acquisition procedures as well as guaranteeing binding timeframes in contracts accomplishment, a new special procedure is introduced by the Regional Administrative Court to be adopted in closed session.” *It is established that procedural errors made in the composition of tenders’ Committee, as well as those related to the exclusion from the tendering procedures due to the shortage of the personal, economic/financial and technical/professional requirements, are to be considered immediately prejudicial and may be appealed to the Regional Administrative Court within 30 days from the date of publication of the Commission’s composition or from the date of the publication of the lists of candidates who have been excluded or admitted. Not appealing against these provisions hinders the right to raise an objection of illegality for the following acts of the tender procedures also including the incidental appeal.”*

It is possible to analyze other remedies to judicial protection that are also foreseen, for example **friendly agreement**, (also extended to the claims for works and service contracts, removing the appeal to the Commission and providing for the conclusion within 45 days), **arbitration** (providing only for the appeal to the administered arbitration as well as the establishment of a Chamber of Arbitration which regulates and holds the register of arbitrators and secretaries, drawing up the Code of Ethics for the Arbitration Camera), **agreement** (in case it is not possible to find other alternatives). It is possible to analyze also other solutions that are also included as the **advisory technical board** (with non-binding assistance functions in order to achieve, during the fulfilment stage, a fast solution of legal disputes) and **pre-litigation advice** issued by ANAC (where ANAC provides advice on issues arisen during the tender process upon request of the contracting authority or by one of the parties concerned). The advice that is mentioned above, is binding and in case of no completion the contracting authority is charged with an administrative fine ranging from 250 to EUR 25,000 that shall be paid by the responsible manager.

4.2 guarantee fund:

The Government decided to allocate 895 million euros for the Guarantee Fund. Other 100 million are going to be eligible for the National Operational Program (PON) "Enterprise and Competitiveness 2014-2020". According to the forecasts of the Ministry of Economic Development, these funds should activate more than 25 billion financial banks for SMEs.

The Guarantee Fund has demonstrated to be one of the main tools for access to SME credit by providing a growing number of guarantees: as of August 31, 2016 (latest available report), access requests to the Fund show a growth of 8.2 % compared to the same period in 2015.

Up to 31 July 2016, the allowable applications were 69,103, it's possible to see an increase of 9.1% with respect to the previous year, with a certain amount of 6.8 billion euros (an increase of 8.4%), that have allowed the financing of the business system for 9.8 billion, an increase of 6.8%.

Most of the applications received in 2016 were referred to other kinds of financial transactions (*37,737 units, accounting for 54.6% of the total*) and transactions lasting no less than 36 months (*30,488, accounting for 44.1% of the total*), and are followed by consolidation operations on the same bank / banking group (*862 units, equal to 1.2% of the total*).

Direct collateral operations represent the prevailing share (55.0% of the total, with 38,018 transactions).

Investments in operations have registered an increase of 33.2% in comparison with 2015, reaching 20.0% of the total (*from 10.390 in 2015 to 13.839 in 2016*) with an average loan amount of 169.1 thousand euro (*EUR 135.4 thousand for non-investment operations.*) Medium / long-term transactions represent the main share of applications received (*55.7% of total*), recording a growth of 13.0% against an increase of 4.6% for short-term transactions.

The Fund, in these years of tight and small credit has demonstrated to be a particularly useful tool for SMEs, giving a support to the liquidity needs and new investments, and will soon be interested in an important reform aimed to target its business ventures more risky ones that have therefore more difficulty accessing the credit.

Based on the anticipations regarding the new operational provisions, the central focus and objective of the reform is the introduction of an internal rating model of the Fund for the initiative of assessing business creditworthiness, with the aim to the current economic and financial assessment system based on the 'use of credit scoring.

The new valuation model will be based on five classes of creditworthiness and the coverage ratio will be higher for investment operations and for lower-rated businesses, while falling for liquidity and short-term

The budget law of 2017 regards a variety of permissions to sustain the investments which regard the industry. One of these are the extension of one year of amortization to the 140% and the institution of an iper-amortization of 250% for the high technological goods.

4.3 Industria 4.0:

With National Industry Plan 4.0, the Government has the intent to support the development of transforming Italian businesses that want to take the opportunities associated with the fourth industrial revolution. The Plan has its assumption in the analysis of the structure of the Italian economy:

1) leverages on the manufacturing vocation of Italy and, specifically, based on the presence of numerous manufacturers of instrumental goods that produce advanced machines and systems 4.0, which are created for the market both internal and external. 2) it is compatible with the particularities of the Italian production system, that is, *“an SME-based system with a wide diversification of production specialties and a limited number of industrial chains and ICT system integrators able to coordinate the evolutionary process in key chain 4.0 of supply and sub-supply”*; 3) Underlines the historical propensity of Italian producers to provide personalized solutions with a fundamental component of intangible values of know-how; 4) focuses in a technology and sectoral neutrality logic by integrating the many technologies available today to activate and govern transformation 4.0.

The Plan presented by the Italian Government in September 2016 is composed by two main guidelines and a number of accompanying guidelines. The first main point Leader (Innovative Investments) has to goal to stimulate and sustain: 1) private investment in the renewal of "machinery fleet" within firms (through the super amortization measure); 2) Major transformer investments using digital technologies and the use of a number of key assets 4.0 (through the measurement of depreciation); 3) the expense of our R & D businesses; 4) Enterprise finance in support of Investment Plan

Furthermore the tax credit is enforced, extended until 2020 and confirmed until 31 December 2018 the Sabatini Ter.

4.4. Sabatini ter:

Sabatini Ter is a measure that supports new investments in machinery, plant and equipment, enterprise equipment, manufacturing equipment and hardware like digital software and technologies for existing or implanted manufacturing facilities wherever they are located in the country

The investment has to include bank financing or leasing, allowed by banks or leasing companies that are members of the MiSE-ABI-Cdp convention, with the following characteristics:

1) be deliberated to cover the investments and up to 100% of them;

2) have a maximum duration, including a pre-amortization or pre-amortization period of no more than 12 months, 5 years from the date of the financing contract or, in the case of financial leasing, from the date of delivery of the asset. Where the supply of financial leasing relates to a plurality of goods, the said maximum term expires from the date of delivery of the last asset;

3) be deliberated for a value of not less than EUR 20,000 and not more than EUR 4) million, even if split into several purchasing initiatives for each beneficiary undertaking;

- to be disbursed in one solution within 30 days of the conclusion of the financing agreement or, in the case of financial leasing, to be delivered to the supplier within thirty days from the date of delivery of the asset. Where the supply of financial leasing relates to a plurality of goods, the delivery takes place in several solutions, within thirty days from the date of delivery of each asset;

- in the case of a financial lease, the lessee shall exercise in advance, at the time of the contract, the option of purchasing provided for in the contract, the impact of which is from the end of the financial lease, subject to the achievement of all the contractual obligations.

In the case of financing or leasing, the Ministry of Economic Development guarantees a contribution, which consists in the amount of which is determined to the extent of the interest calculated on a conventional basis, on a five-year loan and an amount equal to the investment, interest rate of 2.75 percent.

Benefits may be granted to SMEs in all sectors of production (*with the exception of the financial and insurance business sector, referred to in Section K of the ATECO Classification of Economic Activities 2007*), which:

“1) they have an operational headquarters in Italy and are regularly constituted and registered in the Register of Enterprises, or in the Register of Fishing Companies;

2) they are in the full and free exercise of their rights, are not in voluntary liquidation or subjected to concurrency procedures;

3) do not include the individuals who received and subsequently did not refund or deposit the aid identified as illegal or incompatible with the European Commission;

4) are not in such a condition as to be "companies in difficulty".”.

Sabatini has as aim to increase the competitiveness of the productive of the country an increase the possibility for small and medium firms to have access to credit to buy instruments. With the law of the 11th of December 2016, the final term has been propagated until the 31th December 2018 for the concessions of the financing.

For the relaunch of the investments, the super amortization is extended until the 31th December 2017, which consists in an upgrade of 40% of the amortization quotas and of the financial lease rates of new instrumental goods.

Subsequently in order to help the processes of technological and digital transformation in “industry 4.0 “ iper-amortization is essential.

The iper-amortization admits an increase of 150% of the amortizable fiscal cost of specific new material goods. Some of these goods are the ones whose functioning is controlled by computerized systems, which control quality and sustainability, devices for the integration between man and machine and for the improvement of the security in the work place is relation to 4.0.

The iper-amortization can be used for investments made within the 31st December 2017, and for those made within the 30th June 2018, only on condition that by the 31st December 2017 the relative order results to be accepted by the seller and that the beginning payments of at least 20% of the cost of purchases is made.

Doing an introduction about a 40% increase in the purchase cost of intangible assets (some software, IT systems and system integration activities) for those who benefit from the depreciation charge; 1) An important and significant increase in R &D tax credit, with the expansion of the one year measure, the description and definition of one facilitating rate of 50% of eligible incremental costs, the increase of 20 million euros of the maximum annual benefit per enterprise, the extension of the aim of the measurement purposed to resident individuals who carry out R & D activities on foreign affairs. These kind of measures are added to the change “cut” in the IRES rates from 27.5% to 24% and to the measures already in force.

The Patent Box consists the diversification for IRIS and IRAP of 50% of the income from the huge use of intangible assets such as industrial patents, trademarks, industrial designs, software covered by copyright, know how, credit of investment tax in the South. The second main point is about Competences. The Fourth Digital Revolution transforms the labor market and it plays an important role to begin from now on virtuous training paths that create new skills. The Plan anticipates the

expansion of a 4.0 culture across the entire training cycle, from school to university, from higher technical institutes to doctoral courses. There are also the emergence of a few selected National Competence Centers on specific and complementary technological fields, with the important participation of university polytechnics of excellence and of large private players, that are able to launch and accelerate new and innovative projects and technological development and sustain the phase of testing and production of new 4.0 technologies in the SME fabric. It is also going to be favored, thinking about a logic integration among supply and demand for innovation, the distribution of a Digital Innovation Hub network, like a bridge between businesses, research ecosystem and innovation, with a role of support in the estimation activities technology and addressing the most focused skills to make quickly the innovative business investment and adoptive private-public cooperation in the field of technology transfer. It is possible to affirm that the good performance of the Plan is linked to the availability of the right network infrastructures too.

In order to facilitate the financing of the investments of the industries, until the 31st of December 2018 Sabatini Ter is confirmed, with the forecast of an increased contribution for the realization of investments in digital technologies, including investments in big data, cybersecurity and cloud computing.

Nonetheless the credit tax is strengthened and simplified, in order to favor the industries which make investments in research and development activities. From 2017 the measure of recognized relief is increased of 50% for all type of expenses. It increases from 5 to 20 million euros.

Ad hoc measures are required for start-ups and small and medium-sized businesses innovations.

4.5 Startup:

This concept startup was developed in the Silicon Valley in the years 70's and 80's and has the aim to create special elements which are able to monopolize a sector of the market which is still unknown to everyone, such as food delivery.

Also In 2012 the minister of the economic development, made different investments in order to encourage an ecosystem to favor the investments of startups in Italy.

The majority of the Italian startups have its office in Milan with net revenues of 305800€, and which are 1.285, also in Emilia Romagna there are 703 startup firms, and in Lazio 601.

71.3% of the startups produces services for firms, the 30% produces software and informatics advice, 14.8% is involved in research and development activities, and the 8.2% provides

information services.

Also in the industrial sector there are startups, the 18.9%, of which 3.7% produces computers and electronic devices, the 3.4% produces machines, and the 2.1% is concerned with electronic devices.

Numerous are the incentives, Italy's region has created in the years for startups.

Lombardy region has put at disposition 30 million with the project "intraprendo", the first big intervention with the aim to support startups and initiatives of young people or over 50 who no more work.

Also in Lazio, 6.2 million of public venture capital have been stipulated, in Campania instead 7 million for the ones who made innovation for the next 7 years, the startups will also have the possibility to "defiscalizzare" the IRAP.

In Liguria, starters can benefit of 3 million euros to create startups for the production of goods in industrial, artisan or agricultural sector .

Recently, the MIUR has released a new tender for the financing of projects for research and industrial development.

The subjects are for eligible firms of any dimensions which have been constructed within the 1st July 2016 and the project must be presented by a public-private partnership, where there is at least one PMI and one in between university and public entity. Each subject can participate at most at 2 partnerships for each of the areas of specialization.

The tender will finance projects of R&D in areas such as health, energy, cultural heritage, technologies for the environment and agrifood.

The maximum duration of the project must be of 30 months and the total budgets of 497 million euros, 393 for the less developed regions and 104 for the regions of center and north.

This year, the 6th edition of the Technology forum of the European house has been held. Italy results to be the first country of the world for productivity in the research in terms of publications and also one of the leading countries in the production of sectors with high technology . But although all these capacities there isn't a continues growth and competitiveness on global scale . This is due also to a strong difference between the north and the south. One hand Lombardy results to have a very high European ranking , 17th, whilst Calabria 89th.

The problem lies in the investments, both public and private and also of competences, only 7.6% of people with a degree, have a degree in technical and scientific subjects.

4.6 The National Operational Program “R&D”:

The National Operational Program "Research and Innovation" 2014-2020 is the instrument with which Italy support and sustain the realization of the European Union's Cohesion Policy for its most disadvantaged territorial areas.

The Program, controlled by the Ministry of Education, University and Research (MIUR), is concerned with the Transition Regions (TR): Abruzzo, Molise and Sardinia and the Regions in Development Delay (LD), Basilicata, Campania, Calabria , Apulia, Sicily, with a total budget of 1.286 million euro.

National Operational Program Research and Innovation develops in coherence with the strategic goals of the Horizon 2020 and Cosme European programs, jointly with the National Strategic Intelligence Strategy (SNSI) and regional operational programs and strategies for smart specialization

Priority of National Operational Program Research and Innovation is the competitive repositioning of the most disadvantaged regions aimed to produce structural change changes in order to increase the possibility to produce and use quality research and innovation to trigger intelligent, sustainable and inclusive development.

The program's scopes of application are 12: Aerospace, Agrifood, Blue Growth, Green Chemistry, Design, Creativity and Made in Italy (Non-R & D), Energy, Smart Factory, Sustainable Mobility, Healthy, Smart, Secure and Inclusive Communities, Life Technologies, Cultural Heritage Technologies.

In these areas, the idea and the project are to create opportunities for territorial development, to stimulate the formation of "innovation laboratories", where it'll be possible to cultivate new knowledge, talents, innovative entrepreneurship and opportunities to attract skills

National Operational Program Research and Innovation also has the goal to overcome the "project logic" of funding related to single projects, with the aim of making easy the creation of development opportunities for the areas of the regions selected, in order to initiate initiatives of

cooperative-competition (coopetition), focused at promoting collaboration between companies and other subjects (universities, research bodies, etc.). To achieve mutually beneficial information, productive, commercial and product benefits that can have implications very important from the point of view of the results.

All this is combined with the objective of increasing the development of new professional skills required by the labor market through the activation of human capital interventions to facilitate the provision of a skilled profile of right profile for start-ups and to young people.

Another element of the Program's originality is the fundamental focus on improving the efficiency and quality of spending by introducing easy, clear and transparent procedures that renders quickly the procedural process in full administrative fairness.

The National Operational Program Research and Innovation 2014-2020 is developed through three priority axis of action, of which the two main ones are:

Axis I - Investments in Human Capital (€ 283 million)

Axis I envisages the establishment of innovative PhDs (EUR 114 million), measures to attract senior researchers towards lagging development areas (€ 86 million) and mobility measures (€ 83 million) .

Axis II - Thematic Projects (€ 952 million)

Axis II aims to remove structural, business and contextual constraints in line with the guidelines set out in the National Strategic Intelligence Strategy (SNSI) by funding research infrastructures (€ 286 million), technology clusters (€ 327 million) and research projects on qualifying technologies [KET's] (€ 339 million).

Italy 1,1% of PIL invested is much lower in comparison to other countries such as Finland which spends 3,5% in R&D and France with 9%.

Italy's problem is in the portion of financial research or in the conduct of the private sectors.

The portion of investments made by private sectors is much lower in comparison to other countries such as Germany, Ireland or Spain.

Companies make low investments and there is a scarce coordination between the politics of research and industrial.

The problem should be concentrated not only on the quantity of investments but more on the quality

of investments in R&D.

In order to reduce the critical issues of the politics, incentives on the industrial research , collaboration between research and firms, and qualified services to companies for innovation, can be 3 possible solutions.

First, regarding the incentives to the industrial research, there are different problems, such as long time decisions, excessive bureaucracy, uncertainty on the disposability of the resources and scarce use of valuation ex post to verify the impact.

L.46/82(FIT) and D.Lgs 297, reformed at the end of the 90's had the objective to simplify and recede long time decisions have not resolved the problem.

2) Collaboration between research and firms numerous are the problems. Most of the times this collaboration is confused and not clear regarding the divisions of responsibilities, or with a dominant presence of institutions such as universities . It is necessary to define the intermediary objective and to create place for workers highly skilled.

3) Qualified services to companies for innovation

Intermediaries are needed in order to close "PMI" to the sources of solutions. For small and medium enterprises it is much more difficult to have access to research and the primary sources of innovation of technology.

But in many situations, the role of intermediation is not so determinant, creating fixed costs , and intermediators do not have specific competences and so do not create real solutions.

In order to solve this criticities it is possible to improve the policies of research and innovation.

The services identified for firms need to be clear in their contents and methods and in the results which need to be achieved. Variations need to be communicated and to each typology of service needs to correspond a price ceiling of the public contribution. Firms need to be such of the of a competition between the providers of services and need to be free to choose the supplier they believe most apt for their firm.

Firms can also decide to be helped by promoters of innovation, innovation assistant in order to understand the needs of their firm.

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