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REINFORCING INNOVATION EFFECTIVENESS. A NEW METHODOLOGICAL APPROACH FOR POLICY EVALUATION

Abstract: Innovation is considered an important competitiveness factor for companies and a source of wealth for economies. Therefore it is an important subject of policy intervention and regional development. The understanding of what innovation is has evolved in the past decades away from a purely technological definition – of new products and processes introduced on the market, to a wider one including organizational and marketing aspects or incremental innovation in low tech production companies and more recently, innovation in services (European Commission, 2008).

Today, innovation is present in the discourse of politicians and business leaders. They see innovation as a positive value and as a solution to solve social problems and company's competitiveness, so organizations are encouraged to adopt innovative practices through incentives and innovation policies.

The main purpose of this paper is to propose a new methodological approach for public policy supporting innovation evaluation in a territorial based analysis. A new methodology which intended to contribute to strengthen and reinforcing the innovation effectiveness in firms and territory development resulting from support of public mechanisms.

Keywords: innovation, public policies, evaluation, effectiveness, efficiency, governance.

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INTRODUCTION

Nowadays, the concept of innovation presents itself as a fashion or a modern myth. The innovation issue appears a commonplace in speeches of groups with different interests and positions in society and it seems to have the power to generate social consensus. Innovation is often considered, by policy makers and business leaders, the only way to solve urgent societal problems and firms competitiveness. Innovation is regarded as a positive value and every efforts oriented towards the development of significant novelties are fostered (e.g. incentives, innovation policies).

Joseph Schumpeter referred to innovation as *creative destruction* because innovation offers opportunities but it entails risks to. Some types of innovation questions existing competences and routines and requires new patterns of behavior. Moreover, new technologies and processes can unleash unforeseen side effects which can turn innovation into a danger.

Innovation is a complex and multidimensional concept (cultural, economic, organizational, social and technical) and there are several types of innovation. The innovations could have a material (e.g. products, process, equipments, design, etc.) or immaterial (e.g. attitudes, knowledge, etc.) dimension.

The main purpose of this paper is to propose a new methodological approach for public policy supporting innovation evaluation in a territorial based analysis. A new methodology which intended to contribute to strengthen and reinforce the innovation effectiveness in firms and territory development resulting from support of public mechanisms.

A new methodology that seeks, for each specific territorial context, contribute to the following results: i) Evaluate the socio-economic and territorial impacts of knowledge transfer and technology diffusion; ii) Mapping territorial innovation effects and pathways – reinforcing innovation mapping and strategic planning; iii) Monitor innovation productivity, competitiveness and its systemic effects; iv) Monitor the innovation implementing processes and public policies, and support the multidimensional and multiscale evaluation of its results; v) Better understand the knowledge transfer and technology diffusion in a specific territorial bases; vi) Increase the understanding of local and regional contexts of innovation governance.

1. THE CONCEPT OF INNOVATION³

The debate of innovation becomes stronger from the 1970s, when, by strength of changes in economic and socio-cultural context, become visible the great changes in production systems.

In economics, the concept of innovation was introduced by Schumpeter which emphasized the role of technological innovation in creating value and the importance of individual entrepreneurs for entrepreneurial dynamism. According to Schumpeter technological innovation creates a *creative destruction* that undermines the traditional ways of creating value and provides income to the entrepreneurs responsible for their introduction (Cunha, Rego, Cunha & Cardoso, 2004; Oliveira, 2008).

Until the 1950s, the *technical progress* (improvements in equipments) is synonymous of *process innovation* and only in the 1980s; the notion of *product innovation* becomes an issue of great economic importance⁴.

The conceptual legacy of Schumpeter was recognized by Drucker (1986: 39) whom states that innovation is *the imbalance introduced by the innovative entrepreneur, and not the balance and optimization, is the standard of a healthy economy and the central reality of economic theory and practice*.

Some definitions of innovation highlights the element of novelty as a prerequisite for innovation (Downs & Mohr, 1976) and others highlights the changing behavior (individual and organizational) as a requirement for innovation Butler (1981).

In Rogers' definition (1983) innovation depends on the value attributed to the novelty, the meaning that actors attribute to it and its usefulness. Sometimes the concept of innovation approaches to the notion of change in the products and processes of the organization (Handy, 1985). The concept of innovation includes several kinds of behaviors, and even conflicting, ranging from search and discovery to the reproduction of the existing (Dosi, 1988).

Drucker (1986) is one of the authors whom choosed to limit the definition of innovation to the specific context of business and Porter (1990) opts for a definition of innovation in a broad sense that includes several kinds of improvements (e.g. technology, methods, products, processes, marketing approaches, new forms of distribution or new ideas).

³ This issue has been discussed in more details by authors in Serrano, M. M. & Neto, P. (2011).

⁴ Schumpeter's contribution for the recognition of the concept of *product innovation* was very important, but it only would be recognized by economists in 1980s with Rosenberg' contributions.

For others authors, the novelty (in the sense of a rupture with the present situation) is an essential criterion in order to talk about innovation (Amara, 1990; Mezias & Glynn, 1993). In Lundvall (1992) point of view innovation involves processes of learning as a result of relational dynamics between firms and other elements of the institutional environment.

In the Green Paper on Innovation (European Commission, 1995) innovation is a social phenomenon and not just an economic mechanism or a technical process. The concept is taken as a positive value which falls on expectations of solving social problems (Oliveira, 2008). This document emphasizes the technological component but also values the organizational aspects in recognizing the need to involve workers in technological change and its implications for the organization of production and work, and the mechanisms of interaction within the company (Kovács, 2000: 36).

Lisboa (1998) among other authors takes innovation as a positive value and draws our attention to the need to evaluate each process that underlies innovation.

Fact that the contributions to the definition of innovation are numerous. In table 1 we present the definitions of innovation of the authors cited in the text.

Table 1 – Definitions of innovation

Authors	Definitions of innovation
Downs & Mohr (1976)	<i>Adoption of means or ends that are new to the organizational unit that takes it.</i>
Butler (1981)	<i>Selection and retention of any change in behavior that includes variety of products, processes and organizational characteristics.</i>
Rogers (1983)	<i>An innovation is an idea, practice or object perceived as new by an individual or other organizational unit of adoption.</i>
Handy (1985)	<i>Innovation includes all activities aimed at changing the things that the organization does or the way how organization does it.</i>
Dosi (1988)	<i>Innovation concerns the search, discovery, experimentation, development, imitation and adoption of new products, new production processes and new organizational structures.</i>
Drucker (1986)	<i>Innovation is the specific instrument of entrepreneurship. It is the action that endows resources in a new capacity to create wealth. The innovation creates the resource. A 'resource' is something that does not exist until man discovered a use for something existing in nature, and thereby provide an economic value.</i>
Porter (1990)	<i>To include the improvements in technology and in methods or processes of doing things. It can manifest itself in changes in products, processes, new marketing approaches, new forms of distribution and new ideas.</i>
Amara (1990)	<i>Innovation means to create, to launch or disseminate something new. This 'something' new may be a new product or tool, a new service, a new process, a new material or a new organizational form.</i>
Mezias & Glynn (1993)	<i>Innovation materializes new ideas not consistent with the current concept of organizational business.</i>
Lundvall (1992)	<i>Innovation can be considered as new possibilities and use of pre-existing components. Most innovations reflect previously existing knowledge but</i>

	<i>combined in new ways.</i>
European Commission (1995)	<i>Innovation is taken as being a synonym for the successful production, assimilation and exploitation of novelty in the economic and social spheres. It offers new solutions to problems and thus makes it possible to meet the needs of both the individual and society.</i>
Lisboa (1998)	<i>Trying out ideas and inventions of their own or others with a view to achieving improvements in production, marketing or organization and is the way to mobilize, organize and control material resources, knowledge and human resources of an organization.</i>
Nedis & Byler (2009)	<i>Innovation is the ability to take new ideas and translate them into commercial outcomes by using new processes, products or services Innovation is considered as an important competitiveness factor for companies and a source in a way that is better and faster than the competition.</i>

Source: From Cunha *et al* (2004: 607) and completed by authors.

The set of definitions presented points to three core features of the concept of innovation: i) ambiguity - innovation is an open and contingent concept, i.e. it does not produce unique answers to solve problems; ii) ubiquity - innovation is an intrinsic variable of the economic systems because they constantly create new products, processes and markets, and iii) cumulative - the organizational innovation is a cumulative process based on technology and knowledge. In this cumulative process, experiences and practices from the past can impose himself as resistance to change in organizations. For this reason, the innovations do not always produce continuous improvement. Assuming that innovation is a *creative destruction*, successful innovations require disruption (Cunha *et al*, 2004: 607).

In short, the concept of innovation is complex and multifaceted (Kovács, 2000) and appears as a small label for a wide variety of phenomena (Cunha *et al*, 2004). The concept hosting a variety of situations such as: *the adoption of new technological solutions or work processes, launching new products, competition in new markets, establishment of agreements with customers or suppliers, the discovery of new source raw materials, a new manufacturing process, a new way to provide after-sales service, a new modus operandi for the relationship with customers, etc.* (Cunha *et al*, 2004: 605).

2. INNOVATION, COMPETITIVENESS AND KNOWLEDGE⁵

In Green Paper on Innovation, innovation has a variety of roles: it's a driving force, which points firms towards ambitious long-term objectives; leads to the renewal of

⁵ Based in Serrano, M. M. & Neto, P. (2011).

industrial structures; is responsible for the emergence of new sectors of economic activity. In brief, innovation is: i) the renewal and enlargement of the range of products and services and the associated markets; ii) the establishment of new methods of production, supply and distribution; iii) the introduction of changes in management, work organization, and the working conditions and skills of the workforce (European Commission, 1995: 1).

This approach establishes a relationship between innovation and competitiveness and often, the two concepts are taken as synonyms. But this relationship is not linear. It should be introduced in the analysis the variables *strategy* and *factors of competitiveness*. Two companies may have high levels of competitiveness and opposing strategies, e.g.: i) unskilled labor, low levels of supervision, low salaries (ideal-type of textile) and ii) skilled labor, high rates framework, relatively high wages (ideal-type of computer software). There are two possible strategic orientations - high road and low road - to face the challenges of international competition also recognized by Harrison (1997). Put simply, the relationship between competitiveness and innovation can be formulated in two extreme ideal-types of competitiveness standards: i) the traditional pattern of competitiveness based on price (process innovation) and ii) a new competitive pattern based on innovation (product innovation).

In Porter' terminology a competitive firm has the ability to combine high wages and high prices in international markets. The discourse about productivity gains, competitiveness and innovation, says little about the social reality of a country, a region or a company. The analysis of the *sustaining competitiveness factors* helps to understand why companies, sectors, countries or regions have similar levels of competitiveness supported on different factors and report on the competitiveness strategy adopted (Porter, 1990).

From this perspective resulting two consequences: i) science is the 3rd factor of production together with the capital and labor and ii) the necessary knowledge is based more in *intellectual work (knowledge workers)* and require more basic school education. Considering that science is a contribution of major importance for innovation, knowledge resulting from scientific research is the base ingredient of technological innovation (Oliveira, 2008).

Although the literature focuses on the importance of academic knowledge for innovation, there are some authors who admit other types of knowledge, like the typology of learning for innovation proposed by Lundvall (1992) and Malerba (1992): i)

learning by doing - can improve the work process in order to enable improvements in efficiency and productivity gains, and ii) *learning from advances in science and technology* - can lead to major innovations in the product or radical innovations. These two types of learning, mobilize very different kinds of knowledge (Oliveira, 2008: 49).

The concept of knowledge is used in the literature to describe all knowledge useful for innovation, independently of the origin and nature of that knowledge. The neoclassical perspective prefers to use the term *technology transfer* to refer to the transfer of goods and services (e.g. capital or goods). In this process there is no place for man, is the metaphor of the invisible hand that remains on the market of techniques (Oliveira, 2008: 49).

It was Lundvall, in the context of National Innovation Systems (NIS) approach, who gives the relevance of knowledge transfer as a learning process, making it a central theme in this heterodox approaches of innovation. *The innovation reflects learning* (Lundvall, 1992: 9) and learning requires the involvement of people.

The mobilization of knowledge useful for innovation requires two kinds of knowledge: the *tangible knowledge* (present in equipment and other products for immediate use) and *intangible knowledge* (incorporated in people who require learning and assimilation). In this perspective, the diagnosis of problems found in the transfer of knowledge lies in the obstacles to movement (and dissemination) of knowledge so should be promoted mechanisms and policies to remove such obstacles and promote the circulation and use of knowledge (Oliveira, 2008: 51).

The world economy is today based on the gradual transition from a resource-intensive to a knowledge-intensive economy. The economic capacity to gain competitive advantage and economic developments of the innovation depends more than ever, on the way how companies, institutions and territories are able to disseminate, adapt and apply information and knowledge (Neto, 2001).

In the innovation context individual and organizational skills matters. So, innovative firm should have a number of characteristic features which can be grouped into two major categories of skills: i) *Strategic skills* - long-term view; ability to identify and even anticipate market trends; willingness and ability to collect, process and assimilate technological and economic information and ii) *Organizational skills* - taste for and mastery of risk; internal cooperation between the various operational departments, and external cooperation with public research, consultancies, customers

and suppliers; involvement of the whole of the firm in the process of change, and investment in human resources (European Commission, 1995: 1).

Research, development and the technological factor are key elements in innovation. For incorporating these elements firm must make an organizational effort by adapting its methods of production, management and distribution. But the essential factors are, in European Commission point of view, human resources. *In this respect, initial and ongoing training play a fundamental role in providing the basic skills required and in constantly adapting them*⁶ (European Commission, 1995: 1).

The idea that innovation has a crucial role in the processes of economic development of countries, through the action of firms, is shared by several authors including Schumpeter. Innovate is a prerequisite for dealing successfully with the permanent needs of adaptation to an environment increasingly unpredictable, unstable and dynamic (Kovács, 2000).

The motivations of firms to innovate are various and can be associated with survival strategies, competitive strategy or make himself the subject of innovation. In addition to the intrinsic motivations of firms to innovate, we must also consider the diversity of external factors to stimulate innovation, particularly in its social, economic, technological, political and legal dimensions (Kovács, 2000). The company's ability to learn and innovate depends on the internal and external environments. The environment outside the company deserves all the attention because it depends on the motivation to innovate and drive it most of the policies of regional economic development (Vaz, 2006).

3. EFFECTIVENESS VERSUS EFFICIENCY

The concepts *effectiveness* and *efficiency* are often used as synonyms, but there are clear differences between them and the relationship between the concepts in terms of strategic planning, notably in the context of policy-making at European level. *In general, the terms efficiency and effectiveness are used to describe the relationships between inputs, outputs and outcomes* (European Commission, 2009: 31).

The White Paper on Reforming the Commission (2000) says *the concept of efficiency aims at ensuring maximum results with limited resources*. Later a

⁶ Many studies and analyses show that a better educated, better-trained and better-informed workforce helps to strengthen innovation.

Commission Staff Working Document (2008)⁷ clarified that the efficiency concept refers to the concept of production possibility frontier, which indicates the quantity of output which can be efficiently produced for a given input level. In other words, the greater the output for a given input or the lower the input for a given output, the more efficient is the activity (European Commission, 2009: 31). According this definition, efficiency levels may be influenced by environmental conditions (internal and external) which can stimulate or hamper the performance of a policy measure.

The concept of efficiency is more objective and allows a rather straightforward interpretation than the concept of effectiveness. Effectiveness seems to be more difficult to understand because it also depends on political objectives and priorities. In the White Paper on European Governance (2001) the concept of European governance is defined by the rules, processes and behavior affecting the way in which decisions are taken and implemented at European level. In this sense, effectiveness can be understood as one of the 'five principles of good governance', together with openness, participation, accountability, and coherence. The concept effectiveness means that policies must be effective and timely, delivering what is needed on the basis of clear objectives, an evaluation of future impact and, where available, of past experience (European Commission, 2009: 31).

Following this approach, effectiveness describes the extent to which objectives are achieved as well as the relationship between the objectives set and the actual impact of an activity. Whereas efficiency is measured by the relationship between the output (in terms of goods, services and other results), and the resources used to produce them, effectiveness means 'doing the right things right'. An efficient activity maximises output for a given input or minimises input for a given output, which can be interpreted as 'doing things well'. In terms of effectiveness, the focus is more on the impact than on the output of the activity (European Commission, 2009: 32).

4. REINFORCE INNOVATION EFFECTIVENESS

Innovation is considered as the key to fight the current economic downturn by helping businesses to grow and create jobs to counterbalance layoffs elsewhere. In order to promote innovation in the EU as effectively as possible, innovation support needs to be based on a clear policy rationale and to demonstrate the capability to make a real

⁷ Measuring the efficiency of public spending on R&D (2008).

difference (...). Innovations support must demonstrate its economic impact in order to justify further funding (European Commission, 2009: 9). More important than to have big innovation support mechanisms in the EU is to know whether they are effective and how their effectiveness could be further improved.

According Serrano, Gonçalves & Neto (2005) the concept of territorial public policies is a complex process involving various actors and various actions. This process is characterized, among other things, by the coexistence of various hierarchical levels of public decision (Gilbert, 1996), the preparation and participation in concerted action, by joint participation in funding and a management form of contract type (Peyrefitte, 1998).

The design of public policies must take account the regional models and the logic of relationships between local actors and involves negotiation between different stakeholders in the choice of projects to fund. For Orsini (1998), seeking a balance between the interests and the options on alternative should not result from a classical optimization but rather a rational procedure that allows a satisfactory solution overall. The characteristics and specificities of the design process of public policies, organizational arrangements and the model of interaction between different institutions largely determine the kind of results that could be achieved (Serrano, Gonçalves & Neto (2005). Nioche (1992)' definition of public policy - *a public policy is an organized and coherent sequence of actions that seek to address more or less institutionalized in a situation considered problematic* - stands as one of its major functions the problems solving and in this sense it is appropriate to evaluate the policy effectiveness.

The evaluation of public policies should be based on use of different types of indicators: i) indicators of achievement (in terms of actions), ii) intermediate indicators of change in circumstances and behavior (in terms of operational objectives) iii) Indicators of results (in terms of strategic objectives), iv) development indicators (at the level of sectoral objectives or general) (Daucé, 1998).

In order to evaluate the effectiveness of public policies to support innovation and enhance its effectiveness European Commission launched the innovation policy initiative PRO INNO Europe⁸ that *combines analysis and benchmarking of national and regional innovation policy performance with support for cooperation of national and*

⁸ The initiative aspires to become the main European reference for innovation policy analysis and development throughout Europe. Additional information on PRO INNO Europe® is available at www.proinno-europe.eu.

regional innovation programmes and incentives for innovation agencies and other innovation stakeholders to implement joint actions (European Commission, 2009: 2).

The main purpose of this initiative is to know *how to best improve the effectiveness of public innovation support mechanisms in the EU* [because] *in this respect, the public consultation on the effectiveness of innovation support in Europe revealed a high degree of dissatisfaction with existing innovation support measures* (European Commission, 2009: 5). It seems to be clear that the promotion of innovation should be *drive in order to promote innovation in the EU as effectively as possible, innovation support needs to be based on a clear policy rationale and respond to the needs of innovative enterprises* (European Commission, 2009: 5).

The results of the *public consultation on the effectiveness of innovation support in Europe was conducted in order to get more in-depth insights on how to best improve the effectiveness of public innovation support mechanisms in the EU, against the background of changing innovation patterns in enterprises* (European Commission, 2009: 5).

Present now an overview of this public consultation results in eight categories of analysis (European Commission, 2009):

i) Barriers to innovation - the most pertinent barriers to innovation identified are *the lack of access to finance, too high costs of innovation and lack of incentives facilitating cooperation between actors*;

ii) Direct innovation support - the majority of respondents believe that the barriers to innovation can be overcome. *The four most frequently provided forms of innovation support to enterprises over the last three years were financing for innovation projects, support to networking and cooperation, awareness raising and technology transfer*;

iii) Satisfaction of the beneficiaries - *As regards the level of satisfaction of the beneficiaries of public innovation support, the overall perception is not very positive.* The level of satisfaction result from the balance between the expectations of public support and the effective public support the respondents receive and the results suggest *that there is a gap between what enterprises would expect to receive as innovation support and what they actually get*;

iv) Ways of public innovation support - concerning *more effective ways of public innovation support provision there is practically no area that is considered to offer 'best practice'*. *Nearly 80% of the innovation support providers would admit that there is a need to improve existing support mechanisms.* The large majority of respondents

calls for new forms of innovation support and ask for the introduction of *fast-track procedures for administration and evaluation of projects; more integrated innovation support services and involving private organizations and innovation experts more directly in the service provision;*

v) Innovation management - *with regard to innovation management, enterprises would expect to receive better public support primarily for innovation strategy and organizational innovation, including the use of IT and e-business;*

vi) EU involvement in innovation support - there is a theme that seems to be unanimity by recognizing that *EU has an active role to play in this regard. All intervenient clearly indicate the pertinence of EU involvement in innovation support. But what kinds of innovation support do enterprises expect to be offered at EU level? Concerning the specific fields in which the EU should provide innovation support, enterprises view support for financing innovation projects together with support for networking and cooperation between actors as the main areas, where European instruments should be made available;*

vii) Institutional stakeholders - *regarding the institutional stakeholders, the top three priorities at EU level are facilitating cooperation, exchange of information, good practice and policy learning together with the facilitation of technology transfer and access to finance, including leveraging/co-funding of seed and venture capital funds;*

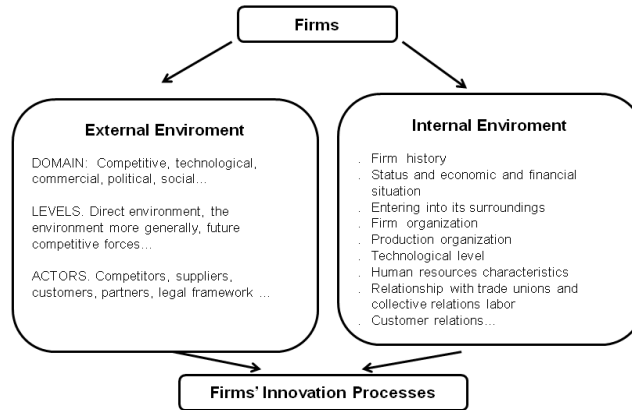
viii) Expectations on how to further improve the effectiveness of EU support measures - *simplification of the participation rules in EU projects, more direct support for SMEs through EU support mechanisms and for better information about EU initiatives, simplification of administrative procedures. The vast majority is of the opinion that introducing fast-track procedures for administration and evaluation of projects could help improve the effectiveness of measures. Three quarters think that offering more integrated innovation support services (e.g. one-stop-shop approach) and involving private organizations and innovation experts more directly in the service provision would help achieve this goal (European Commission, 2009: 5-7).*

5. A NEW METHODOLOGICAL APPROACH FOR POLICY EVALUATION

The proposed methodology focus on the interplay of the different factors affecting innovation processes and aims to overcome the fragmentation of the level of analysis

and encourages the connection of analyses of the inside of organizations with analyses of the societal context in which firms operate (see Figure 1)

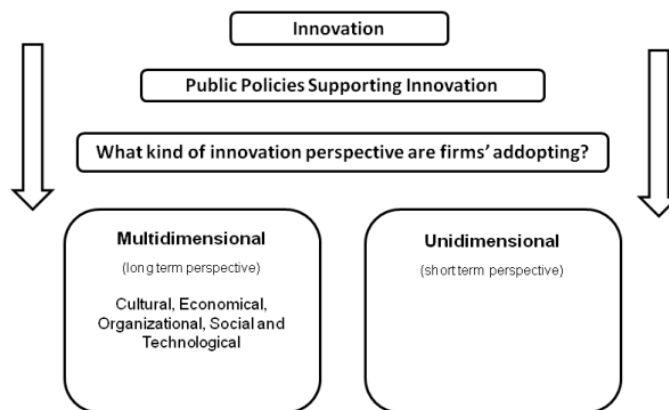
Figure 1 – The methodological analysis of external and internal environment



Source: Serrano & Neto (2011)

Was demonstrated in the theoretical chapters that the concept of innovation is complex and multidimensional and it can be seen in a narrow or broad sense. We aim to understand what kind of innovation perspective firms adopting when they decide to innovate with support of public policies (see figure 2).

Figure 2 – The methodological analysis of innovation perspective



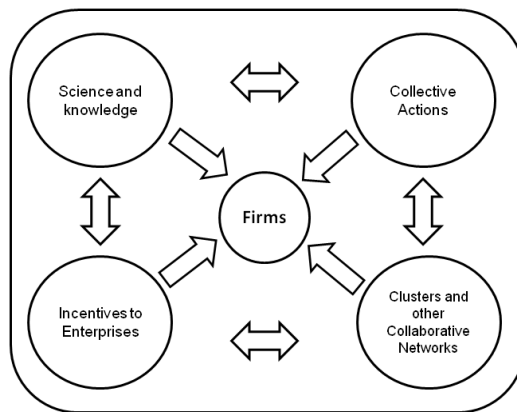
Source: Serrano & Neto (2011)

This methodological approach aims to ensure a systematic analysis in order to consider all actors and factors directly or indirectly associated to public policies supporting innovation or their mechanisms of action and to its major stakeholders and beneficiaries. The analysis model is structured to detect the interaction between four major systems, namely science and knowledge, incentives to firms, territorial collective

actions and clusters and collaborative networks. Now we present the twenty four dimensions for evaluation we defined and illustrated by the figures:

1) Innovation improvement in firms resulting from the support of the science and knowledge system; 2) Innovation improvement in firms resulting from the support of the public incentives directly to firms; 3) Innovation improvement in firms resulting from the support of the public incentives supporting national and regional industrial policies, namely, clusters and collaborative networks; 4) Innovation improvement in firms resulting from the support of the public incentives supporting “collective actions” on territorial bases;

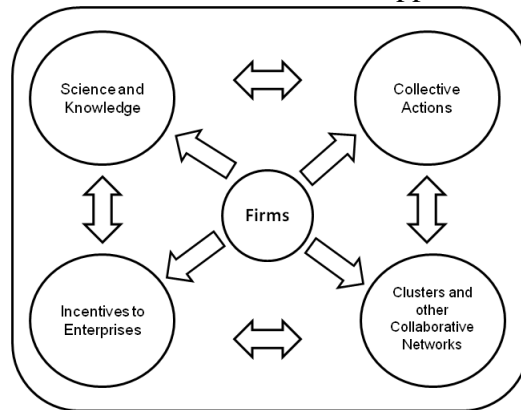
Figure 3 – Innovation improvements in firms resulting from public incentives



Source: Serrano & Neto (20011)

5) Changes in the science and knowledge system resulting from firms’ performance and demand for innovation; 6) Changes in the national and regional industrial public policies resulting from firms’ performance and demand for innovation; 7) Systemic changes in the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks) resulting from firms’ performance and demand for innovation;

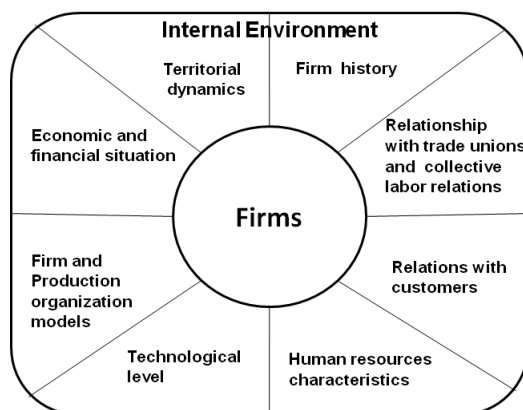
Figure 4 – Changes in public policy resulting form firms performance and demand on innovation support



Source: Serrano & Neto (2011)

8) Positive impacts in firms’ internal environment as a consequence of the innovation improvement in firms resulting from the support and nature of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 9) Negative impacts in firms’ internal environment as a consequence of the innovation improvement in firms resulting from the support and nature of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks);

Figure 5 – Analysis of impacts in firms internal environment

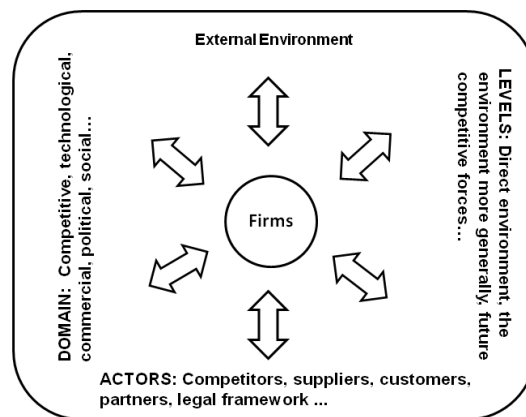


Source: Serrano & Neto (2011)

10) Positive and negative impacts in firms’ internal and external environment as a consequence of the nature and focus of the supporting public policy itself; 11) Systemic changes in firms’ external environment as a consequence of innovation

improvement in firms resulting from the support of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 12) Systemic changes in firms' internal environment as a consequence of innovation improvement in firms resulting from the support of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 13) Systemic changes in firms' internal and external environment as a consequence of changes in the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks) resulting from firms' performance and demand for innovation;

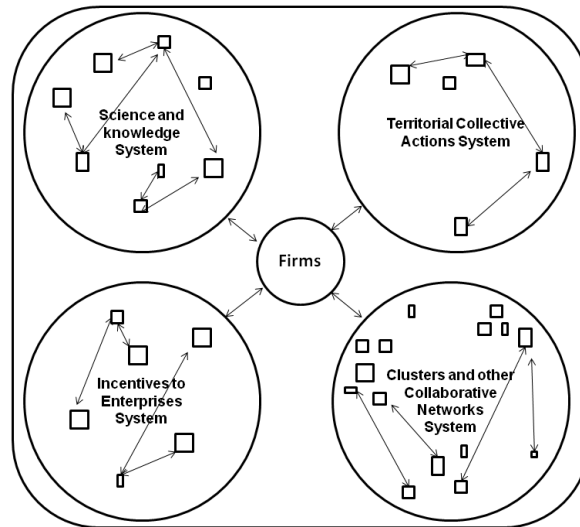
Figure 6 – Analysis of impacts on firms external environment



Source: Serrano & Neto (2011)

14) Systemic changes in the territorial contexts of firms' as a consequence of innovation improvement in firms resulting from the support of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 15) Systemic changes in the four systems (science and knowledge, incentives to firms, collective actions and industrial policies) resulting from firms' performance and demand for innovation; 16) Systemic changes in the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks) resulting from firms' and territory performance and demand for innovation;

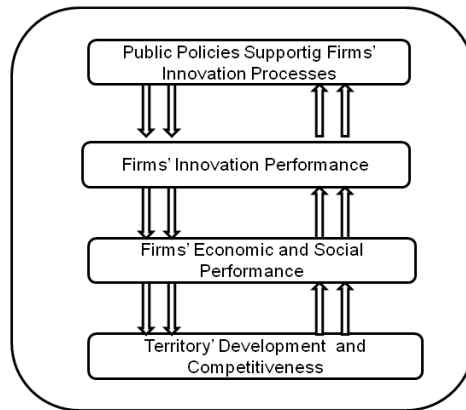
Figure 7 – Analysis of public policies impact on systems' internal relational and governance models



Source: Authors own elaboration

17) Positive and negative impacts in the internal relational model of each of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 18) Positive and negative impacts in the internal governance model of each of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 19) Positive and negative impacts in internal cooperation / competitiveness balance within each of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks); 20) Positive and negative impacts on the systemic relative height and position between the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks);

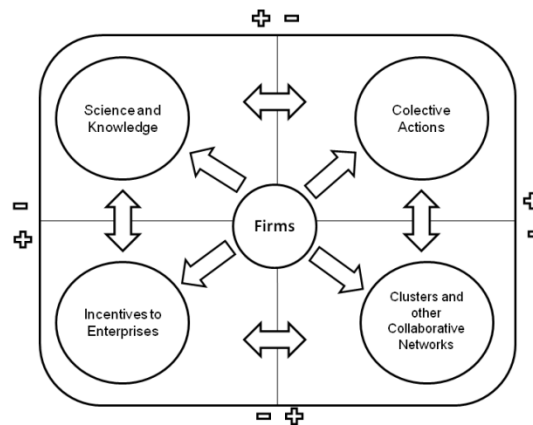
Figure 8 – Analysis of public policies impacts on firms and on territorial competitiveness



Source: Serrano & Neto (2011)

21) Positive and negative impacts in the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks) as a consequence of the nature and focus of the supporting public policy itself; 22) Positive and negative impacts in the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks) resulting from firms' performance and demand for innovation;

Figure 8 – Analysis of systemic positive and negative impacts

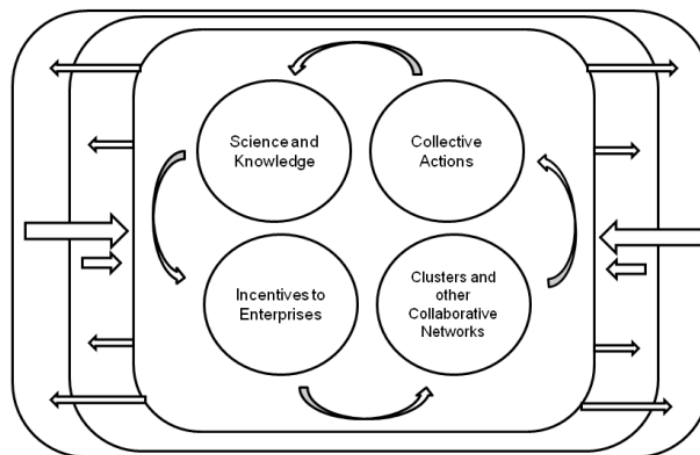


Source: Serrano & Neto (2011)

23) Geographical cartography of impacts on firms resulting from the innovation improvement in firms resulting from the support and nature of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and

collaborative networks); 24) Geographical cartography of impacts on territorial context of firms as a consequence of the innovation improvement in firms resulting from the

Figure 9 - Geographical cartography of systemic impacts at different territorial scales



Source: Serrano & Neto (2011)

support and nature of the four systems (science and knowledge, incentives to firms, territorial collective actions and clusters and collaborative networks).

6. CONCLUSIONS

In theoretical framework we realize that there is no consensus on innovation concept definition because it is a multidimensional and complex process and there are many kind of innovations. While recognizing the need to adopt a systemic perspective of innovation, it seems that technological innovations are more easily implementable than social and organizational innovations.

Usually, innovation studies consider different factors affecting innovation processes but few contributions focus on the interplay of these factors. The proposed methodological model opts for a systemic analysis to overcome the fragmentation of the level of analysis and encourages the connection of analyses of the inside of organizations with analyses of the external context in which firms operate.

This methodological approach for public policy supporting innovation evaluation in a territorial basis aims to contribute to reinforce the innovation effectiveness in firms and territory development resulting from support of public mechanisms. The twenty four analytical dimensions defined above seeks to contribute for understanding a complex universe with so many variables.

But why the importance of enhancing the effectiveness of innovation? The survey results presented show a high degree of dissatisfaction with the existing measures to support innovation.

Considering effectiveness is one of the five good governance principles defined by European Commission, make sense to give all attention to this issue. This concept means that policies must be effectively and timely delivering, on the basis of clear objectives, considering its future impacts and experiences from the past. Effectiveness focus more in impacts than the outputs and inform about the achievement of objectives and its impacts of an activity.

In the new competitive pattern based in innovation firms must develop their strategic and organizational skills. In this context, knowledge (all kind of knowledge useful for innovation) and human resources development are key elements for strength innovation.

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