

Coherence of Policies

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Summary:

Improving the quality of research is a major task for many governments in Europe and global world. It is essential that the most appropriate tools and policies should be selected to achieve this goal. This article provides a theoretical and conceptual analysis, as well as an analysis made by member states in ensuring the coherence of policies in this field. The role of sector policies is discussed, as well as their complementarity to ensure effective compliance. The article also examines the role of certain factors that influence the development, implementation and supplementation of these policies.

Key words: policy mix, joint polices, sector policies, coherence of policies, research domain

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1. Introduction

The development of science and innovation policy in the past ten years continues to focus on the general EU-wide goal, set in Lisbon (2000) and updated in the Europe's 2020 strategy, namely, more research and innovation for more jobs and economic growth.

The goal itself and the strategy for its completion, common to all European countries, suggest a single policy for its accomplishment. The EU countries' convergence and synchronization policies are based on the three pillars supporting the construction of general policy: communications, coordination and cooperation. The applied network approach has largely ensured the realization of these goals. Still, weaknesses and gaps were identified that have hampered the achievement of the expected cumulative and synergetic effect. Shortcomings were reported at both the pan-European and the national level. This led to a "new start for the Lisbon Strategy". (Working together for growth and jobs. A new start for the Lisbon Strategy - COM (2005) 24 February 2005)

Communication, coordination and cooperation between the participants are seen as essential elements of the innovation process. This viewpoint substantially changed the perspective of innovation policy in the recent years, which has shifted from giving significance to infrastructure to giving significance to the collaboration between the actors (companies, organizations, institutions, etc.). What is more, the network approach was expected to establish a framework of conditions (involving mostly the legal and regulatory basis, the level of education, innovative culture, etc.) to enhance the interaction between actors in the scientific innovative processes. (Pavlova, L. 2009).

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At this stage in our country, despite all the reported weaknesses, each ministry develops and implements a sector policy in innovation. However, a national body to coordinate their objectives and actions has not been set up yet. This leads to distortions of synchronization and poor synergy between sector policies. (Angelov, 2009)

Notably these common weaknesses at the European level attracted our attention and prompted us to reconsider the problems by seeking and achieving the coherence of research and innovation-related policies. In this case the meaning of 'coherence of policies' should be interpreted primarily as a parallel, synchronized interagency and inter-institutional process aimed at the development and implementation of a common policy on scientific innovation.

Meanwhile, the selection and improvement of the mechanisms to implement scientific innovative policy has been subject to substantial transformations and developments during this period. Recently, for example, individual policies were replaced by a mix of policies that create better conditions for complementarity and targeting tasks.

2. Mix of policies

How should the 'mix of policies' concept be interpreted? It is based on the idea of creating a mix of policy tools to interact with each other, rather than tools that are self-administered, to increase the impact of the accomplished research and innovation. Another key idea is that science and innovation are influenced not only by the policies conducted in a sphere, but also by the sector policies related to funding,

direct and indirect incentives, regulatory frameworks, etc.

Joint policies are defined as *combinations of policy instruments, which interact and affect the quantity and quality of R&D investment in public and private sectors.*

The main instruments of these policies comprise *all programs, organizations, rules and regulations, actively included in public and private sectors, whose intentional or unintentional action influences the R&D.* The impact of a policy instrument is modified by the other policy instruments in place.

The impact on R&D can be direct or indirect, but it is a fact that all policy instruments from different policy areas have an indirect impact on R&D.

3. Elements of the policy mix

In the design of the policy mix, a clear distinction is made between effective scientific research policy and policy outside the sphere of research, which has an indirect effect.

The following are considered scientific policies:

- **General and sector policies** aimed at R&D, together with direct and indirect tools for their implementation (direct tools are grants, while indirect ones are incentives such as the various tax reliefs or other benefits.)
- **Human Resources Policy**, specifically aimed at R&D
- Specific financing of R&D
- **other policies** that are connected with the research and innovation domains, such as programs for joint research and policy for intellectual property rights protection, etc.

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Non-scientific are those policies affecting the human resources in R&D, e.g. education or social policy, **other** policies impacting indirectly on R&D funding, such as fiscal and macroeconomic policy; **sector** policies affecting innovation with an indirect effect on R&D, etc.

The taxonomy of such a model includes four domains: scientific, innovative, financial and human capital. These domains will be discussed below.

A. Research domain, which includes different types of policies considered schematically:

1. Science policy and the policies aimed at the public and private sectors. The public sector is further subdivided into:

- institutional funding for research projects
- grants extended on a competitive basis
- support for research infrastructure
- selective support centers of excellence
- structural reform of institutions

and the private sector is subdivided into:

- block funding of various sized companies
- grants extended on a competitive basis
- loans extended on competitive basis
- public procurement target for R&D

The general policies incorporate sector policies with the adjacent schemes. Here are some examples of such policies:

- Selective support schemes for existing high-tech sectors
- Selective support schemes for newly emerging high-tech sectors
- Selective support schemes for the traditional economic sectors

2. Innovation policy that takes into account related policies implemented through various tools such as:

- Collaborative research programs
- Technology platforms
- Cluster policies and development of regional clusters
- Support for science parks and other joint initiatives
- Support for university industry interaction
- Support of spin-off companies
- Policy in support of the intellectual products that support the implementation of urgent reforms in the legislation on intellectual property rights

3. Specific financial policy:

- Establishment of risk capital measures targeting R&D
- Loan guarantee schemes for research investment
- Specific measures with regard to taxes and investment in science
- Incremental charges

4. Specific human resources policy

5. Specific educational policy in support of R&D, which implies:

- Support for doctorates and post-docs
- Support doctorates at the beginning of their careers

6. Specific social policy to support R&D as :

- Grants (financial support) for the recruitment of scientific staff
- Mobility schemes for researchers

Possible measurable indicators for the Research domain could be:

- Expenditures on R&D
 - Share of GDP on R&D

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- R&D expenditures per types and branches
- R&D expenditures on research areas
- R&D expenditures per type of sources
- Budget expenditures on R&R
 - Budget expenditures for socio-economic targets
 - Share of budget expenditures from GDP
 - Structure and distribution of budget expenditures for R&D
- Effectiveness from R&D activities
 - N publications
 - Patents

B. Financial domain.

This domain includes a small number of policies from the scientific one.

1. Financial and Fiscal Policy

2. Targeted policy, reporting a specificity related to R&D, which may include activities such as:

- Venture capital for innovative companies and firms
- Loan guarantee schemes adequately supporting innovative behavior
- Implementation of maintenance fees for technology diffusion and innovation
- Favorable fees for selected companies

3. Macroeconomic policies aimed at:

- Sustainable growth
- Measures ensuring low interest rates
- Measures ensuring price stability
- Human capital

Possible measurable indicators for the Research domain could be:

- GDP real growth
 - i. Contribution to annual GDP growth per components

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- ii. Structure of annual Gross added value growth
- iii. Gross added value per branches

- Inflation
- Work force and unemployment
- Coefficient of economic activities in R&D sector
- Share of venture capital of overall R&D investments
- Share of guarantee schemes from R&D investments

C. Domain of human capital:

This domain comprises:

1. Education policy

2. Another policy is not necessarily linked to specific R&D activity

- Support for research activities of students
- Actions to present scientific activities more attractive to students
- Schemes for entrepreneurship training
- Support for lifelong learning

3. Social policy that requires maintenance of a flexible (dynamic) labor market

Possible measurable indicators for the research domain are:

- % of student engagements in R&D activities
- N of entrepreneur programs in the Universities
- N of trained entrepreneurs annually
- Share of LLL supported individuals
- Share of LLL budget from annual R&D and HE budget.

D. Innovative domain

This domain covers:

1. Innovative policy, the following schemes:

- Schemes for technology diffusion

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- Search and interest in the incentive schemes
- Schemes supporting activity information and partner search
- Schemes supporting various networks
- Schemes supporting innovative management
- Support services for SMEs

2. Sector policies for innovation, involving

- Sector schemes for existing high-tech sector
- Schemes supporting new high-tech sectors
- Schemes supporting traditional sectors

3. Other policies

Industrial policy, trade policy, policies with regard to consumer protection and healthcare, as well as environmental policy, regional policy, competitiveness

Possible measurable indicators for the Research domain could be:

- Share of enterprises with innovation activities
- Share of enterprises with new products and technologies as a percentage from total number of enterprises
- Share of incentives as a percentage from total investments in innovations.
- Share of supported SME's via various schemes from the total number of SME's
- Shares of supported innovative branches - comparability

Mix of policies and national innovation system

in drawing the distinction between the different policies or their components, the

factors that influence the relevant policy content should be identified and only then new or old models can be used to redesign the existing policy mix. The first step is to identify the main challenge that the national innovation system (NIS) faces and consider its possible developments. This task should be accompanied by a review of the status of other policies that also need to be mobilized in order to meet certain challenges. Furthermore a parallel evaluation should be made of whether such policies are adaptable to the general public policy and the nature of the challenges. It is also advisable that policies, instruments and other scientific domains adjacent to them, directed at achieving common goals, are assessed. Some current needs, as well as the interaction between the various instruments, should also be evaluated in order to gain complete clarity about what policies and instruments are used and how they are combined.

How could consistent and coherent joint policies be developed? Here are some mandatory actions that need to be taken in order to ensure the compatibility of policies:

1. To outline the challenges to be met, as well as the main challenge to the national innovation system and its effect on system that has provoked changes.
2. To outline the main objectives and priorities of the science policy in the country and see how they have changed in recent years
3. To determine the discrepancy between goals and challenges, if any
4. To analyze the efficiency of the tools for implementation of R&D policy and the

policy instruments from outside science that are relevant to research and boost investments

5. To analyze how the different instruments evolve over time
6. To identify the target actors and establish what types of instruments intervene
7. To determine which instruments have the strongest influence on the level of investments
8. To define the interaction of instruments - positive or not, the level of expenditures on science and innovation
9. To analyze whether science and innovation management allows forms of cooperation between science policy and other policies and the implications for the level of investment

4. Construction of joint policies

As the model presented above is based on domains and the subject-oriented development of appropriate policies according to different domains and their mixing in this construction, it is justified to consider a new decision based as a three-point model with the following main pillars:

- Compatibility;
- Coordination; and
- Areas of intervention.

In building this tripolar model of joint policies, it is essential that adequate building relationships are established with a view to averting negative effects. Moreover, the processes of implementation, evaluation and impact of the formation of joint policies should be monitored and adjusted. It is not sufficient to evaluate only the tools, but also the process of reconciling policies. The

conditions for the effective implementation of the joint policies and the applicable tools of strategic intelligence needed to this effect should also be analyzed.

5. Compatibility

With respect to this aspect of the joint policies applied to the innovation system, it is necessary to clarify how a policy mix that meets the challenges faced by the national innovation system should be developed. It should also be clarified how to balance the system with respect to the orientation of the policy mix and identify its strengths and weaknesses. The compatibility methods through which the coordination between different policy bands and various involved authorities should be taken into account. It is interesting to determine whether there is a potential for coordination of the ascending type (from bottom to top) through integrated policy programs. In this context the major participants should be identified to see who is involved in the mix of policies and specify the possible advantages and disadvantages of involving the various stakeholders in this process.

6. Coordination

The set of strategic objectives and activities undertaken in the R&D field should be consistent with the specific challenges of the national innovation system. This implies that SWOT and PEST analyses should be made and complementary instruments offered respectively. A single solution or instrument is unlikely to suit all objectives. In this regard the following challenges to the innovation systems have been identified:

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1. increasing the low share of R&D expenditure in the private and public sectors.
2. ensuring adequate human resources for R&D and innovation
3. acquiring new technologies and technological capabilities and maintaining the position, hiring a new one to increase the technological level
4. restructuring and strengthening the innovation system, i.e. changing the conditions relating to structure, processes and framework
5. improving the links between actors in science, technology and innovation and strengthening the elements of the triangle.
6. meeting their required number of targeted activities, which need to be coordinated and guided by a specific political body.

7. Areas of intervention

Creating conditions by using various instruments and applying certain types of strategic approaches requires intervention in some areas. Especially important instruments are the direct investments, but they may not be the only instrument for intervention, especially considering that they are limited. There should be a set of direct and indirect instruments to complement them. They will create a natural environment for the development of science and innovation. In the application of indirect instruments, however, it must be taken into account that they sometimes have no effect or their effect may not be expressed. If you focus on certain sectors, it is important to consider the influence, whether direct or

indirect, of industrial research and how it affects different types of policies.

A widespread belief is that companies, for example, are influenced more by the established framework conditions, markets, quality human resources than by ongoing science policy. Adequate assessment of tools used in the areas for intervention and their impact is another aspect of positioning the areas for intervention. Hence an answer should be sought to the following questions of whether:

- the framework conditions are attractive for foreign investments, and if they are not, how to intervene via non-scientific policies that would be influential;
- there are additional incentives for foreign companies, and if there are not, what new direct or indirect schemes could possibly be implemented;
- there are any good universities and scientific organizations that can be reliable partners to businesses;
- the effective regulations on intellectual property or broader cultural phenomena have an effect on partnership and what this effect is.

Human resources are an important element of the established areas of intervention. The policy in this field is of key importance. A new generation is needed that should have new skills to meet the demands of the industry. Given the strategy for human resources elaborated in the EU, each country is expected to develop its own national strategy relevant to this community.

In order to address this challenge, the share of higher education and the existing workforce must be constantly

analyzed. Ireland provides a good example of the attention to the sector of higher education, as this country makes sufficient investments to create adequate resources to build a knowledge-based society. Of all the taxonomy model domains, that of the HR is associated with at least two policies, research and education, which have a significant relation to innovation policy.

In order to establish to what an extent the zones of intervention are related to building a dynamic economy, it is necessary to know what new technological opportunities will emerge and the possible rates of future technological development. Based on this, the policy can support these trends by developing **strategic intelligence** to facilitate the process of dissemination of knowledge and skills. Support can be given to start-ups by ensuring contacts with companies that are already operating in areas where developments or technological breakthroughs can be expected. For example, ICT, life sciences, biotechnology, energy efficiency and others are supported by various measures taken under joint policies such as the thematic programs, specialized incubators, an early scientific development, regional clusters, etc.

On the one hand, the national innovation system and its development are a challenge and are clearly affected by changes in the public sector. On the other, it is very important to ensure a positive change in the framework conditions for investments in science and innovation in the private sector. For example the national innovation system cannot be balanced by very high or very low public-sector R&D. This hampers the normal action of a tool to enhance some

element of the system. Many countries have the problem of both elements being weak and in need of strengthening. The presence of start-ups in the innovative system contributes to strengthening the emerging of new technologies and units respectively. Another challenge is the establishment of appropriate interactions between participants in the scientific and technological innovation system. One of the main tasks is to build effective relationships between public and private entities. A specific set of related challenges can be encountered in:

- improving the level and extent of linkages between public and private research organizations, while promoting the connection between science and industry, and expanding knowledge dissemination
- increasing the share of public investment
- improving the internationalization of science and/or the level of European involvement.

Generally speaking, enough depth of the joint policies creates favorable conditions for integration of different policy domains in the overall picture and strongly increases the influence of other political domains. The effectiveness of joint scientific policies largely depends on the management of a scientific innovation system. Joint policy can be realized when there are coordination mechanisms in place that support each other and increase their influence. Such a policy is best developed if a long-term strategy has been drafted to integrate research and innovation strategies that take into account the impact of other policies.

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Joint policy is also a matter of political and institutional coordination. It involves the setting up of a formal coordinating body, for example a dedicated board(s) or other formal mechanisms of coordination. Possible types of coordination and mini-mix makers create a toolkit to be coherent as a whole to address various aspects of science and innovation, and horizontal coordination geographically. Mini-mix co-ordination is a set of measures that use different types of policy instruments to achieve specific objectives or policy research supporting specific target groups, as new technology-based companies. These tools can be and are not scientifically oriented - for example the development of regulatory measures, fiscal policies, innovation-oriented measures. Experience of this type of coordination is possible and cannot make a definitive assessment of its effectiveness, which in most cases, however, is considered to be long. A major element of this coordination is the joint work of individuals from different domains in order to establish a joint program that uses different sources of funding.

8. What is important to be considered?

In conclusion some basic fundamental recommendations can be formulated, which should be observed in the formation of joint policies.

1. To evaluate the needs of users of NIS through the eyes of experts or stakeholders.
2. To foresee the inclusion of different types of players, which is especially important for the implementation of cluster policy and/or the performance of thematically oriented programs.
3. To conduct a systematic review of the relevant target groups and mini-mix of mechanisms to assess what other elements would be included, what should be the direction of impact and what new activities are added.
4. To conduct regular monitoring and assessment of these policies as a basis for further development.
5. To analyze the effect of coordination of different policies, with feedback to the formation of those policies.
6. To monitor the association of actors when formulating the strategic goal of a policy to ensure generation of considerable interest and eventually reach consensus on a topic. However, this may prevent the prioritization of certain problems and limit structural reform being advocated to maintain the "status quo".
7. To ensure good communication between all participants in the construction of the joint policies and improve the dissemination of good practices.