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Coordinating European national research programmes: the process towards Joint Programming Initiatives

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Abstract

We describe the evolution of the process in coordinating national research programmes which is now addressing Joint Programming Initiatives (JPIs) as a leg to build the European Research Area and provide knowledge-based solution to the Grand Challenges.

We analyze pros and cons of different instruments adopted in the past and compare to the ten JPIs driven by most of the European Countries. We also discuss the worries about the different roles of JPIs and the proposal for the next EU Framework Research Programme, named Horizon2020, which just entered the legislation phase.

Keywords:

Public funding system; Coordination modes; Institutional complementarities; R&D cooperation

1. Introduction

The European Commission (EC) is planning how different research funding sources could be coordinated to meet the objectives of the Europe 2020 strategy (European commission, 2010a) and the Innovation Union flagship initiative (European commission, 2010b).

These objectives are mainly driven by the awareness of the decreased competitiveness of the European economy and by the global economic/societal challenges which are facing the next decades. Namely, EC defined five ambitious objectives to reach a green growth and social progress have in terms of employment, innovation, education, social inclusion and climate/energy (European commission, 2010a).

The EU-27 funding actions should include the next Framework Programme, named Horizon 2020 (H2020), the Competitiveness and Innovation Programme (CIP), the European Institute of Innovation and Technology (EIT) and the R&D component of the Cohesion Funds dedicated to research infrastructures in less developed countries (European commission, 2010c).

The new approach from the Commission is therefore not only a call for innovation but an alternative, in the research world, to the domination of non-strategic, non-industrial research organizations. H2020 will reflect the approach to create operational synergies among the previous separate and mainly not communicating funding schemes (and communities) towards research, innovation and cohesion.

The request of streamlined schemes to well-defined societal objectives is now involving also the contribution of the investments in research by the single Member States.

In fact, most of the research funds in R&D (more than 90%) resides in national investments (see figure 1). These investments are mostly enrolled in personnel and infrastructure maintenance, being close to one third those from the European association of the research funding and research performing organizations (named EuroHorcs).

In this paper we describe the evolution of the process in coordinating national programmes faced by EU which is now addressing Joint Programming Initiatives (JPIs) as a leg to build the European Research Area in order to provide knowledge-based solution to Grand Challenges. JPIs, driven by Participating Countries, have been proposed mainly *accidentally* and their key elements were not clearly identified, as expressed on the EuroHorcs view on JPI (EuroHorcs, 2008). Very recently, a set of more six JPIs have just been launched and the phase of the legislation towards H2020 has started, paving the way towards the definition of the roles of JPIs and Horizon2020.

We analyze pros and cons of different instruments of coordination national programmes in order to understand the process which suggests JPIs, only if streamlined with the EC actions, to be the ultimate European solution in responding to the policy challenges posed by research.

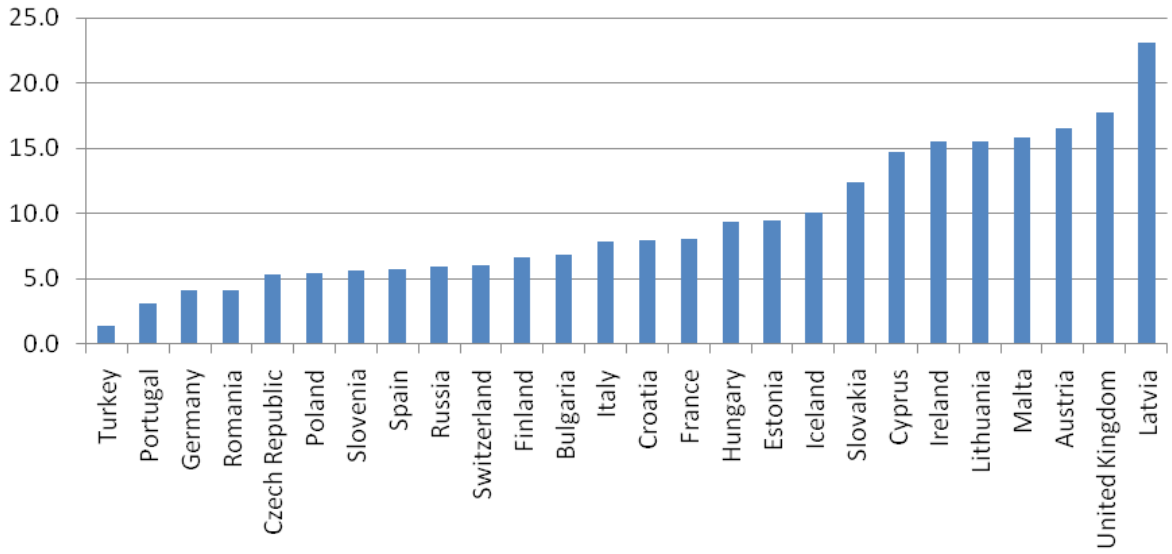

Figure 1: percentage of the total gross expenditure on research and development (GERD) for the year 2008 funded by non-national source. The EU-27 countries is 8.7% (Source: EUROSTAT).

2. Starting the coordination of national research programmes.

2.1 EUREKA and COST

Joint European research initiatives have been mainly based upon three programmes: COST, EUREKA and the Framework Programme (FP).

COST, born in 1971, is an intergovernmental framework for European Cooperation in Science and Technology, now involving 36 countries, allowing the coordination of nationally-funded research on a European level.

It does not fund research projects themselves but can be considered as a platform for the scientific community to cooperate on particular projects (named COST actions) and exchange expertise mainly in pre-competitive research.

COST actions aim at coordinating nationally funded projects, providing financial support to conferences, short-term mobility, training and dissemination activities. It is in some sense “glue money” to facilitate the cooperation between already funded researchers. It is a “bottom-up” process, where researchers propose the Actions, now framed in 9 scientific domains. The COST structures consists of many boards and committees but a high level of flexibility is guaranteed by a “variable geometry” approach, that is, only countries interested in the Action participate.

The budget for the COST actions from FP7 accounts to approximately 240 M€ (Council of the European Union, 2006).

If COST can be considered the scientifically driven, bottom-up, variable geometry platform for coordinating national projects in pre-competitive research, EUREKA is its counterpart aimed at developing generic technologies of key importance for European competitiveness, that is, the science-to-market aspect. EUREKA, born in 1985, is not an EU research programme but rather an inter-governmental initiative to generate and support R&D market-oriented projects.

EUREKA networks does not fund projects but evaluate and approve the collaborative project plan. Funding is allocated at national level and at the moment 39 members are involved, including EU, but there is no central EU budget for supporting EUREKA projects.

In summary it is a bottom-up networking platform to mobilize the necessary financial resources and an easy-to-access partner-search facility.

2.2 ERA-NET

During the Six Framework Programme, the Commission launched a new instrument of funding, named ERA-NET, to coordinate the national research programmes (Horvat et al. 2006). It was the procedure to act the former art. 169 of the Treaty of the European Union (now art. 185 of the Treaty for Functioning of the European Union, TFEU) but it was also a further recognition that the investments needed to tackle and solve some big issues cannot be provided by the Commission: funds from Participating Countries, whose amount account for approximately one order of magnitude larger, were asked to be involved and aligned.

For this reason, the main wish from the Commission was to involve the high level representatives of the Ministries or Funding Agencies, that is research programme owners, capable to take decisions and to allocate resources to fund joint calls planned during the project lifetime.

ERA-NETs are run as Coordinated and Support Action of the Commission, that is they are typically projects of three/four year duration. Though the ERA-NETs are intrinsically aiming at a commitment from the Participating Countries, the eligibility rules to be a participant to the project include also programme managers or local research performers, whose activities could also be not fully fledged. These participants often obtained the mandate from their Ministries or Funding Agencies to participate on their behalf but their support was often limited to the definition, even valuable, of the common research priorities. Moreover, due to the short duration of the projects, the impact in coordinating national research programmes was reduced. We have also the suspect that a sort of “labeling” of fragmented activities from different research groups, without a common project to be developed and which could be occurred in some ERA-NET, has been interpreted as a truly coordination action.

Joint calls are only a tile of a mosaic of many different typologies of actions, especially when the allocated fresh money is negligible when compared to the investments from MS and has to be considered ineffective if not included in a long-term perspective and integrated approach.

But, since Joint Calls are mandatory in the actions to be pursued during ERA-NETs (and more strongly in the ERA-NETs Plus which are focused on launching a single call funded by the partners and EC), we believe the Commission considered Joint Calls as a measureable proof of the efficiency and credibility of coordinating national programmes. A mapping exercise of the ERA-NETs was carried out by JRC-IPTS between October 2009 and January 2010 (Perez 2011). Most of the results can be obtained also through the data which are available on the Netwatch website (http://netwatch.jrc.ec.europa.eu/nw/index.cfm/info/Nets).

In the more than one hundred ERA-NETs, 5 networks launched 33 calls. It is also not possible to extract a complete distribution of the investments per country from the online data (and it is not

reported by the JRC): this “missing figure” seems to confirm a suspect, that is, few countries contributed the most.

Regarding the joint calls, fresh money can be allocated within different procedures: virtual, common and mixed pot. The most used procedure (approximately with 80% of cases) is the virtual pot, mainly depending on obstacles addressed by national regulations in funding foreign researchers or selected by external committee. In the virtual pot, a project which has been selected through the call is financed if the participants are supported by their national respective countries. This often creates administrative obstacles when projects selected for funding include partners from countries where their all financial allocation has been already used.

The common pot has a real transfer of funds from the national budgets to a legal entity which will manage them accordingly to the decisions of a Board in charge of the preparation, selection and monitoring of the calls.

In summary, if we remove from the analysis the best practices associated to some few virtuous networks launching multi-millionaire calls, ERA-NETs did not act as the expected flywheel funding common projects, at least in terms of funds, and, as the INCO interim report has underlined, the costs associated with the administration of the calls could be disproportionately high (European Commission, 2010d).

This being said, ERA-NETs should indeed be considered as an extreme valuable and important instrument to map the potential and best practices at national level, to create trust and build European consortia in addressing the common relevant research priorities.

2.3 ART. 185 of TFEU

The Article 169 of the Treaty of the European Union, then Art. 185 of the Treaty for the Functioning of the European Union, enables the Community to participate in research programmes undertaken jointly by several Participating Countries, including participation in the structures created for the execution of national programmes.

Art.185 is adopted by a co-decision process between the European Parliament and the Council of the European Union. The originality is that the proposal comes from the Participating Countries and not by the Commission.

The Commission is responsible for transforming each initiative into a formal proposal to the Council and Parliament and, after their decision, to proceed with a communication related to the co-funding.

The first pilot action was conducted when FP6 was running: European developing countries clinical trials programme **(**EDCTP**)**, where 14 Participating Countries plus Norway, together with the Commission have taken the initiative of coordinating national clinical research activities

and programmes. The total volume involved is 400 M€, with a 50% EU contribution, permitting 326 projects to be funded.

During FP7 four other initiatives have been launched:

- Ambient Assisted Living (AAL) deals with ICT solutions for the ageing society. It involves 20 Participating Countries and 3 Associated Countries, with a total volume of 600 M€ and a 25% EU contribution**.**
- Eurostars, to support research in small and medium enterprises involved 27 Participating Countries and 6 Associated Countries, with a total volume of 400 M€ and a 25% EU contribution**.**
- European Metrology Research Programme (EMRP) coordinates the metrology community in Europe, with 19 Participating Countries and 3 Associated Countries, with a total volume of 65 M€ and a 33% EU contribution**.**
- BONUS-Baltic Sea Research, mainly related to the marine research for a sustainable use of the resources, involves 8 Participating Countries and 1 Associated Country, with a total volume of 100 M€ and a 50% EU contribution**.**

Art. 185 show a significant and clear European added-value, even if in the case of BONUS this value seems to be limited to northern countries, and permit the consortia to build a flexible legal status to manage the funds. Most of the information reported above can be found through the webpage of the ECCat http://cordis.europa.eu/fp7/art185/home_en.html.

The Interim Evaluation AAL and Eurostars (European Commission, 2011b and Council of the European Union 2011a) has reported that art. 185 creates a substantial leverage effect, it clearly demonstrate the functioning of a partly virtual common pot but operational arrangements has to be improved, specially due to the very costly instrument they adopted.

3. JPI: an inclusive and flexible coordination of research programmes

The economic crisis has decreased the GDP of Participating Countries and, as a consequence, funding research activities. The scenario which drove the ERA-NETs in some way got worse and the need to focus on coordinating efforts is addressed as a mandate not to be delayed anymore.
ERA-NETs implied the involvement of funding agencies but, often, the participants were research performing organizations. This could have given to the actions a biased approach, lacking an integrated vision including all the aspects of the civil society.
The Joint Programming Initiatives (JPI) is indeed the evolution of the process started with the ERA-NETs to coordinate the national research programmes (see figure 2).

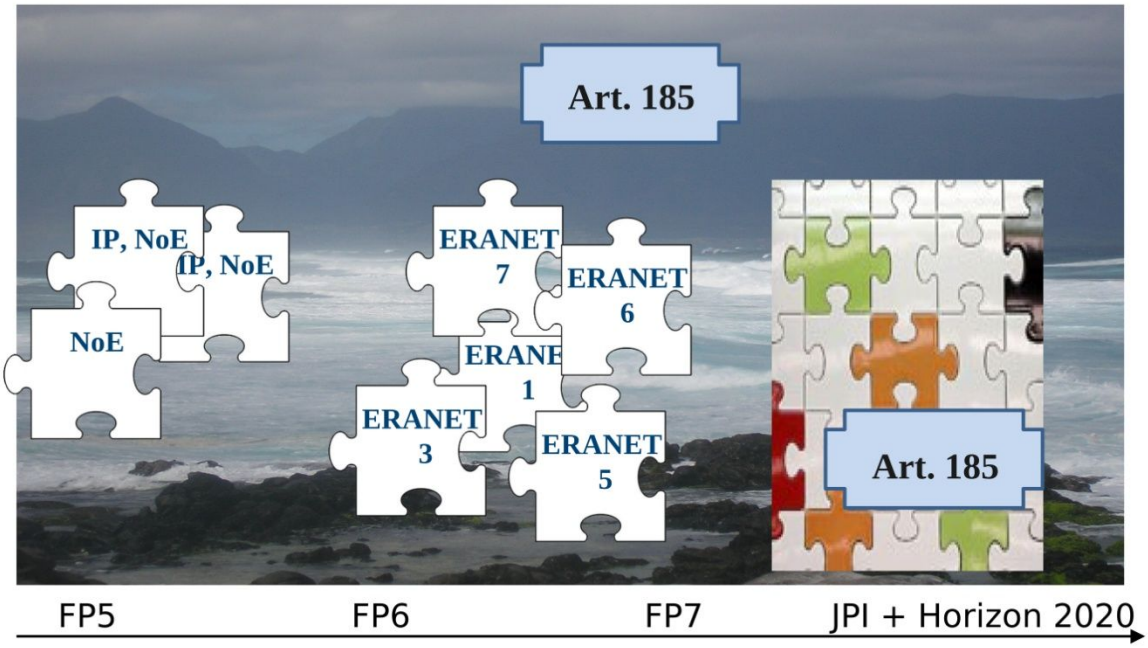

Figure 2: the evolution of the process towards JPIs. Defragmented initiatives (research projects, Network of Excellence, ERA-NETs, art. 185) should be streamlined within a strategic approach aiming at coordinating national research programmes, as tiles of a coherent mosaic.

JPIs were launched as an initiative in 2008 and, at the moment, 10 JPIs have been proposed by participating Countries and then approved by the Council (European Commission, 2008a, Council of the European Union 2009, 2011c)

The first characteristic of JPIs is that they imply long-term vision and planning. They are not linked to single funded projects or actions: they are a table where Participating Countries sit to cooperate.
Their goal is to tackle the societal Grand Challenges, from Climate Changes to Ageing, Food, Energy, Human Health etc., but also to be part of the process toward innovation and job creation as addressed to exit the economic crisis. In fact, “public” joint programming and innovation are connected. Research programmes should in fact fulfill the demand from the socio-economic needs and Governments should set the framework conditions to accelerate innovation (as technology transfer or Public pre-commercial procurement, which can reduce cost and fragmentation).

Knowledge has definitely been addressed to be the base to provide solutions to the problems, making the research to play a fundamental role in driving innovation and societal development. This suggests science to work not only “for” the society but “with” the society and for this reason the list of the research priorities to be addressed to the funding agencies has not to be prepared by the sole scientific community.
In the JPI decision flow, the decision-makers has first to address the priorities for the society, through a foresight and think tank procedure, then to establish which actors they rely on. This ratification should include the relevant stakeholders, from research to industry and public authorities, which will be in charge to develop a strategic research and innovation agenda.
This list of research priorities has to be translated in a plan of actions to be implemented, providing different types of actions *a la carte*. The actions will not be limited to joint calls as usually requested to ERA-NETs, but can include institutional contributions, access to data and infrastructures, research alliances, regulation changes etc.. Any action should be described with its feasibility and impact, so that the high-level representatives for Participating Countries can decide those to adopt. The variable geometry is one of the characteristics of the JPI, that is a flexible mechanism where any country can participate to some of the actions.
The aim of JPI is to create synergies, avoid unnecessary duplications in pre-competitive research and increase the efficiency in its funding. A large additional funding from many Participating Countries would be more efficiently used if concentrated into the Framework Programme and, if limited to few States, could take advantage from what the EU Commission and Parliament counts already for the art. 185 of TFEU (see Ambient Assisted Living, European Metrology Research Programme, BONUS Baltic Sea, Eurostars). In principle, all the Participating Countries should take advantage of participating a JPI since its variable geometry permits to join

some actions without any commitment on others, where a shared value is not clearly visible or feasible.

This variable geometry, added to the management in the hands of Participating Countries, can cause a sort of conflict between the Commission and JPIs in terms of instruments and actions to be adopted. After a first period of misunderstanding but also discussion, the Commission has started to clarify its role in contributing to the definition of the Strategic Research Agendas and being complementary to the actions and funding in the implementation plans of the agendas. EC declares also that its financial contribution to be first of all conditional on appropriate application of the guidelines framework conditions (European Research Area Committee, 2010). These conditions are mainly related to peer review process, selection of excellence and transparency as requisites for funding. Secondly, the EC support will be decided on a case by case study in terms of thematic calls, ERA-NETs and art. 185. Regarding this last instrument, EC affirms it will consider art. 185 only when a JPI clearly demonstrated a fully integration of national programmes (European Commission, 2011c). At the moment, EC already funded or is close to fund Coordinated and Support Actions to support the JPIs, with a 2 million Euros contribution for each JPI, in order to establish an effective governance and provide a coherent Strategic Research Agenda.

The Strategic Research Agendas proposed by the JPIs, in principle, should not differ from those prepared by the Commission using its internal procedures (the so called committology process) but some worries are justifiable since the procedures can be more or less influenced by different stakeholders or countries. For this reason the Commission communicated, implicitly in the very last communication (European Commission 2011d and e), that where the challenges addressed by a JPI will be in line with the priorities of Horizon 2020, ERA-NET or co-funding may be used to provide further support. Thai is, the Commission will design its own Strategic Research Agenda with an independent procedure.

We believe that the new simplified ERA-NET instrument could be interpreted as an action of the EC to avoid this eventual unbalanced strategic approach. As described informally during the JPI Annual Event 2011 organized by the Commission and communicated in the proposal for Horizon2020 (European Commission 2011c, 2011d), this new instrument should be more flexible and include any type of action in coordinating research activities among Participating Countries: that is, a sort of JPI where the EC has the role of the manager and not observer, as it is now in the JPIs.

This will be challenging since, contrarily to the EC rules which has to justify spending common funds, the JPI process could imply that not only excellence and competition could be the rationale for the adoption of actions proposed in the strategic agendas: the cooperation can, as an

example, give the opportunity to get access to knowledge and promote a dynamic industry, even using only personnel exchange, access to data or research infrastructures.

This being said, it is clear that JPI will succeed if they will provide a stable Pan-European science-economy-policy interface. The scientific community has to be credible in its proposals, that is, demonstrating its role in supporting the knowledge-based actions to tackle the global challenges, without focusing only on the curiosity-driven aspects and avoiding conflicts between the disciplines, but fitting the needs of the whole societal communities.
Industry must bring business and society together, reconnecting their success with social progress in a shared value approach (Porter and Kramer 2011). It is not social responsibility, philanthropy, redistribution of sources or even sustainability, but a new approach to achieve the economic success. It is about expanding the total pool of economic and social value, recognizing that social needs define new markets and that benefit is not always associated to profit. In the traditional capitalism view, companies contribute to the society making a profit, which supports employment, purchases, wages, investments and taxes to be reused in the social welfare. This is a short-term vision. Companies can indeed create economic value creating societal value, fostering a cycle of community prosperity which can positively influence the corporate success (Porter and Kramer 2011).
For this reason governance has to support this cycle with regulations, taxes and infrastructures which can enable such a link between economic and societal prosperity, while adopting the proposals from the stakeholders, accordingly to their financial and temporal feasibility.
Profit and nonprofit boundaries have to be smoothed and the responsibilities of business, governments and civil society has not to be separated by insurmountable barriers.
JPI should then become a "*table*" where all stakeholders debate and describe the recipes, while the decisions-makers prepare the menu and ask for cooking.
To date, the 10 JPIs adopt similar organizational structures but a clear difference can be seen between two (related to Oceans and Climate) and the others: the formers adopt a common advisory board including all the stakeholders from the scientific, economic and civil communities, the other eight have separate boards with the scientific board having the central role in preparing the research agendas. The latter approach can cause additional steps to reach a common agreement and could show the same concerns when only the scientific representatives were participating as beneficiaries in the ERA-NETs.

JPIs can not cover all the research thematic. They are aimed to tackle the Grand Challenges and therefore they should include multi-disciplinary and multi-sectorial issues in an integrated

approach, mainly focusing on the cross-thematic and cross-cutting technologies. A too broad set of objectives would decrease their efficiency.

The different typologies of actions could take advantage of all the instruments EU has already provided (ERA-NETs, KICs, art. 185 etc.) or new ones will be proposed as the best tool to implement them.

Coordination, always interpreted as a way to increase efficiency, has to really be accepted at the national level as a selection of the excellences: coordinating could in fact be interpreted as a mere sharing of duties, without taking into account the competences and potentials from the single participants.

JPIs and Horizon2020 should be complementary in building the ERA, where the EU research and innovation funding should support capacity building and the filling large scale emerging knowledge gaps and technological initiatives of great importance to solve the Grand Challenges (see figure 3). For this reason, any competition between EC and Participating Countries in controlling the process of self-coordinating has to be considered in contrast with the ultimate goal.

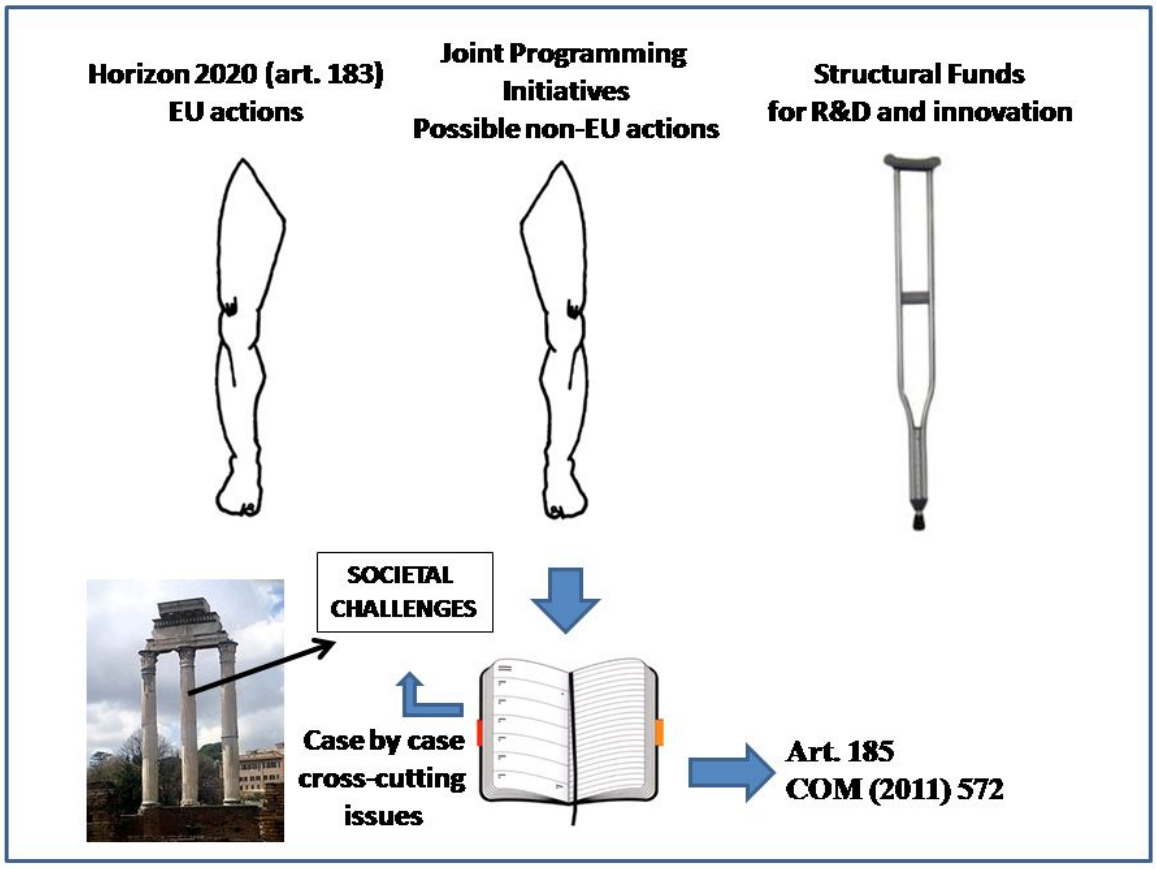

Figure 3: building the European Research Area should imply the coordination of different instruments and initiatives. JPIs, in the cross-cutting issues whose European added value is demonstrated, should be supported by actions/funding from Horizon2020 and art.185. Structural funds are debated to be a further solution to step up the stairway to excellence for some Countries or actions.

4. The real challenge: creating durable trust

The Council recently noted, at the "3094th Competitiveness" meeting (Council of the European Union 2011b), "the considerable progress achieved in implementing ERA, notably since 2007 through the impact of i.e. ERA-NET, ERA-NET+, article 185, Joint Technology Initiatives and Joint Programming Initiatives". In the Commission's communications and in the vision documents released by JPIs, it is clear the will to give to the ERA, that is the research, a central role, either in boosting the innovation either to support knowledge-based decisions. ERA should also be completed by 2014 (Council of the European Union, 2011b). Nevertheless, it seems we are facing a strong functionalizing of research in the near future, while not investing more in the research itself (failing the goal of 3% of GDP wished in Europe2020/Innovation Union).

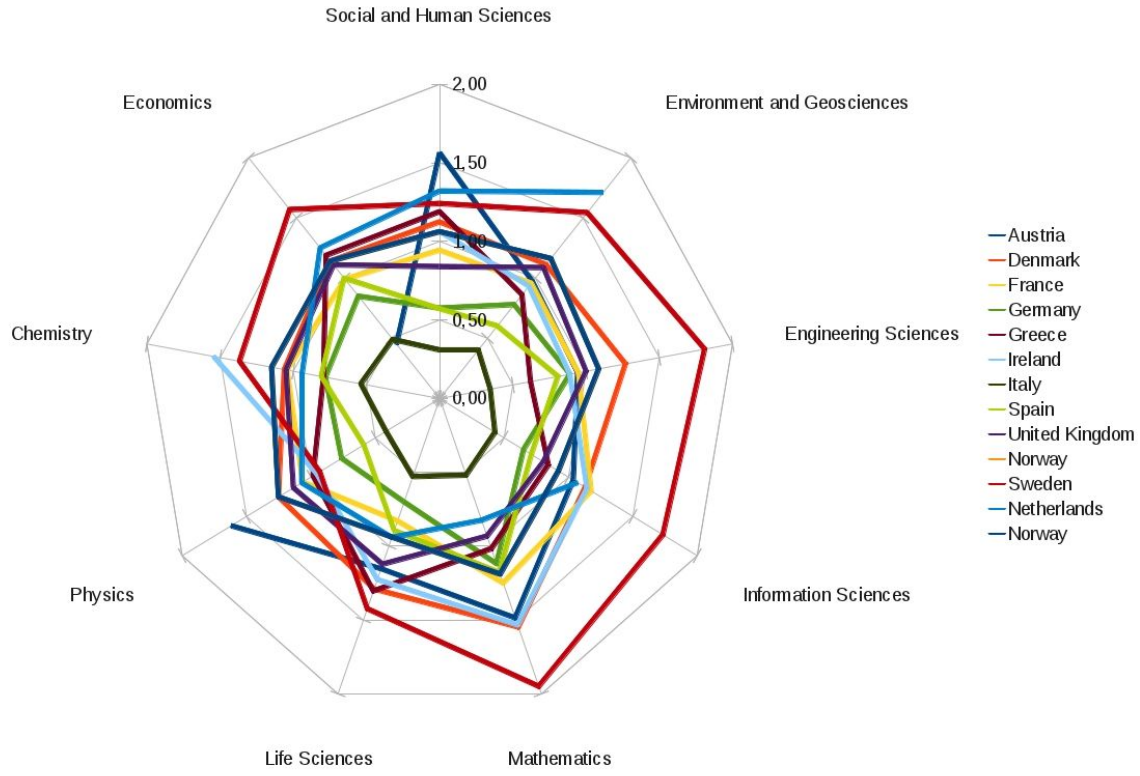

Figure 4: ratio, per specific domain, of the average salary of researchers and the equivalent professions defined by the International Standard Classification of Occupations (European Commission, 2007). Most of European Countries, but Italy, does not show a dramatic undervalue of research in terms of personnel economic return.

In the most of the 27 Member States, the ratio between the average salary of researchers, and the GDP per capita is mainly close to one (Marimon, 2007). When the ratio is performed using the salary of equivalent professions defined by the International Standard Classification of Occupations (European Commission, 2007), it drops below one for few Member States, that is, the career of researchers can be considered comparable to other professions in terms of economic individual perspective (see figure 4). Nevertheless, the salary of researchers changes dramatically among the European countries and this contributes to the relative attractiveness of such a profession (see figure 5).

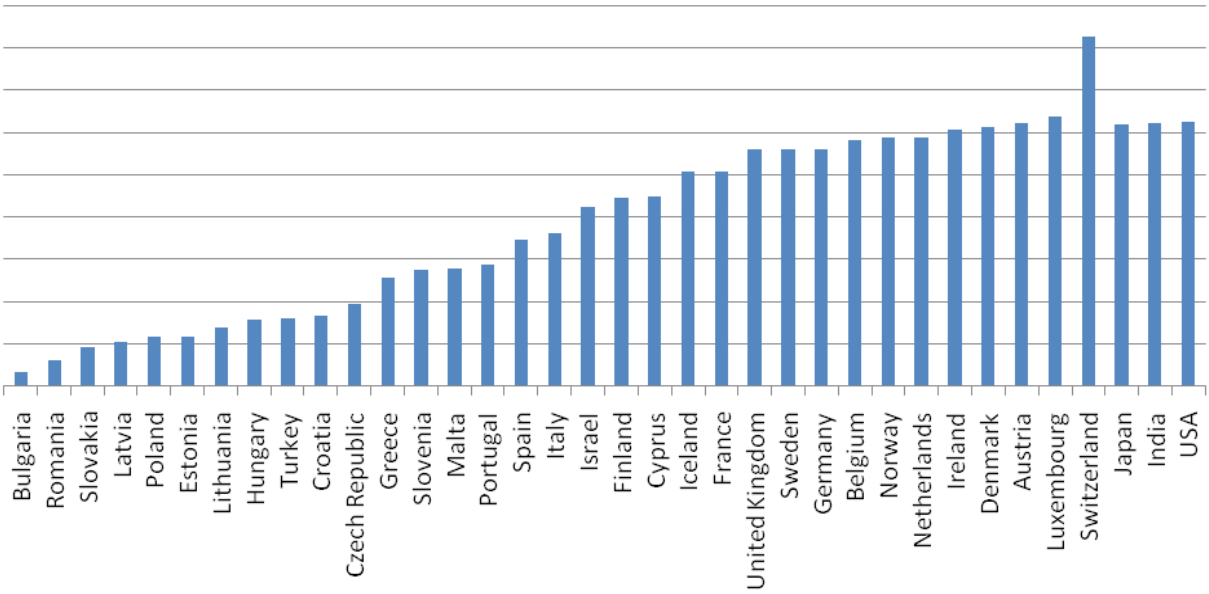

Figure 5: average gross annual salary of researchers (each thick corresponds to 10k€) normalized to the national cost of living (EU27 average = 1, from European Commission, 2007).

One of the problems seems to be the number of researchers: the EU remains less researcher-intensive than the US and Japan. In 2006, the number of researchers per thousand labour force was 5.6 in EU-27, compared to 10.7 in Japan and 9.3 in the US (European Commission, 2008b).
Moreover, the interdisciplinary and multi-sectorial approach needed to face the global challenges implies delays, additional costs and an increased probability of actions' termination (Cuijpers et al., 2011).
When the actions have also to be coordinated through the modalities and organizational forms underlying each Member State, a revised program on research funding could be adopted.
The impact of funding systems on science (i.e. the influence of the top-down agenda on the response from the best researchers,) the comparison between national systems and the

instruments to bring science to economy/policy needs should be developed observing how these shape the relationships between funding agencies, research actors and other stakeholders (Lepori, 2011).

This being said, the real challenge seems, apart driving more investments in research, to be overcoming the distrust between different stakeholders and between European Countries: JPIs and H2020, if coordinated, seem to be the last chance to step from words to actions.

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