



# Investments


in joint and open  
R&D programmes

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# Investments in JOint and Open REsearch Programmes and analysis of their economic impact (JOREP)

## Executive summary

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# 1. Summary

The project covers eleven countries displaying various situations within ERA: medium-size countries with a well-developed science basis, large countries, Mediterranean countries, and Central and Eastern European Member States. These countries are (in alphabetical order): the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Norway, Poland, Switzerland, Spain, and the United Kingdom.

The JOREP study revolves around some key questions: what is the EU member states' engagement in trans-nationally coordinated programmes? What is the openness of their public R&D programmes? What needs do joint and open R&D programmes mainly answer? What are the main motivations driving the joint undertaking of research and the opening of R&D programmes? Are there differences based on broad scientific domains?

In this context, the JOREP project aims at providing a sound quantitative basis for the monitoring of investments in joint and open research programmes in EU countries, as well as empirical evidence of the policy rationales and impacts of these programmes on the European Research Area. Two main activities are involved: a) the collection of data about joint and open programmes according to a set of descriptors, and b) the analysis of motivations and impact. The project has also led to the definition of a set of descriptors concerning joint and open programmes.

JOREP identified about 100 programmes and high level of variability emerged in the national landscapes surveyed. Joint programmes represent, except the European-level initiatives as the Eureka, JTI, Art. 185 Initiatives, a quite limited share of public research funding and, usually, they are quite small, often of symbolic value, with limited forms of cooperation and quite diversified mode of coordination and organization. National pot is the most diffused funding scheme, they have often a limited budget which, in the case of larger initiatives, could benefit from a substantial share of additional European funding. A small number of organisational types of programmes are identified, namely integrated programmes, coordinated programmes and collaborative programmes characterized by different modes of coordination and constellations of actors.

Open programmes also emerge as complex and multidimensional phenomenon, and the opening of national R&D programmes as a more and more emerging trend. National R&D capabilities, the level of openness of national research systems, and the characteristics of national legal frameworks lead to varying degrees of opening of national R&D programmes.

Clear links emerge among motivations, rationales, policy problems behind setting up and managing specific research programmes and other funding instruments, and the range of impacts these produce.

The analysis performed in JOREP provides empirical evidence concerning the characteristics and temporal dynamics of joint programmes and reveals a number of general patterns, which can be interpreted in terms of the relation between the characteristics of (national and European) research spaces and of the different research fields covered by the programmes. These lead to the emergence of a small number of programme types associated with specific policy settings, as well as underlying characteristics of the covered research fields.

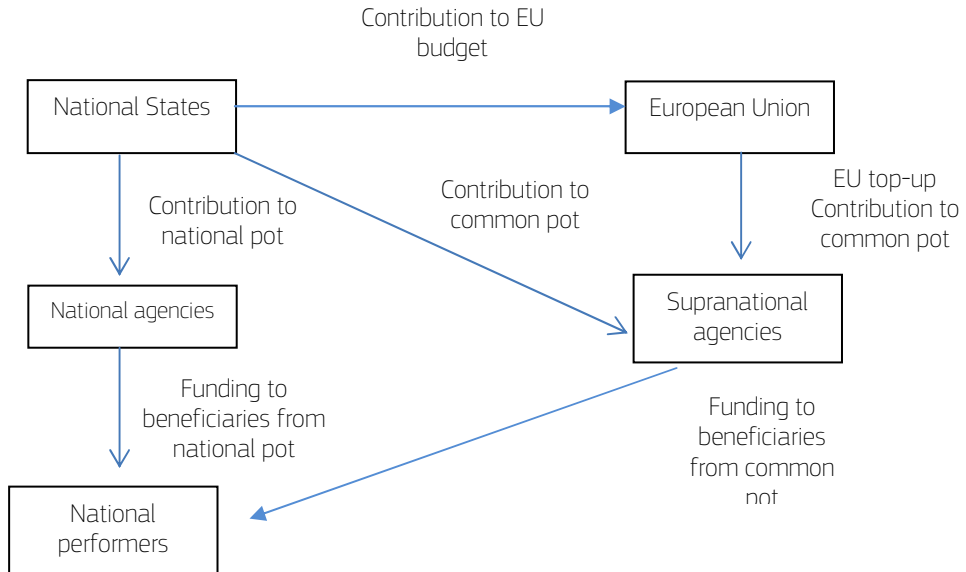
## 2. JOREP CONCEPTUAL FRAMEWORK

The conceptual framework of JOREP grounds on the concept of public funding system to describe the nature and role of open and joint programmes and to address the issue of their impact on the European Research Area. Funding systems are to be considered multilayer systems in which the interaction among four layers – namely policy, funding agencies, performing organisations, and research groups – takes place.

These four entities represent different functions in research funding and are organisationally separate, with few exceptions such as the case of vertically integrated national organisations acting as both funding agencies and research performers (ex. the Academies of Sciences in some Central and Eastern European Countries and the CNRS in France).

The conceptualisation of joint programmes is then based on a representation of public research funding organised in four functional layers - namely policy, funding bodies (agencies, ministries, European Commission), performing organisations (including universities) and research groups – and characterised by two main allocation modes, institutional and project funding. Project funding identifies resources directly allocated by a funding agency to a research group or an individual for research activities limited in time and scope.

This conceptual framework, in JOREP, proved to be suitable for dealing with open and joint programmes and for identifying the descriptors and data to be collected.<sup>1</sup>



MAP 1. Structure of funding flows in joint programmes

<sup>1</sup> The data for the 2000-2009 period have been retrieved only for programmes belonging to the perimeter in 2009, meaning that programmes ended before that year have not been included. While this is unlikely to significantly affect the aggregate figures, it might have an impact on the analysis of individual programmes, especially in cases such as the European initiatives, in which programmes have changed status and name through the years

JOREP provided, for each of the 11 countries involved, a general overview of the national research funding system with a focus on the organization of project funding which emerged to be highly differentiated.

This organisational complexity corresponds to a certain degree of complexity in the structure of funding flows, which requires the introduction of a new conceptual framework besides the one currently adopted in R&D statistics (Map 1). Namely, in joint programmes public resources from the National States can be transferred either to a supranational agency or to a national one, from which they are then allocated to beneficiaries in different countries.



### 3. JOINT PROGRAMMES: BUILDING TYPOLOGIES

JOREP defines Joint programmes as publicly funded research programmes for which at least one of the functions is shared between more than one country (or by regions belonging to more than one country). While most national programmes are managed by a single agency with a clear status and organisational form, the situation is more complex for joint programmes. In very few cases – like the European Space Agency (ESA) – all programme functions are transferred to the supranational level and the role of National States is limited to the provision of funding to that agency. In most joint programmes, processes are shared between the supranational and the national level and there are different ways to organise this division.

The descriptors developed by JOREP make it possible to systematically characterise the organisational forms of joint programmes in relation to how integration is managed, their funding model, the type of agencies managing them, their scientific fields and, finally, the performers participating. Typologies of programmes were built based on the integration of programmes’ functions (mode of integration and submission procedures), and financial resources leading to the identification of at least three typologies of programmes: integrated (with a supranational agency, national pot and EU additional funding), coordinated (with light coordination structures ex. coordination committee, with integration of submission and evaluation procedures) and collaborative (with parallel submission and evaluation, Table 1).

Table 1. Classification of joint programmes by type

Integration of the programme functions		Integration of the funding resources	Type of programme	
Integration	Submission	Funding		
Agency	Single-entry point	Real common pot	Integrated programme with integration of funding	Integrated programmes
Agency	Single-entry point	National pot	Integrated programme without integration of funding	
Coordination	Single-entry point	Real common pot	Coordinated programme with integration of funding	Coordinated programmes
Coordination	Single-entry point	National pot	Coordinated programme without integration of funding	
Delegation	Single-entry point	National pot	Collaborative programme with delegation	Collaborative programmes
Coordination	Parallel	National pot	Collaborative programme – parallel programme	
Independent	Parallel	National pot	Collaborative programme – independent programme	

There are systematic differences across types of programmes concerning their size, number of participating countries and the type of research supported. Integrated programmes are much larger, receive the bulk of EU funding and include almost all JOREP countries, while coordinated and collaborative programmes display, on average, more limited participation and lower budgets. Regarding the selection criteria, it is clear that most collaborative programmes are general-purpose and excellence-oriented programmes.

On the other hand, integrated and coordinated programmes are mainly thematic programmes and the relevance criterion is more important, especially for what concerns integrated programmes. Most collaborative programmes are bilateral programmes and were established by funding agencies or National States. On the contrary, most coordinated programmes and integrated programmes are European-level programmes and were established by the European Commission. This hints at different historical dynamics behind the establishment of these groups of programmes, which we investigate further in the following section.

### 3.1. THE LANDSCAPE OF JOINT PROGRAMMES

The Joint programmes' landscape is highly diversified: the variable-geometry approach to joint programming implies that European Research Area (ERA) countries are, to a large extent, free to decide whether to participate in joint programmes and how much budget to allocate to them. Differences mostly reflect different levels of opening and internationalisation of national research policies or a different organisation of national funding structures.

#### **Programmes starting years and main characteristics.**

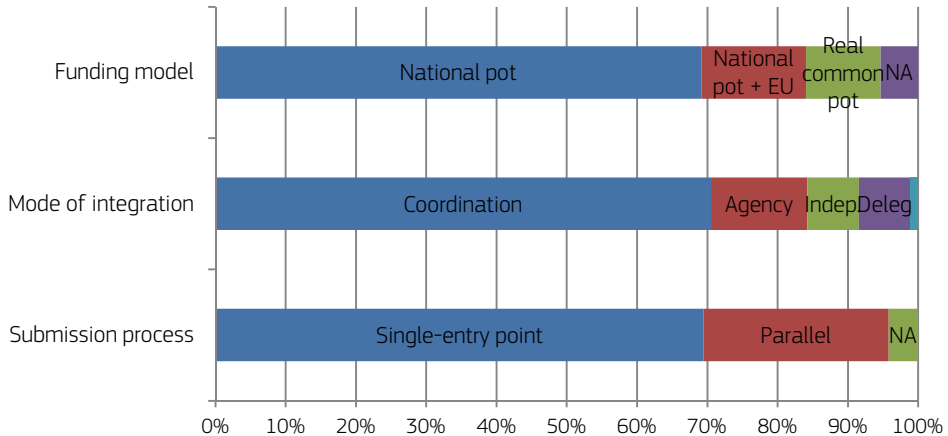
Most programmes were created after the year 2000 and European initiatives were the driving force in the development of joint programmes. This confirms a great dynamism of joint programmes after the launch of ERA, as well as deep changes in the role of different actors. Only 10 programmes were created before 2000 – the oldest being COST (1971) –, 27 programmes between 2000 and 2005, and 60 in 2007-2009. Before 2000, the National States were the only actors establishing joint programmes – 8 out of 10 programmes being established by National States.

After that date, joint programmes were established by the European Union as well as by National States and funding agencies, but with very different roles. Integrated programmes were mostly established by the European Union, whereas – besides joining European initiatives – National States focused on launching collaborative bilateral programmes with third countries. Finally, national funding agencies (mostly research councils) are clearly emerging actors: after a phase characterised by collaborative agreements, they are rapidly moving towards stronger forms of coordination, including the establishment of lead agency agreements.

As for their **organizational characteristics** (i.e. mode of integration, submission process and funding model, Fig. 1) most programmes are characterised by light coordination through temporary committees in charge for project evaluation and selection whereas only a minority of largest programmes (ESA, Eureka, COST, Art. 185 Initiatives (AAL, EMRP), and Joint Technology Initiatives (ARTEMIS, ENIAC) experience a stronger form of integration through the establishment of a supranational agency with a permanent status. Thus, there is a strong connection between modes of institutionalisation on the one hand and size of the programme on the other hand. The

other two modes of integration, namely independent selection by national agencies and delegation of all functions to a national agency (lead agency agreements) characterise a relatively small number of programmes.

Figure 1. Main characteristics of joint programmes. Share of total number of programmes, in 2009



NOTE: ESA INCLUDED, N=95

### Funding models.

Two main funding models emerge: national pot and national pot plus EU contribution for the largest programmes with a supranational agency. This confirms that National States are not willing to delegate decisions concerning budget to supranational agencies, ESA with its very large integrated budget remaining an exception. Thus only those programmes which are sufficiently well-established through some kind of supranational structure are able to generate long-term financial commitment; however, in turn, this takes place only if the provision of EU additional funding creates suitable incentives to national policies.

Finally, the prevalence of the single entry-point method indicates that, even when the budget is not integrated, calls for proposals, submission and, most likely, evaluation are managed centrally at the programme level rather than at the national level. Integration of these programme functions characterises the vast majority of programmes.

### National contributions to joint programmes.

National contributions to the 95 joint programmes identified in the 11 countries covered by JOREP in 2009 accounted for 3.42% of national R&D budgets (GBAORD) in these countries, and only 0.86% when excluding ESA. The 95 programmes in the dataset had a total funding volume of slightly less than 3.5 billion euro (Table 2). About 80% of these resources came from the participating countries, while about 20% were provided by the European Union.

From this perspective, the strategy of joint programmes has been quite successful in mobilising national resources with relatively limited overall EU contribution. For

comparison, the overall budget for EU Framework Programmes was around 6.6 billion euro in 2009.

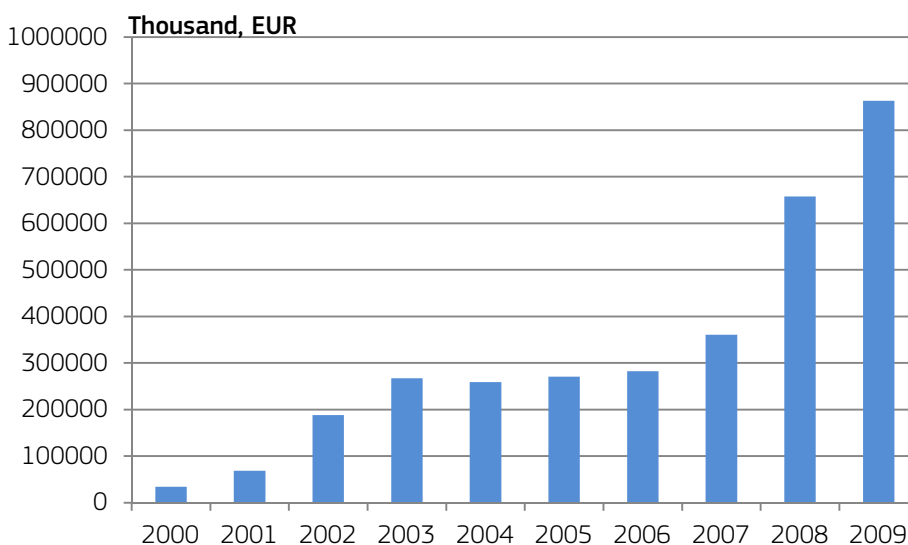
Table 2. Key indicators on joint programmes in JOREP (2009)

Number of joint programmes (ESA included)	95
Total funding volume (mio. €, 2009)	
ESA included with EU funding	3 484 785
ESA included without EU funding	2 799 928
ESA excluded with EU funding	862 627
ESA excluded without EU funding	707 771
Total GBAORD of the JOREP countries (mio. €, 2009)	81 901 230
% of GBAORD of JOREP countries (only national funding)	
ESA included	3,42%
ESA excluded	0,86%
Additional EU funding as % of total budget	19,5%

### Programmes budget.

While the budget for joint programmes strongly increased in the 2000-2009 period, they still represent quite a limited share of public research funding in the considered countries and, in terms of funding volume, are much smaller than other transnational initiatives like the European Framework Programmes (excluding ESA, the total budget of joint programmes was about 10% of the FP budget in 2009, Fig. 2). Rather most joint programmes are quite small, and often of symbolic value, or they involve limited forms of cooperation. Moreover the share of joint programming within the total national R&D budget differs from country to country.

Figure 2. Total budget of joint programmes



NOTE: ESA EXCLUDED, N=94, EUR

The increase in total funding volume was complemented by a rise in EU funding in 2007-2009, through the launch of some large-scale European initiatives, both as volume and as share of the total (from 7% in 2006 to 19% in 2009, excluding ESA). This supports the interpretation that EU additional funding was critical in leading to greater commitment by national states.

#### **Funding distribution among programmes.**

A dozen programmes account for most of the total budget of joint programmes, most of them being European initiatives supported by the European Union and driven by economic relevance and common technological challenges (i.e. ESA, Eureka, COST, ARTEMIS and ENIAC Joint Technology Initiatives, AAL and EUROSTARS Art. 185 Initiatives, 4 ERA-NETs, 3 bilateral programmes.) This proves a strong concentration of funds on a few programmes. Also EU funding is concentrated in few programmes: excluding ESA, there are only 14 programmes receiving EU additional funding, which account for 40% of the total budget of joint programmes; eight of the top nine programmes by budget are supported by the European Union, the only exception being Eureka. For these 14 programmes, the share of EU contribution was 48%, following the rule of equal contributions by the EU and by national states for joint initiatives. This leads to the conclusion that, excluding the two very large programmes established in the past by national states (ESA and Eureka), a substantial share of European funding is required to develop large European-level initiatives.

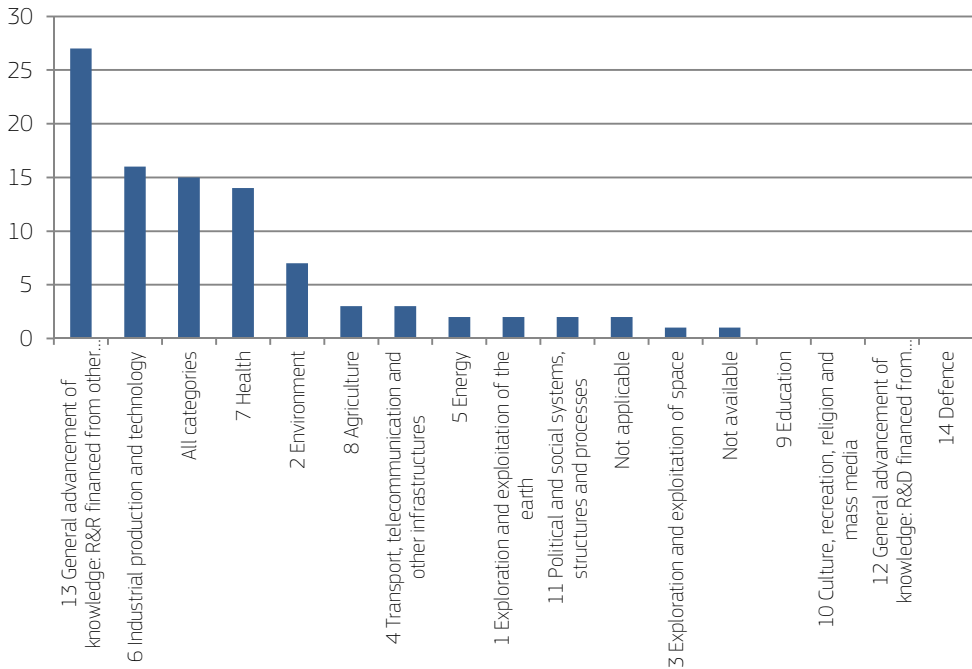
#### **Type of research and policy domains.**

As for the type of research supported by joint programmes these can be broadly divided into three groups in terms of their research topic: technological programmes (EUREKA, JTIs), programmes oriented towards specific policy domains (most ERA-NETs), and science-oriented and general-purpose programmes, supporting research collaboration in most scientific domains. Two policy domains prevail: industrial technology and health.

A large number of joint programmes are either oriented towards basic knowledge (the so-called investigator driven programmes) or generic, in principle open to all scientific and technological domains. Two other policy domains are important, namely industrial technology and health. However, when considering their budgets, it becomes clear that almost all large programmes (also excluding ESA) focus on technology and innovation, like in the case of Eureka and of the Joint Technology Initiatives (Fig. 3).

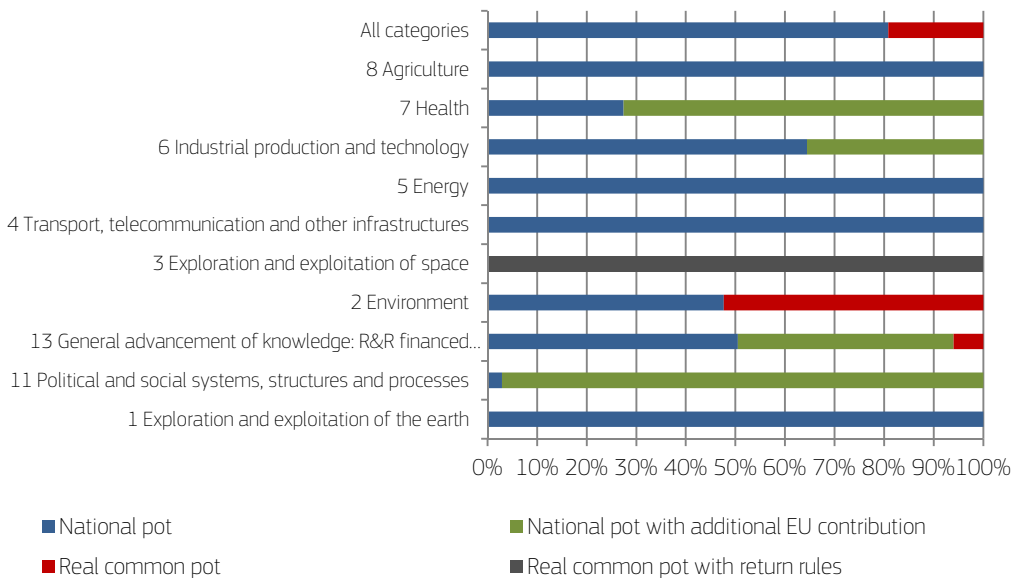
Moreover differences also emerge by area for what concerns integration and funding models (Fig. 4). Regarding the integration model, the programmes which received the largest amounts of funding in 2009 are mostly managed via an agency although the coordination model prevails in most other scientific areas and policy domains. Regarding the funding model, it appears that most programmes are funded through a national pot or a national pot with additional EU contribution.

Figure 3. Number of programmes by NABS category in 2009



NOTE: ESA INCLUDED, N=95

Figure 4. Funding model by NABS category (funding volume, €, in 2009)



NOTE: ESA INCLUDED, N=95, EUR

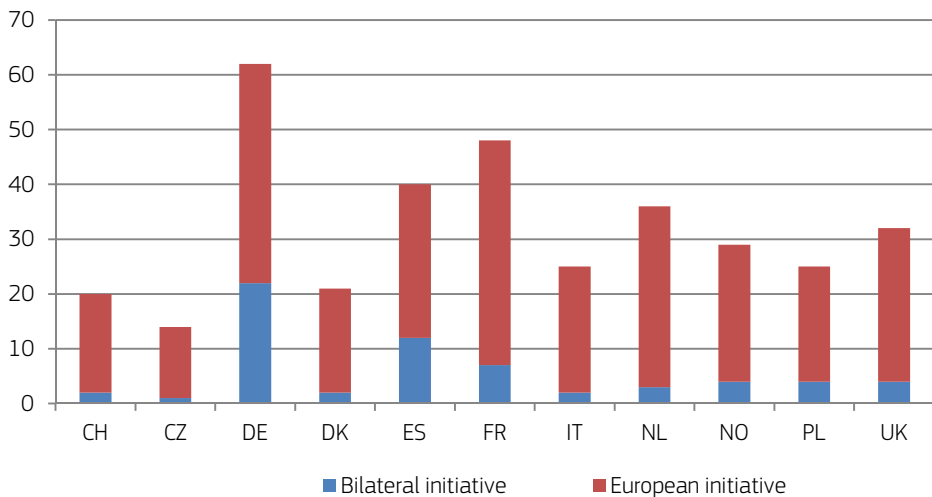
### 3.2. COUNTRIES ENGAGEMENT IN JOINT RESEARCH ACTIVITIES

#### Countries participation to joint programmes.

Participation to joint programmes varies across countries. ERA countries are, to a large extent, free to decide whether to participate in joint programmes and how much budget to allocate to them. Differences might reflect different levels of opening and internationalisation of national research policies or a different organisation of national funding structures.

Although the picture provided by JOREP might not be complete, some clear indications emerge. Firstly, the number of participations indicates variations among the countries for what concerns their interest in developing bilateral projects based on national programme initiatives vs. European initiatives (Fig. 5). Germany, for instance, emerges as the country in which joint initiatives are more numerous, both national ones and European ones.

Figure 5. Number of participations to bilateral and European initiatives programmes, by country, in 2009



NOTE: ESA INCLUDED, N=95

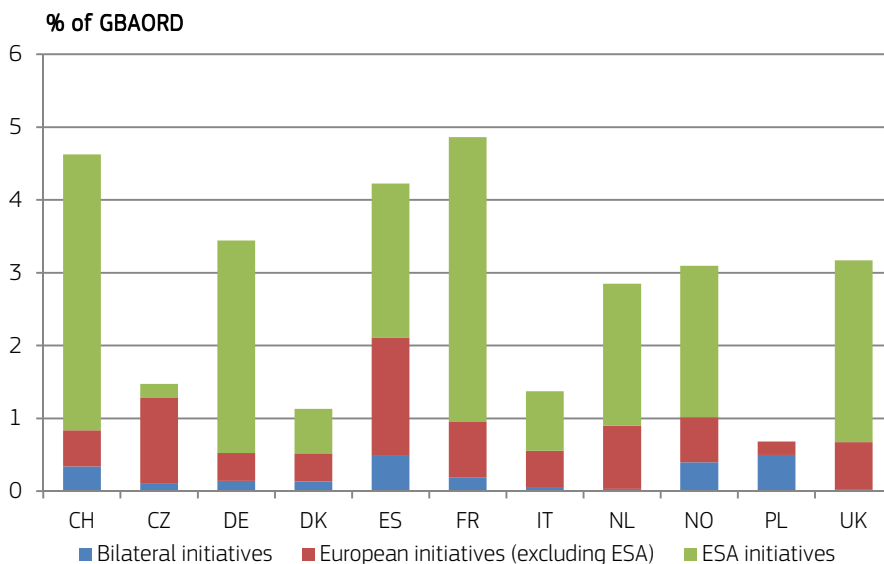
#### Funding volume of joint programmes.

When funding volume is analysed (and ESA is not included), the balance among the countries changes, since Spain and France take on a prominent role, due to the large amount of resources devoted to Eureka. The average investments in joint programmes as percentage of GBAORD by smaller JOREP countries (CZ, CH, DK, NL, NO) are equivalent to the average investments by the largest JOREP countries (DE, ES, FR, IT, PL, UK) (respectively 0.93% and 0.96%, when excluding ESA). In greater detail, it can be noted that the share of participation in bilateral vs. European initiatives also differs from country to country. Switzerland and Norway allocate a rather large portion of their budget to bilateral initiatives, which is probably due to the fact that they are not EU member States. On the contrary, the UK, the Netherlands, Italy, France, and the

Czech Republic spend most of their joint programmes budget on European initiatives (Fig.6).

So, although the involvement in European joint programmes prevails in all the countries, strong differences emerge both with respect to the volume of funding devoted to them and the weight of ERA and non-ERA collaborations. The data reveal how national traditions and history influence national choices regarding trans-national research. On the one hand, European funding schemes help consolidate a shared network among all the countries; on the other hand, national diversities play a role as drivers of globalisation through joint programming.

Figure 6. Total funding volume to joint programmes by country as a percentage of GBAORD, including ESA, in 2009



REMARKS: THE DATA ON THE BUDGET ALLOCATED TO ESA IN POLAND IS NOT AVAILABLE

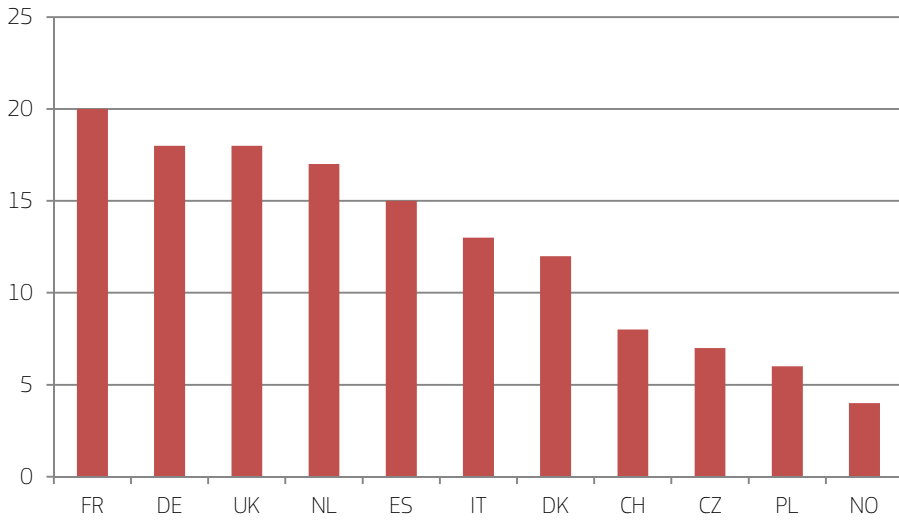
### The role of funding agencies.

To shed light on why and how countries wish to participate in joint programmes the role played by central governments in relation to delegated intermediary actors of joint programmes has to be considered as well as the content of said delegation in terms of power transferred to the agencies. Moreover, the different types of agencies involved are another interesting matter, since the existence of different national coordination modes implies the presence of different national configurations of shared responsibilities, according to the characteristics of the governance of the research funding system. A broad range of agencies participate in joint programmes, including research councils, sector agencies and ministries, innovation agencies, public research organisations and research ministries.

The number of funding agencies varies drastically from country to country. Not surprisingly, larger countries have many more funding agencies involved in joint programmes than smaller ones (Fig.7).



Figure 7. Number of funding agencies involved in joint programming, by country, for the period 2000-2009



Evidence of different national situations in this respect emerges: some countries adopt a more centralised approach, whereas in other countries decisions to participate in joint programmes are taken at the agency level (for instance, in Switzerland). National funding agencies play a prominent role in promoting joint programmes, although their initiatives are of much smaller size. In six countries (Poland, Denmark, the UK, France, Germany, and Norway) decisions regarding financial commitment are essentially delegated to agencies, whereas in three countries these are the remit of the State (Spain, Italy, and the Netherlands). To some extent, this is likely to reflect underlying differences in the level of agencification of the various countries.

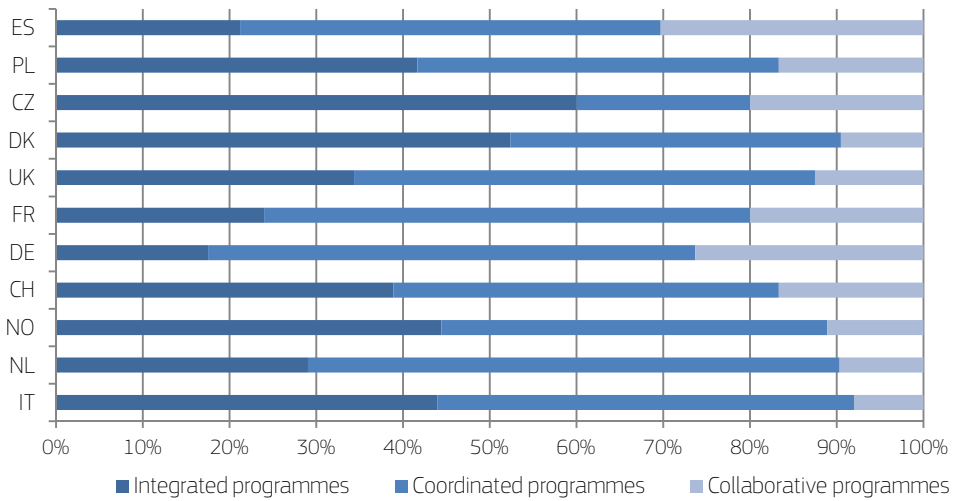
**Forms of collaboration supported by joint programmes.**

European initiatives build strong networks in the ERA and bilateral initiatives link individual ERA countries with the rest of the world. A certain degree of specialisation towards forms of collaboration among ERA countries also emerges. European multilateral programmes take on greater importance at the ERA level, whereas bilateral programmes mainly focus on cooperation with the rest of the world, especially with emerging countries or specific countries (e.g., Spain mostly implements projects with Latin America). Furthermore, ERA internal schemes are likely to be more important than bilateral schemes in terms of programme budgets.

**Differences in participation.**

As to differences among countries for what concerns participation in joint programmes, most of the countries are mainly involved in coordinated programmes (Fig. 8). On the contrary, the share of collaborative programmes on the total number of programmes in which countries are involved is relatively low (except for Spain, where collaborative programmes represent about the 30% of the total programmes). Integrated programmes represent a significant share of the Danish and Czech involvement in joint programmes.

Figure 8. Participation of countries to joint programmes, depending on their type (nb of programmes)

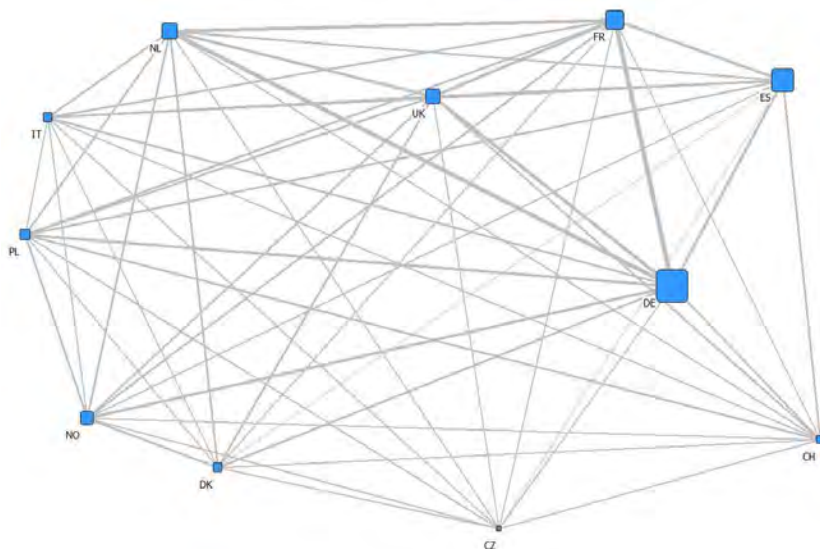


NOTE: ESA INCLUDED, N=95

Data also show that not all the countries participate in the same programmes at the same time. Two mechanisms should be distinguished in this respect: as for European initiatives, countries might choose to participate or not depending on the type of initiative and whether it is in line with their national policy goals; common participation in bilateral initiatives can instead be interpreted as an explicit policy decision to cooperate with a specific country.

This, as it emerges in the following Fig. 9, sheds light on special links, alliances, and commonalities in the internationalisation strategies of different European countries.

Figure 9. Common participation to joint programmes



SOURCE: DESIGNED WITH UCINET FROM JOREP DATA

NOTE: ESA INCLUDED, N=95

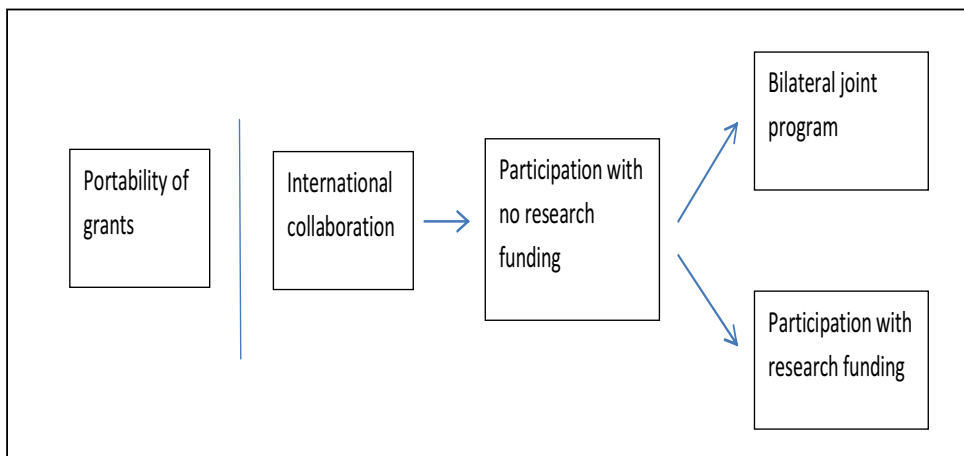
Evidence supports the idea that European initiatives and bilateral programmes clearly play two different functions in the internationalisation of research systems. The former help build a strong and relatively homogeneous network among ERA countries, integrating the less central countries around a core constituted by Germany, France, the UK, and the Netherlands; the latter link individual ERA countries with the rest of the world, but hardly contribute to fostering European-level bilateral cooperation. In so far, the National States display a common propensity towards participating in European joint initiatives; on the contrary, when designing bilateral initiatives, they are driven by national/regional interests, which consolidate existing networks unrelated to any interest in European integration.

### 3.3. OPEN PROGRAMMES

**Defining open programmes.** Open programmes emerge as complex and multidimensional phenomenon.

Open programmes are publicly funded research programmes where research organizations not located in the countries providing resources for the program itself are eligible to participate with an official status. Basic criteria to identify whether a programme has to be considered open or not are then the location and ownership of the participating research organizations, not the nationality of applicants. While open programmes *stricto sensu* are a rather marginal phenomenon in the European funding landscape, national programmes are characterised by varying degrees of opening and there are wide variations among countries in this respect.

Therefore a broader definition of opening which includes different dimensions – portability of grants when researchers move abroad, opportunities for international collaboration with complementary funding, project participation without research funding – could help understanding a more and more diffused trend as the opening up of national R&D programmes (Map. 2).



Map 2. Dimensions and levels of opening of national programmes

**Jorep pilot on opening of national research programmes.** A pilot exploration of this trend in three countries (France, Italy, Switzerland) shows that a certain degree of opening increasingly characterises the larger national research programmes, those constituting the bulk of national research funding, and thus the phenomenon represents a highly relevant evolution in the making of the European Research Area. There is also anecdotal evidence that the opening of national programmes is more widespread than expected and that, in most cases, it is a recent trend rapidly developing. The phenomenon mainly occurs not by providing funding to partners abroad but rather by softening the rules for national programmes in order to make international collaboration possible (with varying degrees of engagement).

The pilot reveals that the degree of opening of national programmes depends on the countries and types of programmes considered. For what concerns the countries, their levels of opening are strongly linked to the levels of internationalisation of their national research systems – with Switzerland being more international than France and Italy, as can be inferred from the varying shares of international academic staff in these countries. Hence, internationalisation of research systems is a driving force of opening, as researchers will have more international ties and reasons for cross-border cooperation in their projects. Concerning the types of programmes, as expected, science-oriented programmes tend to be more open than programmes focusing on national needs, related to either national economy or policies.

Thus, levels of opening are highly selective. International collaboration is encouraged and supported in many national programmes, whereas research funding to partners abroad is possible only under specific circumstances which are beneficial to the national research system (like acquiring specific competences) or to the pursuit of foreign policy goals (like development aid or cooperation with other countries). Another issue regards the matter of grants following researchers and principal investigators, which does not seem to be related to the openness of programmes but rather to the characteristics of national funding systems and to programme goals. For example, portability is limited in France, as projects are attributed to research organisations rather than to individuals.

When research funding must be provided to partners abroad, bilateral joint programmes are the favourite method to open national programmes and they can take two main forms: bilateral international cooperation lines alongside national programmes and lead agency agreements among funding agencies. Finally science-oriented programmes tend to be more open than economy-driven programmes.

In sum, the characteristics of national research systems and of individual programmes influence their level of opening. National policy goals and the needs of the national research communities are more important drivers of opening than European policies and lead to nation-specific patterns, as well as to great differences among countries.

# 4. ANALYSING MOTIVATIONS AND IMPACT OF JOINT AND OPEN PROGRAMMES

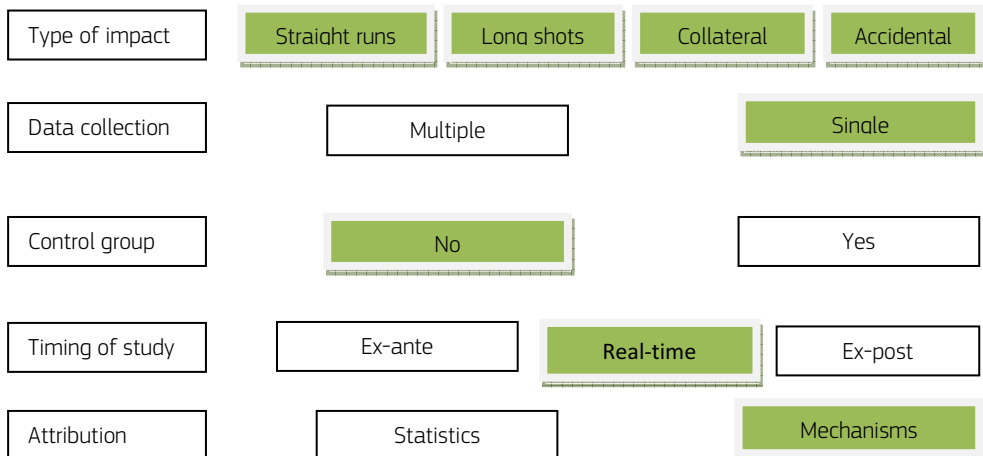
## The methododological approach.

The methodological approach for the analysis of motivations and impact pinpoints the main characteristics and features of programmes analyzed.

Impact has been operationalised as a set of opportunities distinguishing among:

- Intended opportunities - the opportunities that open and joint programmes intend to provide (as stated in their objectives)
- Provided opportunities - the opportunities the programmes really provide (as the signal these send through their selection practices and accountability processes)
- Perceived opportunities - the opportunities they are perceived to provide by (potential) beneficiaries
- Mobilized opportunities - the opportunities that have been mobilised by the beneficiaries

The analysis considers that the opportunities attributed to programmes, as signals they provide, can often be multifaceted and difficult to interpret. Hence, being aware of the generative mechanisms at the basis of opportunities is a key issue to be taken into account. Thus the following proposed integrated framework for capturing motivations and impact of joint and open programmes was adopted (Map 3).



Map 3. Jorep integrated framework (Choices in green)

Expectations regarding intended and expected impact (“straight runs”) and intended and unexpected impact (“long shots”) can be identified through the stated objectives of policy and research funding schemes. Whether or not these intentions are realised depends, on the one hand, on whether they are supported by the core practices and communicated clearly and, on the other hand, on how they are interpreted and used by the potential beneficiaries. Whilst “straight runs” are intended and expected, “long

shots” are effects that are intended but cannot be expected to occur with any level of certainty within a set timeframe.

Unintended and expected impact (“collateral”) is the “collateral damage” that actors expect but cannot avoid because there are many social influences at play which the policy or funding scheme cannot control. Finally, unintended and unexpected impact (“accidentals”) is very interesting as a possibility but difficult to measure. It can, however, be captured if an empirical object is studied exhaustively. We believe that it is possible to capture all the different types of impact by linking together: the opportunities that open and joint programmes intend to provide (as stated in their objectives), the opportunities they actually provide (i.e. the signals they send through their selection practices and accountability processes), the opportunities they are perceived by (potential) beneficiaries to provide, and the opportunities that are actually mobilised by the beneficiaries.

**Programmes analyzed and main sources.** The motivation and impact analysis was developed in two stages: firstly a documentary analysis, secondly an empirical analysis supported by semi-structured interviews and a survey. The following programmes, representing different typologies, have been analysed for motivations and impact analysis:

NORDIC TOP LEVEL RESEARCH INITIATIVE TRI  
ART. 185 EUROSTARS EUREKA  
ART. 185 AAL – AMBIENT ASSISTED LIVING  
JTI ARTEMIS  
ERANET EMIDA  
ERANET + (ERASYS BIO AND ERASYS BIO+)  
BILATERAL PROGRAMME GERMANY-USA FOR REGENERATIVE MEDICINE  
LAA - LEAD AGENCY AGREEMENT  
DFG/ANR  
DFG/ESRC  
SINERGIA

**Main insights from motivations and impact analysis.** The analysis confirms that the programmes have generally met the participants’ expectations as to perceived and mobilised benefits; a rather large share of respondents realised unexpected opportunities, while the number of beneficiaries whose expectations were not satisfied is relatively small.

The typologies of programmes provide useful indications regarding the mode of funding and the type of integration, as well as some common features of the intended opportunities. Nevertheless, the opportunities provided and the perceptions of the beneficiaries display great differentiation across the programmes, and both collateral effects and accidental results are detectable in all the types of programmes. Moreover, while collateral effects might be interpreted as emerging expected benefits, the occurrence of accidental effects remains rather difficult to explain. What is not clear is the extent to which accidental effects derive from the essential uncertainty affecting research endeavours or are the result of poor signalling or management of the programmes.

Generally, funding is not the main motivation to apply, nor is the chance to carry out high-risk activities and improve industry-academic collaborations. The same holds true for the opportunity to develop or access new specialised equipment. Also, the fairer

and more transparent assessment of proposals emerges as a weak motivation, confirming that the participants have limited confidence and interest in evaluation procedures. Differently, cross-boundary and cross-disciplinary collaborations appear to be important motivations for participation, as well as the opportunity to enter or to extend international networks of partners (Tab.3).

Table 3. Perceived opportunities BEFORE the programmes (% Yes answers)

Programmes typology	Integrated	Coordinated	Collaborative	Open	Total
Opportunities					
Monetary resource	15.1%	36.8%	5.9%	29.8%	20.3%
Funding duration	18.9%	5.6%	5.9%	8.5%	11.2%
Risk-taking	21.2%	26.3%	24.2%	29.8%	25.2%
Cross-boundary (geographic or intellectual)	58.5%	68.4%	79.4%	83.0%	71.9%
Industry-academic collaboration	59.6%	5.3%	0%	2.1%	21.7%
Partner network size	39.6%	26.3%	44.1%	72.3%	49.0%
Internationality of partners	40.4%	63.2%	73.5%	21.3%	44.7%
Specialized research equipment access/development	43.4%	31.6%	8.8%	29.8%	30.1%
Dissemination/IP	26.4%	10.5%	8.8%	4.3%	13.7%
Bureaucracy	45.3%	42.1%	36.4%	55.3%	46.1%
Fairness/ Transparency	19.2%	31.6%	30.3%	34.0%	27.8%

As for impact, cross-boundary opportunities are actually perceived and mobilised for almost all typologies of programmes whereas opportunities for industry-academic collaborations mainly concern Integrated programmes only. The same holds true for the opportunity to undertake high-risk activities, which is generally neither perceived nor mobilised, except to a limited extent for open programmes.

For what concerns coordinated programmes, their impact appears to be non-homogeneous across the various funding schemes, showing that different logics are at play under the wide umbrella of coordination. The same holds true for collaborative programmes, showing that these are mainly evolving schemes. The only open programme investigated clearly shows that trans-national and cross-boundary opportunities are main expectations realised by the scheme or represent an additional and unexpected effect (Tab. 4).

Table 4. Mobilised opportunities AFTER the programmes (% Yes answers)

Programmes typology	Integrated	Coordinated	Collaborative	Open	Total
Sufficiency of funding amount	73.1%	73.7%	88.2%	80.9%	78.9%
Sufficiency of funding duration	82.7%	63.2%	94.1%	55.3%	74.3%
Pace of funding release	42.3%	73.7%	82.4%	97.9%	72.4%
Acceptability of bureaucracy levels	62.7%	78.9%	94.1%	100%	83.4%
High risk research/technology development	44.2%	63.2%	29.4%	68.1%	50.7%
Use of funding to do cross-boundary activity (trans-national or cross-disciplinary)	96.2%	100%	97.1%	89.4%	94.8%
Use of funding to train new PhDs/young researchers	54.9%	84.2%	73.5%	93.6%	74.8%
Use of funding to start new industry-academic collaborations	88.7%	26.3%	3.0%	4.3%	36.2%
Use of funding to move into a new field/market	73.6%	52.6%	38.2%	59.6%	58.8%

The interviews with political authorities and programme officers and the survey of beneficiaries unanimously confirm the importance of the programmes and the need to maintain them. Many underline the need for changes to improve management and to better communicate what the programmes are, so that the effectiveness of results can also be improved, but the feeling of outcomes realised is generally good, or very good. Trans-national research per se is a dimension perceived as providing much added value, mainly linked to the ability to develop high-quality research within the global scientific community and across disciplinary boundaries, although the programmes might not actually be so different from the national ones. Moreover, rather than funding, it is integration of the submission procedures, selection and evaluation criteria that is considered a critical issue of joint and open programmes to make them different from other national schemes.

**Key messages from the motivations and impact analysis.** The exploration shows that the conditions created by the programmes are mostly in line with expectations. Signals they provide are not unique and distinctive enough to bring about changes in the nature of knowledge and productivity through their grants. Four key messages emerge then from the analysis:

Programmes do not supply distinctive signals: attributing empirical effects to specific conditions of the programmes is difficult even when typologies are used.

In terms of advocacy, the programmes are different voices joined together, which can influence the decision-making process and modify the effects of public policies and funding allocation.

Emphasis should be shifted from programme evaluation to whether the programmes are able to create the conditions for change; this investigation would provide useful knowledge for policy designing and implementation.

More research on generative mechanisms of opportunities is needed.



# 5. RECOMMENDATIONS

While JOREP is a pilot project, the regular production of data and indicators on joint and open programmes is a major priority in the development of a monitoring system for the European Research Area, as indicated by the ERA monitoring expert group (European Commission 2009) and the 2012 ERA Communication<sup>2</sup>. Accordingly, the JOREP project provides recommendations for future data collection in this area, addressed to the European Commission and Eurostat.

These recommendations specifically take into account the relationships between JOREP and the Eurostat pilot on transnational coordinated research, the OECD pilot project on public funding of R&D (OECD Directorate for Science, Technology and Industry 2010), as well as potential synergies between these data collection.

## 5.1. COLLECTING DATA ABOUT JOINT AND OPEN PROGRAMMES

In terms of data to be collected, JOREP's recommendations deal with the three critical components of the dataset developed, namely the perimeter, the descriptors and, finally, data on funding flows.

a) Perimeter of joint programmes. The construction of a list of joint programmes is a central requirement for data collection, also including financial data. Like in JOREP, the list should be constructed by integrating the list of European Initiatives (provided centrally) with bilateral programmes identified by national experts; information on which countries participate in which European Initiatives is critical in order to reduce the burden of data collection at the national level.

Thus, JOREP recommends compiling a list of all European-level joint programmes including the following information: the name of the programme, the list of participating countries and, for each country, of participating agencies. As a second priority, national experts in each country should include the bi- and multilateral programmes they consider relevant.

This list should be adopted as official reference for all data collection activities at the European and national levels and be updated yearly.

b) Descriptors on organisational characteristics. The set of descriptors developed in the project proved to be very useful to analyse the landscape of joint programmes; moreover, developing closed lists of choices (integrated with remarks) has provided significant advantages in terms of comparability of data. Hence, it is strongly advised to maintain and extend the set of descriptors to all joint programmes in the European Research Area; given the fact that organisational characteristics are rather stable in time, the descriptors could be updated every 2 or 3 years rather than yearly.

The experience of JOREP shows that, while there are no main problems in the collection of descriptors, collecting national-level information requires a well-designed organisational structure with a central unit – taking care of the European-level

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<sup>2</sup> "A reinforced European Research Area Partnership for excellence and growth", COM(2012)392., 17 July 2012 and the accompanying Impact Assessment Commission Staff Document.

descriptors, of quality control, and of the merging of data into an integrated dataset—as well as national experts. Moreover, as for multi-annual data collection, issues regarding programmes demography need to be carefully taken into account and a suitable notation has to be introduced into the dataset.

c) Data on funding flows. JOREP has proven the feasibility of collecting data on the budgets of joint programmes, but it has also confirmed that, since budget decisions are often delegated to funding agencies, this information cannot be collected in a reliable manner from public budgets (the main data source for GBAORD statistics). It is hence recommended to collect this information from national funding agencies through a dedicated questionnaire, detailing for each agency the programmes in which it participates (based on the common programmes list). Furthermore, data on European contributions should be collected directly by Eurostat. It is advised to provide a simple breakdown of public and private beneficiaries, as this is relevant to understand programme functions and easier to implement than a breakdown based on the Frascati sectors.

The definition of a suitable organizational form and of procedures for regular data collection is made more complex by two characteristics: first, the fact that JOREP data include both expert-based descriptive information and statistical data on funding flows; second, the fact that data are owned by different subjects and at different institutional levels, including European agencies, the European Commission, the National States, and national funding agencies.

To overcome these problems, JOREP proposes a structure built on two main components (Map 4).

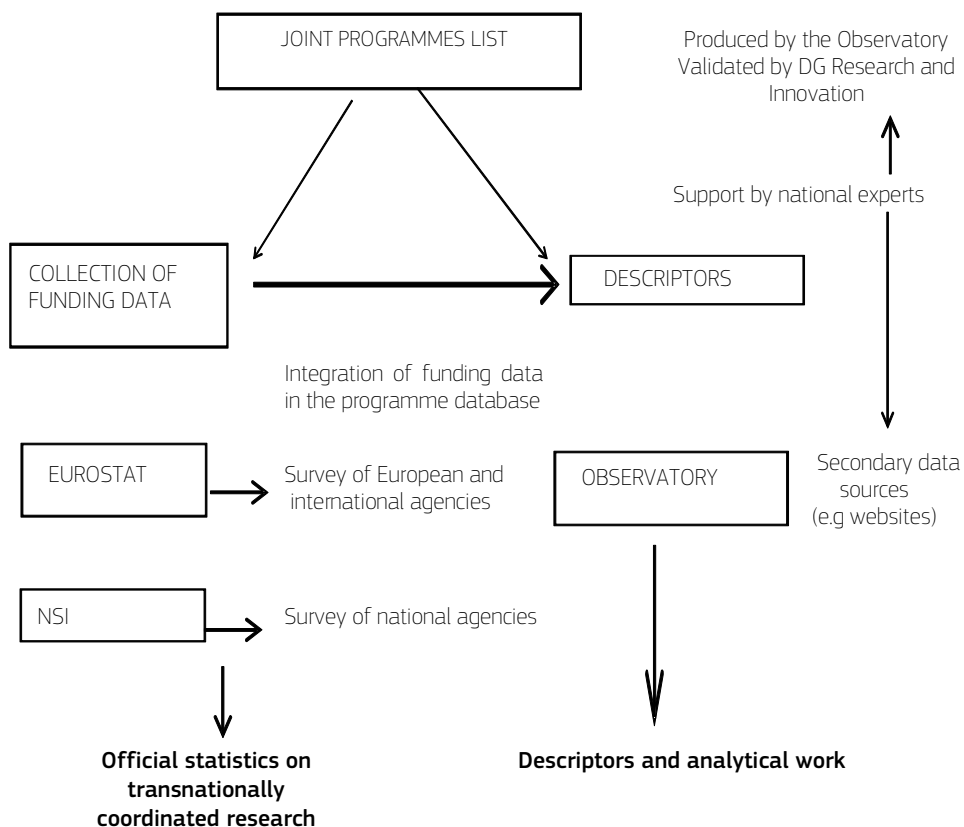
a) First, a European-level observatory on joint programmes should be set up, possibly integrated in existing structures like ERAWATCH or NETWATCH, with the following tasks:

- Defining the perimeter of joint programmes every year (including information on national participation and managing agencies), which should be validated by the European Commission.
- Updating the joint programme descriptors with changes and covering new programmes.
- Maintaining the dataset covering descriptors and programme-level funding data and providing a suitable interface for access by external users (e.g. a web interface to the programme database).
- Regularly producing analytical work on the mapping of joint programmes in Europe.

b) Second, the collection of funding data and the production of statistical indicators should be managed by Eurostat together with the National Statistical Authorities. This represents an extension and systematisation of the current pilot on transnational-coordinated research and is a step towards the integration of joint programmes into official statistics. Production of financial data should be managed through a dedicated survey provided to national funding agencies. Moreover, Eurostat should analyse the European-level funding agencies to determine the level of EU additional contribution to joint programmes and the allocation to beneficiaries of the funds distributed by these agencies directly (either EU funding or real pot funding from national states).

These data would then be used by Eurostat to produce aggregated indicators on transnationally coordinated research funding and by the Observatory to produce

analyses by integrating programme-level funding data into the joint programmes dataset.



Map 4. Proposed organization of joint programme data collection

## 5.2. RECOMMENDATIONS FOR MOTIVATIONS AND IMPACT OF JOINT AND OPEN PROGRAMMES

The analysis of motivation and impact of joint and open programmes should be tackled considering that the opportunities attributed to programmes, as signals they provide, can often be multifaceted and difficult to interpret. Hence, being aware of the generative mechanisms at the basis of opportunities is a key issue to be considered.

It allows distinguishing among the four categories of opportunities suggested by JOREP –mainly those expected and those unexpected – and analysing the impact which could be attributed as a result of programmes' implementation (opportunities mobilised). Furthermore, the opinions of policy actors must be integrated with the beneficiaries' perceptions about opportunities expected and achieved. This allows pointing out the mismatches between declared aims and objectives of the

programmes and the opportunities actually offered, providing insights about the added value of programmes and the effects arising from their implementation.

The approach proposed by JOREP should focus on results reported and discussed, mostly ex-post, in programme evaluation reports and turn evaluation into an opportunity for beneficiaries and stakeholders to share views and opinions about programme organisations, expected goals, and advantages provided. Nonetheless, it is worth underlining, as suggested by the evidence collected, that the main effect of the programmes perceived by beneficiaries is to do ‘things better’ rather than to do ‘better things’.

The table below summarises the recommendations for each of the main issues emerging from the analysis.

Table 5. Recommendations for motivations and impact analysis

Issue	Recommendations	Action
Problem of attribution	Programmes do not supply unique signals: one must be aware of this when attributing empirical effects to specific conditions of the programmes	More research on generative mechanisms of opportunities is needed in order to unpack the emergence of unexpected results
Communication	Programmes pursuing expected impact with adequate practices and clear communication in order to allow correct interpretation and use	Selection practices and accountability processes becoming key elements of programme organisation and assessment
Beneficiaries	Take into account that different beneficiaries have different perceptions of programmes opportunities when programmes are designed and implemented (e.g. as to risk-taking activities, cross boundary and collaboration opportunities)	Beneficiary surveys and surveys involving key programme officers to be developed on a regular basis
Evaluation	The emphasis of programme evaluation shall be on how much programmes are able to create the right conditions for change, thus whether they allow beneficiaries to do ‘things better’ rather than to do ‘better things’	Evaluation Reports should be largely distributed to beneficiaries and stakeholders in order to become “living documents” for future impact analyses. Differences among participation by European countries deserve more attention
Open programmes	Policy shift from ‘open programmes’ to ‘openness of programmes’ as a signal of the country’s strategy toward international networking of national research teams	Participation of non-national partners is an opportunity that programmes must provide; misuse of the opportunity must be considered when programmes are designed



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The study provides a sound quantitative basis for the monitoring of investments in joint and open research programmes in EU countries, as well as empirical evidence of the policy rationales and impacts of these programmes on the European Research Area. The project has carried out a comprehensive collection of data about joint and open programmes according to a set of standardised descriptors, and provided an analysis of motivations and impact of these programmes.

This publication is the executive summary of the study. This publication, as well as the complete Final report of the study, the detailed Analysis Report and 11 Country reports, are available at: [http://www.ec.europa.eu/research/innovation-union/index\\_en.cfm?pg=other-studies](http://www.ec.europa.eu/research/innovation-union/index_en.cfm?pg=other-studies)

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