

A challenge for S&T indicators: Measuring the ERA as a European Integration of Research and Innovation Systems

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Context, rationale, objectives of the paper

Since more than 50 years, through the establishment of a number of intergovernmental organisations or schemes, European states have engaged into joining efforts in research: large infrastructures (CERN, ESRF, ESO...), research performing institutions (EMBL...) as well as joint programming and/or funding capacities (COST, ESF, ESA, Eureka..) have been part of the research landscape for decades. The European construction, since its start, in the late 50's, has constituted a major pillar of this move towards the integration of Research, with the creation of the JRC and, since the mid-80's, the developing of the Framework programmes (FPs).

Since 2000, with the launch of the Lisbon strategy, a more systematic and systemic process has been called for – under the label of ERA. This paved the way for the creation of policy instruments enabling member states in linkage with the commission to engage into policy coordination at various levels; it also opened avenues for the articulation between the non-community and the community research policy initiatives and instruments.

The ERA 2020 vision document, adopted by the Council in December 2008, calls for coordinated S&T policies among MSs in variable geometry, with or without community involvement. Thus, building the ERA has become the over-arching political reference for research policy both at community and national levels. Hence, its monitoring is becoming a driving force for assessments and evaluations, which, among other things, calls for appropriate indicators.

Attempts at the building of such an indicator have been done and are being developed, the basic idea being to measure the volume of research activities undertaken in the context of transnationally coordinated funding or budgeting.

This paper has the same broad objective but revisits the building of such and indicator through:

- (a) proposing an explicit foundation for it, based on a conceptualisation of what ERA stands for ,
- (b) defining the empirical work needed to actually compute the indicator.

Conceptualising an indicator of the making of the ERA

Based on an analysis of the Commission Green paper on the Era (2007) and its five initiatives, on the ERA 2020 Vision document (2008) and recent statements, the ERA is considered as a process of integration of the research and innovation systems at European level, leading towards an European Research and Innovation system (ERIS).

The integration of research and innovation systems: a simple model

a) A functional model of research and innovation systems is proposed as shown in box below.

Orientation function : borne by the political – governmental authorities, this function consists in elaborating the vision of the future of the system, in putting in place its instruments and regulations, its broad objectives and budget; it involves Government and Parliament.

Programming – funding function : in between the governmental and the research performing actors, this function consists in (1) translating the objectives of the former in specific scientific priorities and (2) implementing the processes of funding to allocate resources to the research performers, at institutional, research group or individual level; are concerned here research funding agencies and also core funding agencies (or institutions) to universities and PROs

Research function : it is the function of the performance of research, borne by PROs, universities and firms, which employ researchers, manage infrastructures; they produce, disseminate and transfer knowledge.

b) An elaboration of the meaning of integration is presented, based on an extension of concepts developed for the research function¹. Two types of activities are distinguished (research production and management) and two types of integration are identified (cognitive – conceptual and organizational – behavioral – social), which allows the description of the various facets of what integration entails. This allows for the characterization of levels of intensity of integration: from full integration to coordination to absence of integration (juxtaposition or co-existence).

c) The integration of research and innovation systems can thus be characterised by the level of integration of each one of their functions, as shown by the matrix below.

The research and innovation systems integration model

Intensity of integration Functions of the system	Integration	Coordination	Juxtaposition co-existence
Orientation (public authorities)			
Programming – funding (funding agencies)			
Research (universities, PROs)			

Building the indicator for the making of the ERA

For each country, all its public funding for research is distributed along the three levels of intensity of integration, this being done for each of the functions of the system (each function is concerned by the totality of the public funding). Community research activities and funding are also fitted.

The indicator of European integration of a country is thus defined by 9 numbers, which can be reduced to 3 if weights of 1, 0,5 and 0 are given to integration, coordination and juxtaposition, respectively.

¹ Terttu Luukkonen, Maria Nedeva and Rémi Barré, Integration and excellence - Understanding the dynamics of networks of excellence, *Science and Public Policy*, volume 33, number 4, May 2006

The aggregation of the situation of member states, including the community-level activities, provides a measure of the integration, i.e. of the ERA making, in three indicators.

The empirical work to be done: a detailed outline

In practice, the computation of the repartition of the public research funding in the various categories of integration is based on the identification of the various schemes, instruments, institutions which are implemented by the many actors of the research policy.

The task is therefore to identify the various modalities of “working together” at European scale and classify them in the research and innovation systems integration model presented above.

The second part of the paper will be a first attempt at such a categorization.

Conclusion

The ensuing discussion is devoted to a comprehensive discussion of the merits and limitations of the indicator, identifying possible avenues for its improvement.

We conclude with a tentative discussion on the role and place of the proposed indicators in the political process of constructing the ERA.