

The power of indicators: introduction to special issue on public project funding of research

Benedetto Lepori

THIS SPECIAL ISSUE presents the results of a number of studies that have been undertaken in the PRIME Network of Excellence and in ERAWATCH to characterise and compare public funding of research activities and, more specifically, project funding, broadly meaning funds allocated to research teams from external agencies to perform research activities limited in time, scope and budget.

The relevance of this issue in the framework of today's public debate on how to promote research activities at the national and European level is very clear, as well as the need to dispose of systematic comparisons of the different national funding systems and of their evolution over time. Also, there is a large body of literature in science policy studies dealing with the organisation of public research funding and debating the advantages and disadvantages of the models and organisational structures; sufficient to mention the debate concerning the need to provide enough support to basic investigator-driven research and to avoid too unilateral an orientation towards immediately useful research.

While building on this stock of knowledge and the conceptual models and categories developed by a number of authors (for which we refer to the theoretical part of the papers), our work has been based on an important methodological innovation — the

attempt systematically to produce a set of descriptors and indicators to compare funding systems quantitatively across countries and time. Since R&D statistics largely disregard the issue of characterising the allocation channels of public money, we have devised a specific methodology based on the collection of data from public budgets and funding agencies, and then their elaboration to provide comparative indicators. At the same time, project participants had to provide systematic and standard descriptions of the funding instruments, because we knew from previous work that the lack of this information in a usable form greatly impaired comparative work.

This methodological work took almost two years and is presented in detail in a companion paper published in *Research Evaluation* (Lepori *et al.*, 2008a): the reader should thus refer to it to understand the background of the figures presented here. It is, however, important to understand correctly the difference (and complementarity) between this work and the development of R&D statistics as undertaken by official bodies.

While the work of official bodies aims to construct a systematic set of data concerning research expenditures in a long-term and comparative perspective by collecting original data through surveys (Godin, 2005), our aim was more modest. It was to provide, through the *ad hoc* elaboration of existing data, the answer to some very specific and localised questions, such as comparing across countries the portfolio of public funding or measuring the evolution over time of its share in total public funding. Hence the indicators proposed in these papers are good examples of what we called 'positioning indicators', that is, ones aiming to characterise the position and linkages of the different actors in the national innovation systems (Lepori *et al.*, 2008b).

A second relevant feature of these indicators is that they are not meant to provide complete descriptions of the reality on their own, nor to be used

Benedetto Lepori obtained his degree in mathematical physics at the University of Rome in 1988 and a PhD in communication sciences at the University of Lugano in 2004 with a thesis on Swiss research policy. Since 1997, he has been responsible of the research office of the Università della Svizzera Italiana. His research interests cover Swiss higher-education and research policy, the production of S&T indicators, especially concerning research funding and expenditure, and the introduction of new communication technologies in higher education. He is co-ordinator of the indicators activities in the PRIME network of excellence and chair of the PRIME indicators conference series.

directly for analytical purposes (for example, through mathematical models), but rather as descriptors to support largely qualitative analysis using more conventional sources in science policy studies, such as documentary analysis or results of interviews. This means also that we did not develop a definitive set of indicators, but rather a (not necessarily completely coherent) set of data sources that can be combined to produce case by case the needed descriptors for the analysis, depending on the issues that are specifically raised. The reader will notice this flexible combination of data sources and qualitative information by comparing the different papers of this special issue.

The fact that the categories for the analysis depend critically on the underlying interpretation of the reality and thus that it is perfectly legitimate to revise them for producing alternative descriptions is nicely displayed by the paper of Thèves *et al* on France, where the authors show that the image of a very specific French research system, based on strong public research organisations, weak public universities and direct public funding of private companies, depends largely on the blind use of categories that do not reflect the profound changes in the system during the last two decades. Accordingly, the authors show that considering differently the position of the joint laboratories and the role of CNRS in their funding gives back an image of the French system much nearer to the practice of other European countries.

Two other papers in this special issue show the value of combining quantitative data with qualitative information for the analysis of specific aspects of public funding research. Slipersæter *et al* provide us with an in-depth discussion of the position of research councils and their responsiveness to changing political priorities in three countries — Austria, Norway and Switzerland. They demonstrate the intrinsic multidimensionality of the relationships among councils, policy and science, which can be understood only through the combination of different descriptors, including data on the composition of their portfolio of instruments, and the existence of distinct national trajectories in the considered countries.

Conversely, Potì and Reale use project funding data to test the hypothesis of the shift of delegation modes between state and science from blind delegation towards more directive modes from the state: this is an interesting case where indicators can be used to operationalise and test empirically theoretical models in science policy. Their finding is that changes in delegation modes have been more moderated and complex than usually assumed in the literature, with different national patterns and new modes emerging alongside the existing one. Both papers should thus encourage us to avoid any oversimplification and to look in a more differentiated

way at ongoing changes in science policies.

The helicopter view provided in the first paper of the special issue (which represents the result of a collective effort of the whole group) is exemplary of the value of having even very simple indicators to compare funding systems across countries and time. It provides us with the complex image of similarities between countries (concerning the share of project funding in total research funding, the main policy rationale, the palette of instruments), but inside a flexible model accommodating large national specificities in the share of instruments and beneficiaries and within which each country adopted a specific model to organise the funding allocation. This work allowed us to confirm empirically some widespread hypotheses, such as the increase in the share of project funding and a general shift from investigator-driven projects to thematic programmes. However, it demonstrates also that these common trends do not necessarily cancel out national specificities.

Finally, we included the paper by Dinges *et al* as a result of a study performed in the ERAWATCH project concerning specialisation of public vs private funded business R&D; this is a nice example of how new indicators can be produced to answer specific questions (thus looking to the different national specialisation in public and private funding of business R&D and to their correlation) using existing data sources, in this case exploiting the Organisation for Economic Co-operation and Development (OECD) database on business R&D.

We are aware that some of the data used for these analyses suffer from a number of limitations concerning their availability and quality; we do not think that our results are by any means completely conclusive and definitive. However, we think that they provide some useful advances in our knowledge of funding systems and, what is more important, demonstrate that, first, the combination of *ad hoc* quantitative indicators with theory and qualitative information can bring significant advances in our field and, secondly, that such indicators can be produced at a reasonable effort if the correct methodological choices are taken.

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Tel: +44 1483 824871
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