

**Programme on Innovation, Higher Education and  
Research for Development  
IHERD**

**Policy brief:**

**Public Research Funding Instruments**

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**Abstract**

*This briefing is intended to inform science policy and complement the extant available analyses of innovation-financing instruments with information about research financing and research-based, innovation-financing instruments. It provides classification and descriptions of key state-of-the-art funding instruments and modalities used to provide public support for research and innovation and analysis of these, with a view to assessing their impacts on key policy issues.*

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## What are the current trends in research and innovation funding?

The emergence of the knowledge society as a key motif of economic development and welfare has increased the focus on science and organisations that produce and fund science. One of the more significant impacts of this shift has been an increase in the proportion of funds competitively allocated to block grant funding. Another is the move towards increased research collaboration and internationalisation. For these and other reasons, research-funding instruments (arrangements for allocating money to research groups, individuals and organisations) and modalities (practical arrangements for implementing research-funding instruments) have become strategic issues in science, technology and innovation policy.

One of the most significant developments in research funding is the heightened importance and means of international collaboration. International collaboration has moved from being an optional issue to an imperative for achieving national science, technology and innovation policy goals. Furthermore, the nature of collaboration has changed: previously, international collaboration focused almost exclusively on the research community and on mobility from middle and low income countries to high income countries; at present, international collaboration includes cooperation among research funders (e.g. through joint programming and ERA-NET instruments). Several emerging economies such as Brazil, India and South Africa are employing international collaboration instruments aimed at South-South collaboration. That means that capacity in the administration and management of research funding is a key strategic competence.

## What are the current funding instruments?

*What are research-funding instruments? A research-funding instrument is taken to mean an arrangement for financing or disbursing money to research performers.<sup>1</sup> A research performer may be an organisation, an individual, a group of organisations or a group of individuals employed at different organisations. The most common types of research-funding instruments are block grants, projects and programmes. Some research funders may also employ additional instruments such as vouchers, grants and stipends. Funders funding not only research, but also innovation activities close to research, most commonly use the last three. For example, many research funders now provide proof of *concept funding*. This is funding intended to support work needed to demonstrate the commercial potential of a research finding. Typical activities included in proof of concept funding are business plan preparation and patent application. Many funders refer to proof of concept funding as a grant rather than a project, although there is frequently little difference between these two instruments, with the exception that grants almost always come free of co-funding requirements.*

Research funding is fairly standardised at least with respect to the types of instruments available to the funder. As a result, there is considerable overlap between the instruments deployed by public actors, and private research foundations. Furthermore,

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<sup>1</sup> A further ambiguity is that funders may employ different terminology to describe the same instrument. For instance, it is not uncommon to use the term “research grant” as a collective designation for all types of competitively allocated research funding. Thus a grant may in reality constitute funding for a project, programme or even a stipend.

corporate R&D also uses similar instruments. Regardless of the funder or the level at which the funding is distributed, funding will be allocated either for a project, a programme or, in the case of block grants, as direct budgeting support for salaries, and so on. Corporate R&D contexts also employ projects or programmes as funding instruments to support specific initiatives.

*Project funding:* the most well-known instrument, seen as a generic denotation for all types of competitive fixed-term resource allocation. Projects are usually short to medium-term and allocated funding competitively. They have well-defined target groups and usually require that the recipient give a detailed account of objectives, potential results and beneficiaries, as well as a time frame.

*Programme funding of a longer term nature:* usually refers to a portfolio of projects grouped together under one theme and conducted by a collaborating group of actors. Research funders may use the term to describe either a group of projects administered under a single heading or a group of projects from the recipient perspective.

*Grant:* a term that may refer to a specific instrument or to funding instruments in general. In its specific form, a grant differs from a project in terms of the degree of freedom allowed to the recipient and the degree of administration required by the funder. Many charitable foundations employ this instrument, but ministries and research councils may also make limited use of grants.

*Stipend:* a form of funding that usually does not have a detailed reporting component. It may be used as a complement to another funding instrument or as a stand-alone arrangement. Stipends are used mostly for the allocation of small sums and are often not renewed. Some funders use stipends to subsidise scientific trips, purchase small-scale equipment or similar.

*Voucher:* essentially an undertaking by the funder to reimburse a third party for expenses undertaken on behalf of the recipient.

## **What are the current funding modalities?**

*The term modality may be defined as the means or specifications used to operationalise/implement a funding instrument.* Research funders employ a very limited number of funding instruments. Funders choose to meet new needs and purposes by customising existing instruments to new purposes as they arise. These differentiations are made at the level of requirements, terms of reference and so on. Modality is the term used to refer to these differentiations during implementation. One example of a modality for project funding is whether the call for applications requires one or two steps. Dividing the call into two stages, usually with the first stage requiring an abbreviated version of the project gives the funding body an opportunity to narrow the selection field by excluding projects that do not suit the purposes of the call at an early stage in the process. This approach has the advantage of reducing the administrative burden of the call on the funding organisation and on applicants.

There are a range of framework conditions that decide on the kinds of modalities that are available to a funder. These conditions may be divided into level 1 and level 2. Level

Level 1 conditions refer to legal and structural issues such as the governance structure of the funding body, its mission, the nature of the R&D system it operates within, etc. For example, the Wellcome Trust which is a global charitable foundation operates under a different set of conditions from the Economic and Social Research Council in the UK which receives its funding from the Department of Industry and Business in the UK. Level 1 conditions influence operational issues such as modalities through their framing of possibilities such as potential recipients of funds, reporting regimes, etc.

Level 2 conditions refer to the close to operational aspects of the funding. These types of conditions are shaped by Level 1 factors and the objectives of the funding. For instance, if the funder wants to promote internationalisation, it would hardly be worthwhile to restrict the call to national recipients. Funders may however need to develop modalities that in principle allow them to circumnavigate Level 1 conditions. Internationalisation is a good funding objective to illustrate this. Most public research funders are not mandated to disburse funds to foreign bodies or nationals. A call to promote internationalisation in such a context would then employ the modality of requiring that foreign recipients be employed or partnered with a national body.

Modalities available are:

- One step call - Open call, no or very few limits on type of topics e.g. call for research in the natural sciences or humanities
- One step call- Thematic, for example global challenges
- Two-steps call, no limits on topics, very brief proposals in first step. 2nd step Full proposal
- Two-steps call, thematic focus, very brief proposals in first step. 2nd step Full proposal
- Restricted eligibility – proposals must include specific partners e.g. firms, public sector actors, international partners
- Co-financing – Applicants must be able to finance a previously agreed on percentage of costs of proposed research in order to be eligible for funding

## Objectives

Research funding instruments are often non-exclusive with the same instrument being employed for several purposes. Different purposes may also be clustered. The standard minimum set of objectives for research and innovation funding includes:

*Internationalisation:* funding dedicated to promoting contacts over national borders. This is usually a blend of strategic-oriented funding aimed at inducing specific types of internationalisation goals, historical and foreign policy linkages, aid and development policy goals and so on. This type of funding can have an important strategic dimension when connected to issues such as access to large-scale research infrastructure such as CERN (OECD, 2008).

*Career advancement:* funding aimed at young scholars, usually recent PhD graduates. This funding objective excludes PhD students because in most countries PhD education is treated as part of the tertiary education system. Career advancement is therefore strictly defined as promoting the choice of research as a

career after the PhD. Career advancement may also include special funding to promote the recruitment of disadvantaged groups or may be combined with internationalisation to promote the inflow of highly skilled labour. This category of funding may also incorporate an upper age limit (usually 40) beyond which the scholar is not eligible.

*Career renewal:* a new objective in many countries. During the era in which block grants dominated, it was assumed that universities, research institutes or national labs would take care of this function via their core funding. The increasing emphasis on internationalisation as well as the interest in stimulating university-industry collaboration has led research funders, such as the European Union, to include career renewal as a separate objective. A second motivation for this funding objective is to renew the skills of scholars who may have been less research active or lacked access to research possibilities.

*Capacity building (blue sky research, science driven):* usually reserved for funding directed at basic science research that is curiosity driven or intended to promote the development of a specific field or competence (e.g. nano technology, ICT, materials science). Countries may also choose to build capacity in a specific area of generic research (e.g. biotechnology) or a particular niche (e.g. agriculture-related bio-science).

*Strategic research:*<sup>2</sup> funding aimed at stimulating the research and innovation community to address a specific pre-defined area or areas of focus identified as a national priority. Funding intended to promote research on major challenges may be included in this category.

*Collaboration with industry/public sector:* promotes joint ventures between public research performers, industry and/or public sector. This may be intended to upgrade skills in industry, promote specific technological foci (e.g. precompetitive consortia) or address strategic priorities (e.g. major challenges).

*Commercialisation of academic research:* funding intended to promote science-based entrepreneurship. This category may include infrastructural support for entities such as technology transfer units, entrepreneurship courses, incubators and venture capital for university-based start-ups, as well as research and education.

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<sup>2</sup> This is also referred to in some contexts as *targeted research*; however, funders more commonly employ the term used in the text. In addition, all research funding is effectively targeted, which renders this terminology rather ambiguous.

**Table 1. Grouping of objectives, instruments and target groups**

<b>Funding objective</b>	<b>Instrument</b>	<b>Potential target groups</b>
Capacity building	Block grant, project, programme (thematic or open), Centre of Excellence (COE)	Research group, organisation,
Internationalisation	Stipend, project, programme, COE	Individual, organisation
Commercialisation	Award, expert support, venture capital	Research group, organisation, individual
Collaboration between public research organisation and industry	Voucher, R&D tax credit, programme, project, COE	SMEs, large firms
Strategic research (e.g. major challenges)	Project, programme, COE	Research group, individuals, UI consortia
Career advancement	Project, stipend	Young scholars usually recently graduated PhDs
Career renewal	Project, stipend	Senior research staff, R&D staff

## Peer reviews

A key issue to bear in mind is that all instruments are dependent on some type of selection process (e.g. peer review). This is a precondition for any of the instruments cited here except for R&D tax credits and vouchers. The ability to access peer review committees assumes that the funder has access to a network of potential reviewers. The search costs in terms of time may be quite high initially if funders do not themselves have access to large networks. The most common practice is to tap into existing networks of local academic groups through some institutionalised means. Funders differ in how they do this, but some common routines are to build disciplinary or area-based panels using the local research community. These panels may either be used for first instance reviews or to collect knowledge on international experts who may be suitable reviewers. A common problem in this respect is diversity. Funders have to find means of developing review panels that are sufficiently anchored in local tradition but also comprise international experts. Language and cost are the two most common obstacles.

Peer review is the oldest and most well respected form of review for research. However, it is not unproblematic and newcomers to the process of funding research should note that there are several complex issues with direct implications for practice. Most funding agencies invest in some type of basic knowledge of how peer review works and the pitfalls and advantages for their staff.

## Why engage in a strategic approach to R&D funding?

Recent attempts across all countries to adopt a more strategic attitude to public R&D funding suggests that there is increasing recognition of the need to develop a knowledge base, which can be used as a basis for identifying best practices and sustainable policy. More importantly, the larger the share of public R&D funding allocated through competitive means, the higher the costs of governance of the system. It is at this point that detailed knowledge of the pros and cons of different types of modalities becomes indispensable to funders (Guston, 2008; OECD, 2011). This is even more the case for relative newcomers to the process of funding research. In addition, modalities are

important for the strategic development and management of research funding because they determine the costs of administering and allocating funding.

### Worked example for funding agencies

Table 3. Worked example matching instrument and modality				
Instrument	Implementation (modality)	Objective(s)	Pros	Cons
Project	<i>One step</i> : open call, no or very few limits on type of topics (e.g. call for research in the natural sciences or humanities)	Capacity building	<ul style="list-style-type: none"> <li>Provides a good overview of what the scientific community wants to do</li> <li>No prior knowledge of the area required to prepare the call</li> </ul>	<ul style="list-style-type: none"> <li>Does not allow much steering of choice of topics by the agency</li> <li>Can be expensive and cumbersome to design a review process</li> <li>Can be time consuming depending on the size of the community</li> </ul>
Project	<i>Two step</i> : open call, no limits on topics, very brief proposals in the first step, full proposal for the second	Capacity building, strategic priorities, internationalisation	<ul style="list-style-type: none"> <li>Allows the agency some control in deciding which proposals get to the second round</li> <li>Reduces burden on reviewers allows better structuring of the review process</li> </ul>	<ul style="list-style-type: none"> <li>Some proposals will be disadvantaged by the shortened form</li> <li>Process can take much longer if the lead time between steps 1 and 2 is not very short</li> </ul>
Project	<i>One step</i> : structured call, limit on area of research, type of topic, extra conditionality (e.g. interdisciplinarity or industry collaboration)	Capacity building, strategic priorities, internationalisation	<ul style="list-style-type: none"> <li>Can be done fairly quickly depending on the area</li> <li>Allows more steering of research from extra scientific sources</li> </ul>	Requires a good grasp of the scientific area, knowledge of the local research landscape; and access to the international review committee depending on the narrowness of the specialisations and the size of the local research community
Programme	<i>One step</i> : thematic (e.g. global challenges)	Career development, capacity building, internationalisation, commercialisation, collaboration, strategic research	<ul style="list-style-type: none"> <li>Allows critical mass agglomerations</li> <li>Can attract researchers from outside the national context/facilitate recruitment</li> <li>Has potential for high visibility for the agency and low transaction costs</li> </ul>	<ul style="list-style-type: none"> <li>Requires additional review and monitoring procedures</li> <li>Can be risky</li> <li>Programme evaluation of the agency as well as the recipients may encourage low risk taking</li> </ul>

			<p>(few large programmes)</p> <ul style="list-style-type: none"> <li>• Can lead to path-breaking results</li> <li>• Can support groups that the academy may not otherwise support</li> <li>• Is ideal for promoting strategic research</li> </ul>	<ul style="list-style-type: none"> <li>• Can contribute to entrenching specialisations and groups that may otherwise not be sustainable</li> </ul>
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