International Landscape Study of Research and Innovation Systems

Annex report – country profiles

July 2019
International Landscape Study of Research and Innovation Systems

Annex report – country profiles

technopolis |group| July 2019

Peter Kolarz
Erik Arnold
Felix Dijkstra
Kalle Nielsen
Kristine Farla
# Table of Contents

Introduction .......................................................................................................................... 3  
1 Country template: Australia ................................................................................................. 4 
2 Country template: Austria .................................................................................................... 20 
3 Country template: Belgium (Flanders) ............................................................................ 28 
4 Country template: Canada ................................................................................................... 36 
5 Country template: China .................................................................................................... 44 
6 Country template: Czech Republic ..................................................................................... 51 
7 Country template: Estonia .................................................................................................. 60 
8 Country template: Finland .................................................................................................. 68 
9 Country template: France .................................................................................................... 77 
10 Country template: Germany ................................................................................................. 84 
11 Country template: Italy ...................................................................................................... 93 
12 Country template: Netherlands .......................................................................................... 102 
13 Country template: New Zealand ........................................................................................ 112 
14 Country template: Norway ................................................................................................ 117 
15 Country template: Portugal ................................................................................................ 125 
16 Country template: Singapore .............................................................................................. 131 
17 Country template: Sweden ................................................................................................. 135 
18 Country template: Switzerland .......................................................................................... 143 
19 Country template: UK ........................................................................................................ 148 
20 Country template: USA ..................................................................................................... 158
Introduction

This report is an annex to the ‘International Landscape Study of Research and Innovation Systems’, commissioned by Research England and carried out by Technopolis between November 2018 and February 2019.

This report contains information profiles of the research assessment and funding systems in 20 research-active nations, compiled via desk research and interviews with various stakeholders in each country, always including at least one representative of the organisation principally in charge of the main research assessment system in place.

The findings in the main report for this study are based on analysis of the country templates presented in this annex report.
## 1 Country template: Australia

### 1.1 Country: Australia

### 1.2 Population:
25m

### 1.3 GERD/GDP:
1.88%

### 1.4 GERD/GDP rank (/20):
13th

- There are 42 Australian Higher Education Providers (universities) recipients eligible for research block grants Australia (ED18/000792).
- The Group of Eight (Go8) comprises Australia’s leading research-intensive universities—The University of Melbourne, The Australian National University, The University of Sydney, The University of Queensland, The University of Western Australia, The University of Adelaide, Monash University and University of New South Wales (NSW) Sydney (https://go8.edu.au/)
- Other universities can be classified as following:
  - technical universities – four universities (University of Technology Sydney; Royal Melbourne Institute of Technology (RMIT) University; University of South Australia and Curtin University) represented by the Australian Technology Network (ATN)
  - other pre-1987 universities, including the Innovative Research Universities (IRU) network of seven universities
  - post-1987 universities
- Many research organisations (e.g. National Centre for Social and Economic Modelling (NATSEM) are part of universities.
- Health and medical research is undertaken by researchers in universities, independent medical research institutes and hospitals, as well as their partner organisations in industry and the wider community. There are 82 organisations approved to administer funding from the National Health and Medical Research Council (NHMRC), the Australian Government’s key funding agency for health and medical research.
- In 2018, 76% of NHMRC funding was administered by universities, medical research institutes accounted for 23% of funding and the remaining 1% of funding was administered by other organisations (including hospitals and government organisations).

### 1.5 Overview of RPO landscape

A dual funding system supports Australia’s university research system:

- Competitive research funding for the direct costs of research is primarily provided by the Australian Research Council (ARC) and NHMRC. Both are agencies of the Australian Government.
- In addition to and complementing NHMRC’s investment, the Medical Research Future Fund invests in health and medical research via four key streams: Patients, Researchers, Research Missions and Research Translation (excellence funding). The MRFF Strategy and priorities are outlined at https://beta.health.gov.au/initiatives-and-programs/medical-research-future-fund.
- Research Block Grants (RBG) fund the systemic costs of research, including indirect costs and scholarships for research training and is managed by the Australian Government Department of Education and Training. This funding provision is established under the *Higher Education Support Act 2003*. As of 1 January 2017, block grant funding
comprises two streams of funding, the Research Support Program (RSP) and the Research Training Program (RTP). This funding is awarded retrospectively based on research income generation and higher degree by research (HDR) completions. The RSP and RTP replaced six previous block grant schemes (refer to section 2.1 below).

- A proportion of Commonwealth research funding is also awarded by other agencies to support specific national objectives, including for example the Department of Industry, Innovation and Science to foster growth of Australian businesses.

2. Funding system overview

2.1 What are the main funding system components?

University researchers can apply for competitive funding from two primary funding agencies, the ARC and the National Health and Medical Research Council. Grants offered by these agencies, as well as some other government funding opportunities are listed on Grant Connect,¹ the Australian Government’s grant information system.

The ARC’s purpose is to grow knowledge and innovation for the benefit of the Australian community through funding the highest quality research, assessing the quality, engagement and impact of research and providing advice on research matters. The ARC supports the highest-quality fundamental and applied research and research training through national competition across all disciplines.

**Australian Research Council**

The ARC runs the following grant programs:

- The Discovery Program – supporting fundamental research
- Australian Laureate Fellowships
- Discovery Early Career Researcher Award (DECRA)
- Discovery Indigenous
- Discovery Projects
- Future Fellowships
- Linkage Program schemes – supporting industry research collaboration
- ARC Centres of Excellence
- Industrial Transformation Research Program
- Linkage Infrastructure, Equipment and Facilities
- Linkage Learned Academies Special Projects
- Linkage Projects
- Special Research Initiatives
- Supporting Responses to Commonwealth Science Council Priorities
- National Health and Medical Research Council

---

¹ [https://www.grants.gov.au/](https://www.grants.gov.au/)
NHMRC established a new grant program in 2019 that provides grant funding to improve health and medical research knowledge via a diverse portfolio of schemes that:

- Fund across the spectrum of health and medical research
- Invest in people with outstanding research achievement and promise across all career stages
- Support the most innovative research to solve complex problems
- Meet strategic objectives
- Minimise the burden on researchers of application and peer review

NHMRC provides Equipment Grants to all funded Administering Institutions and provides Independent Research Institute Infrastructure Support by NHMRC Administering Institutions.

The NHMRC grant program comprises of four funding streams:

1) Investigator Grants: consolidate separate fellowship and research support into one grant scheme to support the highest performing researchers at all career stages with funding for their salary (if required) and a significant research support package.
2) Synergy Grants: provide $5 million (AUD) per grant for outstanding multi-disciplinary research teams to work together to answer major research questions
3) Ideas Grants: support innovative and creative research projects of researchers with bright ideas at all career stages, including early and mid-career researchers
4) Strategic and Leveraging Grants: support research that address identified national needs. This includes:
   a) International collaborative schemes
   b) Targeted Calls for Research scheme, which provides one-off grants to address a specific health issue
   c) A dedicated funding stream for Clinical Trials and Cohort Studies
   d) The Centres for Research Excellence scheme to support teams of researchers to pursue collaborative research and build capacity in clinical, population health and health services.
   e) Development Grants scheme supports individual researchers and teams at the proof of concept stage that specifically drives towards a commercial outcome.
   f) Partnerships for Better Health to support and create new opportunities for researchers and policy makers to work together to translate research evidence into health policy and practice

NHMRC via its Postgraduate Scholarship scheme also supports health and medical graduates early in their career so they can be trained to conduct independent research.

NHMRC’s new grant program was established following a Structural Review of NHMRC funding and extensive consultations with the research sector. Further background and information on NHMRC’s grant program is available at https://nhmrc.gov.au/funding/new-grant-program/overview.
Further information on specific NHMRC funding schemes is available at https://nhmrc.gov.au/funding/find-funding.

Medical research institutes, some of which are affiliated with universities, are also eligible to apply for NHMRC funding. Additionally NHMRC provides infrastructure funding annually via two mechanisms, which both involve a calculation to determine the funding levels.

- Independent Research Institute Infrastructure Support Scheme funding is provided to NHMRC approved Administering Institutions that are independent medical research institutes (i.e. not affiliated with universities). Eligible institutions receive up to 20% of NHMRC awarded research funds in that year.
- Equipment Grant Scheme funding is provided to NHMRC approved Administering Institutions to facilitate procurement of equipment. Administering Institutions receive funds on a pro rata basis for the NHMRC grants they hold in a calendar year.

**Block Grant Funding**

In 2019, the Australian Government is allocating $1.92bn to 42 Higher Education Providers (HEPs) as block grants through two programs, the Research Training Program (RTP) and the Research Support Program (RSP).

The objectives of the RTP are to:

- provide flexible funding arrangements to support the training of domestic students and overseas students undertaking higher degrees by research (HDRs) at Australian HEPs
- deliver graduates with the skills required to build careers in academia and other sectors of the labour market
- support collaboration between HEPs and industry and other research end-users
- support overseas students undertaking HDR studies at Australian HEPs

The objectives of the RSP are to:

- provide a flexible funding stream to support the systemic costs of research by Universities, including the indirect costs of Australian competitive grant research
- support the delivery of world class research
- support collaboration between Universities and industry and other research end-users

As part of the National Innovation and Science Agenda (NISA), announced in 2015, the Australian Government implemented changes to RBG arrangements which have become effective from 2017 (for indicators see https://docs.education.gov.au/node/51896).

The RTP replaced three programs - Australian Postgraduate Awards (APA), International Postgraduate Research Scholarships (IPRS), and the Research Training Scheme (RTS).

The RSP replaced three other programs - Joint Research Engagement (JRE), Research Infrastructure Block Grants (RIBG) and Sustainable Research Excellence (SRE).

The block grant programs are designed to drive greater research-industry engagement by substantially boosting incentives for collaboration with business and organisations which use the outcomes of research.

The table below provides provisional figures. Based on this, ARC and NHMRC competitive funding amounts to 47% of total research funding and block grant funding amounts to 53% of total funding for research and training.

**Table 1 2018-19 Research and training budget / allocations (provisional figures)**

<table>
<thead>
<tr>
<th>Funding body</th>
<th>Programme</th>
<th>Budget in national currency, millions</th>
<th>Budget in Sterling, millions (Exchange rate 0.57)</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Research Council (ARC)</td>
<td>Discovery Program</td>
<td>$509</td>
<td>£282</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Linkage Program schemes</td>
<td>$274</td>
<td>£282</td>
<td>8%</td>
</tr>
<tr>
<td>National Health and Medical Research Council (NHMRC)*</td>
<td>Health and Medical Research Program</td>
<td>$883</td>
<td>£503</td>
<td>26%</td>
</tr>
<tr>
<td>Department of Education and Training</td>
<td>Research Training Program (RTP)</td>
<td>$1,027</td>
<td>£282</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>Research Support Program (RSP)</td>
<td>$894</td>
<td>£282</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$3,635</strong></td>
<td><strong>£1,411</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>
### 3. Assessment-based system components

| PRFS | 3.1 Approach | Requirements for institutions administering NHMRC funding:
| --- | --- | --- |
| |  | Applications for NHMRC funding and grants to researchers are administered through approved organisations (Administering Institutions). Organisations are required to demonstrate compliance with specific criteria and establish appropriate policies and procedures to:
| | | • Achieve high standards of research and ethical governance
| | | • Effectively administer and acquit Commonwealth funds
| | | • Ensure researchers comply with NHMRC requirements for responsible and ethical conduct of research, as well as reporting on research
| | | Further information, including a list of NHMRC Administering Institutions, is outlined at [https://nhmrc.gov.au/funding/manage-your-funding/nhmrcs-administering-institutions](https://nhmrc.gov.au/funding/manage-your-funding/nhmrcs-administering-institutions).
| | 3.2 Funding formula | n/a
| | 3.3 Rationale for PRFS | n/a

**Other Conditional funding**

| 3.4 Approach | Competitive funding by NHMRC and ARC is awarded based on a peer review process. All applications are reviewed, using defined assessment criteria and procedures, by other scientists in the field with appropriate expertise. Funding is then awarded on order of merit, within the allocated budget for each grant scheme.

**NHMRC Process**

Peer review processes for NHMRC grants are designed to support the objectives of each grant scheme and achieve high quality peer review while minimising the burden on applicants and peer reviewers. They generally involve independent assessments by peer reviewers in the first stage to ensure rigour, with any panel meetings (undertaken via videoconference or face to face based on scheme) focusing on shortlisted applications requiring discussion. An overall ranked list of applications is then determined based on overall scores, which is used as the basis for funding allocations.

**Assessment criteria**

The assessment of the Investigator and Synergy Grants schemes primarily focus on the track record of the applicant, relative to opportunity. The peer review of Ideas Grants will focus primarily on the science, innovation and significance of the proposed research. Assessment criteria for the Strategic and Leveraging Grants stream vary by scheme.
Table 3: NHMRC grant program assessment criteria

<table>
<thead>
<tr>
<th>Investigator Grants</th>
<th>Synergy Grants</th>
<th>Ideas Grants</th>
<th>Strategic and Leveraging Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track Record (70%)</td>
<td>Track Record (40%)</td>
<td>Research Quality (35%)</td>
<td>Varies with scheme</td>
</tr>
<tr>
<td>Publications (35%)</td>
<td>Publications (35%)</td>
<td>Innovation &amp; Creativity (25%)</td>
<td></td>
</tr>
<tr>
<td>Research impact (20%)</td>
<td>Research impact (20%)</td>
<td>Significance (20%)</td>
<td></td>
</tr>
<tr>
<td>Leadership (15%)</td>
<td>Leadership (15%)</td>
<td>Feasibility (20%)</td>
<td></td>
</tr>
<tr>
<td>Knowledge Gain (30%)</td>
<td>Knowledge Gain (30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Synergy (30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>comprises team diversity and collaboration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For further information on peer review processes in NHMRC’s grant program, see [https://nhmrc.gov.au/funding/new-grant-program/peer-review](https://nhmrc.gov.au/funding/new-grant-program/peer-review).

**ARC Process**

The ARC provides funding to the 42 HEPs and the Australian Institute of Aboriginal and Torres Strait Islander Studies. ARC does not provide funding directly to individual researchers.

Block grant funding is allocated retrospectively to 42 eligible HEPs, based on a funding formula.

---

3.5 Funding formula or allocation key

The funding drivers for RBG allocations from 2017 are set out in the NISA and the Review of Research Funding and Policy Arrangements.

RGB funding formula:

- RTP funding is allocated to institutions on the basis of
  - 25% from Australian competitive grant research
  - 25% from industry and other research income
  - 50% from HDR student completions

- RSP funding is allocated to institutions on the basis of
  - 47.2% from Australian competitive grant research (as listed on the Australia competitive grants register)
  - 52.8% from industry and other engagement research income

“The funding drivers and weightings for the 2017 RBG allocations are set out in the diagram below. Data will continue to be averaged over two years consistent with current arrangements” Australian Government (2016) Because this is a new funding formula, transitional arguments (a safety net) are in place until 2020.
NHMRC Funding Allocation

NHMRC funding is primarily administered from a special Medical Research Endowment Account established under the National Health and Medical Research Council Act 1992. Allocation of funding across schemes is determined based on advice of NHMRC’s Research Committee and Council to NHMRC’s Chief Executive Officer (CEO). The grant applications to be funded are determined based on peer review assessment and subject to Ministerial approval (following the NHMRC CEO’s recommendation).

Note: Approximate funding allocation for the 2018-19 period is $883 million. Percentage values are estimates and subject to change.

The system: Excellence in Research for Australia (ERA) evaluates the research undertaken at HEPs. ERA aims to identify and promote excellence across the full spectrum of research activity, including discovery, experimental and applied research within Australian higher education institutions”. (ARC, 2017)

The objectives of ERA are to (ARC, 2017)

- Continue to develop and maintain an evaluation framework that gives government, industry, business and the wider community assurance of the excellence of research conducted in Australian higher education institutions
- Provide a national stocktake of discipline level areas of research strength and areas where there is opportunity for development in Australian higher education institutions
- Identify excellence across the full spectrum of research performance
- Identify emerging research areas and opportunities for further development
Allow for comparisons of research in Australia, nationally and internationally, for all discipline areas.

In December 2015 the Australian Government announced under its National Innovation and Science Agenda (NISA) a new national research assessment exercise for Australian universities, which would complement ERA. The Engagement and Impact (EI) assessment, examines how universities are translating their research into economic, environmental, social and other benefits. It aims to create incentives for greater collaboration between universities and industry, as well as other research end-users.

In 2017, the ARC conducted a pilot of the Engagement and Impact (EI) Assessment methodology, including testing of quantitative and qualitative measures of engagement and impact. This informed the development of the first national assessment in 2018, which ran alongside ERA.

The objectives of EI are to:

- Provide clarity to the Government and Australian public about how their investments in university research translate into tangible benefits beyond academia
- Identify institutional processes and infrastructure that enable research engagement
- Promote greater support for the translation of research impact within institutions for the benefit of Australia beyond academia
- Identify the ways in which institutions currently translate research into impact.

**EI Method:** Metrics and narratives are assessed and rated by panels of researchers and industry experts, who assign ratings on a three-point scale. Submission components include:

- **Engagement:** An engagement narrative, engagement indicators relating to research income and cash support from end users, and additional quantitative indicators as nominated by the submitting institution
- **Impact and Approach to Impact:** Narratives describing research impact and the university’s approach to supporting the translation of research into impact beyond academia.


**ERA Method:** A range of metrics and peer review are used (depending on the discipline) - Research Evaluation Committees (RECs) evaluate and rate Units of Evaluation (UoE). RECs consist of experienced, internationally recognised experts. Three broad categories of indicators inform their evaluations (ARC, 2017):

1. **Indicators of research quality** - Research quality is considered based on citation analysis, or ERA peer review (depending on the discipline), and other supporting quality indicators. The research quality indicators are the key drivers of ERA ratings; the other two categories of indicators are used as supporting information.
2. **Contextual indicators of research activity** - Research activity is considered based on research outputs, research income and other research items within the context of the profile of eligible researchers.
3. **Indicators of research application** - Research application is considered based on research commercialisation income, patents, plant breeder’s rights, registered designs, and National Health and Medical Research Council (NHMRC) endorsed guidelines. Other measures, such as publishing behaviour and some other
categories of research income, can also provide information about research application.

**Unit of Assessment:** Field of Research at the Institution. ERA and EI evaluate research by discipline / Fields of Research (FoR) (ARC, 2017). FoR are defined by the Australian and New Zealand Research Classification (ANZSRC). All FoR of institutions are evaluated if the low volume threshold is met, ensuring that meaningful levels of data are evaluated. For ERA research is evaluated at a four-digit and at a two-digit FoR level (refer to ANZSRC for an explanation of the four and two-digit levels). EI Units of Assessment are assessed for engagement, impact, and approach to impact at the two-digit FoR level. There are 22 two-digit FoR. Institutions must submit all information for all eligible researchers and all eligible research items produced within the ERA 2018 reference periods. Institutions must submit this information even when it relates to UoEs which do not meet the low volume threshold. Institutions must submit EI engagement, impact and approach to impact for all UoAs which meet the low volume threshold, unless they submit a request not to be assessed (for impact studies only) for an allowable reason.

Since January 2017 ERA is no longer used to inform funding allocation. EI does not inform funding allocation.

### 4. History & effects

**Submission and administration of ERA:**

“Research quality as a key emphasis stems from the 1990s, when research evaluation was such that quantity of outputs was rewarded, leading to an increase in research outputs in Australia, but a drop in quality as measured by citations. To address this problem, evaluation systems focused more on quality than quantity were established, resulting first in the Research Quality Framework (RQF), which in 2008 was then replaced with the ERA” (Acil Allen Consulting, 2013)

A first full ERA round was launched in 2010 and the results were published in early 2011. This was followed by three rounds in 2012, 2015 and 2018 respectively (ARC, 2019). (JRC, 2016). There have been a number of minor changes to the ERA submission guidelines since ERA 2015. The changes made are limited to changes to the structure of submission stages, changes in the process of evaluation, changes to the data to be collected form institutions (e.g. ‘if an institution knows an individual researcher’s ORCID, they must include it in their ERA data’), and to textual clarifications.

**Changes to block funding instruments**

On 7 December 2015, the Australian Government announced new Research Block Grant (RBG) funding arrangements for HEPs as part of the National Innovation and Science Agenda (NISA). These arrangements combined existing RBGs into two programs, the Research Support Program (RSP) and the Research Training Program (RTP). The Research Training Program (RTP) replaced three programs - Australian Postgraduate Awards (APA), International Postgraduate Research Scholarships (IPRS), and the Research Training Scheme (RTS) and the Research Support Program (RSP) replaced three other programs - Joint Research Engagement (JRE), Research Infrastructure Block Grants (RIBG) and Sustainable Research Excellence (SRE).

It was decided that research income and higher degree by research (HDR) student completions will be retained as a driver of RBG funding from 2017.

As of 2017, “research publication counts have been removed from the funding formulae along with HDR student load and the SRE funding moderators - Excellence in Research for Australia (ERA) ratings and transparent costing data”. (Australian Government, 2016)

Research quality, as measured through ERA, is no longer used to inform funding allocations of block grants. However, the Australian Government does allocate block
Grants to universities using program-specific formulae that rewards the performance of each university for the amount of research income they attract and the number of completed postgraduate research degrees.

**Response to the changes**

While ERA only ever informed a small proportion of the block grants (for example less than 5% of SRE funding and 0.6% of total block grant funding in 2016), removing the ‘ERA performance as a funding driver’ was not endorsed by all stakeholders. In May 2016, the Australian government consulted with universities and other stakeholders on new guidelines and changes to HEP reporting requirements. As part of this consultation, universities and other stakeholders were asked to put forward view on what information HEPs could best provide to “best demonstrate value for money and performance under the RSP.” In its response, one university acknowledged the importance of accounting for the performance of funding but found that the ERA was best placed to measure performance. The Group of Eight Australia (2016) response to the changes was as follows:

“One of the stated key objectives of the current reforms is to support the delivery of world class research. As such, results from Excellence in Research for Australia (ERA) – Australia’s respected international benchmarking of research performance – should be a key indicator in the Research Support Program block grant. The previous use of ERA in the allocation of (part of) the SRE block grant was cumbersome and opaque and the current reforms seem to be a missed opportunity to include ERA performance in a simplified and more meaningful manner. These reforms also represent a missed opportunity to include ERA results as an indicator in the allocation of research training funding – as advocated by the Go8 in the response to the review of the research training consultation” While Category 1 income earned is widely consider a proxy for research excellence it is, at the end of the day, an input measure to research and not a designed performance measure of research, as is ERA.”

Australian Government (2016) defended the changes made proposing that the changes simplify the allocation of block grant funding and improve the transparency of funding outcomes. It acknowledged that “there has been some concern raised about the removal of research publication counts from the RBG formulae” but argued that: “this data only drives 7.4 per cent of total funding under the current arrangements. Research publications will remain an important indicator of research quality in the ERA process, in the awarding of competitive research grants, and in overseas HEP global ranking systems which are heavily influenced by research performance including publication outputs and citations.” (Australian Government, 2016. Consultation paper - Sharper incentives for engagement: New research block grant arrangements). In addition, the ARC has found that as a reputational mechanism ERA has and continues to drive behaviour change in the higher education research sector towards improving research quality.

**NHMRC’s new grant program:**

NHMRC’s grant program has been restructured to:

- Encourage greater creativity and innovation
- Provide opportunities for talented researchers at all career stages to contribute to the improvement of human health and
- Minimise the burden on researchers of application and peer review so researchers can spend more time producing high quality research.

Key differences between the current and previous grant program are:
- Replacement of NHMRC’s three largest schemes (Project Grants, Program Grants and Fellowships) with Ideas, Synergy and Investigator Grants, respectively.
- Funding – A greater proportion of the overall budget (MREA) is allocated to individual researchers via the Investigator Grants scheme, specifically from about 16% (salary only via preceding Fellowships initiative) to about 40% (salary and research support package).
- Capping - Stricter limits on the number of applications and grants held by each researcher.

Key strengths of the preceding program that will be continued under the reformed structure include:

- Support excellence across the health and medical research spectrum, taking into account performance measures such as significance and scientific quality of research proposals and the track record/capability of the investigators to deliver research outcomes.
- Opportunities across all four broad research areas (Basic Science, Clinical Medicine and Science, Health Services Research and Public Health).
- Award funding based on rigorous independent peer review of applications to ensure transparency, probity and fairness.

Dedicated initiatives that address national identified needs and strategic objectives (via the Strategic and Leveraging Grants stream).

<table>
<thead>
<tr>
<th>Positive effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>A report was published in 2013, detailing the benefits of the ERA. It found numerous benefits arising from ERA, including:</td>
</tr>
<tr>
<td>• Improved ability to attract and retain international students and academic staff</td>
</tr>
<tr>
<td>• Encouraging new partnerships with other researchers and industry</td>
</tr>
<tr>
<td>• Enhancing the economic, social, cultural and environmental benefits of research</td>
</tr>
<tr>
<td>• Increasing the number of high-quality publications and attaining greater international recognition (Acil Allen Consulting, 2013)</td>
</tr>
<tr>
<td>A more recent ARC survey of the websites of ERA participating universities showed that about 22 per cent of institutions referenced ERA in their strategic planning documents and about 54 per cent referenced ERA in their annual report of performance. In addition, more than 90 per cent referred to ERA and/or their ERA performance on their website (ARC, Annual Report 2017-18, p 42).</td>
</tr>
<tr>
<td>Further, the information collected through ERA submissions and published by the ARC in its reports shows that ERA provides comprehensive longitudinal data on research inputs (including staffing and research income), outputs and quality, allowing insights into Australia’s research system not readily available through other existing public and government collections. This includes discipline-based researcher and gender data, national growth and decline of research activity by discipline, changes in publication trends, and changes to interdisciplinary practices over time.</td>
</tr>
<tr>
<td>Finally, the claim that ERA has helped drive a focus on research quality in Australia’s universities is supported by the general increase in the overall performance of the Australian university sector across each ERA round—as measured in ERA ratings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butler (2003) argued that before the launch of the ERA, research was evaluated based on the quantity of research publications and income and, in relation, there was an increase in the journal publication productivity and a decline in the impact or the...</td>
</tr>
</tbody>
</table>
quality of the research output. She reported that research institutes were under pressure under such a system to produce (and report) relatively large research volumes (books, chapters, etc.) and that this ‘publish or perish’ culture had a negative side effect on the quality of research and can generate substantial pressure on researchers; especially young researchers that have more job uncertainly. ERA was introduced specifically to address this issue, with its focus on research quality (regardless of the size of the unit of evaluation) and not quantity.

Martin (2011) argues that the ERA is:

- Counting inputs as outputs - “In Australia, grant successes seem to be treated as a measure of research success more than most other countries (Allen 2010). Peer review of grant applications is one measure of quality, but grant monies themselves are inputs to research, not outputs. ERA continues the emphasis on grants. Big grants are seen as more prestigious, even when there are no more outputs”
  - Note that in ERA ratings are based primarily on quality of research outputs, research income is a supporting indicator.

- Discouraging interdisciplinary research – “ERA categories are built primarily around disciplines. Interdisciplinary researchers often publish in a range of journals. Their outputs are spread over several different research codes, thus weakening a university’s claim to have concentrations of excellent research. The result is that more narrowly specialised research is encouraged at the expense of cross-disciplinary innovation.”

- Susceptibility to misuse – “ERA is supposed to be used to measure the performance of institutions and research groups, not individuals. However, it did not take long before university managers began enforcing ERA-related measures on individual academics, for example by rewarding those who published in A and A* journals or brought in research grants. Academics are at risk of missing out on appointments or promotions, or even losing their jobs, if their performance falls short in ERA measures, no matter how outstanding they might be otherwise”
  - Note that external quality ratings such as A and A* journal publications are not used as indicators in ERA. The ERA journal rankings were removed from the ERA methodology followed ERA 2010 in response the perverse incentive it was creating in the university sector.

NHMRC’s grant program

The Structural Review of NHMRC’s grant program identified that there was an opportunity to optimise the funding structure, including underpinning assessment components to:

- Encourage greater innovation and creativity in research
- Minimise the burden on researchers of application and peer review so that researchers can spend more time producing high quality research
- Provide opportunities for talented researchers at all career researchers to contribute to the improvement of human health.

The new grant program is being progressively rolled out in 2019 and NHMRC is in the process of implementing an evaluation framework to assess the performance of the program, including assessment components, against the above key aims.
5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance-and assessment-related elements of the funding system?

The ARC provides research funding through its National Competitive Grants Program (NCGP), assesses the quality, engagement and impact of research (through ERA and EI), and advises the Australian Government on research matters.

NHMRC’s purpose is to fund high quality health and medical research and build research capability, support the translation of health and medical research into better outcomes and promote the highest standards of ethics and integrity in health and medical research. NHMRC funds across the full spectrum of research relating to health and medicine, from basic science to clinical, public health and health services research.

The Research Block Grants (RGB) program for the systemic and indirect costs of research and research training is managed by the Australian Government, Department of Education and Training.

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

- The ARC routinely consults stakeholders and reviews the ERA process before and after each round. In addition, the Acil Allen Consulting (2013) Benefits Realisation Review of Excellence in Research for Australia. Final Report. Report to the Australian research Council, 27 September 2013, was also a review of the impact of ERA on the university sector.

- In preparation for the Excellence in Research for Australia (ERA) 2018, the ARC undertook a range of consultation activities. (see https://www.arc.gov.au/excellence-research-australia/era-consultations)

- The ARC released the draft ERA 2018 Submission Guidelines for public consultation.

- “The ARC also reviewed the Draft ERA 2018 Journal List in consultation with Australian Higher Education Providers and peak bodies and disciplinary groups. The ERA 2018 Journal List is designed for the sole purpose of supporting ERA 2018. The list provides components that will be used in the ERA 2018 methodology, including: defining the eligible Fields of Research (FoR) codes that research outputs may be assigned during the submission phase; and defining the publication outlets from which the citation benchmarks are derived”.

- Changes to Research Block Grant (RBG) funding arrangements draws on recommendations set out in:
  - The Watt Review (2015, Review of Research Policy and Funding Arrangements), which recommended that research funding should place greater focus on driving research-industry collaboration, and to simplify the funding drivers.
  - The ACOLA Review (Australian Council of Learned Academies review of Australia’s Research Training System) – a review of Australia’s research training system, to “ensure that it meets the country’s research needs in the 21st-century”.

**NHMRC’s ‘Measuring up’ report**

Bibliographic citations are the referencing of a journal article in a subsequent journal article, indicating some scientific impact of the original work. NHMRC has published the Measuring Up report, a detailed analysis of the impact of NHMRC-supported journal publications.

The citation rate of journal articles resulting from NHMRC-funded research is benchmarked against the world citation average in relevant disciplines. Key findings spanning the 2005-2009 period were:

- NHMRC-supported publications received 60% more citations than the world average.
• In all fields and sub-fields, NHMRC-supported publications had a relative citation impact above that of other Australian health and medical research publications that were not supported by NHMRC funding

• Nearly 40% of NHMRC-supported publications involved international collaborations, with over 110 countries.


Research commercialisation and clinical improvement outcomes

NHMRC is developing a new capability that will enable reporting on outcomes that include commercial and clinical improvement outcomes. NHMRC is piloting a partnership model that enables data scraping and linkage to be used to find outcomes that are beyond grant acquittal. The pilot phase has produced two case studies that focus on commercialisation and can be found at https://nhmrc.gov.au/about-us/news-centre/case-studies-highlight-australian-research-successes.

National strategic review

A Strategic Review of Health and Medical Research in Australia was undertaken in 2013, resulting in 22 recommendations and a long term vision for the health and medical research sector. The Recommendations have informed changes to NHMRC’s grant program.

Broad findings related to outcomes of NHMRC funded research were that:

• NHMRC supported research has a particularly high standing and accounts for a significant number of the country’s most highly cited publications.

• Increases in NHMRC grant expenditure and processes over the previous decade had resulted in increased research quality and delivered significant outcomes.

• NHMRC project grants and other funding schemes leveraged over $800 million of international funding, largely due to the increased quality of research being delivered through competitive granting schemes.

Review of NHMRC grant program

The Structural Review of NHMRC’s Grant Program (2016) identified that the previous program had served Australia well, supporting the development of a highly productive, internationally competitive medical research sector, which has produced high quality research and made major contributions to the understanding of health and disease and the improvement of human health.

It, however, also noted that the system was under increasing pressure due to increasing application numbers, which was having a range of negative effects on health and medical research. For example:

• Researchers were spending a substantial period each year preparing or reviewing grant applications that will not funded, despite many being of high quality.

• Early and mid-career researchers are being discouraged from pursuing a research career.

Applicants may be more likely to propose, and peer reviewers more likely to favour, ‘safe’ research to the detriment of innovation.

5.3 Which stakeholders/organisations had input into review/evaluation activities?

For ERA and EI, Higher Education Providers and other stakeholders, including university cohort groups, discipline peak bodies and representatives of industry and other research end-user groups are consulted as part of range of consultation processes.

The Structural Review of NHMRC’s Grant Program was conducted by the Office of NHMRC, with advice from an Expert Advisory Group, NHMRC Principal Committees
and NHMRC Council. A consultation paper was released for public comment, national public forums were conducted and over three hundred written submissions received. The Strategic Review of Health and Medical Research involved:

- national public consultations across states and territories
- specific consultations with universities, medical research institutes, governments, hospitals, businesses and not-for-profit organisations, and
- submissions from organisations and individuals.

6. Additional points of interest

The 2018/19 budget of ARC for managing the ERA and EI amounts to $5m (£2.8m) in administered expenses. Administered expenses in 2017-18 were $4m and the 2019-20 administered budget is just over $3m. (ARC budget statements).

7. Sources

7.1 Public documents of interest

- Australian government (2016) Sharper incentives for engagement: New research block grant arrangements for universities Consultation Paper
- University of Melbourne. Sharper incentives for engagement: New research block grant arrangements for universities
- Strategic Review of Health and Medical Research (2013)
- Public consultation on the Structural Review of NHMRC’s Grant Program
- Watt Review (2015), Review of Research Policy and Funding Arrangements

7.2 Interviewees

- Sarah Howard, Branch Manager, Research Excellence Branch, ARC
- Kylie Emery, Branch Manager, Policy and Strategy Branch, ARC
2 Country template: Austria

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>8.8m</td>
<td>3.05%</td>
<td>3rd</td>
</tr>
</tbody>
</table>

1.5 Overview of RPO landscape

- 22 public universities (around 300,000 students enrolled in total, 2013/14)
- Three major public research institutes: the Austrian Institute of technology, the Austrian Academy of Sciences and IST-Austria
- 21 universities of applied sciences (Fachhochschulen) (around 43,500 students enrolled in total, 2013/14)
- 9 public and 8 private University Colleges of Teacher Education (Pädagogische Hochschulen) (around 15,000 students enrolled in total, 2013/14)
- 14 private universities (around 14,600 students enrolled in total, 2017/18)
- Several smaller, regional or sector-specific research institutes

1.6 Brief summary/system description

Austria does not have any institutionally formalised national assessment systems. However, via their performance contracts with the Ministry, research performing institutions are obliged to self-evaluate, and best-practice sharing between institutions is increasingly leading to a relatively standardised approach across the board, typically involving site visits and institutional review by international peers, as well as bibliometric analysis. Especially during the talks within the negotiation processes for the performance agreements are dedicated to questionnaires, “challenges”, objective settings and benchmarking exercises – but corresponding to the very diverse institutional landscape on an individualised basis.

The Universitätsgesetz of 2002 established the full autonomy of higher education institutions in Austria. At the same time, Austrian HEIs receive a comparatively large share of funding in the shape of institutional funding. To ensure transparency of the public money spent, the majority of institutional funding to universities and the major research institutes is tied to performance contracts, which include commitments to institutional evaluation. A further part of funding has been based on various indicator-based formula-funding systems. This part in particular has been modified over time, with the intention of ensuring a degree of steering, so that the HEIs better reflect wider government science strategies. The indicators used for this have not generally related to research assessment as such.

In 2019 a new university funding model started (“Universitätsfinanzierung NEU”) which works with around 55% indicator-based funding components.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

No

Primary responsibility for science funding in Austria lies with the Ministry for Economy, Science and research (BMWFV). It supports the Austrian Science Fund (FWF) and the innovation...
agency FFG who are the main providers of competitive funding, and also provides institutional funding to the public universities and the three main public research institutes (for the AIT: BMVIT). Institutional funding for the Universities of applied sciences and other research performers is distributed through a range of federal, regional and private channels in various ways.

Institutional funding to public universities and the main research institutes respectively differ in detail, but follow the same broad approach:

The majority of funding comes as a block grant, contingent on a performance contract negotiated with each individual institution. Internal quality assurance and institutional evaluation processes (and audit of those processes) are part of the performance agreements. Failure to fulfil contractual obligations can affect the agreed funding amount for subsequent funding rounds.

Until recently, a smaller part of the institutional funding is performance-related, based on a funding formula comprised of a formally broad, and now much narrower range of performance indicators. However, in 2019 a new university funding model started (“Universitätsfinanzierung NEU”) which works with around 55% indicator-based funding components.

### 2.3 Shares of funding allocated through the main mechanisms

Austria has amongst the highest shares of institutional funding of any country features in the literature:

- 27% project/competitive funding
- 72% institutional funding
  - In the original system, the ‘formula budget’ 80% was distributed via block grants w/ performance contracts and the remaining 20% via formula based on key performance indicators. These proportions are the same for the public universities and the three main research institutes, though the latter have different sets of indicators.
  - During the past 6 years, a new formula budget was used, the ‘Hochschulraum Strukturmittel’, which accounted for only 7-8% of the institutional funding.
  - The newest version, ‘Universitätsfinanzierung NEU’, launched for 2019, now accounts for 55% of institutional funding.

**Snapshot outline of the funding system:**

- Ministry for Economy, Science and Research
- Austrian Science Fund (FWF)
- Other funders (e.g. FFG)
- Various procedures
- Various other institutions
- Institutional funding: 72%
- Competitive (project) funding: 27%
- Block grant (Performance contracts)
- Formula funding (KPIs)
- Public Universities
- Three major research institutes
The Austrian Science and Innovation system in detail:

Source: ERAWATCH Country Page Austria

3. Assessment-based system components

<table>
<thead>
<tr>
<th>3.1 Approach</th>
<th>n/a</th>
</tr>
</thead>
</table>

3.2 Funding formula | n/a |

3.3 Rationale for PRFS

n/a

[Performance contracts including obligations to evaluate and ensure quality assurance were intended as a necessary mechanism to ensure transparency and accountability following establishment of universities’ autonomy in 2002. Inclusion of an indicator-based performance aspect was introduced to ensure that universities would reflect national science strategies, despite their autonomy.]
Formula funding based on performance indicators

The 7-8% of institutional funding allocated to universities through performance indicators during the past 6 years as ‘Hochschulraum Strukturmittel’ was determined through the following indicators for the years 2013-15, with indicator 4 removed subsequently:

- Indicator 1: Exams – Number of exams operated in Bachelor, Diploma and Master studies, weighted by subject
- Indicator 2: Graduates – Number of graduates in Bachelor, Diploma and Master studies, weighted by subject. For inter-universities degrees, the graduate counts as 0.5 for each university involved
- Indicator 3: Transfer of knowledge – External funds for R&D projects collected from the private sector, foundations and others, both nationally and internationally (grants and contracts)
- Indicator 4: Private donations – External funds collected as donations from privates, companies, foundations and others, both nationally and internationally
- Indicator 5: Cooperation – projects that intend to increase universities’ cooperation activities (internally and externally with partners from industry, Fachhochschulen and other partners).

The figure below shows the indicator suite used for the new funding model in effect as of 2019, the ‘Universitätsfinanzierung NEU’:

Performance contracts

The remainder of institutional funding is based on a performance agreement (Leistungsvereinbarung) between the Ministry and the individual universities. The performance agreement is a public contract that stipulates the activities of universities and the federal government. The contracts run for a period of three years. Negotiations between the universities and the ministry (as representative of the federal level) start a year in advance.

National strategies influence universities’ own institutional development plans, along with each institution’s particular strengths and emphases. The literature suggests that the process of negotiating and writing performance contracts has become increasingly professionalised since the first agreement round in 2006/07, with increasingly standardised templates and sections. According to the current version of the university act the universities have to address the following issues in their performance agreements:
- Strategic goals, profiling, further development of the university and its human resources
- Research, advancement and appreciation of the arts
- Teaching and (further/postgraduate) training
- Policies to reduce drop outs among students
- Improvement of student/staff ratio
- Special offers for working students
- Societal needs (knowledge transfer)
- Strengthening of international orientation and mobility of staff and students
- Cooperation with other universities
- Definition of indicators that allow to measure the achievement of the performance agreement.

Universities and government remain in contact throughout the contract period to discuss the ongoing implementation of agreements’ goals.

**Institutes:**

The Austrian Academy of Science receives its institutional funding through a performance contract covering the entire institutional funding from the Federal Ministry of Science.

Austrian Institute of Technology (AIT) receives its institutional funding through a performance contract with the Ministry of Transport, Innovation and Technology covering the entire public institutional funding. BMVIT is also the major shareholder of AIT.

IST Austria was founded by law in 2006 and established as a greenfield investment. Funding is granted through long-term funding agreements lasting until 2026. There are two providers of institutional funding: the Province of Lower Austria finances the infrastructure (construction and maintenance), and the Federal Government represented by the Ministry of Science for all other costs. This part of the funding is partly conditional and indicator based: A maximum amount of money was set aside for a period of 10 years (2007-2016), broken down into annual appropriations. Two thirds of each annual appropriation are paid unconditionally. The size of the remaining share equals the amount of third-party funding (grants, donations) IST Austria has received in the year before.

### 3.5 Funding formula or allocation key

The weightings for the indicators used to distribute Hochschulraum Strukturmittel funding are as follows (2013-15 period specifically):

- Indicator 1: Exams – 60%
- Indicator 2: Graduates – 10%
- Indicator 3: Transfer of knowledge – 14%
- Indicator 4: Private donations – 2%
- Indicator 5: Cooperation – 14%

### 3.6 Other assessment activities

In Austria, there is no uniform research evaluation system in place at the national level. However, as part of their performance contracts, each university is obliged to undertake institutional evaluations. Probably the single most important advantage of a decentralised evaluation system is that it is capable of dealing with differences among research organisations and between disciplines, as the evaluation can be tailored to the institutional and disciplinary culture and its publishing and other academic habits. The strategic objective of evaluation in this context is quality assurance. This does not only
consider research itself: evaluations cover research, but also teaching and administration etc. Additionally, these evaluations provide information for improvement of the university services, operations and governance and decision making by the university management – in short, for organisational development.

There is no standard prescribed evaluation methodology for Austrian public universities. In general, each university uses a mix of methods for evaluating research and researchers. However, our consultations suggest that universities have generally increased their self-evaluation and monitoring capabilities and that there is increasing contact and sharing of best practice between various institutions’ evaluation units. This has meant that approaches increasingly appear to converge.

The most commonly used method for evaluating research is some kind of informed peer review procedure. Their design may vary in detail, but the key steps of these peer evaluations are:

- Self-evaluation of the evaluation unit (e.g. a department) based on a structured template and on quantitative and qualitative data (human resources, budgets, students, publications etc.).
- Site visit of (mainly international) peers (typically 2-3 days)
- Written report by the peers

Increasingly, universities also rely on metrics including bibliometrics, i.e. on indicator based-systems; these systems typically include publication data and third-party funding as well as different other indicators, e.g. editorships, prizes and awards, scholarships etc. These data are normally included in the information provided to peers in peer review processes as well.

To control the realisation of the performance agreements, universities also have to report on their performance for a number of indicators and on the goals stated in the performance agreement in the so-called Wissensbilanz (‘knowledge scoreboard’), which is prescribed in detail in the Universitätsgesetz (De Boer et al, 2015).

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

Since the Universitätsgesetz of 2002, the general approach to institutional funding in Austria has remained broadly stable. However, there have been some modifications.

Prior to the introduction of the Hochschulraum Strukturmittel (2013), a different formula was used, referred to simply as the formula-funding component. To calculate the formula-based budget about 11 indicators covering teaching, research and societal needs/social goals were used. The calculation of the formula-based budget consisted of several complex steps. So complex in fact, that institutional representatives themselves reported (De Boer et al 2015) did not understand it and found it impossible to estimate what they would be likely to receive through the formula. The formula was also criticised for containing both input and output indicators, for using various un-transparent data sources, and for not being adequate for all types of institutions and subject areas.

The much simpler Hochschulraum Strukturmittel was introduced as an improvement on the old formula funding.

In 2019 a completely new model of university funding (“Universitätsfinanzierung NEU”) has been introduced.
4.2 Are there any known effects of current or former performance- or assessment-based components

In 2011 the formula-based budget was evaluated (Unger et al., 2011) for its ongoing feasibility and effects, which revealed the above-mentioned criticisms. It also noted that the formula budget did not in fact significantly re-distribute money between the universities and, although improvements in the Austrian research and HE system were evident, these were hardly attributable to the funding system itself, as many other factors and processes running in parallel were more likely causes. By contrast, for the funding period 2013-15, the Science Council of Austria concludes that the agreements have had a steering effect on the Austrian universities (Österreichischer Wissenschaftsrat, 2013, from p.35). From the council’s point of view, the performance agreements have contributed to improvements in teaching, profiling and research (reported in De Boer et al 2015).

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The Austrian Federal Ministry of Economy, Research and Science is fully responsible for the processes detailed here (though as mentioned, institutions have ‘ownership’ of their respective institutional evaluation processes. The Austrian Science Council has a degree of oversight and input as well, especially in terms of reviewing the performance contracts.

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

It is part of the remit of the Austrian Science Council to periodically review the system of performance agreements, though there are no clear timelines or intervals for doing so.

- The Science Council of Austria conducted a study of the performance agreements for the funding period 2013-2015 (Österreichischer Wissenschaftsrat, 2013)
- In 2011 the formula-based budget was evaluated for its ongoing feasibility and effects (Unger et al., 2011).

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The input into the review of the performance contracts was largely limited to university rectors and presidents of university senates (the senate have a relatively influential position in the Austrian system.

6. Additional points of interest

Steps are currently taken to introduce a new system (attached to additional funding) similar to the German Exzellenzinitiative: institutional payments awarded via application, in order to reward particular institutional strengths. This is still in progress, but will likely mirror specifically the ‘excellence cluster’ component of the German Exzellenzinitiative.

7. Sources

7.1 Public documents of interest

Austrian Science Council: Analysis of performance contracts 2013-15:

Unger et al – Evaluation of the formula budget:
http://www.equi.at/dateien/Endbericht_Formelbudget.pdf
### 7.2 Interviewees

- Antonio Loprieno – Chairman of the Austrian Science Council
- Elmar Pichl, Director of section IV Universities and polytechnics, The Austrian Federal Ministry of Economy, Research and Science
3 Country template: Belgium (Flanders)

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>Belgium (Flanders)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 Population:</td>
<td>11 million</td>
</tr>
<tr>
<td>1.3 GERD/GDP:</td>
<td>2.47%</td>
</tr>
<tr>
<td>1.4 GERD/GDP rank (/20):</td>
<td>7th</td>
</tr>
</tbody>
</table>

1.5 Overview of RPO landscape

Flanders:
- Academic universities: 5
- Colleges: 16
- Strategic Research Centres (SOC): 3

1.6 Brief summary/system description

The federal state has the responsibility of funding research programmes in areas that are of national interest, such as space and defence. The three regions (Wallonia, Brussels-Capital, and Flanders) each have their own autonomous research policy and are responsible for funding education and research.

2. Funding system overview

2.2 Is there a PRFS (definition: JRC/Hicks)?

Yes

2.1 What are the main funding system components?

The Flemish Department of Economics, Science, and Innovation (EWI) governs the Flemish research system and coordinates a mix of funding instruments to support research. The most prominent of these are the performance-based Special Research Funds (BOF) and Industrial Research Funds (IOF). BOF is aimed at fundamental research whereas IOF dedicated to innovation-focused applied and basic research. The other instruments are mainly aimed at supporting individual researchers. In addition, the Flemish Department of Education and Training (OV) provides institutional funding to the universities which is allocated for education and training purposes. From the perspective of academic fundamental, basic research, the FWO (Fonds Wetenschappelijk Onderzoek Vlaanderen, Research Foundation Flanders) and the BOF (Bijzonder Onderzoeksfonds - Special Research Fund) are the main support instruments. FWO support is granted based on competition between the different universities, while BOF support is a performance-based research funding system of which the funds are allocated and disbursed based on fixed competitive parameters of the Flemish universities.

Competitive project-level funding for strategic research is provided by the Scientific Research Fund (FWO) which is an independent agency of EWI. Furthermore, the Agency for Innovation and Entrepreneurship (VLAIO, also an EWI agency) provides R&D oriented subsidies.

---

2 This excludes the transnational University of Limburg (tUL) which resulted from a partnership between the University of Hasselt in Belgium and Maastricht University in the Netherlands.

3 These include: Imec, the Flemish Institute for Biotechnology (VIB), the Flemish Institute for Technological Research (VITO), and Flanders Make.
The overall balance between institutional and project funding is 45% and 55% respectively. A more detailed overview of shares of funding is provided below.

**Allocation of public funds to basic research 2006-2012**

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FWO-Flanders (competitive funding)</strong></td>
<td>132,750</td>
<td>138,259</td>
<td>146,504</td>
<td>151,131</td>
<td>148,415</td>
<td>156,186</td>
<td>173,040</td>
</tr>
<tr>
<td><strong>BOF</strong></td>
<td>102,033</td>
<td>112,277</td>
<td>126,211</td>
<td>137,910</td>
<td>137,199</td>
<td>140,236</td>
<td>150,652</td>
</tr>
<tr>
<td><strong>Hercules</strong> (50%)</td>
<td>2,800</td>
<td>7,803</td>
<td>7,803</td>
<td>7,418</td>
<td>5,250</td>
<td>10,270</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>234,783</td>
<td>253,336</td>
<td>280,518</td>
<td>296,844</td>
<td>293,032</td>
<td>301,672</td>
<td>333,962</td>
</tr>
<tr>
<td><strong>FWO-Flanders (competitive funding)</strong></td>
<td>57%</td>
<td>55%</td>
<td>52%</td>
<td>51%</td>
<td>51%</td>
<td>52%</td>
<td>52%</td>
</tr>
<tr>
<td><strong>BOF</strong></td>
<td>43%</td>
<td>44%</td>
<td>45%</td>
<td>46%</td>
<td>47%</td>
<td>46%</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Hercules</strong> (50%)</td>
<td>0%</td>
<td>1%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>2%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: Vlaams Indicatorenboek Wetenschap, Technologie en Innovatie 2013

In 2017, the major funding allocations were as follows:

- **FWO**: €371.1m
  - €56m for strategic basic research (incl. doctoral grants)
  - €15.4m for research infrastructure
- **BOF**: €170.2m
- **IOF**: €32.4m
- **Ministry of Education**: €1,131.2b
  - €354.5m for R&D-related activities
  - Majority allocated for education and training

---


*The Hercules programme was designed to fund research infrastructure investments between EUR 150,000 and EUR 1 million. Since 2016 it is administered by FWO-Flanders.*

*https://www.vlaanderen.be/nl/publicaties/detail/vlaams-indicatorenboek-2013*

3. Assessment-based system components

**3.1 Approach**
The BOF is designed to provide universities with funding for fundamental research and is based on a performance-based allocation key. It was first introduced in 1994 and it is based on a small set of parameters with the unit of assessment is the university. The BOF budget is determined on an annual basis by the Flemish (regional) government.

**3.2 Funding formula**

<table>
<thead>
<tr>
<th>PRFS</th>
<th>BOF-key</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural part (60%)</strong></td>
<td>Number of BA and MA degrees awarded&lt;sup&gt;8&lt;/sup&gt; (23%)</td>
</tr>
<tr>
<td></td>
<td>Number of PhDs awarded&lt;sup&gt;9&lt;/sup&gt; (35%)</td>
</tr>
<tr>
<td></td>
<td>Diversity parameter: gender distribution&lt;sup&gt;10&lt;/sup&gt; (2%)</td>
</tr>
<tr>
<td><strong>Bibliometric part (40%)</strong></td>
<td>Publications&lt;sup&gt;11&lt;/sup&gt; in SCIE, SSCI, AHCI, CPCI-S and CPCI-SSH&lt;sup&gt;12&lt;/sup&gt; (16.6%)</td>
</tr>
<tr>
<td></td>
<td>Publications in VVAB-SHW&lt;sup&gt;13&lt;/sup&gt; (6.8%)</td>
</tr>
<tr>
<td></td>
<td>Citations (16.6%)</td>
</tr>
</tbody>
</table>

---


<sup>10</sup> Calculated as the sum of female researchers in terms of Full-Time Equivalent (FTE)

<sup>11</sup> Publications are weighted by the journal's average impact factor over a given reference period.

<table>
<thead>
<tr>
<th>Average impact factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5-14</th>
<th>15-16</th>
<th>17-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>10</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0.5</td>
<td>0.1</td>
</tr>
</tbody>
</table>

---

<sup>12</sup> SCIE = Science Citation Index Expanded, SSCI = Social Sciences Citation Index, AHCI = Arts & Humanities Citation Index, CPCI-S = Conference Proceedings Citation Index-Science, CPCI-SSH = Conference Proceedings Citation Index - Social Sciences & Humanities

<sup>13</sup> Flemish Academic Bibliography for the Social Sciences and Humanities
Starting in 2019, an adjusted BOF-key will be used. The two components described above will largely remain in place but will fall under a part of the BOF-key accounting for 50% of the allocation. For each metric, a 5-year average will be used to ensure stability. The remaining 50% will be determined by a newly introduced part consisting of the following components:

- The amount of external funding received
- Excellence indicators: this includes CSS (Characteristic Scores and Scales), a new tool for measuring research performance as reflected by citation impact.\(^\text{14}\)\(^\text{15}\)
- International co-publications

The decision-making process concerning this adjustment has not been finalised at the time of writing. Therefore, the new allocation key with the specific metrics and their weights has not been published yet.\(^\text{16}\)

### 3.3 Rationale for PRFS

One of the rationales behind the BOF-key is that it stimulates universities to develop internal research policies. The rationale for using a parameter-driven key was that it would ensure fair allocation of funds and reward universities for their performance. The rationale behind the updated key and the introduction of a new part is to strike a balance between providing a stable flow of funding (fixed on a 5-year average of the original metrics) as well as driving excellence with new, more output-focussed metrics.

### 3.4 Approach

The Industrial Research Fund (IOF) is designed to support innovation-focussed research in ‘associations’, partnerships between a university and one or more colleges. Specifically, it provides funding for basic research in strategic areas and applied scientific research. Its objective is to enable valorisation and better align basic and applied research to economic needs.

Similarly, some components in the institutional funding for universities awarded by the Department for Education (OV) overlap with the education-related metrics of the BOF-key. These funds go towards the teaching and education budget allocated to HEIs as institutional funding. In this case, some parameters are normalised according to the size of the HEIs. This allocation is based on a moving average of education metrics over a 7-year period and is therefore much more stable.

### 3.5 Funding formula or allocation key

<table>
<thead>
<tr>
<th>IOF-Key (2018)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of PhDs awarded (from BOF-key)</td>
<td>15%</td>
</tr>
<tr>
<td>Publications &amp; citations (bibliometric part from BOF-key)</td>
<td>15%</td>
</tr>
<tr>
<td>Share of revenues from contracts with industry (for 2006-2015)</td>
<td>30%</td>
</tr>
<tr>
<td>Share of revenues from 7th European Framework Programme</td>
<td>10%</td>
</tr>
<tr>
<td>Share of patents (× 0.5 for applications, × 1 for patents granted)</td>
<td>15%</td>
</tr>
<tr>
<td>Share of spin-offs</td>
<td>15%</td>
</tr>
</tbody>
</table>


### 3.6 Other assessment activities

The data that is collected as part of the BOF-key is also used for research monitoring. For example, the annual Flemish Indicator Books report publication outputs and impacts. There are also indications that the data is used intra-institutionally for allocation and evaluation.

The Flemish Academic Bibliographic Database for the Social Sciences and Humanities (VABB-SHW) is linked to one of the components of the BOF key. Its quality is assessed every 5 years by an evaluation panel commissioned by the Flemish government. This evaluation focusses on the selection procedure for the list of journals, editors, and proceedings, as well as the extent to which the included publications fulfil the criteria as established by law. The evaluation panel must consist of a least five members active in the social sciences or humanities of internationally recognised standing and not working in Belgium.

The Flemish Interuniversity Council periodically carries out evaluations of various research-related practices within the universities once every 5 years. These evaluations cover universities’ research management as well as the BOF and are based on visits and site-visits conducted by a panel of 5-7 experts not from Belgium. This occurs by decree of the Flemish government in conjunction with the EWI. At the end of this, recommendations are formulated. Individual universities also carry out internal reviews of research quality focusing on capacity building, the integration of young academics, support for facilities and equipment, and research projects.

### 4. History & effects

The BOF does not appear to have performance-based predecessors. Rather, since its inception in 1994, BOF has gone through a series of changes. The mechanism has developed as follows:

- **Until 2002:** only considered the number of PhDs awarded, number of graduates, and amount of public and investment money received by the university
- **2003:** introduction of bibliometric data from WoS
- **2008:** inclusion in the bibliometric parameters of publications and citations indexed in the Social Sciences Citation Index (SSCI), the Arts and Humanities Citation Index (AHCI) and the WoS conference proceedings databases
- **Since 2008:** increased emphasis on quality and impact of publications rather than quantity
- **2011:** addition of bibliometric results from VABB-SHW\(^\text{17}\) as a separate indicator.
- **Since 2013:** increased weight of publication and citation counts from 10% to 40% (until 2018)
- **2019:** introduction of an excellence-oriented component accounting for 50% of the key.

The introduction of bibliometric parameters in 2003 marks an important change as, prior to this, the BOF-key was based primarily on input-indicators. The introduction of publication and citation data from the Web of Science meant the BOF-key

\(^{17}\) Flemish Academic Bibliographic Database for the Social Sciences and Humanities, a comprehensive coverage database of scholarly peer reviewed publications in the SSH.
became a PRFS\textsuperscript{8}. Since this amendment, the two most significant changes to the BOF allocation have been the introduction of the VABB-SHW in 2011 and the current introduction of the new excellence-oriented part of the key.

<table>
<thead>
<tr>
<th>4.2 Are there any known effects of current or former performance- or assessment-based components</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the 2010 evaluation\textsuperscript{9}, the Flemish Interuniversity Council (VLIR) indicated that the BOF had a positive effect on the development of talent career opportunities within universities. In particular, the increased support for junior lecturers, introduction of mentors and coaches, establishment of doctoral schools, and increased attention for internationalisation were found to be particularly notable.</td>
</tr>
<tr>
<td>Prior to the introduction of the VABB-SHW, the social science and humanities departments within universities were comparatively underrepresented in the bibliometric-related aspects of the funding and assessment system as these were initially based on the WoS. Furthermore, the introduction of the BOF, paving the way for performance-based funding, also contributed to the introduction of the IOF which is partially based on the same parameters.</td>
</tr>
<tr>
<td>The effect of the BOF-key on publishing has also been studied empirically. One article\textsuperscript{20}, observed the growth of WoS-indexed publications since the inclusion of the WoS database in the key.</td>
</tr>
<tr>
<td>The ongoing introduction of BOF-key based on a variable part as well as a stable part was in part motivated by complaints about the lack of stability in the previous system in which the allocation of funds was determined annually\textsuperscript{21}.</td>
</tr>
</tbody>
</table>

## 5. Ownership, review & evaluation

<table>
<thead>
<tr>
<th>5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Department of Economic Affairs (EWI) has the overall responsibility for the BOF allocation. The bibliometric component is carried out by ECOOM (Centre for Research &amp; Development Monitoring, a consortium of Flemish universities). Data regarding student figures are taken from the Education department’s (OV) own higher education database. The universities report on the internal allocation of BOF funds on an annual basis.</td>
</tr>
<tr>
<td>An ‘Authoritative Panel’ of 18 professors associated with the Flemish universities is appointed by the government and selects the publication channels that comply with the criteria set out in the BOF directive for the VABB-SHW. This panel can also apply additional criteria and propose changes to the BOF regulation. Administrative support to the panel is offered by the Flemish Inter-university Council (VLIR). No separate panel is appointed for the WoS-based indicators.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2 What review and evaluation procedures have been conducted on the performance and assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general, the research policy group at the VLIR takes an active role in discussing ideas and limitations and making new proposals the WoS-publications parameter and the overall BOF-key. Furthermore, the government has also repeatedly encouraged the universities to come forward</td>
</tr>
</tbody>
</table>


\textsuperscript{9} http://www.vlir.be/media/docs/Onderzoeksbeleid/VLIREvaluatieonderzoeksmanagement2010.pdf


related elements of the system?

with consensus suggestions to improve the BOF-key and the BOF-regulation22.

The BOF system was evaluated in 2010 by an external committee appointed by the Flemish Inter-university Council (VLIR)23. The evaluation primarily covered the management of university research but also addressed the BOF. It expressed several criticisms:

- Due to additional financing mechanisms, the BOF had become too complex and unclear for its stakeholders.
- Journal impact factors were not normalised across disciplines
- Individual researchers with heavy teaching workloads were disadvantaged
- It contributed to the pressure on individual researchers to publish affecting academic integrity
- Regarding the Flemish system more generally, the BOF criteria contributed to the increase of targeted research at the expense of bottom-up research.

In 2012, the BOF was reviewed and reformed. One of the changes was that a set of conditions were set-up regarding eligibility for BOF funds. These conditions referred to quality management, strategy, good governance, science communication, and gender diversity. Specifically, universities have to draw up 5-year plans setting out its future plans regarding the university’s research policy and the expenditure of BOF funds.

For three universities (Hasselt, Antwerp, and Brussels) dynamic minimum shares were established to enable them to undertake longer-term research. These minimum shares were introduced to support the relatively smaller universities and maintain the diversity of the university landscape in Flanders. Aside from the BOF, external evaluations of the universities are organised every two years. This covers research but also HR management and an appraisal of the internal distribution of BOF funds.

Starting in 2018, the minister responsible for science policy will commission an evaluation of the BOF every five years.24 The evaluations will focus on effectiveness and efficiency of the BOF as well as its overall impact on research in Flanders25. The evaluation will be carried out by a dedicated panel of experts who will publish their findings and recommendations which is delivered to the Flemish parliament together with commentary provided by the universities.

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The Flemish universities have contributed significantly to the development of the PRFS. Starting in the 1990s, the government has encouraged the universities to experiment with the use of bibliometrics in research evaluation26. For instance, a group of researchers at the KU Leuven was funded to develop and implement a bibliometric indicator in 2001, with a view of including it in the BOF-key. In 2007, all universities became part of this group now known as the Flemish Centre for R&D Monitoring (ECOOM).

---

ECOOM has several working groups tasked with the delivery of indicators for the different bibliometric databases (eg, WoS and VABB-SHW).

For the 2010 evaluation by VLIR the following stakeholders provided inputs:

- Flemish Interuniversity Council (VLIR)
- The universities of Hasselt, Gent, Leuven, Antwerp, and Brussels
- Flemish Science and Innovation Policy Council (VRWI; now defunct)
- Flemish government and relevant departments

6. Additional points of interest

BOF funds are allocated to individual universities. These commonly have an internal allocation process to distribute these funds across projects and fellowships, largely based on intra-university competition. Generally, this process is based on a peer-review by international experts and a bibliometric assessment. This is however increasingly constrained by the conditions attached to the BOF funds.

7. Sources

7.1 Public documents of interest

- Flemish Indicatorbook, ECOOM. Provides policy indicators regarding science, technology, and innovation. It also covers the Flemish funding system: [https://www.ecoom.be/en/node/111](https://www.ecoom.be/en/node/111)

7.2 Interviewees

Gerard Cielens: Research Policy Unit, KU Leuven

Prof. Koenraad Debackere:
- Faculty of Economics and Business, KU Leuven
- Executive director, KU Leuven Research & Development
- Managing director, University Administration and Central Services, KU Leuven
- Promotor-spokesman & principal investigator, ECOOM - Centre for Research & Development Monitoring
4 Country template: Canada

1. Headline facts

| 1.1 Country: Canada | 1.2 Population: 36.7m | 1.3 GERD: 1.60% | 1.4 GERD/GDP rank (/20): 16th |

1.5 Overview of RPO landscape

HERD: 40% of GERD
- 96 Universities
- A large number of colleges (mostly focussed on applied technical research)

GovERD: 7.1% of GERD
- The National Research Council of Canada (effectively an RTO)

1.6 Brief summary/system description

Public research in Canada is very heavily reliant on HEIs. In 2015, HEIs accounted for more than 40% of all R&D performed in the country (HERD/GERD), whereas research performed in the government sector accounted for 7.1%.

Universities Canada has 96 members,27 of which approximately 30 can be considered research intensive on the basis of direct research funding received from the three granting councils (see section 3.5 below) and 15 of the most research-intensive universities are part of the so-called ‘U15’ group.28

Canada is a federal state with a constitutional division of powers between the federal and provincial level. The universities operate under provincial charters but research is not explicitly mentioned in the division of powers and both federal and provincial governments are free to provide support in this area.

At the federal level, a new ‘Research coordinating committee’ (CRCC) was established in 2017 with a mandate to “achieve greater harmonization, integration and coordination of research-related programs and policies and to address issues of common concern to the granting agencies and the CFI.”29 The members of the committee are the heads of the federal research funding bodies as well as government Deputy ministers for science and health. In 2019, the CRCC signed a letter of understanding with their counterparts in UKRI to strengthen collaboration between researchers and funding bodies in the two countries.30

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

Institutional own resources account for almost half of all funding for research conducted at Canadian universities. These resources are ultimately derived from income streams such as post-graduate tuition fees.

27 https://www.univcan.ca/about-us/
28 http://u15.ca/
29 https://www.ic.gc.ca/eic/site/127.nsf/eng/home
The federal government accounts for the bulk of external funding for research at Canadian universities, through the following main streams:

- Granting Council core programme grants and scholarships, across three councils:
  - Natural Sciences and Engineering Research Council of Canada (NSERC)
  - Social Sciences and Humanities Research Council of Canada (SSHRC)
  - Canadian Institute for Health Research (CIHR)

- Tri-council programmes, managed jointly by the three Granting Councils, including (but not limited to) the following:
  - the Research Support Fund (RSF) (section 3.4 and 3.5)

- Science Contribution Agreements are separate government investments with specific conditions as to the timeframe, aim and mode of implementation. These funds are administered by separate bodies.
  - the Canada Foundation for Innovation (CFI) (section 3.6)

Canadian Provinces also support research and innovation to varying degrees. Some provinces – such as Quebec, Alberta and Ontario – have substantial research support programmes. For illustration, a description of research funding in Quebec is included in section 6 below.

### 2.3 Shares of funding allocated through the main mechanisms

Research performed at higher education institutions, amounted to a total of $13,810m CAD in 2016/17:

- HEI own funding: $6,815m (49.3%)
- Federal programmes: $3,170m (23.0%)
- Provincial Governments: $1,154m (8.4%)
- Other sources: $2,671m (19.3%)
  - Private non-profit: $1,467m
  - Business: $1,094m
  - Foreign: $111m

The federal government’s 2018 budget substantially increased the level of funding for Canadian research and these figures may therefore not reflect the most recent developments.

The chart below provides an overview of Canada’s Science and innovation ecosystem at the federal level, highlighting elements of particular interest for this study:

---

Figure 1  Simplified overview of the Canadian research funding system

3. Assessment-based system components

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.2 Funding formula</td>
<td>n/a</td>
</tr>
</tbody>
</table>

3.3 Rationale for PRFS

Canada does not have a performance-based research funding system (PRFS) and the programmes described here do not play any role in assessing the performance of Canadian institutions.

The description focuses on the Research Support Fund (RSF) and Canadian Foundation for Innovation (CFI), as RSF uses a formula to calculate the size of indirect costs funding grants (i.e. a type of metrics-based systems) and because RSF and CFI grants – despite the different method – are used for some of the same purposes as Quality-Related funding in the UK. Even so, neither the RSF or the CFI are equivalent to the UK Research Excellence Framework.

Research Support Fund

The Research Support Fund grants are awarded annually to help cover indirect costs of research at Canadian universities. The institutions have a relatively large latitude to decide how to spend these funds, but it has to be on indirect costs which are not related to a specific project (see section 4.2 below).
The grant size is determined on the basis of direct grant funding from three federal research granting agencies:

- Canadian Institutes of Health Research (CIHR)
- the Natural Sciences and Engineering Research Council (NSERC)
- the Social Sciences and Humanities Research Council (SSHRC)

The grant value available to each institution is calculated each year by the Fund’s administration based on data from the three agencies. The Fund informs the institutions how much they are eligible to receive but the institutions are still required to formally apply for the funding each year.

Outcomes report

Institutions receiving an RSF grant of $25,000 or more must complete and submit an outcomes report, including:

- investment to support research during the reporting period
- the research and research support capacity at the institutions;
- the volume of activities conducted to support research; and
- evidence that institutions are meeting the accountability requirements of the program.

Along with information from other sources, the outcomes report feeds into the program’s performance measurement framework, and into the report to the federal government and general public on investments made through the RSF.

The funding formula is designed to ensure that institutions in receipt of low amounts of agency funding receive a proportionately larger share of the Research Support Funding grant. Consequently, the reimbursement rate varies from around 80% for the smallest institutions to about 20% for the largest universities.²²

### Funding formula for the Research Support Fund

<table>
<thead>
<tr>
<th>Average revenues from CIHR, NSERC and SSHRC research grants</th>
<th>Funding from Research Support Fund*</th>
</tr>
</thead>
<tbody>
<tr>
<td>First $100,000</td>
<td>80%</td>
</tr>
<tr>
<td>Next $900,000</td>
<td>50%</td>
</tr>
<tr>
<td>Next $6 million</td>
<td>40%</td>
</tr>
<tr>
<td>Balance</td>
<td>Percentage calculated annually, based on the total amount available</td>
</tr>
</tbody>
</table>


In the 2018 budget, the Canadian government added approximately $30m CAD annually to the Research Support Fund but did so in the form of a separately managed funding stream, ‘incremental project grants’. This additional budget is set to increase to nearly $60m CAD per year when fully phased in. The ‘incremental project grants’ are directed towards institutions receiving $7 million or more in eligible direct research funding (currently 30 institutions), who incur the highest indirect costs. Unlike the traditional RSF grants, eligible universities are required to

---

²² The reimbursement rates are not made public but the RSF grant size for each university are available: [http://www.rsf-fsr.gc.ca/apply-demande/grants-subventions/index-eng.aspx](http://www.rsf-fsr.gc.ca/apply-demande/grants-subventions/index-eng.aspx)
submit more detailed applications with information about intended expenditure.

3.6 Other assessment activities

Besides the granting councils, a large proportion of government research funding is managed by the Canada Foundation for Innovation (CFI). Established in 1997, the CFI supports the development and operation of research infrastructures at Canadian research performing organisations to increase their capability to carry out high quality research. Among the CFI programmes, several programmes make funding available to cover part of the indirect costs of operation and managing facilities, e.g.:

- The Infrastructure Operating Fund (IOF) covers a part of the operating and maintenance costs of CFI-funded projects to insure optimal use of the funded facilities. Eligible CFI projects typically generate an allocation of 30% additional funding through the OIF for this purpose. Institutions are required to submit an annual IOF report including data on actual expenses occurred in the previous fiscal year in order to release the IOF funding.\(^{33}\)

- The Major Science Initiatives Fund (MSI) provides funding to cover operating and maintenance costs of national Canadian science facilities. Eligible costs include staff salaries, training, maintenance and repairs and more. Funding applications for MSI are submitted in response to a call for tender and go through a ‘merit review’ selection process.

CFI has undertaken a number of studies to assess the results of the funding they provide, although the results of these are not used to make funding decisions. Research assessment includes:\(^{34}\)

- Annual reports on results based on project progress reports.
- Assessments of research capacity, including the ability to attract and retain staff, staff training and development, and creation of intersectoral linkages.
- Analyses of outcomes and impacts, including socioeconomic impact analysis and development of ‘pathways to impact’ among others.

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?
The Research Support Fund was first introduced in 2003 under the name, ‘Indirect Costs Program’. The budget amount has been revised regularly but there are no indications that the nature of the programme has changed.

4.2 Are there any known effects of current or former performance- or assessment-based components?
The ‘Indirect Cost Program’ has been evaluated every 5 years. The programme’s 10-year evaluation was completed in 2014 and the 3rd evaluation, called the 15th year evaluation, is currently ongoing.

The 10-year evaluation found that the programme continued to be highly relevant and catered to a continued need to cover estimated indirect costs incurred by Granting Council grants of 40-60% (Goss Gilroy, 2014).

The evaluation also collected evidence on the use of funds:

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Grant expenditures by expenditure category (in million $ CAD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure category</td>
<td>2008-09</td>
</tr>
</tbody>
</table>

---

33 https://www.innovation.ca/awards/infrastructure-operating-fund
34 https://www.innovation.ca/results-impacts
Accordingly, short term outcomes identified included:

- Improved provision of facilities
- Increased provision of research resources
- Improved efficiency of management and administration (including management of IP and regulatory requirements)

Longer term outcomes enabled by the funds included:

- Improved attractiveness of Canadian research environment, e.g. ability to recruit leading researchers.
- Improved compliance with regulatory requirements
- (Limited) improved knowledge transfer

The report recommended that the programme be continued but also enhanced reporting requirements and key indicators to measure outcomes.

### 5. Ownership, review & evaluation

#### 5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The Research Support Fund is managed by the Tri-agency Institutional Programs Secretariat (TIPS), which is housed within the Social Sciences and Humanities Research Council (SSHRC). TIPS reports to the programme management committee and a steering committee (strategic level), both composed of representatives from the three Granting councils and the Canadian Foundation for Innovation (CFI) as well as Innovation, Science and Economic Development Canada, and Health Canada. The steering committee, in turn, reports to the ultimate programme owners, i.e. the Science minister and the Treasury.35

The ultimate programme owners in government make the political decisions about the budget and overall direction of the programme. These may be announced as part of the government’s annual budget.36

#### 5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

The Canadian research and innovation system as a whole – as opposed to any specific programmes – has been reviewed several times recently.

- Investing in Canada’s Future: Strengthening the Foundations of Canadian Research – Canada’s Fundamental Science Review 2017

---


Among other things, the ‘Fundamental Science Review’ recommended a significantly increasing the budget of the Research Support Fund:

“Recommendation 7.3: The Panel recommends that funding be provided to move the coverage of facilities and administration costs by the RSF on a trajectory from the current level of 21 per cent to 40 per cent, over four years”

The rates of indirect cost funding have been a subject of debate for some time and ultimately concerns the balance between direct and indirect funding, equivalent to the discussions about the balance within the dual support system in the UK.

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The 10-year evaluation of the Indirect Cost Program was conducted by independent consultants on behalf of the granting councils. In the process they consulted sector stakeholders, including:

- Interviews with representatives from 16 organizations (including those from the granting councils, Industry Canada and stakeholder organizations external to government)
- Telephone survey of Vice Presidents of Research (VPRs) at 93 institutions funded in the last five years
- Case studies focussing on the research resources area of expenditure and considered data collected by CARL over the previous five years.

In addition, the granting councils consults the research community on an ad hoc basis on a variety of topics and programmes. In recent years, there has been ongoing consultation about the RSF, especially around reporting requirements and indicators with a view to improving accountability and visibility of the programme.

6. Additional points of interest

As mentioned above, provincial governments also invest in research and innovation. The priority given to R&I by provincial governments varies considerably and since there is no harmonised format for reporting, it is difficult to gain an overall view of the post-secondary research funding ecosystem in Canada. Quebec is the most research-intensive province in Canada and Quebec Research Funds is described briefly for illustration.

**Research funding in the province of Quebec**

The provincial government’s primary vehicle for supporting research are the three Quebec Research Funds (QRF): Nature and technologies, Health, Society and culture. In 2016/7, it’s budget was $188m CAD divided into four main areas of activity:37

- Research Projects (15.9%)
- Research careers (17.9%)
- The new generation (scholarships and fellowships) (26.1%)
- Research clusters (40.1%)

QRF uses a series of 11 indicators – provided by the Montreal-based Observatoire des Sciences et des Technologies (OST) – to assess scientific output and monitor the province’s performance relative to national and global comparators: 38

• 9 bibliometric indicators based on data from Web of Science (e.g. number of publications, international collaboration, and publication impact)
• 2 patent indicators (number of patents overall, number of triadic patents 39)

QRF assesses impact using a framework with five dimensions: 40
• Advancement of knowledge
• Strengthening of research capacity
• Knowledge exchange and informed decision-making (e.g. policy making)
• Benefits and improvements directly derived from research outcomes
• Wider social, economic, environmental and cultural benefits

Other provincial sponsors of research in Quebec include the Ministère de l’Économie, Science et Innovation (MESI), the Ministère des relations internationals et francophonie (MRIF), and Génome Québec. 41

7. Sources

7.1 Public documents of interest

7.2 Interviewees
• Dominique Bérubé, Vice-president of Research Programs, Social Sciences and Humanities Research Council of Canada (SHRCC)
• Dale Dempsey, Director of Programs, Tri-agency Institutional Programs Secretariat (TIPS)
• Louise-Michel Verrier, Deputy Director, Corporate Planning and Reporting, Social Sciences and Humanities Research Council of Canada (SHRCC)

---

41 https://www.mcgill.ca/research/research/funding/provincial
## 5 Country template: China

### 1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20):</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1,390m</td>
<td>2.11%</td>
<td>10th</td>
</tr>
</tbody>
</table>

**Note:** China’s research and innovation system is very complex. This template only covers aspects of it and cannot within the scope of this study consider all parts of the system in detail.

### 1.5 Overview of RPO landscape

Public research in China is performed by research institutes and research universities:

- **Research universities** (20% of research expenditure in 2014)
  - 2,542 HEIs across mainland China
  - Most research is concentrated within a small number of universities, including about 100 universities supported through the ‘Double-First Class’ initiative (see below). The 9 most elite universities are referred to as the ‘C9 group’.

- **3000+ Research institutes** (16% of research expenditure in 2014)
  - The academies of science account for the most important research institutes in China, including:
    - Chinese Academy of Sciences (CAS): 100+ research institutes and 11 supporting organisations, focusing on STEM subjects.
    - Chinese Academy of Agricultural Sciences (CAAS): 42 research institutes
    - Chinese Academy of Social Sciences (CASS): 31 research institutes and 45 research centres
    - Chinese Academy of Medical Sciences (CAMS): 19 institutes and 2 national centres
  - Other research institutes supported by the national government
  - Other research institutes supported by provincial governments

The research institutes, particularly the Chinese Academies of Science (CAS), accounts for the majority of public sector research in China but there has been an increased focus on research universities over the last two decades. This profile will primarily focus on funding for universities.\(^{42}\)

### 1.6 Brief summary/system description

Chinese investment in research and innovation has increased dramatically over the past two decades.

---

\(^{42}\) Analyses of recent reforms of CAS management and reward systems can be found in Liu et al. (2017) and Cao et al. (2018).
2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

No

A complete overview of the Chinese funding system is beyond the scope of this study but central government funding for research taking place in universities generally falls within one of two groups.

**Institutional grants**

Institutional block grant funding specifically for research as seen in the dual support system in the UK do not have a direct equivalent in the Chinese system. Universities receive basic institutional funding from multiple sources at national and provincial level but, in addition to this, there are programmes which provide additional support for institutional development of elite universities under the Ministry of Education (MOE).

From the mid-1990’s until 2016/17, the 211 and 985 programme provided funding for a select group of universities.

- **211 Programme** (“High-level Universities and Key Disciplinary Fields”): The programme was launched in 1995 with the aim to create 100 high-quality universities. It provided block funding for 112 universities (incl. the 985 Programme recipients).

- **985 Programme** (“World Class Universities”): Introduced in 1998 with the aim to create world class universities, the programme provides additional block grant funding for 39 universities.

These programmes were replaced in 2017 with a new initiative for ‘World Class Universities and First-class disciplines’, usually referred to as the ‘Double

---


44 [http://www.gov.cn/xinwen/2017-01/27/content_5163903.htm#1](http://www.gov.cn/xinwen/2017-01/27/content_5163903.htm#1)
**First Class’ initiative** (双一流大学). Like the previous programmes, the initiative has two tiers: 45

- Support for 42 HEIs to develop into world-class institutions
- Support for another 95 institutions with potential to develop world-class expertise within specific disciplines

Three main milestones have been defined for the achievements of these aims: 46

- by 2020: to develop a number of world-class universities and a group of world class disciplines
- by 2030: to have more universities and disciplines among the best in the world; a number of universities and a group of disciplines to be among the best in the world; to have significant improvement in China’s overall higher education strength
- by 2050: the number and quality of world class universities and disciplines to be among the best in the world, China to have become a higher education power.

There appears to be significant continuity between the previous 211 and 985 programmes and the new initiative, and the selection of institutions is very similar. The new initiative does, however, have a much stronger focus on disciplines compared to the previous approach, especially within the second tier. The new programme also has a five-year cycle as compared to the three-year cycle used in the previous programme.

### Programme and project funding

Most funding for public research in China is allocated through programme and project grants, e.g. the National Natural Science Fund (basic research) and Major S&T Projects. Many parts of government are involved in these programmes but the Ministry of Science and Technology (MOST) plays a leading role. The funding system in China has faced a number of challenges. In particular, the research funding system has been very fragmented with a very large number of programmes with overlapping remit, each managed by separate governments.

As part of an effort to address these issues, a major reform of the funding system was announced in 2014. 47 This involves the following (Development Solutions Europe, 2018):

- a unified management structure, including the introduction of
  - a new inter-ministerial coordination mechanism
  - professional project management agencies (similar to the German ‘Projektträger’)
  - central information management systems for grant applications (National S&T Management Information System) and project reporting (S&T Report System)
- a reorganisation of existing funding programmes into five main pillars.

Additional reforms were introduced in 2018. In February of that year, the state council issued an ‘Opinion on Strengthening Fundamental Research’ and a month later, it was proposed to bring the National Natural Science Foundation of China – the main funder of basic research in China – under the

---


47 “Notice on Deepening the Reform of the Management of Central Finance S&T Projects (Programmes, Funds)” [available at: http://www.gov.cn/zhengce/content/2015-01/12/content_39383.htm](http://www.gov.cn/zhengce/content/2015-01/12/content_39383.htm)
The government also introduced a series of new measures to improve the integrity of research, including new procedures for investigating scientific misconduct as well as broader changes in the way research is evaluated (see also section 3.6 below). An overview of the reformed system is shown below.

2.3 Shares of funding allocated through the main mechanisms

Precise information about the amounts of funding allocated under each stream is not in the public domain (see e.g. Reale et al., 2017).

### Simplified overview of R&D funding in China

**Central government**
- Ministry of Science and Technology (MOST)
- Ministry of Finance (MOF)
- National Development and Reform Commission (NDRC)
- Ministry of Education (MOE)
- Provincial governments

**Inter-ministerial Joint Council**
- (23 government bodies)

**Strategic Advisory and Comprehensive Review Committee**

**Funding bodies**
- Project management agencies
- National S&T Management Information System & S&T Report System

**Funding programmes**
- S&T programmes
  - Technology Innovation Guidance Fund
  - Major S&T Projects
  - National Key R&D Programmes
  - Bases and Talents Programme
  - National Natural Science Fund
  - Double first class initiative (formerly 985 and 973)

**Research performing organisations**
- Companies
- Institutes (incl. CAS)
- HEIs
- 10+ research-intensive universities

Source: Technopolis, adapted from Huang et al. (2016) and Development Solutions Europe (2018).

### 3. Assessment-based system components

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.2 Funding formula</td>
<td>n/a</td>
</tr>
</tbody>
</table>

| 3.3 Rationale for PRFS | n/a |

| Other Conditional funding | 3.4 Approach | As described above, the overall approach for the Double-first class initiative (as well as its predecessors) is to support a selection of elite institutions to be able to compete internationally. According to press announcements the institutions for the new plan were selected after “a process of peer competition, expert review and... |

---

48 Some fear that this move could reduce the independence of the foundation and lead to increased politization of funding.

49 [https://www.nature.com/articles/d41586-018-05359-8](https://www.nature.com/articles/d41586-018-05359-8)
government evaluation”. Universities in receipt of funding from these programmes are evaluated every 3-4 years. The details of the evaluations are not known but is thought to be based on domestic benchmarks set by the Ministry of Education, such as the National Subjects Evaluation (NSE). Specific indicators included in these benchmarks include:

- Qualifications of academic staff (e.g. % with PhD degrees)
- Bibliometrics indicators (e.g. publications volume and citation impact)
- Patents
- External funding income
- Prizes and awards
- International rankings

3.5 Funding formula or allocation key

Funding levels are not directly contingent on evaluation results but institutions that fail the evaluation could be excluded from the programme or ‘demoted’ within the hierarchy of institutions. Reportedly, this is a rare occurrence.

3.6 Other assessment activities

Within the remit of the MOST, i.e. the large projects and programmes, the use of evaluation and assessment has evolved significantly over the past two decades. Post-award management and monitoring of grant-funded projects is often more intensive in China than in the UK. For larger awards, a formal management board with representation from government research managers and independent advisors is often required and annual presentations to the research funders are common, even for smaller awards.

The National Center for Science and Technology Evaluation (NCSTE) is a specialised agency affiliated with MOST. Since it was established in 1997, it has carried out evaluations of programmes and policies under different government departments and also engages internationally on these issues. (NCSTE, n.d.) Its role is akin to that of a ‘think tank’ within government which carries out ad hoc independent evaluations and develops evaluation methods.

Evaluation practices are increasingly being mainstreamed across all government departments involved in S&T programmes. A new regulation from 2016 sets out the principles for evaluation of S&T programmes funded by the central government, including stronger coordination, standardisation and professionalism. The regulation including the following types of evaluations:

- S&T planning assessment
- S&T policy assessments
- S&T plan and project evaluation
- Assessment of scientific research institutions
- Evaluation of project management

It hard to ascertain the relative importance of different methodological approaches in evaluations and assessments carried out, but both quantitative and qualitative methods are being employed the above-referenced regulation as well as past NCSTE evaluation practice includes both qualitative and quantitative methods. In July 2018, new statement “Opinions on the Reform of the Evaluation of Programs, Individual Scientists

---

30 [http://www.chinadaily.com.cn/opinion/2017-09/25/content_32446664.htm](http://www.chinadaily.com.cn/opinion/2017-09/25/content_32446664.htm)

31 This section is largely based on interview feedback.

32 Regulations on S&T Evaluation (Provisional), 29 December, 2016.
and Research Institutions” was issued. The document suggests a change of emphasis from a focus on bibliometric indicators towards a broader assessment of the quality, contribution and impact of research (Cao et. al. 2018, p. 136)

In previous decades, much assessment work has been prospective in nature, aimed at identifying priorities for new strategic programmes and investments. The mainstreaming and codification of evaluation approaches described above has contributed to a development towards a more comprehensive use of evaluation across the ‘evaluation cycle’ including both ex post evaluations and informing policy design.

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

As described above, the ‘Double First Class’ initiative replaces two previous programmes, ‘211’ and ‘985’ but the group of institutions in receipt of funding has remained relatively unchanged.

4.2 Are there any known effects of current or former performance- or assessment-based components

There are no evaluations of the 211 and 985 programmes in the public domain, but academic analysis suggests that the overall policy has been a significant catalyst for change in the higher education sector.

Among other things, it is thought to have increased productivity and encouraged modernisation of campuses. The incentives for universities to strive for ‘world class’ status also carry risks: For some universities, this might incentivise them to maximise performance on specific indicators used in league tables without regard of the context in which the university is situated, or it can have a demoralising effect on universities for which ‘World Class’ status is an unrealistic ambition (Song 2018).

The programmes have also contributed to a significant concentration of resources within a small number of HEIs. An analysis from 2014 showed that more than 70 per cent of government funding to universities went to the 112 institutions (out of several thousand HEIs in China) supported under the 211 and 985 programmes (Liu et al. 2017, p. 663).

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The 985 and 211 programmes as well as the new ‘Double first class’ initiative are primarily owned by the Ministry of Education in collaboration with the Ministry of Finance and the National Development and Reform Commission. They are implanted in partnership with provincial governments which provide match funding and support.

Programme owners at the national level, include the Ministry of Education as well as other ministries which oversee their own universities. (Huang et al. 2016, p. 29).

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

The programmes have reportedly been subject to extensive review and consultation across the sector, but it is unclear to what extent this has contributed to the design of subsequent iterations.
5.3 Which stakeholders/organisations had input into review/evaluation activities?

| n/a |

6. Additional points of interest

| n/a |

7. Sources

<table>
<thead>
<tr>
<th>7.1 Public documents of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 科技评估工作规定（试行）[Regulations on S&amp;T Evaluation (Provisional)], 20 December, 2016</td>
</tr>
<tr>
<td>• 国务院印发关于深化中央财政科技计划,（专项、基金等）管理改革方案的通知, 国发〔2014〕64号 [&quot;Notice on Deepening the Reform of the Management of Central Finance S&amp;T Projects (Programmes, Funds)&quot;] (available at: <a href="http://www.gov.cn/zhengce/content/2015-01/12/content_9383.htm">http://www.gov.cn/zhengce/content/2015-01/12/content_9383.htm</a>)</td>
</tr>
<tr>
<td>• Liu, Schwaag-Serger, Tagscherer and Chang (2017), “Beyond catch-up—can a new innovation policy help China overcome the middle-income trap?”, Science and Public Policy, 44 (5), 656-669.</td>
</tr>
<tr>
<td>• NCSTE (n.d.), Introduction of NCSTE, Brochure.</td>
</tr>
<tr>
<td>• Reale, E. et al. (2017) Public Funding Country Profile China Annex 4 Analysis of National Public Research Funding PREF.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7.2 Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Professor Sylvia Schwaag-Serger, Deputy Vice-Chancellor, Lund University</td>
</tr>
<tr>
<td>• Dr. Yun Yang, Research Fellow and Director, International Cooperation Division, National Center for Science and Technology Evaluation (NCEST)</td>
</tr>
<tr>
<td>• Academic (anonymous)</td>
</tr>
</tbody>
</table>
6 Country template: Czech Republic

1. Headline facts

| 1.1 Country: Czech Republic | 1.2 Population: 11 million | 1.3 GERD/GDP: 1.68% | 1.4 GERD/GDP rank (1/20): 15th |

1.5 Overview of RPO landscape

Overall, there are 219 registered Research Organisations (ROs), 163 of which were public research organisations (PROs). ROs are those institutions that are registered as such and entitled to public support.

- Public universities: 26
- State universities: 2 (Policy Academy & University of Defence)
- Academy of Sciences (CAS): 54 internal research institutes
- Sectoral public research institutes
- Private research institutes

Regarding public research, public universities and CAS institutes are considered to be the key actors.

1.6 Brief summary/system description

Czech research policy is quite centralised as regional authorities do not have responsibilities in this area although some have launched their own policy initiatives such as innovation vouchers. Between the policies on national and regional levels, coordination is somewhat limited. Overall, the funding of public R&D has traditionally occurred primarily through institutional support although the amount of project-level funding has risen in recent years. The vast majority of public research is performed by the public universities and the Academy of Sciences.

2. Funding system overview

| 2.1 What are the main funding system components? | 2.2 Is there a PRFS (definition: JRC/Hicks)? | Yes |

The RD&I (Research, Development and Innovation) Council is an advisory body and is the key actor with regards to the governance of the national RD&I system and proposes the annual budget for research and development.

RD&I policies are implemented through actors at the intermediary level. The most important of these are the Ministry of Youth Education and Sports (MEYS) which provides funding for the HEIs and large research infrastructure. In the case of universities this covers both funding for teaching purposes as well as funding for research. The Czech Academy of Sciences (CAS) is also a major recipient of funds and distributes this across its internal institutes. Furthermore, there are two agencies, the Technology Agency of the Czech Republic (TA CR) and the Czech Science Foundation (GA CR). The TA CR provides competitive funding for applied research whereas competitive grants for basic research are allocated by the...

---


GA CR. Additionally, there are several other ministries\textsuperscript{56} that, to a lesser extent, provide funding as well and maintain ties with specific sectoral or departmental public research institutes.

### 2.3 Shares of funding allocated through the main mechanisms

Institutional funding occurs via two main channels. The Czech Academy of Science (CAS) receives approximately a third of the allocation for institutional funding, which it subsequently redistributed across its member research institutes. The budget for the Academy of Sciences is largely determined politically. Second, the Ministry of Education, Youth, and Sports (MEYS) provides approximately half of institutional funding budget to the Higher Education Institutes (HEIs)\textsuperscript{57}. From the perspective of the universities, the balance between funding for teaching, research, and from external (eg. European) sources varies per institutions since some are much more research active than others. The remaining share of institutional funding is distributed through the various ministries to other publicly registered research organisations.

\* Only those registered as Research Organisations (ROs) are entitled to public funding.


### 3. Assessment-based system components

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Metodika’ is the research assessment methodology used to allocate institutional funding. It was first introduced in 2004 and has been renewed several times. Currently, the Czech system is in a state of transition from Metodika as it was until 2016, to a completely new system from 2020 onwards. The new system, ‘Metodika 2017+’, is still under development but its component parts are being implemented gradually in a series of phases until it is fully implemented in 2020. Below, the</td>
<td></td>
</tr>
</tbody>
</table>

\*\* Notably the Ministries of Education; Industry & Trade; Culture; the Interior; Health; Agriculture; and Defence

The allocation mechanism as it was before the transition was initiated is described. After that, details on the transition phase are provided.

The units of assessment are individual Research Organisations (RO) or hierarchically subordinate bodies (faculties and institutes), respectively. These are understood as universities and research institutes receiving public funding and are included in a dedicated registry which is updated annually. The “old” methodology, valid until 2016, was partially indicator- and peer-review-based, depending on a type of the outcome. The result of the assessment was a scoring system based on an algorithm taking into account the journal level indicator (for WoS and Scopus indexed outcomes) and the qualitative result of peer-review (for books and Czech-based journals). For both, a certain amount of points was calculated and assigned.

The evaluation was based on three mechanisms (in the Methodology called “pillars”). In the first, different types of publication results, were evaluated and received a set of points. In the second pillar, a set of selected high-quality results was submitted for expert evaluation. These outcomes were assessed in a binary manner (“yes” or “no” decision). Those labelled as “YES” were rewarded with additional points as well as the recipients of ERC grants. The third pillar focuses on non-scientific outcomes from R&D such as patents, animal breeds, and plant varieties.

In the new system, a combination of peer reviews, international experts, bibliometrics, site-visits, and self-assessments will be used. For all versions of the Evaluation Methodology, the national database of research results (“RIV”) is used as a data source. Publications included in the PRFS (articles, chapters, books and proceedings) must meet the inclusion criteria for particular publication types in the RIV, which is first and foremost criterion of the peer-review.

### 3.2 Funding formula

#### Overview of the old Metodika system (2013-2016)

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Indicator</th>
<th>Explanation &amp; points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pillar I (75%)</td>
<td>Journal articles (Web of Science, SCOPUS, ERIH, Czech periodical)</td>
<td>Points are awarded to publications depending on the field of study, language and whether it was published in a national or international periodical.</td>
</tr>
<tr>
<td></td>
<td>Books</td>
<td>Institutions whose employees received ERC grants receive 2000 points. The number of results selected for expert consideration is proportional to the amount of institutional funding received.</td>
</tr>
<tr>
<td></td>
<td>Chapters in edited volumes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Articles in proceedings</td>
<td></td>
</tr>
<tr>
<td>Pillar II (10%)</td>
<td>Peer-review of selected results by expert panel</td>
<td></td>
</tr>
</tbody>
</table>

---

58 RIV = The Registry of Information about Results and Innovations will be the main data source for the disciplines in which results are usually books or articles published elsewhere than international databases, and for the results of applied research and development. The database has been described e.g. in Good, Vermeulen, Tiefenthaler, & Arnold (2015) or newly in Sile et al. (2018). For more details see [https://ecoom.uantwerpen.be/sites/en/edrssh/0/europeandatabasesmap/CZE](https://ecoom.uantwerpen.be/sites/en/edrssh/0/europeandatabasesmap/CZE).


60 Results from some fields of study are not evaluated at all, for some there is a percentage limit within the point total. For further details on the number of points per type of output, field, and scope, see the Metodika 2013 documentation.

61 One result per 10 million CZK.
in the previous year. Results of all institutions are then grouped according to the field of study and rank in terms of significance. Points are awarded based on each institution’s share of the most significant result.

<table>
<thead>
<tr>
<th>Module</th>
<th>Description &amp; indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td><strong>Quality of Selected Results</strong></td>
</tr>
<tr>
<td></td>
<td>Assessment by expert panel of selected outcomes in the preceding 5-year window</td>
</tr>
<tr>
<td>M2</td>
<td><strong>Efficiency of research</strong></td>
</tr>
<tr>
<td></td>
<td>• Bibliometric analysis conducted for all publications produced by RO and indexed in WoS and/or Scopus in over previous 5-year publication window. Only publications reported in the RIV are counted.</td>
</tr>
<tr>
<td></td>
<td>• As a result of quantitative analysis, the distribution of publications in the first decile and four quartiles according to the Article Influence Score and Scimago Journal Rank, respectively, is counted.</td>
</tr>
<tr>
<td></td>
<td>• In 2017 only the simple analysis based on journal-level indicators was used. In forthcoming years, there is a shift towards a more robust approach containing the size of the units (FTEs), citations and finer-grained discipline-specific approaches (e.g. multi-authored publications) and others.</td>
</tr>
<tr>
<td>M3</td>
<td><strong>Social relevance</strong></td>
</tr>
<tr>
<td></td>
<td>Self-evaluation reports are produced by the ROs and provided to MEYS. The reports cover qualitative and quantitative information regarding transfer of results into practice, obtained funds (national and international), applications of research, knowledge &amp; technology transfer outside academia, quality of life, economic benefits, welfare benefits, contribution to national and cultural identity.</td>
</tr>
<tr>
<td></td>
<td>Additional parameters include: involvement of students in research; optional lectures/seminars related to the research of the given RO; practical training of students; quality of education and participation of doctorands; international and national renowned awards for research excellence; mobility of researchers between ROs and the</td>
</tr>
</tbody>
</table>

The **new** system consists of five modules that are described below. The relative weight of each module is to be determined for each RO separately.

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Patent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(15%)</td>
<td>European. US, or Japanese</td>
</tr>
<tr>
<td></td>
<td>Czech or other national patents used in license agreements</td>
</tr>
<tr>
<td></td>
<td>Other patents not being used by the patent owner</td>
</tr>
<tr>
<td>Breed</td>
<td>New animal breeds</td>
</tr>
<tr>
<td>Variety</td>
<td>New plant varieties</td>
</tr>
</tbody>
</table>

---

62 See the Metodika document for a more precise overview.
The responsibility for various Modules remains with national bodies - RVVI (M1 and M2) and on the level of funding providers, e.g. MEYS (M3, M4, M5), respectively. The M1 and M2 assessment is conducted mostly by RVVI with a preceding contribution of ROs (reporting into RIV, reporting of excellent results – M1) whereas the M3-5 Modules are conducted by ROs themselves and reported to MEYS. The ability to conduct self-evaluation procedure must be accredited by MEYS for each RO. A valid M3-5 self-evaluation procedure includes above all the self-evaluation report, site-visits with international peers and the Final Report. The Final Report is transferred to MEYS which decides about the funding allocation.

Based on this assessment exercise, ROs are grouped in 4 groups (A, B, C, and D) according to the quality of their research which subsequently determines the funding they received. The Methodology 2017+ is in a transition period. Therefore, in 2017 and 2018 only the M1 and M2 modules have been conducted and have been reviewed by panels of experts. In order not to interfere with the previous Evaluation Methodology, the publication window was set starting with the publication year 2016 and onwards. In the 2017 and 2018 evaluation, only module M2 has been taken into account in the funding decisions. This determined funding in the year of evaluation + 1; however, evaluation still influences only the yearly increase of the core funding of ROs. As of 2019, M1 and M2 will be implemented fully and are to be reviewed by a panel of international experts taking into account results from 2016-2018. For now, results of these assessments determine a small portion of institutional funding (around 20%) whereas the remainder is based on the outputs from the Metodika 2013-2016 methodology. For the 2020 evaluation round, the Methodology 2017+ will be implemented fully, and all five modules will be used. Then, the five-year evaluation period is expected. How much of institutional funding this will determine is still under discussion.

### 3.3 Rationale for PRFS

The implementation of the Metodika system was based on the following rationales:
- Inform quality management of R&D and innovation, at all levels
- Enhance the efficiency of the public expenditure of funds
• Support the quality and international competitiveness of Czech R&D&I
• Distribute and add to the accountability of the stakeholders of the R&D&I system
• Get information for granting subsidies for long-term conceptual development of a research organisation

The overall reasoning has been to connect research evaluation to the allocation of institutional funding rather than to quality or strategy considerations. In the new system, quality concerns are given more weight.

<table>
<thead>
<tr>
<th>Other Conditional funding</th>
<th>3.4 Approach</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.5 Funding formula or allocation key</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The Czech Academy of Sciences (CAS) has had a tradition of internal research evaluation since the 1990s. It conducts evaluations of its own research institutes every four to five years. It is largely based on several evaluation committees, each associated with a specific discipline, who assess both the institutes and research teams within these. It uses a combination of qualitative peer reviews and bibliometric information to draw conclusions regarding research quality and formulate suggestions for improvement.

To a degree, this methodology overlaps with the methodology that is used by universities. Ultimately, the idea is that, from 2020 onwards, universities, CAS institutes, and governmental research institutes will be using the same methodology for research assessment.

The RDI Council also runs an annual evaluation of the Czech research system as a whole. The objective is to compare the Czech system with foreign countries, assess overall performance, and track progress in national programmes. This takes into account annual results of ROs, reports from external institutions (e.g. OECD and EC), and thematic evaluations regarding specific disciplines or national priorities.

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

Metodika is rooted in the National Policy on Research & Development for 2004-2008 which emphasised the need to improve the quality of the evaluation system. Results of such evaluations were considered as important inputs to policy development and decision-making. The resulting evaluation methodology introduced a metric-based system to assess the quality of research performance.

Metodika was reformed in 2008 and the resulting methodology contained the following fundamental changes:

- A narrower function focusing on evaluation as part of a performance-based resource allocation system

---

64 Technopolis Group (2011) International Audit of Research, Development & Innovation in the Czech Republic. Final Report 3 - The Quality of Research, Institutional Funding and Research Evaluation in the Czech Republic and abroad
65 Ibid.
• Restriction of scope to the quantification of research outputs
• Broadened coverage to the evaluation of R&D results for institutional funding at the level of funding bodies.

After the International Audit (see 5.2), Metodika 2013-2015 was developed with a reformed methodological approach. Changes included the introduction of a panel review, improved definitions of research outputs, and efforts to increase trust in the fairness of the system amongst the research community\textsuperscript{67}.

Metodika 2013 was prolonged until 2016 despite sentiments that National R&I programme evaluations should be reviewed and that ex-ante, on-going, ex-post evaluations and impact analyses were not regularly conducted according to international standards. The new system being rolled out at the moment marks another sharp change as it represents a significant move away from an assessment system focused on metrics alone. This move from a count-based system to a more explicitly quality-oriented system is arguably the biggest change that has occurred in recent years.

4.2 Are there any known effects of current or former performance- or assessment-based components

Metodika was introduced in 2004 with the motivation of improving quality of Czech public research. During the first 3 to 4 years of its implementation, a positive effect was indeed witnessed. With time, however, the focus shifted towards research volume at the expense of quality as research quantity was also, to an extent, rewarded. One reason for this was that some of the research output types eligible for points under the old scoring system were not strictly scientific. Furthermore, evaluations of the 2009 methodology noted that the points awarded as part of the evaluation exercise were interpreted as indications of quality and were used to reward or punish, and that the relationship between funding and evaluation started to dominate Czech R&D policy\textsuperscript{68}.

The quantitative result of the Evaluation Methodology 2013-2016 also substituted HR policy on the level of the ROs. The researchers’ quality and performance were often assessed based on the number of points allocated to his/her publications. Together with the fact that core funding is for 100% influenced by PRFS, this often led to the production of short-term, “easy” outcomes and in some disciplines to distorted publication patterns overall.

Due to the relative lack of new rules for the preparation and evaluation of research programmes in recent years, overall standards for research evaluation continue to be low, limiting insights for policy makers and other stakeholders\textsuperscript{69}. This is expected to improve once the new 5-module system sees full implementation in 2020 and will be complemented with structural evaluations every 5 years.

The ongoing transition of the system has also created some challenges in terms of acceptance. The implementation of the first phase (M1 and M2) was criticised for focusing too heavily on bibliometrics which was not favourable to institutes that were less research-active. Research managers and faculty deans resisted the move away from a point-based system as this latter facilitated

\textsuperscript{67} Ibid.
easier management of individual research departments. Finally, other stakeholders in the research community disagreed with the fact that, to an extent, institutions performing research of lesser quality were still receiving funding as a result of it.

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The RD&I Council has a legal obligation to prepare the evaluation methodology and use this for the evaluation of results of research evaluations within ROs and for reviews of the national system.

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

A 2011 International Audit\(^{70}\) of the RD&I System in the Czech Republic expressed a number of criticisms of Metodika. Several shortcomings were identified such as; an exclusive focus on immediate research outputs, a reduction of the complexity of performance, a lack of consideration for disciplinary differences, the common treatment of all institutions regardless of their missions, the lack of perception of the evaluation system as part of the policy cycle \(^{71}\). This review has been critical in terms of triggering changes to the system that are currently being implemented.

None of the Ministries conduct evaluations for the assessment of its departmental research organisations\(^{72}\).

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The RDI Council steering committee together with a panel of international experts conducts reviews and can seek inputs from open consultations with relevant stakeholders and exports at its own discretion.

6. Additional points of interest

It is worth noting once more that the overall system is currently in a state of transition and that the final design and implementation of the assessment system are still under discussion. Details reported here are therefore subject to change.

7. Sources

7.1 Public documents of interest


\(^{70}\) Technopolis Group (2011) International Audit of Research, Development & Innovation in the Czech Republic. Final Report 3 - The Quality of Research, Institutional Funding and Research Evaluation in the Czech Republic and abroad


\(^{72}\) Ibid.
| **Technopolis Group (2011) International Audit of Research, Development & Innovation in the Czech Republic. Final Report 3 - The Quality of Research, Institutional Funding and Research Evaluation in the Czech Republic and abroad** |
| **Council for Research, Development, and Innovation (2018) Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-tied Aid Programmes.** |
| **Dr. Petr Dvořák – Vice-chairman, Council for Research, Development, and Innovation & Vice-Rector for Research, Masaryk University.** |
## Country template: Estonia

### 1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country: Estonia</th>
<th>1.2 Population: 1.3 million</th>
<th>1.3 GERD/GDP: 1.28%</th>
<th>1.4 GERD/GDP frank (20): 18th</th>
</tr>
</thead>
</table>

**1.5 Overview of RPO landscape**

- Public universities: 6 – University of Tartu and Tallinn Technical University are the most significant in terms of funding and research outputs.
- Private university: 1 – primarily focused on education rather than research.
- Private R&D institutions: 6 - Cybernetica AS, Protobios OÜ, BioCC OÜ, Tervisetechnoloogiate Arenduskeskus AS (Competence Centre on Health Technologies), AS Toidu- ja Fermentatsioonitehnoloogia Arenduskeskus (Centre of Food and Fermentation Technologies), and Tarkvara Tehnooloogiate Arenduskeskus OÜ (Software Technology and Applications Competence Center).
- Public Research Organisations (PROs): 5 – these are relatively small in size and are mostly under the supervision of the Ministries of Education and Research, Social Affairs, and Culture. There are also a few other research organisations operating privately or under the supervision of the Academy of Sciences.
- Centres of Excellence in Research: 9 – these include research teams from different institutions aimed at national and international cooperation. These are supported through EU Structural Funding.

### 1.6 Brief summary/system description

The legal basis for the organisation and functioning of the Estonian research system is the Organisation of Research and Development Act. The government together with the parliament shape the policies; the parliament approves the research, development and innovation strategy and state budget for research.

- The Research and Development Council, which consists of four ministers and eight members appointed by the government, directs the state's research and innovation policy and advises the government in such matters.

- Different ministries prepare and implement sectoral policies. The Research Policy Committee is an advisory body to the Estonian Ministry of Education and Research (MER). The respective advisory body to the Estonian Ministry of Economic Affairs and Communications is the Innovation Policy Committee.

- State foundations, the Estonian Research Council and the Archimedes Foundation, are the principal institutions organising research within the area of responsibility of MER, and Enterprise Estonia, which operates under the supervision of the Estonian Ministry of Economic Affairs and Communications, is the principal institution funding innovation. Direct public funding for research is provided either as competitive research grants or as baseline funding for public research institutions. Furthermore, the MER also provides funding to the Estonian Research Council, which is the main R&D support structure and funding agency, the Archimedes Foundation, the main

---

Implementation agency for R&D, and the Academy of Sciences. A significant amount of research funding is provided through EU Structural Funds (57-60% in 2011-2015; 48-42% in 2016-2021).

- Research and development work is carried out by public sector research institutions (primarily universities) and private sector research institutions. Approximately 70% of Estonia's research personnel are employed by public sector research institutes, where just over 50% of public research is conducted.
- The Estonian Academy of Sciences acts under a separate law. It is an independent association of top-level scientists and scholars, with commitment and responsibility to advance scientific research and represent science nationally and internationally.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

Yes

The primary funding instruments financed from the state budget are baseline funding and research grants. EU structural funds contribute a substantial share of the public R&D funding; in Estonia these are deemed a part of the state budget.

Research grants are meant for financing activities necessary for the realization of high-level R&D projects. Competitions for research grants are organised by the Estonian Research Council and the funds provided by the MER.

Baseline funding means the financing of research and development for the purpose of attaining the development objectives of a research and development institution, including for co-financing national and foreign projects, opening new research directions, and investing into infrastructure. Baseline funding is allocated under the leadership of the Estonian Ministry of Education and Research. Baseline funding is provided to R&D institutions that have received a regular positive evaluation from the state budget via the budget of the MER.
2.3 Shares of funding allocated through the main mechanisms

- Research grants: 60% (competition based) (2018)
- Baseline funding: 40% (non-competition based) (2018)

Over time, these ratios are shifting to a more equal balance (see section 6)

Please note: given share reflects the proportions two main national research funding instruments described in 2.1. It did not account EU structural funding programmes (given on the scheme below).

MER research budget in 2018 (million EUR)

### 3. Assessment-based system components

**PRFS**

#### 3.1 Approach

Performance-based funding was introduced in 2004. It is based on a set of R&D performance indicators and it applies to all public R&D institutions, i.e. public universities and other public research institutions, independent from legal status, that have passed the regular evaluation of research activities. Funds come from the MER budget and are distributed under contracts between the R&D institute and the corresponding ministry (primarily the MER). Base funding is determined annually but, in order to provide for some stability in the flow of funding, takes into account the 3 preceding years. Regarding bibliometrics, the Estonian Research council prepares a list of publications associated with Estonian institutions, which are then validated by said institutions in agreement with the Council.

---


### 3.2 Funding formula

<table>
<thead>
<tr>
<th>Weight</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>Research areas of national significance (e.g. research in Estonian language and literature, Estonian history, etc.)</td>
</tr>
<tr>
<td>95%</td>
<td>Performance-based</td>
</tr>
<tr>
<td>40%</td>
<td>number of high-level publications in internationally recognised journals(^ {77, 78} )</td>
</tr>
<tr>
<td></td>
<td>number of high-level research monographs(^ {79} )</td>
</tr>
<tr>
<td></td>
<td>number of registered patents(^ {80} )</td>
</tr>
<tr>
<td>50%</td>
<td>Amount of R&amp;D financing from other sources (i.e. targeted research, commissions by enterprise, municipalities, ministries, etc.)</td>
</tr>
<tr>
<td>10%</td>
<td>Number of doctoral graduates</td>
</tr>
</tbody>
</table>

### 3.3 Rationale for PRFS

The rationale given for using an entirely performance-based allocation mechanism is that it encourages initiative-taking but also accountability of R&D institutions for their activities. Second, it is intended to help institutes focus on core activities and, in doing so, realise better results. Finally, the system is also supposed to provide institutes with a degree of financial stability and confidence\(^ {81} \).

### 3.4 Approach

Project-level funding for individuals or research groups is based on public competition\(^ {82} \). Applications are evaluated by the Estonian Research Council through peer review and the eventual funding is provided by the Ministry of Education and Research. Historically, project-level funding and research grants have represented a significant source of funding for the Estonian universities and research institutes (see section 6).

The evaluation of grant applications is based on the quality of research and capacity for conducting research projects on behalf of individual researchers or research teams. Additional considerations are the balance of field-specific R&D, type of R&D (basic research, applied research, and experimental development according to OECD Frascati Manual definitions), strategic national developments, and societal or entrepreneurial necessities.

### 3.5 Funding formula or allocation key in 2019

From 2020 onwards, the values of the grants will be increased and a new ‘proof-of-concept’ grant will be added.

---

\(^ {77} \) Coefficient of 1 for publications in Web of Science databases Science Citation Index Expanded, Social Sciences Citation Index, Arts & Humanities Citation Index and/or database Scopus (except books)

\(^ {78} \) Articles with more than 100 authors get a coefficient of 0.5 and those with over 1000 authors a coefficient of 0.3. This was introduced in 2016. Before, all considered articles had a coefficient of 1.

\(^ {79} \) Monographs published by the editorial office named in the list published in Estonian Research Information system and fully prepared by author (coefficient five); one chapter prepared by the author (coefficient one); two or more chapters prepared by the author (coefficient of two).

\(^ {80} \) Registered patent application with coefficient 2 and patent with coefficient 3.


\(^ {82} \) One of the instruments ‘Institutional Research Funding’ should not be confused with institutional funding as understood within the context of this study.
<table>
<thead>
<tr>
<th></th>
<th>Size of grant, incl. overhead (EUR per year)</th>
<th>Average duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small</td>
<td>Large</td>
</tr>
<tr>
<td>Postdoctoral grant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-exp.</td>
<td>33,600 (incoming) 40,000 (outgoing)</td>
<td>n/a</td>
</tr>
<tr>
<td>Exp.</td>
<td>35,700 (incoming) 42,500 (outgoing)</td>
<td></td>
</tr>
<tr>
<td>Start-up grant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-exp.</td>
<td>46,875</td>
<td>75,000</td>
</tr>
<tr>
<td>Exp.</td>
<td>50,625</td>
<td>81,250</td>
</tr>
<tr>
<td>Team grant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-exp.</td>
<td>131,250</td>
<td>185,000</td>
</tr>
<tr>
<td>Exp.</td>
<td>142,500</td>
<td>200,000</td>
</tr>
<tr>
<td>Topic-specific grants*</td>
<td>Non-exp.</td>
<td>Size is more flexible and can range from 500,00 to 1,000,000</td>
</tr>
<tr>
<td></td>
<td>Exp.</td>
<td></td>
</tr>
</tbody>
</table>

Source: ERC

3.6 Other assessment activities

In order to be eligible to receive baseline funding, institutes need to pass the regular evaluations carried out by the Estonian Research Council. The latter appoints a committee of international experts that, through peer reviews and site-visits, determine which institutions can receive baseline funding for the coming period. The level of research and development of the corresponding field of research and development at a research and development institution is assessed by comparing it with internationally recognised criteria. The regular evaluation of research institutions is vitally important as threshold condition for eligibility: only those institutions who have passed regular evaluation are entitled to allocation of the baseline funding and to submit application to competitive calls for funding research topics of research organizations (including Universities). The results of regular evaluation do not influence to amount of money allocated. The regular evaluation of R&D institutions is valid for 7 years. After that a new round of evaluation is carried through. These regular evaluations were introduced in 2010. Another round was conducted in 2017 and the 3rd cycle is currently ongoing.85.

In addition, target evaluations are also carried out periodically by the Estonian Research Council. The scope of these evaluations ranges from specific research fields to individual funding instruments. They are typically used to preparing strategic development plans for research and development or other research policy decisions and measures, or for assessing and analysing the impacts and implementation thereof. Recently conducted targeted evaluations covered:

- Professorships in research areas of national significance (2016)

---

83 These are planned for 2022 and have not been added yet.
4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

After Estonia gained independence from the Soviet Union in 1991, a new R&D system had to be built from the ground up. A system of baseline funding based on performance criteria was first introduced in 2004 and does not have a predecessor. In fact, there was no system for institutional funding up until 2004 at all. Rather, universities and research institutes were largely dependent on the research funds brought into the institutions by individual researchers which inhibited from engaging in strategic tasks at the level of the institution. This issue was also highlighted in systemic evaluations (see section 5.2).

When baseline funding was introduced this was based on a performance-based allocation mechanism in order to emphasise quality in research. This system is still in place today and has remained relatively stable over time. The main changes to it have been regarding the weights assigned to specific components of the key and their specifications. Most notably, in 2017, the relative weight of external R&D funding has increased from 40% to 50% in the current system (resulting in a reduction of weight for research outputs from 50% to 40%) in order to promote contractual research. Finally, in 2018, within the component of external R&D funding, the weight of revenues from business enterprise sector contracts, and sale of licences, patents and protected plant sorts, was doubled in order to raise economic impact.

4.2 Are there any known effects of current or former performance- or assessment-based components

The historically lower levels of institutional baseline funding in comparison to competitive project-based funding are argued to have created some weaknesses in the Estonian research system. The high dependence on competitive research grants has meant that research institutions cannot set long-term objectives due to the lack a stable environment. Although EU Structural Funds have made significant contributions to modernising the research infrastructure, the insufficient national funding means these are not used in full capacity. Furthermore, it inhibits institutions in developing career models for researchers. However, recent efforts on behalf of the MER are addressing these issues.

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

Evaluations of funding applications and eligibility criteria for baseline funding are organised by the Estonian Research Council and carried out by an external Evaluation Committee of international experts. The amount of annual institutional funding is established by the State Budget and distributed according to a performance formula according to a directive of the Minister of Education and Research on the recommendation by the Estonian Research Council.
5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

Several high-level reviews of the overall Estonian system have taken place. The first was a review by the Royal Swedish Academy and the Swedish Research Councils in 1991 in order to build up an Estonian research system after it gained independence. In 1994, the Estonian Research and Development Council conducted an evaluation of the research landscape and served as a basis to rearrange it. Third, a large-scale evaluation of the entire research, development, technology, and innovation system was conducted by the Policy Research in Engineering, Science and Technology (PREST) unit at the University of Manchester in 2003, commissioned by the Ministry of Education and Research. One of the conclusions of the report concerned the lack of base-line funding for research institutes and was an important factor in the introduction of baseline funding system in 2004.

In 2007, Estonia’s overall research, technology, development and innovation policy mix was reviewed by a panel of external experts. The review was organised by the Ministry of Economic Affairs and Communications and was commissioned by the European Commission. The review also covered the allocation of base-line funding.

In 2011-2012, the European Research Area Committee (ERAC) carried out a peer review of the Estonian research and innovation system. This was an important input for the Estonian RDI Strategy for 2014-2020. Furthermore, the Estonian R&D&I system is also being evaluated by the Horizon 2020 Policy Support Facility in 2018-2019. The report is expected to be published in the second half of 2019. Efforts to develop a new framework for research grants and baseline funding have been initiated and are set out in ‘Estonian Research and Development and Innovation Strategy 2014-2020 “Knowledge-based Estonia”’ and the MER’s Proposals for the Organisation of Research Funding.

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The 1991 and 1994 evaluations monitored the performance of research activities of the universities and other research institutions at the level of research groups. The 2003 evaluation focused more on the level of institutes and organisations and also involved relevant ministries.

The 2007 and 2012 reviews were carried out using focus groups consisting of policy makers from different Estonian ministries and agencies, as well as stakeholders from the business and academic communities.

6. Additional points of interest

At the introduction of (performance-based) baseline funding in 2005, the ratio of project to baseline funding was initially 90:10. This ratio has gradually changed over time and was around 60:40 until recently. This ratio has been the topic of an ongoing debate but there is the accepted goal is to further shift this ratio to 50:50 to reduce the reliance on competitive funding, and provide a more

---


89 Estonian Research Council - A New Framework of Research Grants and Baseline Funding in the Estonian Research and Development Funding System

stable flow of funding giving PROs more room to make strategic choices. As of 2019, the ratio is now approximately around 50:50.

7. Sources

<table>
<thead>
<tr>
<th>7.1 Public documents of interest</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estonian Research Council</strong></td>
</tr>
<tr>
<td>Siret Rutiku – Head, Department of Research Funding</td>
</tr>
<tr>
<td><strong>Ministry of Education and Research</strong></td>
</tr>
<tr>
<td>Dr. Rein Kaarli – Advisor, Research Policy Department</td>
</tr>
</tbody>
</table>

---

8 Country template: Finland

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country: Finland</th>
<th>1.2 Population: 5.5 million</th>
<th>1.3 GERD/GDP: 2.75%</th>
<th>1.4 GERD/GDP rank (/20): 5th</th>
</tr>
</thead>
</table>

1.5 Overview of RPO landscape

- Universities: 14 (including 1 National Defence University)
- Universities of applied sciences: 23 (including one Police University College)
- Science agencies and research institutes under the steering of the Ministry of Education and Culture: 4
- State research institutes under the steering of other administrative sectors: 12

1.6 Brief summary/system description

The Finnish Government is advised by the Research and Innovation Council which discusses key issues relating to the development of research and innovation policy that supports the wellbeing, growth and competitiveness of the economy. The Ministry of Education and Culture is responsible for steering science policy, funding basic research, and funding Higher Education Institutions (HEIs) as well as the Academy of Finland. The majority of research funding based on competitive bidding derives from the Academy of Finland, The Business Finland (formerly known as The Finnish Agency for Innovation ‘Tekes’) and the European Union. Current public support for business R&D is remarkably low and no tax incentives are used.

2. Funding system overview

2.1 What are the main funding system components?

Public R&D funding is primarily allocated to the Ministry of Education and Culture and the Ministry of Economic Affairs and Employment, and their respective agencies. Institutional funding is provided to Finnish HEIs (both universities and universities of applied sciences) by the Ministry of Education and Culture. The latter also supports the Academy of Finland (Research Councils; a funding agency) which is one of the primary providers of competitive research funding.

The Ministry of Economic Affairs and Employment provides innovation-oriented funding through for applied research and to Business Finland, the innovation agency.

2.3 Shares of funding allocated through the main mechanisms

Finland’s public allocations for publicly performed research is allocated for 56 % and 44% in the form of organisational level (institutional) funding and project funding respectively.

Out of competitive project-level funding, the Academy provides funding for scientific research, researcher training, and overall improvements in research capacities. Business Finland, on the other hand, funds applied research in higher education institutions (including universities of applied sciences), research institutes and businesses.
3. Assessment-based system components

3.1 Approach
Since Finnish HEIs only charge tuition fees from students outside the EU/EEA, they rely significantly on public funding. This is completely allocated on the basis of a performance-based formula that covers both research and education. The current funding formula was introduced in 2017. The level of assessment is the university rather than individual departments or research groups. The internal distribution of funds, however, occurs at the university’s discretion.

The approach of the core funding model for universities is explicitly performance-based with regards to both education and research. Focus areas are impact, quality, and internationalisation. Data regarding the different criteria are submitted annually by the university as part of their funding application.

3.2 Funding formula
Core funding model for universities 2017

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Metric</th>
<th>Sub-components &amp; explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>13%</td>
<td>Master’s degrees</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>33%</td>
<td>9%  PhD degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13% Scientific publications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight for refereed publications: level 0 (0.1), level 1 (1), level 2 (3), level 3 (4) Weight for other publications: 0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9%  Completed research funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Internationally competed research funding – 3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nationally competed research funding and corporate funding – 6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2%  International teaching and research personnel</td>
</tr>
<tr>
<td>Other education and science policy considerations</td>
<td>28%</td>
<td>12% Strategic development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strategy of the university, implementation of the strategy, national education and science policy aims</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9%  Field-specific funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All fields of art, engineering, natural sciences, medicine, dentistry, and veterinary medicine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7%  National duties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Special national duties, teacher training schools, National Library of Finland</td>
</tr>
</tbody>
</table>
3.3 Rationale for PRFS

The Ministry of Education and Culture states that the purpose of the financing models is to improve the quality, impact and productivity of the higher education institutions. Furthermore, the model allows the core funding distributed to the higher education institutions to be allocated as a single entity. The funding model uses the past three-year-averages as performance indicators in order to provide stability in the system. In reality, changes in the performance of individual HEIs tend to be relatively minor and very gradual, resulting in fairly modest changes in performance funding from one year to the next. The higher education institutions then decide on the internal allocation of funding independently on the basis of their strategy.

3.4 Approach

A different allocation model is used for universities of applied sciences. The model emphasises performance in terms of education but focuses more on research and development as opposed to academic research. Overall focus areas are quality and internationalisation as well as regional impact and linkages with business and industry.

### Core funding model for universities of applied sciences

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>79%</td>
<td>Bachelor’s degrees</td>
</tr>
<tr>
<td></td>
<td>40%</td>
<td>Number of students who have gained at least 55 study credits</td>
</tr>
<tr>
<td></td>
<td>23%</td>
<td>Number of employed graduates</td>
</tr>
<tr>
<td></td>
<td>5%</td>
<td>Study credits in open UAS education and in non-degree programmes</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>Degrees in vocational teacher training</td>
</tr>
<tr>
<td></td>
<td>3%</td>
<td>Student feedback</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>Student mobility to and from Finland</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>15%</td>
<td>External R&amp;D funding</td>
</tr>
<tr>
<td></td>
<td>4%</td>
<td>Master’s degrees</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>Publications, public artistic and design activities, audio-visual material and ICT software</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>Teacher and expert mobility</td>
</tr>
<tr>
<td>Strategic development</td>
<td>5%</td>
<td>Strategic funding</td>
</tr>
<tr>
<td>Field-specific funding</td>
<td>1%</td>
<td>Field-specific funding</td>
</tr>
</tbody>
</table>

3.6 Other assessment activities

Funding is also linked to performance contracts between the university and the Ministry of Education and Culture and takes into account strategy and future objectives as well as an evaluation of previously agreed targets. There are negotiations on the agreements of the results (performance agreements) concerning the universities and universities of

---

applied sciences. The Ministry interacts continuously with HE institutions, science agencies and research institutes.

The Academy of Finland is periodically evaluated (1993, 2004, 2013) by international experts, commissioned by the Ministry of Education and Culture. Universities and universities of applied sciences are themselves legally responsible for taking part in external evaluation of their quality systems. This is normally performed by the Finnish Education Evaluation Centre (FINEEC), but institutions can commission their evaluation from other agencies’ as well. FINEEC also conducts other enhancement-led evaluations on Finnish higher education94.

Evaluations of the domestic and foreign academic publication channels are conducted by ‘Publication Forum’, (in Finnish often referred to as JUFO) which is a rating and classification system to support the quality assessment of research outputs. To account for the different publication cultures characteristic of various disciplines, the classification includes academic journals, book series, conferences as well as book publishers. The three-level classification rates the major foreign and domestic publication channels of all disciplines as basic, leading, or highest level. The evaluation is performed by 23 discipline-specific Expert Panels composed of some 200 distinguished Finnish or Finland-based scholars. Publication Forum operates under the auspices of the Federation of Finnish Learned Societies (TSV). The Steering Group appointed from amongst the scientific community and major organisations in science administration is responsible for the development of the Publication Forum operations. Since 2015, the classification has been used as a quality indicator of the research output produced by universities within the university funding model established by the Ministry of Education and Culture. Among the appropriation criteria, scientific and other publications account for 13 per cent of the basic funding to universities95.

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

Performance agreement for higher education were first introduced in 1994. In 1998, a formula-based allocation for competitive research funding was introduced. This was reformed in 2010 and again in 2013. In 2014, a new formula was added for universities of applied sciences.

Until 2010, the allocation of institutional funding was based on the following indicators: the university's operational expenditure in the last year of the previous performance agreement period; new students and other targets specified in performance contracts, education appropriation, research appropriation including graduate schools, project funding and Centre of Excellence, funding from the Academy of Finland, and the amount of external resources96.

In 2013, this was changed in order to put more emphasis on different dimensions such as quality, effectiveness, and internationalisation and consisted of three main components; education, research, and additional education and science policy objectives. The current funding formula, introduced in 2017, is based on the same three components but with different weights between them.

Throughout 2003–2015, the policy of the ministry has been to update the funding model every 3 to 4 years which corresponds with the standard

94 For more information https://karvi.fi/en/higher-education/
95 http://www.julkaisufoorumi.fi/en/publication-forum
4.2 Are there any known effects of current or former performance- or assessment-based components

Indicators regarding student intake and graduations have a relatively high weight which ensures a relatively stable flow of funding for the universities.

Regarding the measurement of research outputs, a 2012 ERAWATCH report\(^97\) notes that whilst the total number of research outputs places Finland in a strong international comparative position, this is not necessarily the case when it comes to research quality, and notes that in terms of international rankings, Finland has few areas of international excellence. As such, the relative emphasis in the indicator selection on numbers of publications is problematic. The use of the three-level classification evaluations run by to gauge the quality of research outputs goes some way to address this imbalance between number of outputs and research quality\(^99\).

The renewed funding model for HEIs is expected improve scientific quality but incentives for cooperation and societal and economic impact remain comparatively weak.

A 2013 paper\(^100\) made the following conclusions on the effects of the performance-based funding scheme:

- Increased graduation rates, particularly amongst male students
- Limits on the scope of strategic planning and autonomy due to the emphasis on output-based indicators
- Diminished importance of the performance agreements between the universities and the Ministry of Education
- Increased incentives to improve funding attraction processes
- Facilitation of internal distribution based on reported output measures
- Inter-university competition for funding

A recent article\(^101\) analysing the effects of accountability mechanisms in universities in the Nordic countries remarked that, in the case of Finland, the use of bibliometrics in the performance evaluation system caused turmoil, even though the rating system itself has remained in the hands of the scientific community. Discussions continue regarding an increased focus on quantity over quality resulting from the use of bibliometrics. Moreover, research assessment exercises, which represent a common quality assurance method for internal quality assurance of universities, are based on peer review of scientific panels. Here, professional accountability and managerial accountability are interwoven.

---


5. Ownership, review & evaluation

| 5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system? | The Ministry of Education and Culture is responsible for assessing the output data provided by the HEIs. Finland’s Parliament decides on government budget, including the amount of core funding allocated by the Ministry of Education and Culture to the universities and universities of applied sciences. |

| 5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system? | Generally speaking, the Ministry of Education and Culture usually authorises reviews which are conducted by agencies, researchers and/or consultant firms etc. Inputs are provided by the major stakeholders on public and private and third sector through a variety of methods, such as queries, surveys, interviews and desk studies. |

The Academy of Finland conducts periodic reviews of the state of scientific research in Finland, producing materials that support universities’ and research institutes’ development efforts and that strengthen the knowledge base of science policymaking. Statistics Finland produces reports on ‘Science, Technology and Information Society’ describing research and development activity and the resources used for its funding and research, enterprises’ innovation activity and the use of information and communications technology by enterprises and individuals. It also describes the funding allocated to R&D from the state budget and examines changes occurring to R&D funding over different time-periods.

FINEEC is an independent agency responsible for the evaluation of education. It operates as a separate unit within the Finnish National Agency for Education. It carries out evaluations related to education including the operations of education providers from early childhood education to higher education. FINEEC’s audit model has been renewed for the third round of audits (2018-2024). The aim of the new audit model is to support higher education institutions in the continuous development of their operations, and to encourage internationalisation, experimenting and a creative atmosphere at higher education institutions. In the new audit model, there is a stronger emphasis on student-centred approach and societal impact of activities.

Externally, the Finnish Higher Education System was reviewed as a whole in 2015 by Technopolis Group, commissioned by the Ministry of Education and Culture. It focussed on analysing its strengths and weaknesses and identify proposals to improve the higher education system and strengthen Finland’s innovation system.

Regarding other external evaluations, a 2017 review of the Finnish innovation system by the OECD concluded that the planned reforms to strengthen strategic research orientation in HEIs are unique among the Nordic countries but that it was too early to comment on the effects. In addition, more support is needed for strategic research and innovation.

---

103 http://www.stat.fi/til/ttt_en.html
and adequate steering and funding of public research institutions, remains a challenge\textsuperscript{107}.

The use of performance-based funding schemes in universities was also the subject of a paper\textsuperscript{108} in 2013 which discussed some if its effects (see 4.2).

Furthermore, a recent high-level evaluation of the government’s fiscal policy has been carried out in 2017 by the VATT Institute for Economic Research and the Economic Policy Council that, amongst other things, also analysed the Finnish research and innovation landscape\textsuperscript{109}. One if the topics discussed were the effects of recent policy decisions, particularly related to the reforms of vocational education, university admission systems and research funding.

Finally, an impact assessment of the reforms in higher education has been run by the Ministry of Education and Culture\textsuperscript{110}. One of its conclusions was that the majority of the funding of higher education institutions still comes from the government and the funding is steered using indicator-based funding models that according to the evaluation limit the actual autonomy of the higher education institutions.

<table>
<thead>
<tr>
<th>5.3 Which stakeholders/organisations had input into review/evaluation activities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs for the 2015 review were provided by a panel of international experts. For the review interviews were held with multiple stakeholders:</td>
</tr>
<tr>
<td>• Aalto University</td>
</tr>
<tr>
<td>• Academy of Finland</td>
</tr>
<tr>
<td>• AKAVA</td>
</tr>
<tr>
<td>• Arcada Polytechnic</td>
</tr>
<tr>
<td>• Confederation of Finnish Industries Haaga-Helia</td>
</tr>
<tr>
<td>• Kajaani University of Applied Sciences</td>
</tr>
<tr>
<td>• Lapland University of Applied Sciences Lappeenranta University of Technology</td>
</tr>
<tr>
<td>• Ministry of Employment and the Economy</td>
</tr>
<tr>
<td>• National Institute for Health and Welfare, THL National Union of University Students in Finland, SYL Oulo University of Applied Sciences</td>
</tr>
<tr>
<td>• Tampere University</td>
</tr>
<tr>
<td>• Tampere University of Applied Sciences</td>
</tr>
<tr>
<td>• Tampere University of Technology</td>
</tr>
<tr>
<td>• Technical Research Centre of Finland, VTT</td>
</tr>
<tr>
<td>• Tekes</td>
</tr>
<tr>
<td>• The Finnish Education Evaluation Centre (FINEEC), Karvi</td>
</tr>
<tr>
<td>• Union of Students in Finnish Universities of Applied Sciences, SAMOK University of Eastern Finland</td>
</tr>
<tr>
<td>• University of Helsinki</td>
</tr>
</tbody>
</table>

\textsuperscript{110} http://julkaisut.valtioneuvosto.fi/handle/10024/161051
6. Additional points of interest

The universities were completely state-owned until 2010 when they gained independence under the Universities Act. Two of the universities are foundations pursuant to the Foundations Act and other are corporations under public law. They remain, however, almost entirely publicly funded. The universities of applied science under Ministry of Education and Culture operate as public limited companies.

The Ministry of Education has progressively received a larger allocation as funding for the Academy of Finland has increase whereas funding for VTT, the PRO's and university hospitals has been cut. This decline in public funding for the business enterprise sector is due to the shifts towards refundable instruments.

Recent reforms include the pooling of resources to the Prime Minister’s Office (PMO) and the establishment of the Strategic Research Council (SRC) at the Academy of Finland. These reforms are intended to strengthen knowledge- and evidence-based decision making, to train academics to carry out policy relevant analysis, and to target resources to solve societal challenges.

7. Sources

<table>
<thead>
<tr>
<th>7.1 Public documents of interest</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Education and Culture:</td>
</tr>
<tr>
<td>Erja Heikkinen – Director, Division for Science Policy</td>
</tr>
<tr>
<td>Tuomas Parkkari – Senior Ministerial Advisor, Department of Higher Education and Science Policy</td>
</tr>
<tr>
<td>Matti Kajaste – Councillor of Education</td>
</tr>
</tbody>
</table>

---

9 Country template: France

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20):</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>67 million</td>
<td>2.25%</td>
<td>8th</td>
</tr>
</tbody>
</table>

The public research sector in France is dominated by two main groups of research performing institutions:
- Public research Organisations: 62% of expenditure (2014), incl:
  - the National Centre for Scientific Research (CNRS)
  - the Atomic Energy Commission (CEA)
  - the National Institute for Health and Medical Research (INSERM)
  - the National Institute for Agricultural Research (INRA)
- Higher Education Institutions: 34.5% of expenditure
  - 67 Universities
  - 223 'Grandes Écoles'

The remaining 4% of expenditure is accounted for by NGOs and in-house research carried out by government institutions.

1.5 Overview of RPO landscape

In the post-war period, the French science system was dominated by large, vertically integrated government research organisations (such as the CNRS), whereas universities played a less prominent role in research. The boundaries are now less obvious as a large proportion of research is organised through ‘mixed lab’ located at universities but funded through the PROs (e.g. CNRS).

A series of reforms stretching back to the 1980s but accelerated in 2006/7 have introduced new elements into the system:
- Increased autonomy of universities, especially over financial and human resources (2007)
- Contractualisation of the relationship between the government and universities in the form of mandatory multi-year contracts (2007)
- Increased territorial coordination in research clusters, allowing universities, grandes écoles and research institutions to pool resources in order to improve results. (2006)

One element in this reform was the creation of an independent agency responsible for evaluating public research, AERES (now HCERES) in 2007 (Paradeise 2018).

The French public research system remains rather complex with a large number of actors with overlapping responsibilities. (OECD 2014)

1.6 Brief summary/system description

1. Funding system overview

<table>
<thead>
<tr>
<th>2.1 What are the main funding system components?</th>
<th>2.2 Is there a PRFS (definition: JRC/Hicks)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both research organisations and universities rely on government block grants for a large proportion of their research income, about 70-75%. Of this, the majority comes from the Ministry for Research</td>
<td>No</td>
</tr>
</tbody>
</table>
2.3 Shares of funding allocated through the main mechanisms

As of 2014, research organisations and HEIs received their income from the following main sources (David & Roussel, 2017):

- Research organisations:
  - ‘Government budget allocations’ (block grants): 70.0%
  - ‘Contractual resources’ (external funding): 21.9%
  - Other resources contributed by the institutions themselves: 8.1%
- Higher education
  - Government budget allocations (block grants): 73.4%
  - ‘Contractual resources’ (external funding): 20.9%
  - Other resources contributed by the institutions themselves: 5.7%

Figure 2  Overview of funding mix for public research in France (2014)

Source: Technopolis adapted from David & Roussel (2017)

3. Assessment-based system components

PRFS 3.1 Approach HCERES evaluates research at multiple levels, including institutions and research units. HCERES also evaluates research and educational
programmes and more recently also coordinated research sites. HECERS does not evaluate the performance of individual researchers.

**Institutions**

Each institution, whether operating under the supervision of the Education Ministry or other government departments, is evaluated within a five-year period on a rolling basis. The current list of institutions to be evaluated by HCERES counts about 310 HEIs and research institutes. The reference period for the evaluation is the past 4-5 years.

Institutions are evaluated along the following five key dimensions:

- **Positioning**: Positioning within the local, national and international landscape.
- **Strategy**: The targets set by the institutions and the resources dedicated to achieving them.
- **Organisation**: Internal organisational structure underpinning the strategy.
- **Governance**: Rules and decision-making processes.
- **Management**: Management tools used, including information systems.

In addition, HEIs are will be assessed on research and teaching, student attainment, knowledge transfer and more.

**Research units**

HCERES evaluates more than 500 research units each year, along three main criteria:

- **Quality of research output and activities**, including:
  - Production of knowledge
  - Interaction with the environment
  - Research-based education
- **Organisation of the unit**
- **Research strategy**

**Methodology:**

The methodological approach used by HCERES relies primarily on peer review complemented by certain indicators, some of which are mandatory.

The process involves two main elements:

- A self-evaluation report submitted by the institutions following the outline from HCERES.
- An external evaluation conducted by a committee of national and international experts. This includes a site visit during that includes meeting with stakeholders (representatives of supervising institutions and bodies; heads of research units; different categories of research staff; PhD students) and drafting of the evaluation report. Meetings

---

112 [https://www.hceres.fr/PRESENTATION/Missions](https://www.hceres.fr/PRESENTATION/Missions)

113 This is instead the role of the Conseil National des Universités (CNU) which advises the government on qualifications, recruitment and careers of university professors and lecturers ([https://www.conseil-national-des-universites.fr/](https://www.conseil-national-des-universites.fr/))

114 Based on guidelines for the 2019-2020

115 In the assessment of research units, 'supervisory institutions and bodies' refers to the universities or institutes overseeing the units being assessed.
with different categories of staff and PhD students take place separately in order to encourage open and honest feedback.

All evaluation reports are signed by the committee president. The evaluation report is communicated to the supervising bodies. An evaluation summary is published on the HCERES website.

For the assessment of the scientific production in research units, a series of guidance notes for each discipline have been produced by independent committees coordinated by HCERES. The guidance notes follow the same structure in all fields of research but depending on the research fields, committees have added a list of journals to the guidance notes, sometimes categorised according to their importance.116

Research units no longer receive a score but a qualitative summary statement (‘appréciation synthétique’) for each of the three criteria.

The assessment system was originally intended to inform the allocation institutional block grants to universities.

In 2009, the Education Ministry set up a funding formula, System of distribution of resources to activity and performance (‘SYMPA’). The formula was meant to work in three steps:

- Universities were assessed as described above
- The assessment was translated into a performance score, with 80% weight given to research and 20% to teaching.
- The performance score would form the basis for the allocation of 20% of the block grants from government to universities.

Among other things, data quality and computation and the impact on university budgets led many within the sector to oppose the Sympa formula, and the Association of University Presidents were able to get the funding reform withdrawn in 2011.

There is currently no link between the results of the HCERES evaluations and the amount of the of direct funding received from the government. HEIs and research organisations may, however, use internal funding formulas and take the HCERES evaluation reports into account in their decisions about internal distribution of funding.

### 3.2 Funding formula

<table>
<thead>
<tr>
<th><strong>Research units</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The evaluation of research units has the following stated purposes:</td>
</tr>
<tr>
<td>• help staff assess their potential and identify their position within the regional, national and international context</td>
</tr>
<tr>
<td>• provide the governing bodies of higher education institutions and research bodies with information that is useful for managing their organisations</td>
</tr>
<tr>
<td>• underpin HCERES evaluation of study programmes, research, institutions and territorial coordination.</td>
</tr>
</tbody>
</table>

### 3.3 Rationale for PRFS

<table>
<thead>
<tr>
<th><strong>Other Conditional funding</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3-4 Approach</strong></td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td><strong>3-5 Funding formula or allocation key</strong></td>
</tr>
<tr>
<td>n/a</td>
</tr>
</tbody>
</table>
4. History & effects

The evaluation of public research has been undertaken in France in different forms for several decades. The National Committee for evaluation of Higher Education Institutions (CNE) was established in 1985 and tasked with systematically evaluating universities and HEIs. The body developed methodological standards and published some 240 evaluation reports. Other bodies with similar tasks included the national committee for the Evaluation of Research (CNER) and the Mission scientifique, technique et pédagogique (MSTP). The responsibility for evaluation of research activities was thus spread out across a number of different organisations (Chevallier 2013).

### Table 1. Research evaluation France before and after 2006/7 reforms

<table>
<thead>
<tr>
<th>Until 2006</th>
<th>From 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities and grandes écoles</td>
<td>CNE</td>
</tr>
<tr>
<td>University research units</td>
<td>MSTP</td>
</tr>
</tbody>
</table>
| Research organisations | Internal (research organisations)  
| Mixed research unites (UMR) |  
| Research programmes and policies | CNER |

Source: Technopolis adapted from Chevallier (2013)

The Agence d'évaluation de la research et de l'enseignement supérieur (AERES) was set up in 2007 to assess public research in France, covering all fields and all organisational levels with the exception of individual researchers. AERES effectively incorporated CNE, MSTP and CNER and took over the responsibility for evaluating research organisations as well. AERES implemented seven ‘evaluation campaigns’ before being shut down in 2012.

The High Council for Evaluation of Research and Higher Education (HCERES) replaced AERES in 2014. HCERES plays a similar role to AERES but several important changes were made to the evaluation methodology:

---

117 Internal evaluations are still conducted by internal evaluation bodies of Research organisations, but they include and take into account HCERES evaluation reports.

118 HCERES does not systematically evaluate research programmes and policies. On occasions, it is tasked with evaluating specific programmes, typically large national research programmes which include many institutions such as ‘Plan Cancer’. The national research agency (ANR) is responsible for evaluating the research programmes they fund.
- research units no longer receive a score but instead a summary statement
- evaluation no longer seeks to identify active and non-active research members within the unit but evaluates research units as a whole
- the system of official journals and publications is abandoned and replaced by Guidance notes ('Guides des produits et des activités') that include a larger array of research outputs and activities and allows each research community to characterise them.

The effects of the introduction of the assessment system in the French system has not been formally evaluated. HCERES was evaluated by the European Association for Quality Assurance in Higher Education (ENQA) in 2017 but this review focussed on higher education rather than research.

Assessments of the wider impact of the research evaluation system can be found in the wider literature (e.g. Paradeise, 2017):
- The effect of the assessments on the distribution of funding has been limited and as such the direct impact on institutions have been limited. In terms of funding, the strengthening of competitive ‘external’ grant funding has been much more effective.
- The main impact of ARES/HCERES has been reputational. The standardised assessment of research units across the sector and mandatory publication of evaluation reports effectively ‘named and shamed’ poorly performing labs and increased focus on publications and contributions to societal challenges.

### 5. Ownership, review & evaluation

#### 5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The evaluations are run by the HCERES, an independent administrative authority. Thus, the evaluation is performed separately from the allocation of research funding by the Ministry for Higher Education and Research. Nevertheless, the information may be used by research organisations and universities to inform decisions on internal allocation of funding.

#### 5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

The HCERES is governed by a board made up of 30 representatives from the French and international research community appointed for a four-year term. The Board defines the annual evaluation schedule and the measures required for ensuring the quality, transparency and publication of its evaluation procedures.\(^{119}\)

---

5.3 Which stakeholders/organisations had input into review/evaluation activities?

After each ‘campaign’ (i.e. annual programme of evaluations), HCERES carries out a satisfaction survey of the institutions and external experts involved. The survey covers the evaluation process and usefulness of the outcome. Considering the feedback from stakeholders but also relying on their own initiative, the director of HCERES departments at can propose changes to the evaluation methodology and to propose changes to the HCERES President. Major improvements must be approved by the board.

There are several examples of recent changes.

- The evaluation committees must send a list of questions to the universities before the site visit to allow them to prepare.
- Universities are asked to identify the 20% most significant items within the total research output, although the latter is still considered.
- HCERES is in the process of creating more digital tools.

6. Additional points of interest

n/a

7. Sources

7.1 Public documents of interest


7.2 Interviewees

- Prof. Pierre Glaudes, Director, Department of Research Evaluation, HCERES
- Prof. Pascal Marty, Scientific Advisor, Department of Research Evaluation, HCERES

---

120 http://www.hceres.com/PUBLICATIONS/Evaluation-reports/Feedback-on-the-evaluation-of-institutions (report in French)
10 Country template: Germany

1. Headline facts

| 1.1 Country:  | 1.2 Population: | 1.3 GERD/GDP: | 1.4 GERD/GDP rank (/20): |
| Germany       | 83.7m           | 2.93%         | 4th                        |

1.5 Overview of RPO landscape

- 120 public universities
- 220 universities of applied sciences (Fachhochschulen)
- 60 art and music colleges (Kunst/Musikhochschulen)
- Public research institutes:
  - 69 Fraunhofer institutes
  - 18 Helmholtz institutes
  - 91 Leibnitz institutes
  - 84 Max Planck institutes (5 outside Germany)
- 40 federal research institutes attached to specific sectoral ministries
- 150+ additional Länder research institutes on various topics and fields

1.6 Brief summary/ system description

Germany does not have a performance-based research funding system based on research assessment. There was a system evaluation of the German science system conducted in the late 1990s (resulting of the need for a stock-take after German reunification), though even that exercise distinguished between research funded by the DFG and several other research institute types. More broadly, the German science landscape is considered to be too complex and multi-level (e.g. federalism, multiple different institution types) to suitably lend itself to national research assessment exercises. However, the German Council of Science and Humanities constructed a framework for national research assessment in the early 2010s, though this was not rolled out into regular assessments nationwide. The German Council of Science and Humanities also conducts various field evaluations, and the German Centre for Higher Education and Science Studies (DZHW) created in 2013 conducts considerable monitoring of science in Germany, which is also used for policy advice.

The principle of federalism is critical to institutional funding in Germany: the 16 Länder each are responsible for higher education policy and funding. As such, each has its own funding system, though most approximate to a combination of block grants (with performance contracts) and use of indicator-based formulae. However, the federal level (mostly via the DFG) provides project/competitive funding, and has in recent years, jointly with the Länder, contributed to institutional funds via the Excellence Strategy (formerly the Excellence Initiative) – large institutional payments awarded via successful application and review, in order to ensure that ‘peaks’ of excellence exist alongside the overriding principle that each Land should have good HE and research facilities.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

No

Across the literature it is frequently noted that the research funding system in Germany is rather complex. This is due to the fact that the 16 Länder are highly

autonomous in matters of education policy. Therefore, the Länder mainly focus on education and research at the public universities and Fachhochschulen, whereas the federal government mainly funds PROs (Max Planck, Fraunhofer, etc), and also undertakes much of the project/competitive funding.

However, the Federal Ministry for education and research (BMBF) also has a mechanism through which to enhance the institutional development of German universities: the Excellence Strategy. The Strategy is organized by the BMBF and funded jointly with the Länder, while the German Science Foundation (DFG) and the German Council of Science and Humanities (Wissenschaftsrat) are given responsibility for running it. Altogether, its predecessor, the Excellence Initiative, distributed 2.7 billion euros over the years 2012-2017.

The extent of autonomy given to universities and Fachhochschulen by each Land differs slightly, and the overall ‘balance of power’ in terms of influence and responsibility for these institutions between the federal and Länder levels has also shifted back and forth over time, going back at least to the 1980s (De Boer et al 2015). Yet, most Länder exercise a performance-oriented distribution of funding, (‘leistungsorientierte Mittelvergabe’) which includes instruments such as lump-sum funding, performance agreements (with varying degrees of steering ability) or formula-based distribution, sometimes including ex-post performance measures. There are several differences between how individual Länder approach this. In general, there was a tendency for performance-oriented aspects to become more significant elements of the funding distribution over the past 10-20 years, but this trend appears to have ceased, with most Länder stabilising to between 10 and 25% performance-oriented funding.

It should also be noted that, aside from the federalist principle, the von Humboldtian ‘ethos’ shapes the German system to a degree, in the sense that teaching and research are considered to be closely related and so much of the funding system addresses these two components together. This also applies to an extent to the Excellence Initiative/Strategy.

Given the array of different research performing organisations in Germany and the number of different sub-systems, it is hard to define the exact proportions. However, a frequently-cited aggregate value is that the overall balance of project vs. institutional funding for R&D splits into 64% institutional and 36% project funding.

The share of project funding is, however, likely somewhat lower for the Fachhochschulen.

Meanwhile, the four main research institute types each have quite different shares:

<table>
<thead>
<tr>
<th></th>
<th>Institutional</th>
<th>Ratio Federal/Länder</th>
<th>Project</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helmholtz</td>
<td>65%</td>
<td>9:1</td>
<td>29%</td>
<td>6%</td>
</tr>
<tr>
<td>Fraunhofer</td>
<td>36%</td>
<td>9:1</td>
<td>27%</td>
<td>37%</td>
</tr>
<tr>
<td>Max Planck</td>
<td>81%</td>
<td>5:5</td>
<td>15%</td>
<td>4%</td>
</tr>
<tr>
<td>Leibnitz</td>
<td>78%</td>
<td>5:5</td>
<td>16%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Van Dalen et al 2014

The share of Länder institutional funding that is dependent on formulae including performance indicators (as opposed to performance contracts or unconditional block grants) ranges from 1.5% to 95% from Land to Land, with several Länder increasing this share by several tens of percentage points over the years (figures up to 2011 cited in van Dalen et al 2014). However, different types of indicators
are involved, not all of which necessarily reflect ‘performance’ in an ex-post evaluative manner.

### 3. Assessment-based system components

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
<th>n/a [Despite a range of different funding systems, no Land appears to have a PRFS as such]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.2 Funding formula</td>
<td>n/a</td>
</tr>
<tr>
<td>3.3 Rationale for PRFS</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Conditional funding</th>
<th>3.4 Approach</th>
<th>Germany effectively has 16 different systems, though van Dalen et al (2014) note that most or all generally involve various combinations of the following three components:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Incremental-discretionary part. This part is based on previous year’s funding and corrected for inflation (non-competitive). When there is a serious need for investment, the institution can start negotiations with the state government. During the past years, the Länder have gradually moved away from this type of funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Contract- or mission-based part. In order to achieve goals of the state government, like internationalization and gender equality, the state government can financially award well-performing institutions. This type of funding is generally non-competitive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Indicator-based part This funding procedure has become increasingly popular. This part typically exists of a teaching and a research</td>
</tr>
</tbody>
</table>
component, whereas the research component is typically more important for universities than for Fachhochschulen.

De Boer et al (2015) provide two illustrative examples:

**Northrhine Westphalia**

(14 universities, 16 Fachhochschulen, around 60 PROs)

Institutional funding consists of a basic part (attached to a performance contract) (77% in 2013) and a performance-related grant (23% in 2013). The performance budget (*Leistungsorientierte Mittelvergabe*) differs for universities and Fachhochschulen. The indicators used have varied and have included graduates, doctoral graduates, third party funding, academic staff, new entrants, and female professors. Indicators have been changed based on the ministry’s experiences. In 2007 for example, the number of indicators was reduced from five to three (focusing on the areas of teaching, research and gender equality) in order to simplify the funding model. Political and societal debates have also influenced the use of performance indicators.

The ministry signs a target and performance agreement with each of the institutions. The performance agreements cover a period of two years for both universities and universities of applied sciences. Through the negotiation process the goals and targets are specified and institutions have the opportunity to stress the areas where they want to profile themselves further.

We note that, following the most recent Land elections in NRW, there are ongoing plans to reform the funding system, though details are as yet unconfirmed.

**Thuringia**

(5 universities, 4 Fachhochschulen + 2 ‘universities of cooperative education’ also providing tertiary education with a strong focus on practical experience)

The funding model in Thuringia consists of three parts:

The core budget (80%) – indicator based

The performance budget (14.5%) – also indicator based

The general design and innovation budget (5.5%) – a small additional pot, largely tied to specific activities to be conducted, allocation process unclear, but includes formal application and review.

The core budget is based on three indicators:

- Number of students in the standard period of study
- Number of graduates
- Share of third party income related to total third party income from all Thuringian higher education institutions

The performance budget is the result of five indicators:

- Share of the total number of students in the standard period of study in the system
- Share of the total number of doctoral graduates and PhD degrees awarded in the system
- Share of the total number of female students in the system
- Share of the total number of female professors in the system
• Share of the number of students in continuing education in the system

**The Excellence Strategy**

Whilst the Länder’s institutional funding systems tend strongly to emphasise teaching metrics and are not designed to lead to strong concentration of research excellence, the Federal government (with contribution by the Länder) runs the Exzellenzstrategie. This funding is not strictly institutional but also not strictly project-based. However, it rewards institutions (or parts thereof) for research excellence in an essentially competitive manner. We cover this aspect in section 6 of this template.

**Northrhine Westphalia**

The current performance funding model distributes 23% of each institution’s basic grant based on performance indicators, so that the amount for each institution is proportional to the whole budget the institution receives. As above, note that system reform is currently under discussion.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Universities</th>
<th>Fachhochschulen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates</td>
<td>50%</td>
<td>75%</td>
</tr>
<tr>
<td>Third party funding</td>
<td>40%</td>
<td>15%</td>
</tr>
<tr>
<td>Share of female professors</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

De Boer et al (2015)

**Thuringia**

The core budget (80% of institutional funding) is calculated as follows:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students in the standard period of study</td>
<td>62.5</td>
</tr>
<tr>
<td>Number of graduates</td>
<td>22.5%</td>
</tr>
<tr>
<td>Share of third party income related to total third party income from all Thuringian higher education institutions</td>
<td>15%</td>
</tr>
</tbody>
</table>

These indicators are further calculated differently, in the sense that there are weightings by disciplines and further variation in relation to type of institution and type of programme.

The performance budget (14.5% of institutional funding) is calculated as follows:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of the total number of students in the standard period of study in the system</td>
<td>35%</td>
</tr>
<tr>
<td>Share of the total number of doctoral graduates and PhD degrees awarded in the system</td>
<td>30%</td>
</tr>
<tr>
<td>Share of the total number of female students in the system</td>
<td>12.5%</td>
</tr>
<tr>
<td>Share of the total number of female professors in the system</td>
<td>12.5%</td>
</tr>
<tr>
<td>Share of the number of students in continuing education in the system</td>
<td>10%</td>
</tr>
</tbody>
</table>
The size of the institution is taken into account in calculating the performance budgets. To avoid large fluctuations, maintain continuity, give some planning predictability, and control the overall budget, the state ministry also uses minimum and maximum thresholds based on the previous year. The maximum win or loss for any institution is 4% of the core and 2% of the performance budget annually.

Whilst there are no research assessments in Germany that are tied directly to funding, some broader research assessment and evaluation work is undertaken separately from funding. The German Council of Science and Humanities (Wissenschaftsrat, WR) is a major player here. It advises the Federal Government and the governments of the Länder. It produces recommendations on the development of science, research and higher education, helping to ensure that German science and humanities remain competitive at national, European and international level.

In the early 2010s, the WR constructed a protocol for national research assessment in Germany, the ‘Research Rating’. This involved convening disciplinary panels to discuss what would constitute high research quality in a field-specific way, and generating standard indicators for research assessment in each field. This included data on PhD supervision, bibliometrics in some fields, and peer review in others. Where peer review was to be involved, it was limited to two outputs per department, so as to limit the burden and focus on the ‘peaks’.

There was an ambition to roll out this system as a nationwide exercise to occur in regular intervals. Some voices also mooted tying the results to funding, but these were rare. However, even without attachment to funding, the Research Rating was never turned into a national system. However, the protocol developed by the WR is used in several Länder sporadically, sometimes to assess specific fields (e.g. when there is a policy-driven, strategic need to do so).

The Wissenschaftsrat conducts field evaluations and similar exercises, so these do not take the shape of research assessment or focus on institutional-level activity. Instead, these serve a range of possible strategic purposes, describing research activity nationwide using bespoke methods in each case.

Broader national research assessment exercises are therefore not practiced in Germany. A key reason is that Germany is generally understood to be too complex and multi-levelled (e.g. federal system, universities and research institutes, etc) to conduct such all-encompassing assessments. In the late 1990s, a broad evaluation of the German science system was conducted as a result of the need to ‘stock take’ after German reunification, though even that system review was split up into different parts (DFG and various institute types were evaluated respectively).

Though more related to monitoring than assessment as such, it is worth mentioning the German Centre for Higher Education and Science Studies (DZHW) created in 2013 conducts considerable monitoring of science in Germany, which is also used for policy advice.

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

The various systems in place in the German Länder have changed over time, especially during the 2000s, when most Länder enacted legislation to increase the extent of institutional autonomy and mechanisms were needed to ensure transparency of the allocation of funds. From those Länder covered by the literature, modifications have generally not been especially radical, typically involving modified indicator selection and/or increasing shares of funding allocated via competitive as opposed to basic/block funding mechanisms.

https://www.wissenschaftsrat.de/home.html
The Exzellenzstrategie was preceded by the Exzellenzinitiative (2007-17), a broadly similar funding instrument consisting of two 5-year rounds. Following the success of this initiative, the Exzellenzstrategie effectively marks the transition towards long-term commitment of this approach.

4.2 Are there any known effects of current or former performance- or assessment-based components

The effects of the Länder systems appear to be minimal regarding behaviour-change. De Boer et al (2015) note that the amount of funding that can be redistributed through good or poor results in the competitive part are too low, though it is unclear whether there is evidence for this causal link. However, the systems are generally acknowledged to have ensured greater transparency of funding allocation, especially as at least some Länder make all indicators and calculations for all institutions publicly available.

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The Exzellenzstrategie is run jointly by the DFG and German Council of Science and Humanities, both are attached to the Federal Ministry of Education and Research (BMBF).

The funding arrangements for universities and Fachhochschulen are owned by the individual Länder.

The Research Ranking was developed by the Wissenschaftsrat, but is deployed in various ways at the Länder-level.

5.2 What review and evaluation procedures have been conducted on the performance and assessment-related elements of the system?

The effectiveness of the joint initiatives Federal and Länder governments is annually assessed through monitoring reports of the Joint Science Conference (‘Gemeinsame Wissenschaftskonferenz’) (GWK, 2016a, GWK, 2016b). The Initiative for Excellence has undergone an extensive evaluation by a committee of international experts in 2016 (IEKE, 2016) and the results have been consequential for the formulation of the Excellence Strategy. (JRC 2017)

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The evaluation of the Exzellenzinitiative contains methodological information and notes that, via interview, over 100 stakeholders provided input. These are almost exclusively from the academic sphere, but includes many different levels of seniority, from undergraduate students via PhDs, postdocs, professors and rectors. Some input was also sought from representatives of non-university research organisations and of universities abroad.

More generally, when significant decisions are to be taken, executive typically also consult with the ‘Alliance of science organisations’, consisting of DFG, the four major research institutes, the Von Humboldt Foundation, the German Academy of natural sciences, DAAD, the university rector’s conference, and the German Council of Science and Humanities. These 10 organisations provide a ‘sounding board’ for major decisions.

6. Additional points of interest

The German institutional funding system(s) do not facilitate concentration of funding into the best institutions and as such is not conducive to generating individual outstanding institutions within the broader institutional landscape. There are many reasons for why this approach is chosen, most notably rooted in German federalism. However, there is a drive especially from the federal level to also foster a select number of outstanding institutions with an exceptionally strong international profile, internationally known research strengths and the ability to also attract the best researchers in
the world to work there. To facilitate this, the BMBF and German Council of Science and Humanities (with a 25% contribution from the Länder) launched the Exzellenzinitiative (Excellence Initiative) in 2007, which transitioned after two funding rounds into the more permanent Exzellenzstrategie (Excellence Strategy) in 2017/18.\textsuperscript{123}

This policy awards additional sums of what is essentially additional institutional funding via competitive application for specific purposes intended to help establish institutional research strength, profiling and reputation. Under the Excellence Initiative, there were three tiers of funding:

- **Graduate schools**, to provide high-quality doctoral training and stimulating research environments, attract the brightest doctoral candidates in Germany and from abroad and provide the best support and supervision, and encourage early-stage scientists to achieve autonomy and independence in their research.

- **Clusters of excellence**: internationally visible and competitive priority research areas at universities and their non-university partner institutions. Based on clearly defined visions and goals, they carry out top-level academic research that contributes to the university’s strategic research priorities, strengthens scientific networking and co-operation among the participating institutions, and provides an attractive training and research environment, especially for early-stage researchers.

- **Future Concepts**: only universities with at least one graduate school and one cluster of excellence could receive this. It supported specific university-level activities that strengthen international excellence in research and training. The funding was intended more broadly for universities to establish and maintain themselves among the leading world research institutions in their priority research areas. (OECD 2014)

The average funding was about €1 million a year for graduate schools and about €6.5 million for clusters of excellence. Universities with successful Future Concepts applications received up to €13.5 million a year from Excellence Initiative funds. In the second round (2012) 45 Graduate schools were funded, as well as 43 Clusters and 11 Future Concepts.

The Excellence Initiative/Strategy essentially functions in the manner of competitive funding, in that it consists of sums of funding given out on a competitive basis, through an application and review process, with criteria largely centered on scientific excellence. However, it is worth mentioning here, as the funding is a payment to the institution and, rather than being focused on a particular research project, it supports institutional profiling and development. In short, it is competitive funding, but is intended to achieve some of the things that are typically in the remit of institutional funding allocation in many other countries.

Following highly positive evaluation (2016), the Excellence Initiative was re-organised into the Excellence Strategy, with the first round of funding to be determined in 2018/2019 and an annual budget of €533m (again split 75/25 between Federal level and Länder). It has been reduced to two funding lines:

- **Excellence Clusters** (€385m per annum): field-specific areas of institutional strength that work collaboratively with other academic and non-academic institutions. An institution can host more than one cluster and the funding per cluster lasts for seven years. Re-application is necessary to renew funding after the seven-year period. The first round of 57 Clusters under the Excellence Strategy has been awarded in 2018.

- **Excellence Universities** (€148m per annum): institutions with at least two clusters can apply for the status of an Excellence university. This extra funding does not need to be renewed as such, but every seven years the institution must be subject to an audit to check that it continues to fulfil the necessary criteria. It must also continue to secure at least two clusters. Following award of the first round of clusters, the process to award the first round of Excellence universities is due to conclude in 2019.\textsuperscript{124}

\textsuperscript{123} https://www.bmbf.de/en/excellence-strategy-5425.html

\textsuperscript{124} https://www.bmbf.de/de/die-exzellenzstrategie-3021.html
# 7. Sources

## 7.1 Public documents of interest

<table>
<thead>
<tr>
<th>Evaluation of the Exzellenzinitiative:</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.bmbf.de/de/die-exzellenzinitiative-staerkt-die-universitaere-spitzenforschung-1638.html">https://www.bmbf.de/de/die-exzellenzinitiative-staerkt-die-universitaere-spitzenforschung-1638.html</a></td>
</tr>
</tbody>
</table>

Final report and recommendations on the Research Rating:


[Note: link may be subject to change following a pending web site re-design]

## 7.2 Interviewees

- Dr Jan-Christoph Rogge (Directorate 411 - Higher education legislation, Excellence strategy, DFG, Futurium, Federal Ministry of Education and Research, BMBF)
- Dr Rainer Lange (Head of Research Division, German Council of Science and Humanities)
11 Country template: Italy

1. Headline facts

| 1.1 Country: Italy | 1.2 Population: 61 million | 1.3 GERD/GDP: 1.29% | 1.4 GERD/GDP rank (/20): 17th |

1.5 Overview of RPO landscape

- There are 95 Higher Education Institutions in Italy, they are all autonomous and establish their own mission, governing bodies and teaching and research structures (OECD, 2017). This includes:
  - 61 state universities (public)
  - 17 non-state universities (private)
  - 6 higher schools and 11 online universities
- The National Research Council is the largest research body in Italy and has seven thematic departments drawing on a research capacity from across the country.

1.6 Brief summary/system description

National funding for scientific and technological research is mainly provided by the Ministry of Universities and Research (MIUR), which also funds the Italian National Research Council (CNR). MIUR also funds other larger research organisations and institutions.


Other public bodies, including regional government, play a role in funding research in specific sector/thematic areas. This includes, for example funding by the Italian ministry for health to the National Institute of Health (Istituto Superiore di Sanità).

University Funding in Italy is allocated by MIUR based on the Fondo di Finanziamento Ordinario (FFO) – the financing fund of the Italian university system (based on decree law November 10, 2008).

Research Institutes are financed with another fund (FOE)

The abovementioned funding for scientific and technological research is, for the most, awarded in relation to historical ties and/or past performance. MIUR also awards competitive funding. One example of a competitive call for funding is PRIN (Progetti di ricerca di Rilevante Interesse Nazionale) (http://prin.miur.it/).

2. Funding system overview

| 2.1 What are the main funding system components? | 2.2 Is there a PRFS (definition: JRC/Hicks)? | Yes |

FFO funding includes a basic funding quota, allocation is informed by informed peer review and by metrics, such as data on student enrolments.
The merit-based share of the FFO is awarded on the basis of a Performance Based Research System, informed by the VQR. According to the law no. 98/2013 a maximum of 30% of total resources is allocated and up to 23% of the FFO is allocated to date.

General guidelines for the university system FFO 2016-2018 plan and the related indicators for the evaluation of results are set out in the Ministerial Decree 8 August 2016 n. 635. The 2016-2018 plan aims to:

1. Improve on the results achieved in the planning of the 2013-2015 three-year period (including revision of courses and criteria to improve labour market prospects for students and strengthen the international courses)
2. Modernise research, research environments and pedagogy
3. Young researchers and awards due to the teachers (including provision of three year contracts and mobility programmes)
4. Valorise the responsible autonomy of the universities

In 2018, MIUR also provided funding for departments of excellence (see Article 1, paragraphs 314-337 of the Law of 11 December 2016 no. 232). The objective of this funding is to strengthen the research excellence of the top 20% departments. €271m was awarded/targeted to 180 departments of excellence (see Article 1, paragraphs 314-337 of the Law of 11 December 2016 no. 232).

The majority (60%) of FFO research funding is allocated on the basis of a basic block grant. Performance-based funding drives 23% €1.7bn of funding in 2018 (close to the initially projected 24%). This merit-based share of the FFO was allocated to Universities (98.8%) and Special Institutes (1.2%) in recognition of their pursuit of excellence. The 23% allocation is an increase from the 7% allocated under the FFO in 2009.

### Table 3 2018 MIUR funding FFO

<table>
<thead>
<tr>
<th>Programme</th>
<th>Budget in national currency, millions</th>
<th>Budget in Sterling, millions (Exchange rate 0.9)</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Basic fund [quota base]</td>
<td>€4,428</td>
<td>£3,985</td>
<td>60%</td>
</tr>
<tr>
<td>Of which standard cost per student enrolled</td>
<td>€1,380</td>
<td>£1,242</td>
<td>31%</td>
</tr>
<tr>
<td>B. Merit based fund [quota premiale]</td>
<td>€1,693</td>
<td>£1,524</td>
<td>23%</td>
</tr>
<tr>
<td>Research results</td>
<td>€1,016</td>
<td>£914</td>
<td>60%</td>
</tr>
<tr>
<td>Evaluation of recruitment policies</td>
<td>€339</td>
<td>£305</td>
<td>20%</td>
</tr>
<tr>
<td>Valorisation of responsible autonomy (research environment, teaching quality, and internationalization strategies)</td>
<td>€339</td>
<td>£305</td>
<td>20%</td>
</tr>
<tr>
<td>C. Other</td>
<td>€1,206</td>
<td>£1,085</td>
<td>16%</td>
</tr>
</tbody>
</table>
3. Assessment-based system components

The system: The Research Quality Assessment exercises (VQR) aims at evaluating the research outcomes of public universities and research institutes. Other (public and private) institutions can voluntarily submit their research outcomes for evaluation. “The VQR exercises aim to provide an up-to-date assessment of the state of research in the various scientific fields, in order to promote the improvement of research quality in the assessed institutions and to allocate the merit-based share of the Fondo di Finanziamento Ordinario (FFO) – the financing fund of the Italian university system”.

Methods: “ANVUR evaluates the quality of the outcomes of the research of the universities and research institutes, mainly through informed peer review, as mandated by the Presidential Decree no. 76/2010 (under art. 3, paragraph 1, letter a and paragraph 2, letter b).”(ANVUR, 2017)

- In STEM areas and, to some extent, in Economics and Statistics, peer evaluation is integrated with the use of bibliometric indicators concerning citations and journals’ impact, extracted from the ISI/Web of Science and Scopus databases.
### Funding formula

- In HSS (with the only partial exception of economics and statistics), evaluation is based purely on peer review
- Overall, more than 50% of the publications submitted for evaluation was subject to peer review

**Periodicity:** Currently, VQR is carried out every five years according to the law no. 232/2016, art. 1, paragraph 339

**Unit of Assessment:** department

For funding purposes MIUR mainly uses the indicators as follows:

- 60% of the merit based allocation is based on the results achieved in the Research Quality Assessment (VQR 2011-2014)
- 20% is based on the evaluation of the recruitment policies for the 2015-2017 three-year period, using in particular the data related to the 2011-2014 VQR
- 20% on the basis of the results relating to the Valorisation of responsible autonomy pursuant to the provisions of art. 5 of the DM n. 635 of 8 August 2016

MIUR allocates funding based on the score given to universities by ANVUR

**Publications** admitted for evaluation are:

- Books
- Articles and review essays
- Books chapters
- Other scientific publications, including compositions, designs, projects (architecture), performances, exhibitions, arts objects, databases and software
- Patents

Publications are evaluated by ANVUR against (ANVUR, 2017):

a) originality, to be intended as the degree according to which the publication is able to introduce a new way of thinking about the object of the research;

b) Methodological rigor, to be intended as the degree according to which the publication adopts an appropriate methodology and is able to present its results to peers;

c) Actual or potential impact, to be intended as the level of influence – current or potential – that the research exerts on the relevant scientific community

ANVUR evaluated publications by using 'a dual system of evaluation', that is by informed peer review or by bibliometrics. The bibliometric results are reviewed by a consensus group. This group can recommend research outputs to be put forward for peer review.

A critique of the system suggests that the two methods give different evaluation results. The higher the share of peer review, the lower the evaluation.


The inclusion of bibliometrics in the assessment makes the VQR less resource intensive. The use of bibliometrics is more readily accepted in some disciplines.
Bibliometric evaluation is based on:
- An indicator of journal impact (choice left to the researcher) IF5Y, ArticleInfluenceScore in WoS or IPP, SJR in Scopus
- Number of citations as of February 29th, 2016

The funding for departments of excellence was awarded based on an assessment of scientific outputs, based on the VQR results and based on the department’s mission statements.

3.3 Rationale for PRFS
Objectives of VQR as declared by ANVUR:
- To inform the ministry with the necessary indicators to be used in distributing university financing
- To provide the university management with relevant information for the governance of the university system
- To provide students, households and young researchers with relevant information in order to guide their personal choices

3.4 Approach

3.5 Funding formula or allocation key

3.6 Other assessment activities
The Higher Education Quality Assurance system has been introduced in Italy by Law n. 240/2010 and Legislative Decree n.19/2012 and is operational since 2013. The objective of AVA is to:
- “To assure that the higher education institutions operating in Italy uniformly provide an appropriate quality of their services
- To support the exercise by the Universities of responsible and reliable autonomy in the use of public resources and in collective and individual behavior related to education, research and knowledge and technological transfer activities
- To improve the quality of education and research”
AVA does not have a strong focus on research.
“AVA sets standards for the self-assessment by programmes and institutions, concerning their internal procedures and the outcomes of their activities, and for the external assessment of the quality assurance systems. External evaluation is based on peer review, is carried out by experts appointed by ANVUR through on-site visits and document analysis. It addresses the following activities”:

- Accreditation of new Universities and programmes
- Periodic accreditation of Universities and their programmes

“In each University the Quality Assurance (QA) key actors are the following: the Nucleo di Valutazione (Independent Evaluation Unit – NdV), the Commissioni paritetiche docenti-studenti (Joint Teaching-Student Committees – CPDS), the Presidio di Qualità (Unit responsible for the internal QA system – PQA)”.

**Third Mission and Societal Impact of Universities and Research Institutes**

“Third Mission has been officially included among the institutional activities of academic institutions, alongside teaching and research. Indicators and parameters for Third Mission assessment have been increased and modified (Ministerial Decree no. 47/2013) and taken into account for the accreditation of Institutions (Ministerial Decree no. 987/2016).” [http://www.anvur.it/en/activities/third-mission-impact/](http://www.anvur.it/en/activities/third-mission-impact/)

As part of the VQR 2011-2014, the evaluation has been carried out through informed peer review, i.e. using indicators to inform the evaluation of the reviewers. A dedicated panel has been set up, the Committee of Experts on the Evaluation of Third Mission (CETM) whose members have been selected from a specific register set up by ANVUR after a public call on the basis of their competences and experiences as scholars, managers and stakeholders/partners of academic institutions’ Third Mission activities”. “The outcome of the panel’s work has been published in the VQR 2011-2014 Third Mission Evaluation Report and summarized in a specific section of the VQR 2011-2014 Final Report. An individual analysis was made for all the evaluated institutions”. This evaluation is not tied to funding.

Universities are also evaluated in reference to the three year FFO funding plan. Universities; achievement against the 2016-2018 plan will be assessed against the PBFS indicators stipulated in the plan. University projects are evaluated by a special evaluation committee, appointed by decree of the Head of the Department of Higher Education and Research and composed of representatives of the MIUR and ANVUR. The evaluation is carried out taking into account the following criteria:

- Clarity and consistency of the project with respect to the MIUR programming objectives
- Degree of project feasibility, economic adequacy, additional direct co-financing
- Capacity of the intervention to make a real improvement compared to the starting situation

---

### 4. History & effects

<table>
<thead>
<tr>
<th>4.1 Do current performance- or assessment-based components have predecessors?</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The Italian research system has traditionally been characterized by an institutional block funding allocation mechanism based on education metrics” (JCR, 2016).</td>
</tr>
</tbody>
</table>

**The VTR evaluation 2001-2003**

The first-ever national research evaluation in Italy was launched in December 2003, managed by the Committee for the Evaluation of Research (CIVR). The characteristics of the VTR evaluation included: ¹²⁵

---

• It was fully based on peer review evaluation method: a pool of experts assessed each submitted research product and expressed a qualitative judgement that was then mapped to a quantitative categorial rating.

• The ‘structures’ (universities/institutes) autonomously selected the submitted products in the measure of max. 1 product per 2 FTE researchers, choosing among the entire production over a three-year period.

• CIVR divided the national research system into 20 scientific-disciplinary areas, including 6 interdisciplinary sectors, and set up an evaluation panel responsible for the assessment of each area.

MIUR determines the timing of the assessment. The timing of the VQR is aligned with the government budget.

**The VQR 2004-2010**

The VQR 2004-2010, launched in November 2011, covered a seven-year period of research activities. With more than 100 participant organisations, almost 70,000 contributors, and approximately 190,000 research products being evaluated, it was the most ambitious research evaluation exercise ever carried out in Italy. The evaluation reports were published in 2013; the results therefore guided the funding allocation in 2013.

**VQR 2011-2014** reduced the number of publications to 2 per FTE. This change was proposed by ANVUR in response to the shorter coverage (4 years instead of 7 years).

The next evaluation exercise will take place in 2020 with reference to the period 2015-2019. ANVUR may revise the number of products to be submitted by FTE researcher.

**Further changes**

There may be scope for the inclusion of an institutional level narrative statement in which universities would set out their objectives and reflect on the universities impact on society. This idea has not yet been formalised.

Separate to the VQR, ANVUR has proposed to MIUR the launch of an annual light-ough assessment of research outputs (basic metrics) and third mission statements. MIUR has not (yet) endorsed this idea.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication of results</td>
<td>2006</td>
<td>2013</td>
<td>2017</td>
</tr>
<tr>
<td>Method</td>
<td>Peer review</td>
<td>Mixed peer review &amp; bibliometrics</td>
<td>Mixed peer review &amp; bibliometrics</td>
</tr>
<tr>
<td>Coverage</td>
<td>3 years</td>
<td>7 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Submitted products</td>
<td>0.5 product per FTE researcher</td>
<td>6 products per FTE researcher</td>
<td>2 products per FTE researcher</td>
</tr>
<tr>
<td>Nr of scientific areas</td>
<td>20 areas</td>
<td>14 areas</td>
<td>16 areas</td>
</tr>
<tr>
<td>Focus</td>
<td>Teaching &amp; research activities</td>
<td>Teaching, research &amp; third-mission activities</td>
<td>Quality of publications Quality of publications of new hires and people promoted – Number of doctoral students and post-doc researchers External competitive funding Increase/decrease of research quality with respect to the previous evaluation exercise</td>
</tr>
</tbody>
</table>
4.2 Are there any known effects of current or former performance- or assessment-based components

Effects of bibliometrics used in PRFS (ANVUR, 2017)

“Preliminary evidence looking both at some detail of the data gathered in performing the exercise and at the general performance of the Italian University system in the international scenario” suggests:

- An increase in journal articles as a mean of disseminating knowledge, both in areas evaluated with bibliometric indicators and in those where mainly used peer review was used
- An increase in the use of the English language, especially in HSS
- Some evidence of convergence in evaluation results between the north and the south of the country
- Persistence of strong performance differentials among the two geographical areas

Researchers, including within the Italian system, have looked to critique the robustness of bibliometrics:

- Malgarini (2014) Presentation: Evaluating Research in Italy: methods and practices
- Abramo, Cicero, D’Angelo (2013). National peer-review research assessment exercises for the hard sciences can be a complete waste of money: the Italian case. Scientometrics, 95:311–324

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

- The Ministry of Education, University and Research (MIUR) is responsible for governance of the education system and sets nationwide minimum standards and central principles. Some responsibility for education is shared between the central government and regions (http://www.miur.gov.it/programmi-di-finanziamento).  
- The National Agency for the Evaluation of the University and Research System (Agenzia nazionale per la valutazione del sistema universitario e della ricerca, ANVUR) evaluates higher
education institutions. So far, ANVUR has evaluated 133 research institutions, 95 of which were universities.

- The Conference of Rectors of Italian Universities (Conferenza dei Rettori delle Università italiane, CRUI) counsels MIUR on setting university objectives and allocating financial resources.

### 5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

The Italian government sets no requirement for the evaluation of the VQR.

ANVUR has self-commissioned an external evaluator to carry out a review of ANVUR. This review is currently ongoing.

Prior to launching the latest VQR exercise, ANVUR ran a public consultation inviting the community to comment on the draft terms of the VQR. The response to consultation was collated and reviewed by a group of rectors.

It has not yet been decided if a similar consultation will be launched in preparation for the next VQR.

The VQR has been the subject of academic research, some of this research focused on understanding the results of peer review vs those of bibliometrics.

ANVUR is criticized for not making VQR data public:


### 5.3 Which stakeholders/organisations had input into review/evaluation activities?

The previous consultation for the VQR invited response from the wider community (universities, etc).

### Additional points of interest

n/a

### Sources

#### 7.1 Public documents of interest


Education Policy Outlook: Italy © OECD 2017

#### 7.2 Interviewees

- Marco Malgarini, Evaluation of University Research, Director of Research Unit, ANVUR
- Sandro Momigliano, director of ANVUR
12 Country template: Netherlands

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>The Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 Population:</td>
<td>17 million</td>
</tr>
<tr>
<td>1.3 GERD/GDP:</td>
<td>2.03%</td>
</tr>
<tr>
<td>1.4 GERD/GDP rank (/20):</td>
<td>11th</td>
</tr>
</tbody>
</table>

1.5 Overview of RPO landscape

- Research universities: 18, 14 of which are members of the Association of Universities in the Netherlands (VSNU)
  - University medical centres: 8
- Universities of applied sciences (UAS): 36
- Public research institutes: 29
  - TO2 federation (TNO, GTIs, WUR): 5
  - NWO institutes: 9 (of which 1 in collaboration with KNAW)
  - KNAW institutes: 15 (of which 1 in collaboration with NWO)
- Top consortia for Knowledge and Innovation (TKIs): 15

NWO is the Netherlands Organisation for Scientific Research and KNAW is the Royal Netherlands Academy of Arts and Sciences.

1.6 Brief summary/system description

Public funding of scientific research occurs in four ways. Firstly, institutional funding is provided through block grants by the Ministry of Education, Culture, and Science (OCW). Secondly, competitive grants are provided through intermediary organisations and ministries. Third, there are several governmental research institutes that receive direct funding. Similarly, policy-oriented research is also funded directly. There is also a fiscal system in place designed to support R&D through tax credits. Furthermore, some research, particularly in healthcare, is supported through non-profit foundations. Finally, the EU Framework Programmes represent an important source of international funding. Overall, R&I policies are centralised at the national level with the government being the primary financing body.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)? | No

Public funding of scientific research occurs through three main streams. The first concerns HEIs and is provided through block grants consisting of a mix of base allocations and university-specific components. Base allocations are divided further into education and teaching, and research.

The second stream consists of competitive project-specific research grants. These are awarded through intermediary organisations such as the Netherlands Organisation for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences.

---

128 The JRC considers the Dutch system a form of ‘limited’ PRFS because funding is partially allocated on research-related outputs.
International Landscape Study of Research and Innovation Systems

Sciences (KNAW), and the Netherlands Enterprise Agency (RVO). International competitive funding is mainly provided by the EU. The third stream is a mix of revenues from various other activities performed by the university such as teaching and contract research.

The main shares of R&D expenditure in the Netherlands by source are as follows:
- Private: 52.3%
- Government: 31%
- Other national: 2.7%
- International: 13.9%

### Table - Funding of R&D in the Netherlands in 2017 (in million EUR)

<table>
<thead>
<tr>
<th>Source Recipient</th>
<th>Private funding</th>
<th>Public funding</th>
<th>Other national sources</th>
<th>International funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private firms</td>
<td>7084 (48.3%)</td>
<td>161 (1.1%)</td>
<td>17 (0.1%)</td>
<td>1353 (9.2%)</td>
</tr>
<tr>
<td>HEIs</td>
<td>350 (2.4%)</td>
<td>3350 (22.9%)</td>
<td>300 (2%)</td>
<td>375 (2.5%)</td>
</tr>
<tr>
<td>Research Institutes</td>
<td>248 (1.7%)</td>
<td>1045 (7.1%)</td>
<td>62 (0.4%)</td>
<td>306 (2.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>7682 (52.4%)</td>
<td>4356 (31.1%)</td>
<td>379 (2.6%)</td>
<td>2034 (13.9%)</td>
</tr>
</tbody>
</table>

Percentages based on total R&D funding (EUR 14.651 billion)

*Source: Rathenau Institute*

Research universities received the following shares of funding (figures from 2016):
- Public funding: 56%
- Tuition fees: 9%
- Third parties (including NWO, EU, firms, and other organisations): 27%
- Other revenues: 8%

Of the budget allocated to public research institutes, NWO and KNAW received 56% and 10% respectively in 2018. The overall balance between organisational and project funding is approximately 70% to 30% respectively.

---


3. Assessment-based system components

The Self Evaluation Protocol (SEP) was first introduced in 2003. Currently, the third iteration is in place for the period 2015-2021. The SEP applies to specific research units or institutes (primarily research universities and the NWO and KNAW institutes) and has to be conducted once every 6 years, on a rolling schedule. It primarily relies on peer-reviews and self-assessment exercises in which information is gathered about strategy and activities.

The SEP describes the various tasks that are assigned to the Board, the Assessment Committee, and the Research Unit (Appendix A of SEP 2015-2021). Broadly, the steps can be categorized as follows:

- **Design**: The institution’s board decides when an assessment has to take place and at what aggregated level. The research unit drafts a working plan, in which it outlines the focus points of the self-assessment, and the Terms of Reference are specified, including any requests or questions to the peer review committee. The working plan is amended and approved by the board.
- **Appoint peer review committee**: The research units propose the members and chair of the review committee. The board amends and approves the proposal and appoint the committee members.
- **Self-assessment**: The research unit under evaluation provides information on the research that it has conducted, on its strategy for the coming years, on its PhD programmes and on its research.

---

132 Meaning evaluations take place throughout the 6-period rather than on pre-specified points in time.

133 At universities it is the board of the university, at KNAW and NWO is the board of the umbrella organisation (NWO / KNAW).
integrity policy by providing a self-assessment and additional documents. The self-assessment must be finished one month prior to the site visit.

- **Peer review/site visit:** The peer review committee assesses the research, strategy, PhD programmes, and research integrity on the basis of the self-assessment, the additional documents, and interviews with representatives of each research unit during a site visit. The peer review process is guided and assisted by an independent secretariat (often QANU in the Netherlands).

- **Preliminary assessment report:** The peer review committee passes judgement on the research quality, societal relevance, and viability of the research unit, both in qualitative and quantitative scoring.

- **Feedback:** The research unit receives the assessment report and provides feedback correcting any factual errors or misunderstandings.

- **Submit final assessment report to board:** The review committee submits final assessment report to the institution’s board.

- **Board’s position document:** The board receives the report, acquaints itself with any comments of the research unit, and determines its own position on the assessment outcomes. In the position document, the board states what consequences it attaches to the assessment outcomes.

- **Publication assessment report & Position document:** The board sees to it that the assessment report and the position document are made public.

- **Follow-up:** The board monitors follow-up actions by the research unit on assessment committee’s recommendations. The board decides how such monitoring takes place.

3.2 Funding formula

There is no explicit link between the SEP scores and allocation of funding. Instead, the model for direct public funding to the 14 research universities is as follows (percentages in bold based on the 2017 budget, percentages within the 4 main components are from 2014):

- **Education and teaching (41.5%)**
  - Student-based component (65%)
    - Number of full-time EEA BA and MA students * (2/3)
    - Number of BA and MA degrees awarded * (1/3)
  - Education allocation (35%)
    - Basic allocation: university-specific portion with a historical basis independent of performance or quality
    - Component based on special facilities (e.g. libraries), ‘vulnerable’ degrees, and ministerial decisions (17%)
    - Portion distributed in fixed percentages. This also includes a performance-based component (see 3.5)

- **Research (40.8%)**
  - Number of BA and MA degrees awarded * (15%)

---

<table>
<thead>
<tr>
<th>3.3 Rationale for PRFS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Conditional funding</strong></td>
<td><strong>3.4 Approach</strong></td>
</tr>
<tr>
<td>The primary aim of the SEP is to reveal and confirm the quality and relevance of the conducted research to society and to improve these where necessary. Specifically, for researchers, SEP aims to give clarity about the way quality, societal relevance, and strategy are assessed and how these impacts can be improved. Secondly, it provides institutional boards with a means to tracking the impact of their research policy. Third, it supports the government in determining outcomes of their expenditure and support on the research system. Finally, it informs the society and private sector of the progress of research in solving a variety of problems.</td>
<td></td>
</tr>
<tr>
<td>One component of the allocation mechanism described in 3.2, the use of performance agreements, is worth presenting in further detail here. In 2013 a system was introduced in which a portion of the teaching budget for HEIs would be allocated conditional upon a performance-based mechanism, called ‘Prestatiebox’. The basis for these agreements were the ambitions of universities in the field of education, research and valorisation. The rationale behind this was that it would allow universities to enable their strengths and develop a profile based on these. The performance agreements were university-specific and contained a set of indicators in line with the institutes profile. These indicators were selected by each institute individually. Nevertheless, several common indicators were included across the agreements and in several cases, results from the SEP evaluations were also considered. If the objectives set out in the performance agreements were met, the universities received funding as part of their education allocation (7%). The use of these agreements was initially a pilot from 2013 to 2016. As of now these are being reviewed but are expected to be used until 2022. The design of this instrument is still unknown as the relevant agreements will be set up in the future, but budget projections indicate that it they will increase to 4% of the teaching budget by 2022.</td>
<td></td>
</tr>
</tbody>
</table>

---

136 These refer to strategic collaborations between faculties to create links between education, research, and societal goals.
The funding within the ‘Prestatiebox’ consists of two components; one tied to education and the other tied to institutional profiles and strengths. This section provides the indicators most commonly used in the performance agreements\(^{140}\). Reported percentages apply to the teaching allocation in 3.2.

### Education (5%)
- Quality of bachelor education: student satisfaction, share of student in ‘excellence’ trajectories, share of students in programmes accredited as good or excellent by NVAO.
- Quality more generally: share of teaching staff with a quality mark (BKO), education intensity (bachelor’s degrees with a minimum of 12 contact hours per week in the first year), and indirect costs (overhead).
- Success: efficiency (graduations during the nominal period plus one year), dropouts after the first year, transfers to a different bachelor’s programme within the same institute.

### Institutional profile and strengths (2%)
- National competitive funding (second stream): number and value
- International competitive research funding: number and value of grants
- Number of scientific publications
- Scientific impact: citation-impact
- PhDs: number, revenue, average time of education
- Research quality per discipline/institute: based on SEP scores
- Position in global rankings: e.g. Shanghai, Times Higher, Leiden Ranking

### Additional qualitative considerations
- Collaborations, international strategic partnerships, participation in alliances and consortia
- Termination/initiation of specialised research institutes and Centres of Excellence (including investments in infrastructure and financial support mechanisms)
- Termination/initiation of avenues of research: partially as a result of SEP scores
- Attraction of international researchers: i.e. visiting professors
- Formulation of broad research themes and associated organisational changes such as cross-faculty programmes
- Initiation of graduate schools and participation in research schools
- Setting up PPPs
- Alignment of research programmes not national sector plans, top-sector policy, and ‘Grand Challenges’

To a lesser extent, valorisation was also considered as part of the performance agreements. These were the most frequently-used indicators by the 14 research universities:
- Income from contract research and the third stream of funding

| Patent applications  |  |
| Spin-offs and start-ups based on the universities IP  |  |
| Participation of students and ECTS in entrepreneurship education  |  |
| Number of professional publications and annotations  |  |
| License agreements  |  |
| Revenues from contract teaching  |  |
| Externally financed lecturers and staff with shared appointments  |  |
| Co-publications with private firms  |  |
| Citations and interviews in written-online media  |  |
| Public-oriented publications and activities  |  |
| Memberships of official advisory bodies to the government  |  |
| Position in Leiden Ranking for University-Industry Collaboration and Elsevier Science Works ranking  |  |
| invention disclosures  |  |
| Networks and partnerships with external stakeholders  |  |
| Post-compulsory programmes  |  |
| Alumni working for non-academic organisations  |  |
| Additional considerations in terms of: alignment with (inter)national innovation agendas, participation in innovation contracts with industry, participation in science parks and incubators, participation in city or regional bodies, organisation and participation in exhibitions and cultural manifestations.  |  |

### 3.6 Other assessment activities

Aside from the SEP, monitoring and analysis of the science system is also carried out by the Rathenau Institute, part of the KNAW. Furthermore, the KNAW also has an advisory function with respect to quality assessments in different fields of research. It produces a report with assessment recommendations and a set of quality indicators for these different fields. Recently it has provided these for the design and engineering principles, the humanities, and the social sciences.

Evaluations of the research conducted in other research institutes such as the TO2-group, including TNO, also take place periodically, typically once every 4 years. This happens according to a separate evaluation protocol, the EMTO (Evaluation and Monitoring of Applied Research) which was developed by the Rathenau institute and was first implemented in 2016.

Finally, so-called disciplinary consultations take place involving the deans of faculties or institute active in a particular field of research. These are organised bottom-up by the universities and research institutes in the context of the SEP in order to organic country-wide visitations and establish national benchmarks per discipline that will feed into the SEP-evaluations.

---


### 4. History & effects

#### 4.1 Do current performance- or assessment-based components have predecessors?

Prior to SEP no country-wide framework was in place. Up until 1982, faculties were responsible for quality assurance in research. This was criticised for the lack of accountability to the OCW. Conditional financing was introduced whereby external assessment committees assessed research programmes. This changed in 1992, when autonomy and self-regulation were favoured, and universities were made responsible for ensuring quality. Simultaneously, the national association of universities (VSNU) developed a national evaluation system together with NWO and KNAW featuring regular assessment by international committees. This system was trialled across universities up until 1998.

In 1999, NWO and KNAW and VSNU decided to create a taskforce (KWO) to design a new country-wide framework that applied to research universities as well as the KNAW and NWO institutes. In 2001, a report was published by the KWO taskforce proposing a design for an evaluation framework. Subsequently, the first iteration of SEP was implemented for the period 2003-2009 followed-up by the second round from 2009-2015. The latter was evaluated in 2013 and later reformed. The reforms were focussed around improving its fit with the demands of science and society. The key changes that were implemented are the following:

- Research unit strategy is now taken into account
- More attention for societal relevance
- Expansion of the assessment of PhD programmes
- Assessment of scientific integrity
- Removal of productivity as an independent criterion
- Categorisation of committee’s opinion
- Introduction of a new scoring model
- More transparency in the results and follow-up of research evaluations

#### 4.2 Are there any known effects of current or former performance- or assessment-based components

Studies of the SEP have shown that evaluation is appreciated as an instrument of management. There is also appreciation of the fact that boards of the research organisations are free to take autonomous decisions in response to the outcomes. Furthermore, SEP scores regarding quality, productivity, relevance, and feasibility have consistently increased. However, no comprehensive overview of the evaluations has been produced partially because the comparability between them is relatively poor. Therefore, it is difficult to draw conclusions about its effects.

Regarding the use of performance agreements, some effects relevant to research have been identified. The focus areas and strengths described in performance agreements have been aligned with trends in science and society as well as (inter)national innovation agendas. Furthermore, many universities have invested in said areas through public-private partnerships, an appointment strategy for new lecturers, and by attracting guest researchers. In other cases, new focus areas were added or expanded to maintain leadership. These activities are reflected in the offering of master’s programmes as several universities have introduced research master’s and PhDs trajectories in graduate schools.

Collaboration with other universities, R&D labs, and research institutes have also been prioritised to a greater extent than before the performance

---


145 Ibid
agreements. For instance, strategic alliances have become more prevalent. Furthermore, more university research has started to span multiple disciplines. Overall, the most important changes in the current SEP are the increased attention for a research group’s strategy, the introduction of indicators for societal relevance and impact, and a simplified scoring-scale with more narrowly defined score categories. The latter was done to better differentiate between ‘excellent’ and lower scores as this had become somewhat devalued\textsuperscript{146}. Other adjustments include a specification of the level of aggregation the SEP applied to at least 10FTE.\textsuperscript{147} Finally, thematic areas were added such as research integrity\textsuperscript{148} and diversity.

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The responsibility for the SEP assessment is shared between NWO, KNAW, and VSNU. An independent committee for research integrity (LOWI) also exists. The boards of research universities and institutes also share the responsibility for carrying out the assessments.

Qanu, a quality assurance agency is also involved in managing the evaluations. The ‘Prestatiebox’ was an instrument of the Ministry for Education, Culture, and Science (OCW).

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

Regarding the SEP in itself, this is evaluated by a committee of the VSNU, NWO, and KNAW at the end of each cycle.

The Rathenau Institute published a study in 2013 reflecting on the history of research evaluation in the Netherlands. One of its conclusions pointed to the lack of a comprehensive overview of the evaluations conducted across the universities and in the past.

The performance agreements were reviewed and monitored at several points in time by the Review Committee for Higher Education and Research (RCHO). In 2013 RCHO published an initial monitoring report, a mid-term review in 2014, and a concluding report in 2016.

Currently, an evaluation of the system of NWO and KNAW institutes is ongoing. This evaluation is conducted by an independent committee of experts and will analyse the role these institutes play in the Dutch research landscape. A report of this evaluation is expected to be published in February 2019.\textsuperscript{149}

Finally, the van Rijn Committee, appointed by the ministry of education (OCW) will review the current funding system, especially the different funding streams, for higher education and research with a view of amending it in 2019. This builds on a previous review of the funding system by the Centre for Higher Education Policy Studies (CHEPS).\textsuperscript{150}

---

\textsuperscript{146} i.e. scores of ‘Excellent’ and ‘Very Good’ had become increasingly common.

\textsuperscript{147} Previously, universities and institutes had considerable freedom in determining what constituted a ‘research group’, the SEP’s unit of assessment.

\textsuperscript{148} For which new codes have been developed that are now subscribed by the VSNU, NWO, KNAW, TO2, NFU, and the association of Universities of Applied Sciences: https://www.vsnu.nl/en_GB/research-integrity

\textsuperscript{149} https://www.nwo.nl/beleid/wetenschapsvisie/portfolio-evaluatie+nwo+en+knaw+instituten+2018

\textsuperscript{150} https://www.twedeekamer.nl/downloads/document?id=f25451af-288c-4b8f-9606-1a7b2b5e7 eck
title=Bekostiging%20van%20het%20Nederlandse%20hoger%20onderwijs%3A%20kostendeterminanten%20en%20varianten.pdf
### 5.3 Which stakeholders/organisations had input into review/evaluation activities?

The SEP evaluations typically rely on national consultations with university/institute officials, research managers, researchers, and policy advisors. Seeing as the SEP is very much a bottom-up exercise run by the universities and institutes themselves, such consultations are an important way of collecting inputs, using these to adjust the SEP, and reducing opposition to changes.

### 6. Additional points of interest

N/A

### 7. Sources

#### 7.1 Public documents of interest


#### Interviewees

- VSNU
  - Han van Yperen, Policy Advisor
  - Elke van Cassel, Policy Advisor
- Ministry of Education, Culture and Science
  - Martijn Poel, Senior Policy Official
13 Country template: New Zealand

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20):</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>4.8 million</td>
<td>1.26%</td>
<td>20th</td>
</tr>
</tbody>
</table>

1.5 Overview of RPO landscape

- Universities: 8
- Institutes of technology and polytechnics (ITPs): 16
- Wānanga\(^{151}\): 3
- Crown research institutes (CRIs): 7. These are crown-owned companies, each associated with a particular sector, that carry out scientific research for the benefit of New Zealand.

1.6 Brief summary/system description

The New Zealand Ministry of Business, Innovation, and Employment is the main governing body of the research system. Regarding funding, there are three main types of funding mechanisms in place; institutional, negotiated or on-demand, and contestable or competitive funding. Furthermore, funding mechanisms can be further differentiated according to their overall purpose. Investigator-led instruments focus on knowledge creation and excellence whereas mission-led instruments prioritise relevance. Furthermore, there are industry-led instruments dedicated to long-term sustainable economic growth, productivity, and competitiveness.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)? | Yes

The vast majority of institutional funding is allocated by the Tertiary Education Commission, a Crown agency not associated with a Ministry, through the Performance Based Research Fund (PBRF). Beneficiaries of the PBRF are universities, institutes of technology and polytechnics (ITPs), private training establishments (PTEs), and wānanga.

The ministry of Business, Innovation, and Employment is the main provider of competitive funding. Some of this is allocated through Callaghan Innovation (the innovation agency), the Health Research Council, and the Royal Society of New Zealand and their respective funds. It also provides competitive funding through a wide range of its own funds\(^{152}\). One of these is the Strategic Science Investment Fund (SSIF) of which most is distributed to the crown research institutes (CRIs) and the remainder went to research infrastructure.

2.3 Shares of funding allocated through the main mechanisms

<table>
<thead>
<tr>
<th>Competitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.3% - Competitive research funds (excl. SSIF)</td>
</tr>
</tbody>
</table>

\(^{151}\) A wānanga is characterised by teaching and research that maintains, advances, and disseminates knowledge and develops intellectual independence, and assists the application of knowledge regarding ahuatanga Maori (Maori tradition) according to tikanga Maori (Maori custom).

3. Assessment-based system components

The Performance-Based Research Fund (PBRF) is a performance-based funding system to encourage and reward excellent research in New Zealand’s degree-granting organisations. It was first introduced in 2003 and supports research, including post-graduate level teaching support. It is accessed by universities, institutes of technology and polytechnics (ITPs), wānanga and private training establishments (PTEs). The size of the PBRF funding pool is determined by the Government through its annual Budget. The PBRF comprises three funding components\(^5\)\(^4\) – Quality Evaluation, Research Degree Completion and External Research Income. Data on degrees and external research income is collected annually. The peer review is less frequent; reviews took place in 2003,

\(^{53}\) Data for 2016 from the Tertiary Education Commission.
\(^{54}\) [https://www.tec.govt.nz/funding/funding-and-performance/funding/fund-finder/performance-based-research-fund/]
3.2 Funding formula

- 55% - Quality evaluation measure involving periodic peer assessments of research performance eligible staff. TEOs present their staff members’ research in Evidence Portfolios that are assessed for quality by expert peer review panels (see section 6 for more details).
- 25% - This element is a yearly measurement of the number of PBRF-eligible postgraduate research-based degrees completed at participating TEOs.
- 20% - This element is a yearly measurement of the amount and type of income received by participating TEOs from external sources for research purposes.

3.3 Rationale for PRFS

The primary objectives of the PBRF are to:

- Increase the quality of basic and applied research at New Zealand’s degree-granting tertiary education organisations (TEOs)
- Support world-leading teaching and learning at degree and postgraduate levels
- Assist New Zealand’s TEOs to maintain and lift their competitive rankings relative to their international peers, and
- Provide robust public information to stakeholders about research performance within and across TEOs.

3.4 Approach

The Government introduced core funding for Crown Research Institute (CRI) in July 2011 to give CRIs a much larger portion of stable, long-term funding. Core funding was awarded on the basis of contracts for a five-year period, expiring in June 2016. In 2015-16, the Government reviewed\(^{155}\) CRI core funding. Following this, CRI core funding was moved to form part of the new Strategic Science Investment Fund (SSIF).

3.5 Funding formula or allocation key

N/A

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

The PBRF has been in place since 2003 and does not appear to have a performance-based predecessor. Prior to reforms in the 2000s, tertiary education institutions received funding based on equivalent full-time students adjusted by weighting for different course costs. This funding covered capital and operating costs, as well as tuition and research. In allocating funding, there was little attention to accountability, capacity building, and governance.

Over time, changes have been made in terms of weightings. For instance, after the 2012/2013 review (see 5.2) the proportion of PBRF income allocated based on external research income was changed from 15% to 20% of the fund.

Studies have pointed to the tension the PRFS’ tendency to encourage competition among individual researchers and the benefits of collegiality in research. Positive effects include increases in quality of research as measured by the expert panels; improvements in qualification completion rates of Doctoral and Masters degrees; increases in PBRF-eligible external research income although it remains challenging to attribute any of these changes to specific parts of the PBRF. The measure for degree completions can be weighted and, as is the case in NZ, used to encourage a particular group into tertiary education (students of Maori and Pacific origin). Measuring completions rather than enrolments ensures that universities are only enrolling students they believe are capable. However, through the use of a fixed RDC pool of funding, organisations will seek to increase their cohort year on year, to maintain or grow their “market share”. This leads to a decrease in the unit of funding per completed degree.

5. Ownership, review & evaluation

<table>
<thead>
<tr>
<th>5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?</th>
<th>Delivery of the PBRF is monitored by the Tertiary Education Commission (TEC).</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?</td>
<td>The PBRF is reviewed periodically to examine the ways that the government can continue to support research excellence by improving the effectiveness and efficiency of PBRF settings and ensuring that it delivers solid outcomes for learners, businesses, communities and New Zealand as a whole. An upcoming review of PBRF will commence in mid-2019, following the completion of the 2018 Quality Evaluation. The terms of reference for the review were approved by the Cabinet on 17 September 2018. Before that, the PBRF was reviewed by the Ministry of Education, the Ministry of Business, Innovation and Employment and the Tertiary Education Commission in 2012/2013. The review highlighted areas that could be changed to increase the fund’s efficiency and effectiveness. These changes were implemented in 2014.</td>
</tr>
<tr>
<td>5.3 Which stakeholders/ organisations had input into review/ evaluation activities?</td>
<td>For the upcoming review an independent panel will undertake the review, and members will be appointed by the Minister of Education and the Associate Minister of Education (Jenny Salesa) in 2019.</td>
</tr>
</tbody>
</table>

---


Expert Advisory Panel advice to inform the 2012/13 review of the Performance-Based Research Fund, 2013.
6. Additional points of interest

New Zealand is one of the only countries in the world that include individual-level assessments. It is based on a direct assessment of their research outputs by peer review. This involves creation of an Evidence Portfolio (EP), which is submitted to the Tertiary Education Commission (TEC) who will assign it to a quality category.

The EPs submitted by researchers consist of three types of evidence:
- Research outputs (ROs)
- Peer esteem (PE)
- Contributions to research environment (CRE).

Each researcher is entitled to submit up to 30 examples of each, plus 4 nominated research outputs. They can be either quality-assured or non-quality assured, and include: published academic work, work presented as non-print media, other types of output (patents, material, products etc.).

PE is designed as a gauge of a staff member’s research quality, and is a measure of the recognition of their research by their peers. Evidence of PE can include: research-related fellowships, prizes, awards; ability to attract graduate students or to sponsor student into higher-level research positions/qualifications/opportunities; research-related citations and favourable review. They note that the number of citations alone is not a good measure, as they may not be positive.

CRE designed to provide an opportunity for staff to indicate their role and contributions to a vital, high-quality research environment. Examples of CRE evidence are: membership of research collaborations and consortia, facilitating discipline-based and research networks, supervision of student research.

7. Sources

7.1 Public documents of interest

7.2 Interviewees
- Sharon Beattie, Senior Advisor for the PBRF Quality Evaluation, Tertiary Education Committee
14 Country template: Norway

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>5.3 million</td>
<td>2.03%</td>
<td>12th</td>
</tr>
</tbody>
</table>

There are two main groups of publicly funded research performing organisations in Norway:

Higher education institutions:
- 10 universities,
- 9 Specialised university colleges (3 private)
- 14 University colleges (6 private)
- Private specialised university institutions
- University hospitals

44 research institutes (49 units) in receipt of government ‘base funding’:
- Technical-industrial institutes
- Primary industry institutes
- Social science institutes
- Environmental institutes

1.5 Overview of RPO landscape

The government funds a high proportion of R&D in Norway, 44.9% (2015) as compared to an OECD average of 26.2%.

The HEI sector accounts for 33% of all R&D expenditure (GERD). The universities are the most important R&D actors in this group and spend about two thirds of HERD.

Research institutes play a prominent role in Norway compared to most other countries and account for 21% of total R&D expenditure (2016), of which 60% is spent by institutes eligible for 'base government funding'. Technical-industrial institutes is the largest group and account for 31% of R&D spend in the institute sector (2016).

1.6 Brief summary/system description

The government funds a high proportion of R&D in Norway, 44.9% (2015) as compared to an OECD average of 26.2%.

The HEI sector accounts for 33% of all R&D expenditure (GERD). The universities are the most important R&D actors in this group and spend about two thirds of HERD.

Research institutes play a prominent role in Norway compared to most other countries and account for 21% of total R&D expenditure (2016), of which 60% is spent by institutes eligible for 'base government funding'. Technical-industrial institutes is the largest group and account for 31% of R&D spend in the institute sector (2016).

2. Funding system overview

2.1 What are the main funding system components?

Institutional funding accounts for a very large proportion of funding for Norwegian universities. External funding (e.g. from research councils) constitutes a relatively small proportion of HEI government income.

The greatest share of institutional funding is allocated as unconditional block grants for both teaching and research, whereas a smaller proportion are made contingent on performance indicators.

2.2 Is there a PRFS (definition: JRC/Hicks)?

Yes

---

160 https://www.forskningsradet.no/en/About_the_institute_sector/1254010731859
2.3 Shares of funding allocated through the main mechanisms

Institutional government funding for universities are allocated with the following weights:

- Unconditional block grant: 69%
- Teaching performance-based funding: 26%
- Research performance-based funding: 5% (1.6% publication indicator, 3.4% external funding)

3. Assessment-based system components

Performance-based research funding

The Norwegian research assessment employs a metrics-based system including both input and output indicators. The publication indicator is the only one of the four elements which conforms to the strict definition of a PRFS in the literature. The funding formula contains four main elements:

- Income from Research Council Norway and regional research funds
- Income from mission-based funding (BOA)
- Funding from EU Horizon 2020
- ‘Publication points’ (described in more detailed below)

In addition to these indicators, funding is given for teaching-related indicators, including number of PhD-graduates.

The performance indicators are collected each year as the basis of the budget two years later. The assessment was first implemented in 2004 and first formed the basis of university funding in 2006.

**Institute sector**

Research institutes are required to meet a set of criteria to qualify for direct institutional funding in the first place. Among other criteria, they must show that they can publish research through recognised channels and that they can attract external funding from e.g. RCN and EU programmes. As shown above, approximately 60% of research expenditure in the Norwegian institute sector is conducted by institutes which receive basic government funding.

**The publication indicator**

The so-called 'Norwegian model' for bibliometric assessment of research outputs consists of three main elements (see e.g. Sivertsen 2016):

- A complete national information system containing validated bibliographical records for peer-reviewed academic literature across all disciplines
- A publication indicator with a system of weights that makes field-specific publishing traditions comparable across fields in the measurement of ‘Publication points’ at the level of institutions
- A funding model which reallocates a small proportion of the institutional government funding according to the institutions' shares in the total of Publication points.

For the purpose the national information system (Ad 1), existing sources such as the Web of Science and Scopus were not sufficiently complete, as compared with the institutions’ internal information systems (CRIS). In 2010, local CRIS systems were integrated into a national system, CRIStin, with participation of around 160 institutions.

In order to qualify for funding under the Norwegian system, ‘scholarly publications’ must fulfill a number of criteria, not least that it has been peer reviewed.

In a second step (Ad 2), publication points are awarded for eligible publications according to the type and the quality of the publication channel as shown in the table below:

<table>
<thead>
<tr>
<th></th>
<th>Level 1</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal article (ISSN)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Book chapter (ISBN)</td>
<td>0.7</td>
<td>1</td>
</tr>
<tr>
<td>Book (ISBN)</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

'Level 2' is a field-specific list of the most prestigious publication channels (e.g. journals, book publishers), representing up to 20% of the world publications in each field. The list is revised every year by discipline-based committees made up of representatives from the research community as described in section 5.1 below.

Publication points are measured at the level of institutions and fractional counts are calculated for co-authored publications and for authors with multiple affiliations. The system is designed to make the necessary
3.2 Funding formula

Discipline-specific adjustments to ensure that the performance measure (publication points) is comparable across disciplines.

**Universities**

The performance-based funding for research has a closed budgetary frame, about 5% of total government funding for universities, and thus serves to determine the distribution of a fixed amount between the institutions. This contrasts with performance-based funding education-related activities, which has an open budgetary frame.

As one of four elements, the publication indicator governs a small proportion of government funding, approximately 1.6% of direct institutional funding for universities. Since the introduction of the publication indicator, overall scientific production has increased (see below) and, as a consequence, the value of each ‘publication point’ has decreased accordingly. One publication point now commands approximately 2,500 euros, about half of what it did in 2005.

**Institutes**

Basic funding is allocated according to three main criteria, differentiated across the four groups of institutes:

<table>
<thead>
<tr>
<th></th>
<th>Environment</th>
<th>Primary industries</th>
<th>Social Sciences</th>
<th>Technical-industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance-based</td>
<td>5%</td>
<td>2.5%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Fixed basic funding</td>
<td>55%</td>
<td>67.5%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Strategic investments (SIS)</td>
<td>40%</td>
<td>30%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The performance-based funding is different from the funding formula for universities but has similar elements, as shown here:

- National research income from external sources (45%)
- Publication points (see below) (30%)
- International income (20%)
- Completed doctorates (5%)

3.3 Rationale for PRFS

The introduction of the publication indicator served two main purposes:

- To improve information about research production for the use of both government (for gov and institutions)
- To improve productivity and quality of Norwegian research

The decision to differentiate between ‘Level 1’ and ‘Level 2’ publications (see above) was taken in order avoid perverse incentives as observed previously in Australia and New Zealand, where researchers were incentivised to maximise publication volume in sub-standard publications. An alternative solution considered at the time was to introduce an indicator based on citation impact but the two-level differentiation of journals was chosen instead.

Other Conditional funding

In addition to performance-based research funding, the Norwegian funding formula contains an indicator-based performance assessment of teaching.
3.5 Funding formula or allocation key

26% of institutional university funding is distributed based on these indicators:

- Student ‘points’ (based on the number of students)
- Number of internationally mobile students, i.e. receiving international students and sending Norwegian students on foreign exchange.
- Number of students graduating
- Number of PhD candidates graduating

3.6 Other assessment activities

The Research Council Norway is responsible for evaluating research institutes which receive institutional (‘basic’) funding. The evaluations do not specifically focus on the effect of base funding on the institutions but have a broader scope. The purpose of these evaluations is i) to provide information for the Research Council for the use of policy-making and strategic planning as well as ii) for the institutions themselves for strategic and scientific development. Evaluations of each of the four main groups of research institutes (see above) have been completed between 2014 and 2018.162

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

One of the interesting aspects of the Norwegian system is that, although contested, it has been relatively stable since it was introduced.

The funding formula for universities was amended – although not fundamentally altered – in 2015/16. Among other changes, the range of external funding sources counted in the performance indicators was extended to include a broader range of EU programmes and private sources to encourage collaborative research. This included the addition of the indicator, ‘Income from mission-based funding (BOA)’ in the funding formula

In addition, changes were made to the publication indicator as a result of the 2013/14 evaluation as detailed below. This change applied both to universities and institutes.

4.2 Are there any known effects of current or former performance- or assessment-based components

The effects of the publication indicator were assessed in the 2013/14 evaluation. Although the introduction of the indicator coincided with a sustained increase in funding for HEIs, the evaluation found that the observed increase in productivity within the sector could, in part, be attributed to the system. The increased productivity was particularly pronounced among previously less productive disciplines and staff.

The evaluation pointed to three areas of in need of improvement which were subsequently addressed:

- The calculation of publication point was changed to achieve a more balanced indicator across fields, and there were given extra weight for international collaboration
- Concerns about the inappropriate use of the indicator locally at individual institutions for managerial purposes was addressed by setting up inter-institutional learning arenas and agreeing

162 https://www.forskningsradet.no/no/Institutt evalueringer/1182736860814
national recommendations for good practice in use of the indicators

- Finally, the process of selecting level-2 publication channels has been made more transparent with the introduction of an interactive internet portal (https://npi.nsd.no).

Basic funding for research institutes was reviewed in 2012. Among other things, the recommendations from the report lead to a simplification of the funding formula for institutes (Damvad 2012).

### 5. Ownership, review & evaluation

#### 5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

The funding system for HEI is owned and coordinated by the Ministry for Education and Research, The Research Council Norway (RCN) has the strategic responsibility for the institute sector – and thereby also the administration of institutional funding – on behalf of relevant sector ministries.

The wider sector is involved in the design and academic administration of the publication indicator which is used for both HEIs, hospitals and institutes:

- On assignment from the ministry, Universities Norway (UHR) has established the National Board of Scholarly Publishing (NPU), which is responsible for the academic administration of the publication indicator. The NPU is made up of representatives from across the HEI, hospitals and institute sectors and reports to the board of the UHR.
- For each scientific field, a scientific panel is constituted, which is responsible for nominating publication ‘channels’ (including book publishers where relevant) to be adopted onto the list of ‘Level 2’ publications.\(^{163}\)
- Individual researchers can also make suggestions, which can be considered by the panels.

#### 5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

The performance-based element of the funding system is not always reviewed independently of other parts of the system. The main review and evaluation activities are:

- There is a fixed annual procedure to review the list of publications (Levels 1 and 2) as described above
- In addition, the publication indicator was subject to an independent evaluation in 2013/14 by a team from Denmark. (Aargaard et al., 2014)
- As described above, evaluations of Norwegian research institutes which receive institutional funding are carried out under the aegis of Research Council Norway.

\(^{163}\) A full list of panels is available on the NPI website: https://npi.nsd.no/organisering
5.3 Which stakeholders/ organisations had input into review/ evaluation activities?

For the 2013/14 evaluation of the publication indicator, a range of sector stakeholders were consulted, including:

- A survey of researchers at universities and university colleges
- A survey of university management (rectors, deans, heads of department)
- Case studies of selected institutions.

6. Additional points of interest

The ‘Norwegian model’ has been imitated in several other countries, including in Denmark, Finland and Belgium.

Considering the relationship between performance and funding, it is interesting to note that the performance-based element of the Norwegian system only governs a small proportion of funding but still has clear observed effects on behaviour. The funding also gives institutions with an incentive to report results in an accurate and timely manner.

The future of the publication indicator is being discussed in Norway at the time of writing on several grounds.

- The indicator approach will need to be reconciled with the government’s commitment to open access and the so-called Plan S.\(^{164}\)
- There are also ongoing discussions about the compatibility of the publication indicator with the DORA convention. The National Board of Scholarly Publishing has taken the view that the publication indicator is used as a budgetary instrument to determine funding at an institutional level – and not to assess individuals – and therefore not in violation DORA. On the other hand, institutions do often use the indicator for internal management purposes and there is an ongoing effort to ensure appropriate use across institutions (see above)
- More generally, it has been argued that the publication indicator has now ‘done its job’, since the productivity of Norwegian researchers is now at a comparable level to counterparts in other Nordic countries.

In the institute sector, a recent report from the Norwegian research council (2018) recommends an overall increase in base funding for institutes combined with an increase of the performance-based element to 20% (p. 110).

7. Sources

7.1 Public documents of interest

- Norwegian Publication Indicator (NPI): [https://npi.nsd.no/informasjon#](https://npi.nsd.no/informasjon#)

available at: https://www.regjeringen.no/globalassets/upload/kd/vedlegg/rapporter/basisfinansiering_evaluering2012.pdf?id=2324014


7.2 interviewees

- Johs Kolltveit, Special advisor, Department for Research Institute Policy and Public-Private Research Coordination, Research Council Norway
- Vidar Røeggen, Senior Advisor, National Board of Scholarly Publishing (UHR Publishing), Universities Norway (UHR)
Country template: Portugal

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portugal</td>
<td>10.3m</td>
<td>1.27%</td>
<td>19th</td>
</tr>
</tbody>
</table>

1.5 Overview of RPO landscape

- Public universities: 13
- Private universities: 7
- R&D units: 307. The vast majority of these are associated with the public universities.
- Public polytechnic institutes: 20
- Associate Laboratories: 26

Most of the research takes place within universities, including the semi-autonomous R&D units under their control.

1.6 Brief summary/system description

R&I policy is governed by the Ministry for Science, Technology, and Higher Education (MCTES) and the Ministry for the Economy (ME). The principal funding agency is the ‘Fundação para a Ciência e a Tecnologia’ (FCT) which acts as the research council. The FCT provides funding for academic research units, and support for research projects. Applied R&I is funded by the ‘Agência Nacional de Inovação’ (ANI) but this is relatively minor. Private non-profits such as the Gulbenkian Foundation and the Champalimaud Foundation also provide research funding.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

Yes

Project-level funding is allocated on a competitive basis according to the three main orientations of objectives influencing allocation criteria, i.e.: whether it oriented towards knowledge advancement (mostly on topics decided by the researchers themselves); driven by policy topics (more related to R&D strategy); or by the goal of achieving economic innovation. In some cases, these objectives can be mixed, such as in funding instruments oriented towards both policy and innovation. Project funding is provided by the research council (FCT) and the innovation agency (ANI). Institutional funding is mainly composed of the core allocations to R&D units and higher education institutions. The Higher Education Institutions received direct basic funding from the Ministry of Science, Technology, and Higher Education and is designated for teaching purposes. It is allocated on the basis of a formula. For R&D units, the majority of which is associated with

---

165 Associate Laboratories are scientific research units (public or non-profit private units) associated with Ministry of Science, Technology and Higher Education selected to collaborate in pursuing specific objectives within the Government’s science and technology policy, including consultation on the definition of programmes and policy instruments.


2.3 Shares of funding allocated through the main mechanisms

In 2013 the share of organisation-level funding was 53%, while project-level accounted for 45%\(^{169}\) of public research funding.

---

### 3. Assessment-based system components

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The R&amp;D Units Multiannual Funding Program was initiated in 1993 with the main objective of promoting the institutional organization of the Portuguese research system associated with higher education and not-for-profit institutions in research centres and institutes of the initiative of groups of researchers. Portuguese R&amp;D units are reviewed periodically. Past evaluations were carried out in 1996, 1999, 2002, 2007 and 2013, and one currently ongoing. Review panels (usually around 6-7) are set up for the main disciplines of the applying R&amp;D units and consist exclusively of international peers. R&amp;D units are defined as groups of researchers formed around a specific research field or theme and that are affiliated to a university or another research organisation. The evaluation is a nationwide exercise and takes place every 3 to 6 years and determines funding for multiple years. The evaluation involves informed peer review in which judgement is partially based on numeric inputs such as bibliometrics. Other sources of information are self-evaluation reports submitted by the R&amp;D units and qualitative assessments of their strategies. The review process consists of three stages.</td>
</tr>
</tbody>
</table>

---


First, a preliminary evaluation of the R&D unit is carried out. This is followed up by a site visit of the unit. Finally, in the third stage, an overall evaluation of the unit is carried out based on the inputs of the previous two stages and the evaluation panel reaches its final decision.

There is no fixed funding formula, rather a process of informed peer review is used. The three evaluation criteria for the review exercise are as follows:

- **B** - Merit of the team of Integrated Researchers.
- **C** - Appropriateness of objectives, strategy, plan of activities and organization for the following five-year period (2018-2022). The criteria have equal weightings and are graded on a 5-point scale.

<table>
<thead>
<tr>
<th>Numeric score</th>
<th>Label</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Excellent</td>
<td>All relevant aspects of the assessment criteria successfully addressed. Any shortcomings are minor.</td>
</tr>
<tr>
<td>4</td>
<td>Very good</td>
<td>Assessment criteria very well addressed/met, although certain improvements are still possible.</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>Assessment criteria well addressed/met, although improvements would be necessary.</td>
</tr>
<tr>
<td>2</td>
<td>Fair</td>
<td>Assessment criteria broadly addressed; however, there are significant weaknesses.</td>
</tr>
<tr>
<td>1</td>
<td>Poor</td>
<td>Assessment criteria addressed in an inadequate manner, or there are serious inherent weaknesses.</td>
</tr>
</tbody>
</table>

For each criterion the scores are added up so that each unit will get a resulting score out of 25. Units are then graded as follows:

<table>
<thead>
<tr>
<th>Cumulative Score (out of 20)</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥15</td>
<td>Exceptional</td>
<td>R&amp;D Unit recognised as an international reference for its scientific and technological output and exceptional contributions to its area of research</td>
</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>R&amp;D Unit distinguished by the high quality and international merit of its scientific and technology output and with significant contributions to its area of research</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>R&amp;D Unit with high quality and national merit and with significant contributions of international relevance in its area of research</td>
</tr>
<tr>
<td>&lt;15 &gt;12</td>
<td>Good</td>
<td>R&amp;D Unit with quality at the national level, reduced internationalisation and some contributions to its area of research</td>
</tr>
</tbody>
</table>

\(^{70}\) Units must score at least 4 points in each of the ratings of criteria A and C, and it must also score at least 3 points in each of the ratings of criteria B and D.

\(^{71}\) Units must score at least 3 points in any of the four evaluation criteria ratings.
Based on this, a selection of R&D units is made that will proceed to stages 2 and 3. The overall scores of the R&D units are translated into funding decisions but the rules for these decisions are not transparent which has also been criticised. Instead, only general observations regarding funding for the most recent round can be made. In 2013, 45% of the units evaluated did not pass to the second stage of the evaluation and were expected to receive less than €1k per researcher, per year. The funding to be assigned to the research units evaluated in the second stage is about €70m per year.

3.3 Rationale for PRFS

The main objectives of the funding to be awarded by FCT on the basis of this evaluation are:

1) to promote the organizational base of the national Science and Technology (S&T) system in R&D Units;
2) to support the access to shared resources for R&D activities and actions aiming to create, enhance or increase the value of the conditions assured by each R&D Unit for better fulfilment of its goals;
3) to complement, as judged appropriate, the funding obtained by R&D Units for general activities and the strengthening of their internationalization, in order to ensure the institutional conditions that increase the potential of a better use of available resources, including the enhancement of joint funding of employment plans of PhD researchers and the support of PhD programs;
4) to contribute to additional exploitation costs of results of previous activities and projects of the R&D Unit researchers whose objectives have been successfully accomplished.

Other Conditional funding 3.4 Approach

All higher education institutions receive direct basic funding from the Ministry of Science, Technology and Higher Education for the purposes of teaching. The allocation of this is based on a formula.

Further to the base funding allocated to R&D units through the aforementioned process, units that received a score of Good, Very Good, or Excellent, are eligible for additional ‘Programmatic Funding’. This is decided by the evaluation panel based on the unit’s plans for the upcoming funding period, results obtained in the previous period, and specific needs of the unit. If granted, Programmatic Funding is earmarked for PhD fellowships, salary costs for new PhD researchers, internationalisation, or other support for specific purposes. The amount of Programmatic Funding a unit can receive is capped at a third of the total amount of funding allocated to the unit.

Finally, some national research programmes also use formula-based allocation procedures to provide institutional funding in target areas. These are the; Science, Technology and Higher Education Programme, European Science Foundation (2015) ESF Report on the Evaluation Process of the Foundation for Science and Technology (FCT) R&D Units.

Participation in European or international infrastructures and networks.
The following parameters are used in allocating direct basic funding to public universities.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>Number of students for all the courses approved for public funding</td>
</tr>
<tr>
<td>Cost factor to allow considering specific institutional characteristics, as well as to differentiate areas of study</td>
<td>Staff average costs (indirect measure of qualification) Teacher/student ratios Teacher/non-academic staff ratios Funding depends on reference costs calculated using the same criteria for every institution, using a predefined relationship between other current expenses and personnel costs (15/85)</td>
</tr>
<tr>
<td>Quality indicators</td>
<td>Level of the academic staff qualification (fraction of the academic staff holding PhDs) Graduation efficiency rate Post-graduation efficiency rates (masters and PhDs awarded)</td>
</tr>
</tbody>
</table>

Universities are free to run their own internal assessments but there are no other national assessment systems.

Until 1994, the main type of institutional funding was block funding allocated to the national public laboratories by their respective ministries. This changed when the R&D Units Multiannual Funding Program was introduced. The system initially had a ‘pure peer review model’ but gradually transitioned to a review process that is also informed by bibliometrics.

Compared to the 2013 assessment procedure the biggest difference in the current evaluation rules are: the introduction of 3 sequential phases in the evaluation process, the reduction of evaluation criteria to three, and the centralisation of all evaluations under FCT.

The evaluation system has created a dynamic in how the higher education system organises itself. For instance, education effects were generated as a result of the inclusion of PhD programmes as one of the indicators. It has also stimulated flexibility and re-organisation and promoted internationalisation as well as improved quality.

As for the R&D units, FCT representatives have indicated that some units have adjusted their organisational and/or scientific focus as a result of the evaluations.

5. Ownership, review & evaluation

<table>
<thead>
<tr>
<th>5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?</th>
<th>The entire assessment exercise is authorised and run centrally by the FCT. It appoints the different review panels consisting of international experts based on the disciplines of the R&amp;D units.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?</td>
<td>Each review round typically includes reflections on the overall procedure by the review panels. This takes place every 4 years approximately and is conducted by a coordination team consisting of a panel of 4 independent scientific experts.</td>
</tr>
<tr>
<td>5.3 Which stakeholders/organisations had input into review/evaluation activities?</td>
<td>The FCT board of directors and the scientific community under open public participation.</td>
</tr>
</tbody>
</table>

6. Additional points of interest

N/A

7. Sources

<table>
<thead>
<tr>
<th>7.1 Public documents of interest</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>7.2 Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCT</td>
</tr>
<tr>
<td>Isabel Vittorino, Director of the Department for R&amp;D Units</td>
</tr>
<tr>
<td>Luis Fortes, Science and Technology Manager, Institutions Support Department (DAI)</td>
</tr>
</tbody>
</table>
16 Country template: Singapore

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country: Singapore</th>
<th>1.2 Population: 5.6m</th>
<th>1.3 GERD/GDP: 2.16%</th>
<th>1.4 GERD/GDP rank (1/20): 9th</th>
</tr>
</thead>
</table>

According to Statistics Singapore, there were 69 public-sector organisations performing R&D in Singapore in 2016:177

- 13 Higher education institutions ($1,648.8m SGD)
  - 6 Autonomous Universities
    - The National University of Singapore (NUS),
    - Nanyang Technological University (NTU),
    - Singapore Management University (SMU),
    - Singapore University of Technology and Design (SUTD)
    - Singapore Institute of Technology (SIT)
    - Singapore University of Social Societies (SUSS)
  - Other post-secondary educational institutions:
    - 5 Polytechnics
    - Institute of Technical Education (vocational training)
- 31 Governmental organisations ($1,011.4m SGD)
- 25 Public Research Institutes ($1,125.8m SGD)
  - National research agency A-Star, including 20+ research entities

1.5 Overview of RPO landscape

At 2.16% of GDP (2014), Singapore is a moderately research-intensive country overall. The largest sector in the public research landscape in Singapore is the Higher Education Sector ($1349.3m SGD, 2014, 15.8% of GERD). Most research is performed by the six Autonomous Universities. Polytechnics also perform some research which tends to be industry-oriented.

Singaporean government statistics distinguishes between ‘public research institutes’ and the ‘Government sector’. The institute sector made up of the 20+ ‘research entities’ under the National research agency A-Star undertakes mission-oriented research and expended 989.4m SGD on R&D in 2014, or 11.6% of GERD. The governments sector, covering labs directly associated with government ministries, accounts for about 29% of non-business research (972m SGD, 2014, 11.4% of GERD).

The Campus for Research Excellence and Technological Enterprise (CREATE) was set up to host collaborative research centres between global universities (e.g. University of Cambridge, MIT, ETH).178

1.6 Brief summary/system description

2. Funding system overview

| 2.2 Is there a PRFS (definition: JRC/Hicks)? | No |

---

177 https://www.tablebuilder.singstat.gov.sg/publicfacing/createDataTable.action?refld=14652
178 https://www.create.edu.sg/
2.1 What are the main funding system components?

The government’s five-year plan, Research Innovation Enterprise 2020, sets out the funding instruments to support the development of Singapore’s research with a budget of $19bn SGD over the period (2016-2020). It contains the following main strands:

- **Technology Domains**
  - Advanced Manufacturing and Engineering (AME)
  - Health and Biomedical Sciences (HBMS)
  - Urban Solutions and Sustainability (USS)
  - Services and Digital Economy (SDE)

- **Cross-cutting domains**
  - Academic Research
  - Manpower
  - Innovation and Enterprise

Within the ‘Academic Research’ domain, the plan contains funding for research without prescribing a specific theme or area. These include:

- **National Research Foundation programmes**:
  - NRF Fellowships
  - NRF Investigatorship
  - NRF Competitive Research Programme
  - Returning Singaporean Scientists Schemes

- **Ministry of Education (MoE): Academic Research Funding (AcRF)**

These different funding streams are administered within the system of research funders shown in the chart below.

2.3 Shares of funding allocated through the main mechanisms

Data on public funding of research and innovation programmes in Singapore are not in the public domain.

---

**Figure 3. Overview of funding for public research in Singapore.**

Source: Adapted from NRF website (https://www.nrf.gov.sg/about-nrf/rie-ecosystem)
### 3. Assessment-based system components

| PRFS | 3.1 Approach | The closest match to a performance-based system in Singapore is the Academic Research Funding (AcRF), provided by the Ministry of Education. The programme has three strands:
- AcRF Tier 1 - core institutional funding to the four research-intensive AUs that is allocated within each AU through an internal competitive process.
- AcRF Tier 2 - supports research projects on a competitive basis across the AUs. Provides funding of up to $1 million (SGD) per project over three years.
- AcRF Tier 3 - supports high-impact, multidisciplinary research programmes in the AUs. Provides funding of between $5 million to $25 million (SGD) per programme over five years.

Tier 1 explicitly gives support in the form of core funding and will be the focus of the subsequent section. |
| PRFS | 3.2 Funding formula | The allocation of AcRF Tier 1 funding is done in two steps:
- The Ministry allocated an overall budget to each university, at least partly on the basis of metrics, but the exact method for determining the amount given to each institution is not disclosed to the public.
- Each university runs competitions to allocate funding for projects proposed by individual PIs within the institution. The criteria can vary between each institution and discipline. |
| Other Conditional funding | 3.4 Approach | The Ministry of Education and the National Research Foundation also funds five Centres of Excellence, hosted at local universities. The five RCEs were selected through a competitive process between 2007 and 2010. White papers and subsequently full proposals were submitted for peer reviews and evaluated by the MOE's Academic Research Council (ARC), a committee of distinguished international scientists and academics. The RCE's progress is reviewed by an International Review Panel every three years. |
| Other Conditional funding | 3.5 Funding formula or allocation key | n/a |
| Other Conditional funding | 3.6 Other assessment activities | n/a |

---

[179] https://www.nrf.gov.sg/rie2020/spurring-academic-research-excellence
4. History & effects

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Do current performance- or assessment-based components have predecessors?</td>
<td>n/a</td>
</tr>
<tr>
<td>4.2 Are there any known effects of current or former performance- or assessment-based components</td>
<td>n/a</td>
</tr>
</tbody>
</table>

5. Ownership, review & evaluation

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?</td>
<td>The programme is owned by the Ministry of Education but largely run by the individual institutions, i.e. the six Autonomous Universities.</td>
</tr>
<tr>
<td>5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?</td>
<td>n/a</td>
</tr>
<tr>
<td>5.3 Which stakeholders/organisations had input into review/evaluation activities?</td>
<td>n/a</td>
</tr>
</tbody>
</table>

6. Additional points of interest

n/a

7. Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Details</th>
</tr>
</thead>
</table>
| 7.2 Interviewees                                                       | Consulted on factual information contained in the template:  
  • Ang Mei Wei, Senior Manager, Academic Research Division, Ministry of Education |
17 Country template: Sweden

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country: Sweden</th>
<th>1.2 Population: 10 m</th>
<th>1.3 GERD/GDP: 3.25%</th>
<th>1.4 GERD/GDP rank (/20): 2nd</th>
</tr>
</thead>
</table>

1.5 Overview of RPO landscape

Sweden has a high overall level of investment in R&D, 3.25% of GDP in 2016. Approximately a third of this is spent on research performed in the public sector. Public sector research is dominated by universities with a marginal role for research institutes. Within the HEI sector, the Broad established universities and specialised universities account for most of the research performed, whereas a small amount of research is carried out at New universities and colleges.

- Broad established universities: 53%
- Specialised universities: 37%
- New universities: (approx.) 5%
- Colleges: (approx.) 5%

As shown below, the internal distribution within the sector has been relatively constant although the overall amount of funding has increased (Forskningsbarometern 2017):

1.6 Brief summary/system description

On the priorities of Swedish research and innovation policy in recent years have been a strengthening of the science base, in the face of stagnating levels of R&D investment, educational attainment and research and innovation outputs (citation scores, patents) relative to comparable countries.

The policy response has been an increase in government investment in R&D, including increased institutional funding for universities. In the period from 2007 to 2014, government spending on R&D increased nearly 50% and a high level of investment has been maintained since then. In parallel, the “autonomy reform” of 2010 deregulated the university sector and gave institutions greater autonomy for strategic planning. 

Compared to other similar countries (e.g. Denmark), Sweden has a larger number of institutions with very diverse roles and it has been an important aim for the government – especially since 2016 – to maintain this diversity.

---

## 2. Funding system overview

### 2.1 What are the main funding system components?

**Institutional funding**
- Compared to many other countries, HEIs in Sweden receive a large proportion of their funding as institutional block grants, or ‘direct funding’.
- In addition, HEIs receive a small proportion of their funding through the so-called ‘ALF’ funds, short for Medical Training and Research Agreement, allocated following an agreement between the national government and the seven county councils about medical research and training.

**External funding**
- Sweden has a rather complex research funding system involving a large set of funding bodies with partly overlapping remits:
  - Swedish Research Council (VR) (response-mode, investigator-driven research)
  - Sector-specific research funders:
    - Swedish Defence Research Agency
    - The Energy Agency
    - FORMAS, the Swedish Research council for sustainable development.
    - FORTE, the Swedish Research Council for Health, Working Life and Welfare
  - Swedish Agency for Innovation Systems (VINNOVA)
  - Research Foundations
    - Swedish Foundation for Strategic Research (SSF)
    - Foundation for Strategic Environmental Research (MISTRA)
    - Knowledge Foundation (KK)
    - Foundation for Baltic and East European Studies,
    - the Swedish Foundation for Health Care Sciences and Allergy Research (Vårdal)
    - Swedish Foundation for International Cooperation in Research and Higher Education (STINT)
  - Significant private sources (non-profit):
    - Knut and Alice Wallenberg Foundation (SEK 1.4 billion in 2013)
    - Swedish Cancer Society SEK 392 million (2013)

### 2.2 Is there a PRFS (definition: JRC/Hicks)?

Yes

### 2.3 Shares of funding allocated through the main mechanisms

<table>
<thead>
<tr>
<th>Funding Mechanism</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional funding:</td>
<td></td>
</tr>
<tr>
<td>‘Direct funding (block grants):</td>
<td>39.1%</td>
</tr>
<tr>
<td>ALF funding:</td>
<td>4.4%</td>
</tr>
<tr>
<td>External grant funding:</td>
<td></td>
</tr>
<tr>
<td>Research councils:</td>
<td>18.4%</td>
</tr>
<tr>
<td>Public research foundations:</td>
<td>2.8%</td>
</tr>
<tr>
<td>Private non-profit:</td>
<td>11.8%</td>
</tr>
<tr>
<td>EU funding:</td>
<td>4.1%</td>
</tr>
<tr>
<td>Businesses:</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

The composition of HEI funding for research breaks down as follows:
International Landscape Study of Research and Innovation Systems

3. Assessment-based system components

**PRFS**  
3.1 Approach

**General system**

Sweden introduced a performance-based system to determine the distribution of part of the institutional funding stream for universities in 2009.\(^{182}\)

It is a **metrics-based system**, include an input element and output based elements. Only the latter is considered part of a PRFS in the strict sense, but both will be described here.

The bibliometric data used for this method is obtained from a third-party provider, Clarivate, and mirrors the content in the Web of Science database.\(^{183}\)

In 2018, a third element was added to the formula based on an expert assessment of institutional strategies for interaction with the wider society. The assessment has been developed and carried out by the Swedish innovation agency VINNOVA (VINNOVA 2016) as illustrated below:

---

\(^{182}\) Before this, additional funding was given as a top-up for external funding in 2007 and 2008.

\(^{183}\) A description, in English, of the VRs use of bibliometric data is available here: https://www.vr.se/download/18.781fb75316/9505b8cd21b8e5/1529480567144/The+bibliometric+database+at+the+Swedish+Research+Council+-+methodology+and+indicators.pdf
Performance-based ALF funding

In addition to the general funding system a performance-based funding system has been put in place for part of the ‘ALF’ Funding for clinical research (see above).

In the latest ALF agreement 2015 national government and county councils agreed that as from 2019, 20 per cent of the ALF funding will be allocated based on the quality of clinical research.

An initial evaluation was made in 2017. Three external international expert panels assessed, independently of each other, the quality of the following principal areas:

5. The quality of scientific output
6. Clinical significance and societal impact of the clinical research
7. The prerequisites for clinical research

General system

Funding sources

Overall, the system governs a relatively small share of government funding for universities. This includes additional funding invested in the sector as well as a redistribution of a proportion of existing funding. The exact amount and nature of the funding distributed has varied year-by-year as shown in Figure 4.

When the system was first introduced, the model only governed the distribution of additional (‘new’) funding (2009). The following year (2010), 10% of direct government funding was held back and distributed via this method. Institutions were guaranteed an overall increase of at least SEK 5m as a combined effect of both additional funding and redistribution of existing funding. In practice, the redistribution of funding has led to relatively small amounts transferred, generally from smaller colleges to larger institutions. This share was increased to 20% in 2014 but following was not used in 2017 and in 2018 only used within each of three groups of institutions (thereby preventing transfers away from smaller institutions).
From 2009 to 2017, the funding formula contained two main elements with equal weight:

- External competitive grant income: 50%
- Publications (bibliometrics): 50%

The formula below summarises the funding formula:

\[ \text{Publication volume} \times \text{citation impact} \Rightarrow \text{bibliometric index score} \]

The bibliometric data used for this method is obtained from a third-party provider, Clarivate, and mirrors the content in the Web of Science database. \(^{184}\)

The publication volume is calculated on a field-adjusted basis to account for differences in publication propensity and coverage in bibliometric databases between disciplines. As there is no standard bibliometric method for achieving this, a procedure has been devised involving the so-called ‘Waring method’.

As of 2018, the funding formula contains three elements:

- **External competitive grant income**: 33%
- **Publications (bibliometrics)**: 33%
- **Interaction with wider society**: 33%

### 3.3 Rationale for PRFS

In the context of the policy of increased investment in and autonomy for institutions, the performance-based system aims incentivise institutions:

- to prioritise research quality
- to focus on areas where they have potential to achieve high quality

---

\(^{184}\) This differs from the ‘Norwegian model’, which is based on an aggregation of institutional CRIS, deemed to be more comprehensive than commercially available alternatives, especially in HSS disciplines.
In addition, the system aims to

- increase transparency in funding allocation

With the rejection of a UK-inspired system for peer-review based research assessment, FOKUS (see below), it remains the case that performance-based funding is not used for research assessment, which instead is carried out separately (see below).

The rationale for introducing a performance-based element to ALF funding is to “identify, highlight and reward good examples.” The longer-term aim is to improve the quality of clinical research in Sweden more generally.

### 3.6 Other assessment activities

At least two other mechanisms for research assessment are used in the Swedish system:

- Large universities implement self-assessment

  Evaluations following this model are more formative in nature – feeding into the institutions strategic planning and internal budgeting – and do not have direct implications for funding. To the extent that this helps improve performance on the indicators included in the existing government funding formula, this may, of course, lead to funding increases in the medium to long term.

- The research councils implement subject reviews

In addition, the Research Council performs a comprehensive analysis of the Swedish research system in preparation of the Government Research Bill every four years, most recently in 2016.¹⁸⁵

### 4. History & effects

#### 4.1 Do current performance- or assessment-based components have predecessors?

The Swedish model has been essentially unaltered since it was introduced in 2009, but it has been subject to much debate and several alternatives have been discussed.

In 2013, the Swedish Research Council was commissioned by the government to design a new system for allocating research funding for universities. The proposed system, FOKUS, was inspired by the UK Research Excellence Framework (REF). Research would be assessed on the basis of peer review completed by citation analysis and impact case studies along four main dimensions:

- Background information (not graded)
- Scientific / artistic quality (70%)
- Quality enhancing factors (15%)
- Impact beyond academia (15%)

FOKUS would have been a radical departure from the existing, metrics-based system but following criticism from the sector, the Government decided not to implement it.\(^{186}\) The model was found to be too costly to implement and universities expressed concerns about their institutional autonomy, preferring to manage institutional evaluations themselves.\(^{187}\)

In 2019, UKA published a review of HEI funding in Sweden in the period 2007-2017. The review included an analysis of the financial consequences of the performance-based model but not an evaluation of its effect on research quality or impact. Overall, it found that the effect of the formula had been rather limited although it had led to some redistribution towards the large research-intensive institutions.

Other sources point different types of effects:

- The model gives an additional incentive to increase third stream funding and this appears to have resulted in an increased investment from industry into universities (Jonkers and Zacharewicz, 2016)
- The bibliometric indicator has had an impact on institutions, where the use of bibliometric indicators has become more widespread.
- In 2016, the new Swedish government also argued that the model has led to a concentration of resources within the group of traditional universities and that new universities and colleges had benefited much less from the increase in resources invested in the sector since 2009 (Swedish Government, 2016, pp. 56-59).

### 5. Ownership, review & evaluation

#### 5.1 Which organisation 'owns' and runs (if different) the performance- and assessment-related elements of the funding system?

The performance-based funding system is owned by the Ministry of Education with methodological support from the Swedish Research Council (VR). The latter performs the bibliometric analysis which underpins half of the performance-based funding allocation.

#### 5.2 What review and evaluation procedures have been conducted on the performance and assessment-related elements of the system?

The prime example of a review of the current system was the process which resulted in the proposed FOKUS system which was eventually rejected. The performance-based funding system is regularly up for debate, but this does not follow a regulated review process.

#### 5.3 Which stakeholders/organisations had input into review/evaluation activities?

The Swedish system has been designed and revisions considered after broad consultation and participation from the HEI sector. When the initial system was designed, this followed a public government inquiry into improving the education funding model and consultation on the results within the sector.\(^{188}\) Similarly, the FOKUS system was designed by the by the Swedish Research Council (VR) with support from other research funding bodies (see above) and involved consultation with the sector more broadly, which ultimately led to a rejection of the proposed system.

---


\(^{187}\) Sivertsen (2017, p. 3)

\(^{188}\) [https://www.regeringen.se/rattsliga-dokument/statens-offentliga-utredningar/2007/11/sou-200781/]
6. Additional points of interest

In February 2019, the Swedish government published a report on the future governance of steering of higher education institutions, which contains a number of recommendations (Swedish Government (2019)).

- Development of a new national system for quality assurance and evaluation of research
- Less emphasis on financial incentives as these are seen to be counterproductive, but more emphasis on dialogue and professional standards as steering tools.
- Possible models include the Dutch Standard Evaluation Protocols or contracts between universities and government as seen in several countries.

7. Sources

7.1 Public documents of interest

- UKA (2019), Finansieringen av svenska universitet och högskolor

7.2 Interviewees

- Lars Olof Mikaelsson, Ministry of Education
## 18 Country template: Switzerland

### 1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country: Switzerland</th>
<th>1.2 Population: 8.5m</th>
<th>1.3 GERD/GDP: 3.37%</th>
<th>1.4 GERD/GDP rank (/20): 3rd</th>
</tr>
</thead>
</table>

### 1.5 Overview of RPO landscape

- 2 Federal universities of technology (ETHZ and EPFL) and four federal research institutes (Paul Scherrer Institute, Swiss Federal Institute for Forest, Snow and Landscape Research, Swiss Federal Laboratories for Materials Science and Technology, Federal Institute of Aquatic Science and Technology)
- 10 Cantonal universities (plus a long-distance learning university and the university of Liechtenstein)
- 7 Cantonal Universities of applied sciences (UAS), 1 Private UAS; (arts/music in Switzerland are part of the UAS); 14 universities of teacher education (*Universities of Teacher Education are typologically related to the UAS, directly qualifying students for a profession*)
- Around 30 mostly federally funded research institutes (including ‘Research facilities of national importance’)

### 1.6 Brief summary/system description

In terms of institutional funding, Switzerland essentially has a binary university system: the Federal Universities of Technology (ETHZ and EPFL) are funded by the Swiss Confederation, whilst the other universities, UAS and Universities of teacher education are largely funded by the Cantons. Teaching and research in the latter are funded through relatively simple formula-based allocation (numbers of students and / or acquired project funding), whilst institutional funding for the federal institutes rests on performance contracts. The Swiss funding system as such is relatively straightforward. The main areas of complexity lie in the intricate relationships between federal and cantonal level, as well as between individual cantons.

### 2. Funding system overview

#### 2.1 What are the main funding system components?

- Institutional funding is primarily provided by the Swiss Confederation (for the federal universities of technology) and the cantons (for the cantonal universities and the universities of applied sciences).
- The cantons have a prominent role in the Swiss funding system: they are largely responsible for institutional funding for the cantonal universities, the universities of applied sciences (Fachhochschulen) and the universities of teacher education. There is a somewhat complex system that ensures funds are distributed between cantons to account for the fact that students may study outside their home canton. The federal level also makes an important contribution to the cantonal universities and cantonal universities of applied sciences. For each funding period, the Higher Education Council determines the public funding requirements of higher education institutions and other institutions within the higher education

#### 2.2 Is there a PRFS (definition: JRC/Hicks)?

No
sector. The federal funds are then allocated on the basis of uniform and performance-based principles.

- Apart from institutional funding the Swiss National Science Foundation (SNSF) is the primary funding body for promoting scientific research with particular attention to promoting young scientists (the allocation of research money is primarily based on competition). Approximately 50 percent of the SNSF-budget is allocated to project funding, around 21% to career schemes and around a quarter is allocated to (larger) scientific programmes.

- Innosuisse (formerly CTI) provides funding for knowledge-based innovation and development (applied research and development) with matching funds from the industry. It works towards KTT between public research and the business sector.

- The participation of Switzerland in the EU framework programmes offers new opportunities for the Swiss research community for cross-border research and collaboration in international networks. Therefore it has a high degree of importance in the Swiss funding landscape.

- The State Secretariat for Education, Research and Innovation (SERI) is the policy body responsible for federal R&I funding. The two federal universities of technology (ETHZ and EPFL) are funded by the Confederation on the basis of strategic goals.

### 2.3 Shares of funding allocated through the main mechanisms

<table>
<thead>
<tr>
<th>Description</th>
<th>Institutional Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal universities and research institutes</td>
<td>72% federal contribution, 16% competitive Project funding, 12% private funding</td>
</tr>
<tr>
<td>Cantonal universities</td>
<td>53% cantons, 14% federal contribution, 14% competitive Project Funding (SNSF/InnoSuisse/EU), 19% private funding</td>
</tr>
<tr>
<td>Cantonal universities of applied sciences</td>
<td>51% cantons, 24% federal contribution, 5% competitive Project Funding (SNSF/InnoSuisse/EU), 20% private funding</td>
</tr>
</tbody>
</table>

### 3. Assessment-based system components

#### 3.1 Approach
n/a [There is no performance-based research funding system in Switzerland]

#### 3.2 Funding formula
n/a

#### 3.3 Rationale for PRFS
n/a

#### Other Conditional funding

<table>
<thead>
<tr>
<th>Description</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>The share of federal funding allocated to cantonal universities and universities of applied sciences is based on a formula that includes input as well as output indicators, split into a teaching and a research component. The indicators used are:</td>
<td></td>
</tr>
<tr>
<td>Number of students</td>
<td></td>
</tr>
<tr>
<td>Number of students from abroad</td>
<td></td>
</tr>
<tr>
<td>Graduates (BA, MA and PhD)</td>
<td></td>
</tr>
</tbody>
</table>
3.5 Funding formula or allocation key

Regulated in the ordinance implementing the Higher Education act, art. 7 et seq.

For cantonal universities:
- Teaching: 70%
  - Students: 50%
  - Students from abroad: 10%
  - Graduates (MA and PhD): 10%
- Research: 30%
  - Income from SNSF and EU FP: 22%
  - Income from KTI and others: 8%

For cantonal Universities of Applied Sciences:
- Teaching: 85%
  - Students: 70%
  - Students from abroad: 5%
  - Graduates (BA): 10%
- Research: 15%
  - Third party funding: 7.5%
  - Knowledge transfer: 7.5%

3.6 Other assessment activities

The SBFI has a long tradition of publishing systemic reviews on the R&I system. The SBFI regularly monitors R&I activities through a variety of publications such as the "bibliometric analysis of scientific research in Switzerland" and the impact studies on the Swiss participation in the EU Framework Programmes. Furthermore, a broader analysis is carried out in the report "Research and Innovation in Switzerland", which is published every four years (latest edition 2016).\(^{189}\)

4. History & effects

4.1 Do current performance- or assessment-based components have predecessors?

JRC (2016) notes that the Swiss system has remained largely unchanged since the 1990s. However, there have been very recent efforts to ensure that the processes for funding of cantonal universities and universities of applied sciences becomes more comparable. Thus, the use of a formula for federal funding contributions using different weightings for the two institution types appears to be new.

4.2 Are there any known effects of current or former performance- or assessment-based components

None documented.

“The different assessment criteria of the federal basic contributions for universities and universities of applied sciences support the differentiation and the different practical profiles (basic research vs. applied research and practice-oriented teaching).”

5. Ownership, review & evaluation

5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?

SBFI is responsible for the institutional funding (federal universities of technology, other directly funded research facilities as well as the Confederation’s share of the institutional funding of the cantonal universities and the universities of applied sciences). Project funding and, more generally, competitive research funding is the main task of the two federal funding agencies: the SNSF (the Confederation’s funding body for basic scientific research) and Innosuisse (the Confederation’s funding body for science-based innovation). In addition, the federal offices also have means to promote research in their respective fields.

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

There is an options assessment study from 2016 by an independent consulting organisation reflecting on various new funding formulas for the federal contribution to universities and polytechnics:


A number of parameters show that the Swiss higher education system (and thus also the financing) functions efficiently and successfully: High employment rate of all graduates, university rankings, patents, research publications, etc.

According to the Higher Education Act (Art. 69), a report will be delivered 2021-2024 regarding several factors:

- The effectiveness of public expenditure
- The effects of the funding system on the finances of the Confederation and the Cantons, on their higher education institutions, on disciplines and on other higher education institutions referred to in this Act
- The competitiveness of higher education institutions
- The employability and activities of graduates after completion of their higher education studies.

5.3 Which stakeholders/organisations had input into review/evaluation activities?

The SBFI strives to involve all relevant actors in such evaluations, such as the cantons (as responsible bodies for the HEI), the national funding agencies (SNSF and Innosuisse), politics and the federal administration, the academies of science, the corresponding research communities, the Swiss Science Council or

---


191 See e.g. the “outputs” in the “Bildungsbericht 2018” (swiss education report): http://www.skbf-csre.ch/en/
the private sector. The involvement of such stakeholders, however, depends to a large extent on the respective study interests.

6. Additional points of interest

n/a

7. Sources

<table>
<thead>
<tr>
<th>7.1 Public documents of interest</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2 Interviewees</td>
<td></td>
</tr>
<tr>
<td>• Marco Scruzi Head of Unit, 'Higher Education Policy', SBFI</td>
<td></td>
</tr>
<tr>
<td>• Nicole Schaad Head of Unit, 'National Research', SBFI</td>
<td></td>
</tr>
</tbody>
</table>
19. Country template: UK

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20):</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>66 million</td>
<td>1.69%</td>
<td>14th</td>
</tr>
</tbody>
</table>

1.5 Overview of RPO landscape

- There are 181 HE providers in the UK (HESA, 2016/17)
- 162 higher education institutions in the UK are in receipt of public funding via one of the UK funding councils that returned data to the Higher Education Statistics Agency (HESA, 2016/17)
- The UK system is diverse including large multi-faculty universities, small and specialist institutions and institutions of varying research intensity
- The UK holds expertise across the full range of academic fields and collaborates extensively internationally

1.6 Brief summary/system description

In the UK there is a dual support system for research. Public investment in research is delivered in two elements

- Performance related formulae funding (e.g. quality related research funding-QR) is informed by a national level assessment of research excellence through the Research Excellence Framework. Peer review is at the heart of the assessment process. Funding is allocated annually by the UK Funding bodies in line with the published performance related formulae. The REF takes place at five to seven year intervals ensuring a periodic update to the allocation of this stable funding stream
- Programme and project grants are awarded to support individuals and teams as well as institutions specifically. Awards focussed on supporting individuals and teams focus on disciplines, areas or challenges are awarded by the Research Councils on the basis of academic peer review. Strategic level project/ programme grants designed to stimulate institutional innovation are delivered by UK funding bodies based on expert review, this funding varies in type, approach, frequency and scale between the devolved nations

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)?

Yes

In the UK there is a dual support system for research. Public investment in research is delivered in two elements

- Performance related formulae funding (e.g. quality related research funding-QR) is informed by a national level assessment of research excellence through the Research Excellence Framework
- Programme and project grants are awarded to support individuals and teams as well as institutions specifically

2.3 Shares of funding allocated through the main mechanisms

Research grants and contract income and funding body grants are part of a larger envelop of income to HEIs. Research grants and contract income to HEIs represents 17.8% of HEI total income and funding body grants to HEIs represents 15.9% of total income (HESA 2014/15). 34% of the sum of this funding (£3.8bn) is research income.
52% of the total research income is income from funding bodies towards research (recurrent funding), this is equivalent to 18% of total income from funding bodies and research grants and contracts.

48% of the total research income is income from research grants and contracts. The REF is used to allocated research income from the funding bodies (recurrent funding).

**HESA, Income in 2014/15**

<table>
<thead>
<tr>
<th>Source of income</th>
<th>Funding body</th>
<th>Income</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding body</strong></td>
<td><strong>grants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent (research)</td>
<td></td>
<td>£1,963 m</td>
<td>18%</td>
</tr>
<tr>
<td>Recurrent - other (including non-recurrent special funding)</td>
<td></td>
<td>£433 m</td>
<td>1%</td>
</tr>
<tr>
<td>Grants for FE provision (not applicable to SPC)</td>
<td></td>
<td>£105 m</td>
<td>4%</td>
</tr>
<tr>
<td>Recurrent (teaching)</td>
<td></td>
<td>£2,366 m</td>
<td>21%</td>
</tr>
<tr>
<td>Release of deferred capital grants - buildings</td>
<td></td>
<td>£307 m</td>
<td>3%</td>
</tr>
<tr>
<td>Release of deferred capital grants - equipment</td>
<td></td>
<td>£106 m</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Research grants and contracts</strong></td>
<td><strong>BIS Research Councils, The Royal Society, British Academy and The Royal Society of Edinburgh</strong></td>
<td>£1,795 m</td>
<td>16%</td>
</tr>
<tr>
<td>EU sources</td>
<td></td>
<td>£836 m</td>
<td>7%</td>
</tr>
<tr>
<td>Non-EU sources</td>
<td></td>
<td>£392 m</td>
<td>3%</td>
</tr>
<tr>
<td>Other sources</td>
<td></td>
<td>£63 m</td>
<td>1%</td>
</tr>
<tr>
<td>UK central government bodies/local authorities, health and hospital authorities</td>
<td></td>
<td>£939 m</td>
<td>9%</td>
</tr>
<tr>
<td>UK central government tax credits for research and development expenditure</td>
<td></td>
<td>£496 m</td>
<td>4%</td>
</tr>
<tr>
<td>UK industry, commerce and public corporations</td>
<td></td>
<td>£337 m</td>
<td>3%</td>
</tr>
<tr>
<td>UK-based charities</td>
<td></td>
<td>£1,034 m</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>£11,191 m</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Finance statistics for 2016/17 will become available as open data in March 2019 (HESA).

**Research income, HESA 2014/15**

<table>
<thead>
<tr>
<th></th>
<th>Income</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding body grants: Recurrent research funding</td>
<td>£1,963 m</td>
<td>52%</td>
</tr>
<tr>
<td>Research grants and contracts from the BIS Research Councils, The Royal Society, British Academy and The Royal Society of Edinburgh</td>
<td>£1,795 m</td>
<td>48%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>£3,758 m</td>
<td>100%</td>
</tr>
</tbody>
</table>
Institutional funding is awarded by the UK funding bodies. External government funding is awarded competitively on the basis of specific project proposals. This includes funding from the national Research Councils awarded primarily on the basis of peer review of the scientific excellence of proposals within a disciplinary context and funding from Innovate UK to meet specific policy / needs (relevance funding). The characterisation of funding into ‘relevance’, ‘excellence’ and ‘institutional’ does not imply that these are unique characteristics. Institutional funding rewards excellence and relevance. Institutional funding mainly (but not only) flows to universities. The diagram does not imply that research organisations and universities are similar in scale.

3. Assessment-based system components

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The system: The Research Excellence Framework (REF) is the mechanism in the UK for nationally assessing the quality of research produced by higher education institutions</td>
</tr>
<tr>
<td></td>
<td>The assessment takes place at intervals of 5 to 7 years</td>
</tr>
<tr>
<td></td>
<td>Method: “The REF is a process of expert review. The recent independent review of the REF and subsequent consultation confirmed widespread confidence in discipline-based expert review, founded upon expert judgement. (...) The REF is a single framework for assessment across all disciplines, with a common set of data required in all submissions, standard definitions and procedures, and assessment by expert panels against broad generic criteria.” REF 2018/01 July 2018 Draft guidance on submissions</td>
</tr>
<tr>
<td></td>
<td>The assessment takes place within a Main Panel and Unit of Assessment structure allowing all areas of research to be captured</td>
</tr>
<tr>
<td></td>
<td>The REF is an assessment of institutions’ performance, at the level of disciplinary groups (Units of Assessment). First implemented in 1986: The UK was the first country to introduce a PRFS system</td>
</tr>
</tbody>
</table>

| 3.2 Funding formula | There are three distinct elements to each submission made by each Unit of Assessment and these are assessed by peer review sub-panels |
against the following generic criteria (REF 2018/01 July 2018 Draft guidance on submissions):

- “Outputs: The sub-panels will assess the quality of submitted research outputs in terms of their ‘originality, significance and rigour’, with reference to international research quality standards. This element will carry a weighting of **60 per cent** in the overall outcome awarded to each submission”

- “Impact: The sub-panels will assess the ‘reach and significance’ of impacts on the economy, society, culture, public policy or services, health, the environment or quality of life that were underpinned by excellent research conducted in the submitted unit. This element will carry a weighting of **25 per cent**”

- “Environment: The sub-panels will assess the research environment in terms of its ‘vitality and sustainability’, including the approach to enabling impact from its research, and its contribution to the vitality and sustainability of the wider discipline or research base. This element will carry a weighting of **15 per cent**”

### Main elements of the submissions and number of Units of Assessment (UoA),

<table>
<thead>
<tr>
<th>Main elements of the submission</th>
<th>No. of UoA</th>
<th>Key source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RSE 1986</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Research income and expenditure</td>
<td>37 (cost centres)</td>
<td>Bence &amp; Oppenheim 2005, Martin &amp; Whitley 2010</td>
</tr>
<tr>
<td>- Research planning priorities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Five best publication and other output from the previous five years of the unit/department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Descriptions of links to industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RSE 1989</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Staff returns</td>
<td>152</td>
<td>Jones &amp; Sizer 1990</td>
</tr>
<tr>
<td>- Publication and other output including two publications and other noteworthy publications or public output per member of staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Total numbers of publications in relation to the number of full-time staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Data on students and studentships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Data on research grants and contracts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Statement of research plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- General observations on other matters including consultancies and external recognitions</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RAE 1992</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Overall staff summary</td>
<td>72</td>
<td>Universities Funding Council 1992</td>
</tr>
<tr>
<td>- Active research staff return</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Two publications and two other forms of output for only the research active staff and other output and summary of publications and other output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Students and studentships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- External research income</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RAE 1996</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Overall staff summary</td>
<td>69</td>
<td>RAE 1996</td>
</tr>
<tr>
<td>- Research active staff details</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Publications and other public output: up to four outputs per selected staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Research students</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.3 Rationale for PRFS

The explicit goal of the first assessment in 1986 was increasing selectivity in the allocation of public resources (OECD, 2010; Geuna and Piolatto, 2016). The system and its purpose have been developed and been revised over time.

The REF 2014 had three stated purposes (REF, 2011).

<table>
<thead>
<tr>
<th>Year</th>
<th>Details</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Staff details: individual selected as research active and data on other academic staff, postdoctoral research assistants, other staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research outputs: up to four research outputs produced by each member of selected staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research students and studentships</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research income</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Textual commentary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RAE 2001</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Staff details: individual selected as research active and data on other academic staff, postdoctoral research assistants, other staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research output: up to four research outputs produced by each member of submitted staff (minimum 50%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description on research environment and data on research students, research studentships external research income (minimum 5%) and esteem indicators (minimum 5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RAE 2005</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>Staff details (research active staff selected), including individual staff circumstances</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research outputs: up to four research outputs produced by each member of submitted staff (65%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact template and case studies, underpinned by research excellence (20%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environment: data on research doctoral degrees awarded, the amounts and sources of external research income and research income-in-kind (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>REF 2011</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>Staff details (research active staff selected), including individual staff circumstances</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research outputs: 2.5 times the combined FTE of Category A submitted staff included in the submission (60%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact template and case studies, underpinned by research excellence (25%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environment: data on research doctoral degrees awarded, the amounts and sources of external research income and research income-in-kind and an institutional-level environment statement – institutions strategy and recourses to support research and enable impact (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>REF 2021 Draft guidance on submissions</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

The explicit goal of the first assessment in 1986 was increasing selectivity in the allocation of public resources (OECD, 2010; Geuna and Piolatto, 2016). The system and its purpose have been developed and been revised over time.

The REF 2014 had three stated purposes (REF, 2011).
• Inform the selective allocation of grants for research by the four higher education funding bodies to the institutions which they fund, from 2015-6
• Provide accountability for public investment in research and produce evidence of the benefits of this investment
• To provide benchmarking information and to establish reputational yardsticks, for use within the higher education sector and for public information

Beyond this, the Stern review (2016) identifies additional purposes of the REF:
• It can create a strong performance incentive for universities and for individual academics
• It can be used by universities and other bodies to inform decisions on resource allocation

<table>
<thead>
<tr>
<th>Other Conditional funding</th>
<th>3.4 Approach</th>
<th>The Research Councils of UKRI fund research on a competitive basis (<a href="https://www.ukri.org/funding/peer-review/">https://www.ukri.org/funding/peer-review/</a>). Proposals for Research Council funding are assessed by a process known as Peer Review. Senior academics or “peers”, from the UK and overseas, who work within relevant areas of research are involved in the review process. This assessment or “review” provides the basis of the funding decision. Each Research Council publishes information about its peer review process. There are differences in the way research councils conduct the Peer Review process but there is a common Peer Review Framework which helps simplify and standardise the processes. The Peer review process usually involves a two-stage process where proposals are considered by external experts (by correspondence) and then by a Research Council Board/Panel (at a meeting).</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>3.5 Funding formula or allocation key</td>
<td>Researchers can apply for grants. Funding is awarded competitively.</td>
</tr>
</tbody>
</table>

| 3.6 Other assessment activities | |

4. History & effects

4.1 Do current performance or assessment components have predecessors?

“REF 2021 has developed through an evolutionary and consultative process, building on the successes of the previous REF, and earlier RAEs, and introducing key changes in response to sector feedback. In implementing the recommendations of the Stern review, informed by consultation feedback, the funding bodies have sought to strike a balance between continuity and development, introducing changes where it is judged they can bring demonstrable improvements, while recognising the efficiency gains in maintaining continuity where possible”. (REF 2018/01 July 2018 Draft guidance on submissions)

There were four RAEs (in 1992, 1996, 2001 and 2008) that were followed by the Research Excellence Framework (REF) in 2014. REF 2018/01 July 2018 Draft guidance on submissions sets out the guidance for the REF 2021. Main changes overtime are as follows (Review of the Research Excellence Framework, 2018):
Research Selectivity Exercise, 1986
- Introduction of an exercise to distribute funding more prudently and selectively

Research Selectivity Exercise, 1989
- Context: A second exercise was carried in 1989 with the intention of developing a more selective and systematic approach (Jones & Sizer 1990). The proportion of institutional funding for research governed by the exercise increased, so close to half of institutional research funding was distributed on the basis of it (Martin & Whitley, 2010).
- Main change: Formalisation of a peer review system that evaluated two ‘publications’ for each member of staff

Research Assessment Exercise, 1992
- Context: The Higher Education Funding Councils (HEFCs), for England, Wales, Scotland, and Northern Ireland were established by Act of parliament in 1992. The respective governments set the amount of funding to be distributed and the HEFCs were now responsible for the distribution (Lee & Harley, 1998). The purpose of the RAE 1992 was described as to inform funding of basic research but the funding bodies also sought to assess the quality of research in general (HEFCE 1997). Following the 1992 Further and Higher Education Act, 35 of the former polytechnics became eligible for research funding.
- Main change: Increase in the funding distributed on the basis of the RAE results

Research Assessment Exercise, 1996
- Context: By the time of the 1996 RAE, the submission was normally managed by a university manager familiar with the procedures for submission.
- Main change: Increase in the number of publications submitted for review from two to four

Research Assessment Exercise, 2001
- Context: Ahead of the 2001 exercise, the funding bodies reaffirmed that the purpose of the RAE was to produce ratings of research quality, which would be used to determine funding for research. An additional set of principles was introduced, amongst other, to help ensure credibility and transparency.
- Main change: Expectation from panellists to treat each publication or output on its merits

Research Assessment Exercise, 2008
- Context: Following the RAE 2001, there was dissatisfaction concern regarding the burden that the approach placed on the academic system and there was a question as to whether a metrics based system could help reduce that. Roberts (2003) conducted a review of the RAE. The RAE 2008 changed the threshold of quality definition making the system slightly more dynamic.
- Main change: Introduction of quality profiles

Research Excellence Framework, 2014
- Context: In preparation for the next exercise, the four funding bodies first commissioned an initial open consultation on the REF. This consultation was informed by a series of studies that were commissioned by HEFCE to scope the development the exercise including work to consider the utility of metrics. Towards the end of 2009, the UK funding bodies issued a second consultation that was informed by the studies and the results of a bibliometrics pilot. The outcomes of this consultation contributed to the design of the next exercise. This
The draft guidance on submissions for the REF 2021 (July 2018) suggests that a lot has changed since the publication of the Stern review in 2016. The REF (2014/2021) identifies excellent research wherever it is found. The results of the exercise inform funding on that basis. Throughout the period in which national
assessment has been undertaken we have seen research quality improve, it is important to note that it is one part of a complex research system. The REF has also been applied as a wider policy lever drawing greater attention to issues of equality and diversity and the research environment. The introduction of impact has also been significant in supporting a culture change within higher education institutions towards the support and recognition of the value of research beyond the traditional output.

Concerns have been raised previously about the ability of the exercise to assess effectively research that does not take place within the boundaries of the Unit of Assessment panels. Analysis if REF2014 data indicates that interdisciplinary research performed equally well in the 2014 assessment however the number of flagged interdisciplinary outputs indicated that a lower number than expected were submitted to the exercise. This may suggest that research managers are less likely to submit interdisciplinary outputs to the REF than other outputs.

The REF is an assessment of institutions, but concerns are often raised about the impact that the assessment may have on individuals. Mitigations have been introduced into the exercise to take account of early career researchers and equality and diversity through staff circumstances and REF2021 will consider all research active staff.

Concerns remain within the academic community regarding the impact of national assessment on individual academics. Research England is currently undertaking a pilot evaluation of REF2021 which tests the feasibility of evaluating the perceptions, experiences and understanding of the REF among academics across career stages, and in a range of departments and universities.

The Stern Review also raised concerns about selectivity and gaming in the context of the REF. Recommendations were made to reduce the need for the selection of individuals within the exercise to reduce burden and the potential for game playing. This resulted in a recommendation that all research active staff are included in the exercise. This recommendation is being implemented in REF 2021.

The REF now exists in an environment where a system for the assessment of teaching has also been introduced. The Teaching Excellence and Student Outcomes Framework (TEF) is a national exercise.

5. Ownership, review & evaluation

5.1 Which organisation 'owns' and runs (if different) the performance- and assessment-related elements of the funding system?

The HEFCs that provide performance based formulae funding are:

- Research England (RE), under UKRI, replacing the Higher Education Funding Council for England (HEFCE) since 2018
- Scottish Higher Education Funding Council (SFC)
- Higher Education Funding Council for Wales (HEFCW)
- Department for the Economy Northern Ireland (DEFNI)

The Research Excellence Framework is overseen by the REF Steering Group which is comprised of members of the UK Funding Bodies. The Director of Research at Research England and serviced by representatives from the REF team.

5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?

Each RAE/REF has been reviewed internally and externally and by means of open consultations

- The former HEFCE undertook a robust internal and independent evaluation of the 2014 exercise. In partnership with the other UK HE funding bodies, the former HEFCE ran a number of projects that together provided a comprehensive evaluation of REF 2014. This programme of work included
an evaluation of impact, an assessment of the cost of the exercise, evaluation of interdisciplinarity within the exercise and sector feedback

- The REF was also independently reviewed by Lord Stern taking into account the evaluation of REF 2014 and sector consultation including feedback from institutions, researchers and funders

<table>
<thead>
<tr>
<th>5.3 Which stakeholders/organisations had input into review/evaluation activities?</th>
</tr>
</thead>
</table>
| The development of the REF involves extensive sector consultation including formal open consultation exercises, policy development engagement and engagement with academic assessment panels. REF 2021 has involved several consultation exercises. These have included initial consultation on the core policies for REF2021 and detailed consultation on the specifics of the guidance for the exercise. These consultation exercises are open to all respondents including individuals. 

The HE sector is also a central participant in the evaluation of the REF. The evaluation of REF2014 by the UK funding bodies included feedback from institutions, academic peer reviewers and impact assessors. The independent review undertaken by Lord Stern received over 300 responses from higher education institutions, businesses and industry, research charities, government departments and academics and individual experts. |

<table>
<thead>
<tr>
<th>6. Additional points of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Public documents of interest</td>
</tr>
<tr>
<td>- HESA 2014/15 <a href="https://www.hesa.ac.uk/news/03-03-2016/income-and-expenditure">https://www.hesa.ac.uk/news/03-03-2016/income-and-expenditure</a></td>
</tr>
<tr>
<td>- REF 2018/01 July 2018 Draft guidance on submissions</td>
</tr>
<tr>
<td>- Stern (2016) Building on Success and Learning from Experience An Independent Review of the Research Excellence Framework</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7.2 Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>n/a (direct support from Research England)</td>
</tr>
</tbody>
</table>
20 Country template: USA

1. Headline facts

<table>
<thead>
<tr>
<th>1.1 Country:</th>
<th>1.2 Population:</th>
<th>1.3 GERD/GDP:</th>
<th>1.4 GERD/GDP rank (/20):</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States of America</td>
<td>326m</td>
<td>2.74%</td>
<td>6th</td>
</tr>
</tbody>
</table>

Note: The USA’s research and innovation system is very complex. This template only covers aspects of it and cannot within the scope of this study consider all parts of the system in detail.

- There are over 4,000 higher education institutions in the US, including several elite private universities, state universities and a wide array of specialist institutions
- Only around 200 of these are classified as research universities (high to very high research activity) by the Carnegie Classification of Institutions of Higher Education. These attract the vast majority of research funding to the sector
- Public research institutes play an important role in the US and can be distinguished into two broad categories:
  - Federal laboratories under the control of a federal agency (government intramural R&D) and
  - Federally funded R&D centers (FFRDCs), which conduct research for the US government but are administered by either industry, university or private non-profit organization.

The USA are unique among the countries we have covered in that there is no federal institutional funding to public HEIs and funding for research is allocated almost entirely competitively. Individual states provide institutional funding to public HEIs, though this is strongly focused on teaching missions. Input indicators (and, increasingly, performance indicators) around teaching are typically used to allocate this. Private endowments, funding and foundations also contribute substantial amounts of funding, particularly to the prestigious private universities. There is no national research assessment in the US that could be compared to the other countries covered in this study. However, the Carnegie Classification of Higher Education Institutions acts as a benchmark and prestige-based way of increasing research performance.

2. Funding system overview

2.1 What are the main funding system components?

2.2 Is there a PRFS (definition: JRC/Hicks)? | No

It is important to note that the US is a major outlier in that a far greater share of R&D expenditure than in any other country – over half – is focused on the defence sector. This aspect is very different from other countries and is beyond the scope of this study.

Aside from this aspect, public R&D funding comes primarily from the NIH, which focuses on health research, the National Science Foundation and the Department of Energy Office of Science. Small further shares come from a large number of other agencies including NASA, NOAA and others.

For the most recent federal budget (FY 2019), funding figures are:
• NIH $39b
• NSF $8.1b
• NASA science accounts $6.9b
• DOE Office of Science $6.6b

The teaching-component of public universities is funded by the individual states. In the past this used to be based purely on input indicators (e.g. number of students enrolled), but in recent years almost all states have adopted performance components as well. Though almost all funding is competitive, there are some small exceptions, e.g. various agricultural research facilities (through the Land Grant system) and specific units within wider research performing organisations that do receive institutional funding via a range of different mechanisms. Additionally, the NSF’s EPSCoR programme distributes some institutional funds specifically to those parts of the HEI system that receive the least amounts of competitive funding as a way to redress the strong funding concentration in elite universities (and particular states).

Federal funding to HEIs is almost entirely competitive. The following figures from 2009 give an indication of the main shares:

- Department of Health and Human Services (NIH & other): 66%
- NSF: 14%
- Department of Defence: 9%
- Other agencies: 6%
- Department of Energy: 3%
- NASA: 2%

Whilst about 80% of NSF and NIH funding goes to HEIs, a more significant portion of Department of Energy funding goes to its intramural national labs.

<table>
<thead>
<tr>
<th>PRFS</th>
<th>3.1 Approach</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.2 Funding formula</td>
<td>n/a</td>
</tr>
<tr>
<td>3.3 Rationale for PRFS</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

---

### 3.4 Approach

The only significant conditional institutional funding component at US HEIs is for the teaching component at public universities. Historically the US states provide institutional funding in relation to the number of FTE students the universities enrol. However, over the past two decades this model has changed in almost all states to incentivise performance. Increasingly, states have included output metrics that determine some of the funding. These are typically still limited to teaching metrics (e.g. graduation rates), though some states also include occasional research-related metrics, such as PhD graduation rates or external funding secured.

### 3.5 Funding formula or allocation key

Each state has different performance-based components in its mechanism. De Boer et al (2015), cite some examples:


### 3.6 Other assessment activities

The Carnegie Classification of Higher Education Institutions has been the leading framework for recognising and describing institutional diversity in US higher education since 1970. The Carnegie Commission on Higher Education developed a classification of colleges and universities to support its programme of research and policy analysis. The classification was originally published in 1973, and updated in 1976, 1987, 1994, 2000, 2005, 2010, 2015 and 2018 to reflect changes among colleges and universities. This framework has been widely used in the study of higher education, both as a way to represent and control for institutional differences, and also in the design of research studies to ensure adequate representation of sampled institutions, students, or faculty.

The Carnegie Classifications include any institution that conferred at least one degree in academic year 2016-17 as reported through the National Center for Education Statistics. The Classification is not strictly a research assessment. However, institutions are measured on a range of metrics and receive a classification accordingly. Although the classification has no financial consequences, the prestige of being ranked in a high category (the highest being ‘R1 – Doctoral universities – Very high research activity’) provides an incentive in itself, particularly in a competitive system like the US, where such a marker of prestige can help attract outside investment.

There are also various other accreditation bodies for HEIs and other research organisations, some of which use peer review and site visits in their processes.

Additionally, the National Academy of Sciences carries out field evaluations in the US. These do not follow a standard procedure: various federal agencies typically contact the Academy to undertake an evaluation of a particular field of interest for particular strategic purposes.

### 4. History & effects

#### 4.1 Do current performance- or assessment-based components have predecessors?

n/a

---

194 For an overview, see:

[https://www.aau.edu/sites/default/files/AAU%20Files/Key%20Issues/Accreditation%20%26%20Accountability/Overview%20of%20US%20Accreditation%202015.pdf](https://www.aau.edu/sites/default/files/AAU%20Files/Key%20Issues/Accreditation%20%26%20Accountability/Overview%20of%20US%20Accreditation%202015.pdf)
### 4.2 Are there any known effects of current or former performance- or assessment-based components

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there any known effects of current or former performance- or assessment-based components</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### 5. Ownership, review & evaluation

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Which organisation ‘owns’ and runs (if different) the performance- and assessment-related elements of the funding system?</td>
<td>n/a</td>
</tr>
<tr>
<td>5.2 What review and evaluation procedures have been conducted on the performance and assessment related elements of the system?</td>
<td>n/a</td>
</tr>
<tr>
<td>5.3 Which stakeholders/organisations had input into review/evaluation activities?</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### 6. Additional points of interest

In addition to the Carnegie Classification of institutions, the National Academies of Sciences, Engineering and Medicine (at the time as the National Research Council) conducted a survey of graduate programmes in the mid-1990s, which was once repeated. This was an attempt to rank programmes to give postgraduate students information about the quality of different programmes in the US. The ranking was conducted at the department level (unlike the Carnegie Classification, which ranks entire institutions). The ranking was created by conducting reputational/opinion surveys around the country, so that peers would rank departments nationwide within their discipline. However, in part due to problems around the robustness of survey-based reputational rankings, there do not appear to be plans to run this exercise again in future.

### 7. Sources

<table>
<thead>
<tr>
<th>Section</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2 Interviewees</td>
<td>• Irwin Feller (Professor Emeritus of Economics, Penn State College of the Liberal Arts)</td>
</tr>
</tbody>
</table>