Chapter 9. The governance of public research policy across OECD countries

By

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Good governance of public research policy can boost the effectiveness of public investment in research. This chapter describes the governance of public research policy across 35 OECD member countries and its evolution over 2005-17. It sheds light on different research-policy contexts that explain why a "one-size-fits-all" approach is inappropriate. The chapter successively addresses four core governance dimensions with important implications for research sector performance. It first discusses the objectives of national STI strategies for higher education institutes (HEIs) and public research institutes (PRIs), which are increasingly expected to contribute to raising national R&D intensity and to address societal challenges. It then describes the variety of organisations allocating funding and evaluating performance. The section that follows discusses the growing autonomy of HEIs and PRIs and the use of associated policy tools, such as performance contracts. The last of the four core governance dimensions relates to the modes of stakeholder involvement in policy decision-making. The chapter concludes with a review of potential future developments.

Introduction

The contributions to innovation of research conducted by higher education institutions (HEIs) and public research institutions (PRIs) are well recognised, as is the need for public support for such research. In the emerging globalised knowledge economy, where the best innovations are key success factors, research is more important than ever. Yet many countries struggle to increase public budgets for research. Consequently, countries deploy a battery of policy instruments to orient investments in public research. Each national policy mix is shaped by the mechanisms and institutional arrangements governing policy action on publicly funded research in HEIs and PRIs. More effective policy governance arrangements can enhance the effectiveness of research funding. For instance, involving all stakeholders in policy design can help identify better policies to overcome obstacles hindering public research activities.

This chapter describes the governance of public research policy across 35 OECD member countries and its evolution over 2005-17. It sheds light on different research-policy contexts that explain why a "one-size-fits-all" policy approach is inappropriate. It outlines institutional choices countries are in a position to change.

More specifically, the chapter addresses four core dimensions that shape the policy mix regarding HEIs and PRIs and provides findings (Figure 9.1), with important implications for the research sector's performance (e.g. Aghion et al., 2010; Breznitz, 2007).

Figure 9.1. Four core dimensions that shape the policy mix

This chapter identifies a number of common characteristics and trends across these dimensions of the governance of public research policy (Table 9.1) using the results of an OECD survey on the governance of research policy conducted after a three-year process of in-depth data collection and validation[1] (Borowiecki and Paunov, 2018).

The chapter is structured as follows: The first section discusses the objectives of national STI strategies for HEIs and PRIs. This is followed by a description of the institutions allocating funding and evaluating performance. The third section discusses the autonomy of HEIs and PRIs, followed by a section devoted to an overview of stakeholder involvement in policy decision-making. The final section concludes with a review of potential future developments.

HEIs and PRIs in national STI strategies

Public research features prominently in national STI plans or strategies, which are in place in 33 (i.e. 94%) of the 35 OECD countries surveyed. They outline national priorities for research and innovation, and define the expected contributions of HEIs, PRIs, industry and civil-society actors (e.g. non-governmental organisations [NGOs] and foundations). Policy demands across OECD countries include finding solutions to societal challenges (e.g. demographic change and sustainable growth); developing key technologies (e.g. digital technologies) for competitiveness; and increasing national research and development (R&D) intensity. Countries' STI strategies differ in terms of the national priorities they set (i.e. societal challenges, research fields and/or industries), the targets they define (i.e. R&D intensity) and how they monitor progress in reaching these targets.

Table 9.1. Common characteristics across OECD countries

Dimension	Common characteristics of how public research is organised across OECD countries
HEIs and PRIs in national science, technology, and innovation (STI) strategies	• National STI strategies set out prominently the expected contributions of higher education and public research to technology development (incl. of digital technologies), raising national R&D intensity and addressing societal challenges, such as the Sustainable Development Goals. • STI strategies often set measurable targets for HEIs and PRIs, such as increasing the number of tenure positions for young researchers, the share of female researchers and the number of collaborative research projects with industry.
Institutions allocating funding and evaluating performance of HEIs and PRIs	• Specialised agencies are in charge of competitive, project-based funding to HEIs and PRIs. Where several agencies provide such funding they are specialised by research field, provide either funding for research or innovation, or there are separate agencies for the national and regional level. • Performance contracts between ministries/agencies and individual HEIs have been adopted in several OECD countries over the past decade. They set goals and link them to the block funding of HEIs. • Countries have invested substantially in evaluation and monitoring the performance of HEIs and PRIs. Several new institutions have been created for this purpose over the past decade.
Autonomy of HEIs and PRIs	• Reforms over the past decade have increased HEIs' autonomy with regard to budget allocations, recruitment and promotions of researchers, as well as industry relations, including the creation of technology transfer offices, spin-offs, and industry partnerships. • Most national restrictions to autonomy apply to the setting of researchers' salaries.
Stakeholders' involvement in policy-making	• Stakeholder involvement in university boards has increased across the OECD. Civil society and industry shape policy decisions of HEIs – particularly where these have substantial autonomy – by sitting on HEI governing boards or councils. • National research and innovation councils often offer opportunities to shape policy directions for stakeholders from civil society – including members of labour unions and non-profit organisations (NGOs) – and industry – often large firms but also in some cases SMEs. • New tools such as online consultations to solicit input from civil society have been used more widely in combinations with traditional consultation methods, such as working groups and roundtables.

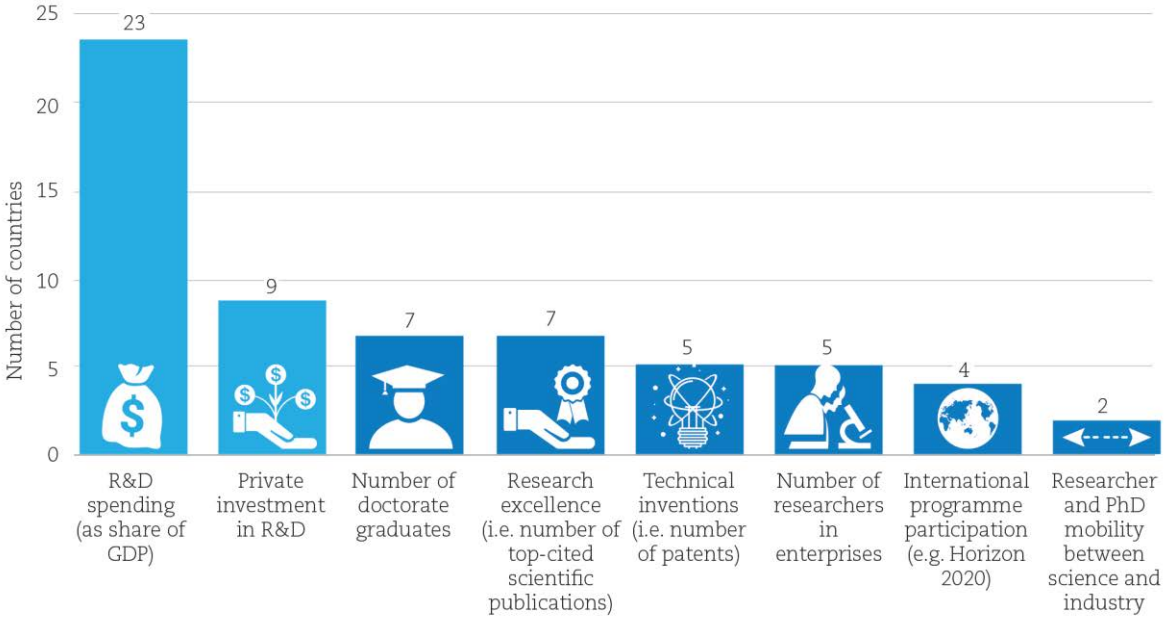
Looking at the data collected by the OECD governance of research policy survey, three main observations can be made. First, most strategies (i.e. in 31 of 33 countries, plus the Brussels-Capital Region, the Flemish Region and the Walloon Region in Belgium) identify

specific scientific research areas, technologies and economic fields, e.g. energy and energy technologies; health and life sciences; information and communication technologies; and nanotechnology and advanced materials. A growing number of strategies place digital-transformation objectives at the core of their strategic orientations, as discussed in Chapter 3.

Second, STI strategies also define the expected contributions of HEIs and PRIs to overcoming socio-economic challenges. In 30 (i.e. 91%) of the 33 countries surveyed, and in the Brussels-Capital Region, the Flemish Region and the Walloon Region, STI strategies address major societal challenges, including demographic change, health, environment, smart transport and cities. The STI strategies of 25 (i.e. 76%) of 33 countries, the Brussels-Capital Region and the Walloon Region stress the need for research and innovation to develop a sustainable economy. The strategies of 13 (40%) of 33 countries emphasise the importance of STI in addressing demographic change. Finally, the STI strategies of 15 (45%) of 33 countries, as well as the Flemish Region and the Walloon Region, also encourage investment in STI to improve transport systems.

Third, most national STI strategies include quantifiable benchmarks for policy outcomes (Figure 9.2).

Figure 9.2. Quantitative targets included in national STI strategies



Note: The figure corresponds to question 2.6.e of the OECD survey on the governance of research policy ("Does the national STI strategy or plan address any of the following priorities? Quantitative targets for monitoring and evaluation [e.g. setting as targets a certain level of R&D spending for public research?]). It showcases only countries where the national STI strategies have quantitative targets. Israel and Luxembourg do not have national STI strategies. Australia, Chile, the Czech Republic, Denmark, Finland, France, the Netherlands, Sweden Switzerland, and the United Kingdom have not set quantitative targets.
Source: Borowiecki and Paunov (2018).

The national STI strategies of 23 (70%) of 33 countries, and the Brussels-Capital Region, the Flemish Region and the Walloon Region have a national R&D intensity target. The data also shows that 11 (or 33%) of national STI strategies and the STI strategies of Brussels-

Capital Region and the Walloon Region have targets HEIs and PRIs at the core of policy attention. These targets include raising funding for doctoral students (7 of 33 strategies, plus the Brussels-Capital Region), and increasing job placements for researchers and PhDs in industry (5 out of 33 strategies, plus the Brussels-Capital Region). Japan's Fifth Science and Technology Basic Plan for 2016-20 features targets for increasing the number of tenure positions for young academic researchers and raising the share of female researchers among newly hired university personnel. It also sets quantitative benchmarks for knowledge transfer between universities and industry. These include increasing private funding for university research, the amount of collaborative research funds received from industry and the number of licence agreements on university patents.

Institutions allocating funding and evaluating performance

Institutions allocating project-based funding

Project-based funding – i.e. funding mostly allocated by agencies to a research group or researcher to perform a specific item of research and/or innovation – is an important tool to incentivise HEIs and PRIs to contribute to national STI objectives. Together with institutional block funding, it accounts for the bulk of funding for public HEIs and PRIs, complemented (to a lesser degree) by funding from industry and other segments of the private sector. The governance setting, notably which institution provides such funds, also contributes to raising the effectiveness of project-based funding.

The evidence shows that in 31 (i.e. 89%) of 35 OECD countries, national agencies decide on project-based funding allocations for HEIs. In most countries (30 countries out of 35, plus Wallonia and Flanders, for HEIs; 25 out of 34 countries, plus Wallonia and Flanders, for PRIs), ministries provide institutional block funding. The main roles of these agencies is to fund research and innovation projects; among other responsibilities, they also provide expert advice on related policy.

The institutional landscape for project-based funding is a dynamic one. Between 2005 and 2016, 10 OECD countries created new project-funding institutions. They include the French National Research Agency (ANR), created in 2006; the Innovation Fund Denmark, created in 2014; and the State Research Agency (AEI) in Spain, created in 2015.

Several countries use multiple agencies to allocate project-based funding. In 12 of 31 OECD countries, a single agency provides project-based funding, compared to 2 or more specialised agencies in the remaining 19 countries (Figure 9.3).

Agencies specialising in research fields usually exist where such research has very special features (e.g. health and medical research) and are an important research base in the country. In Australia, for instance, the National Health and Medical Research Council manages funds for health and medical research, whereas the Australian Research Council handles competitive calls for all other research fields. Canada has several such specialised agencies, including the National Research Council, the Natural Sciences and Engineering Research Council; the Canadian Institutes of Health Research; and the Social Sciences and Humanities Research Council of Canada.

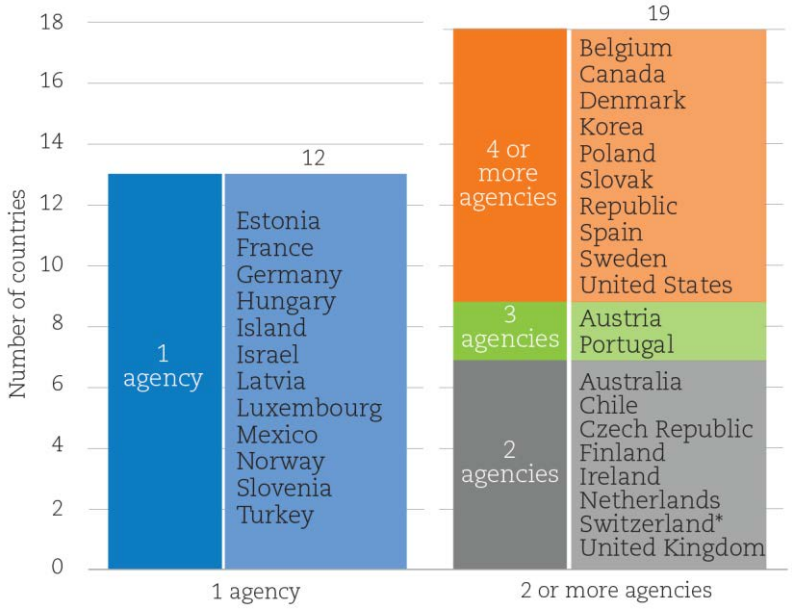
In several countries featuring multiple agencies, research and innovation tasks are separate, reflecting the divided responsibilities across different ministries. In Austria, the Austrian Science Fund (FWF) is responsible for basic research, whereas the Austrian Research Promotion Agency (FFG) and the CDG-Christian Doppler Research Association fund applied research. This reflects the ministerial division of responsibilities, whereby the

Federal Ministry of Science, Research and Economy is responsible for research, and the Federal Ministry for Transport, Innovation and Technology is in charge of innovation.

In countries with federal structures, education, research and innovation tasks are shared between the national level and the federal state or subnational level. In Germany, the federal states oversee education policy (including teaching at HEIs), whereas nationwide PRIs and the national German Research Fund (among other national and regional players) provide financing for research and innovation. In addition, a variety of competitive funding tools for project-based research funding of HEI and PRI have been implemented. In Belgium, five regional funding agencies provide project-based research funding.

Over 2007-17, some countries reduced the number of funding agencies to simplify funding applications (creating a "one-stop-shop"), reduce funding fragmentation and increase efficiency. Denmark, for instance, created the Innovation Fund Denmark in 2014 by merging the Danish Council for Strategic Research, the Danish National Advanced Technology Foundation and the Danish Council for Technology and Innovation. The merger's objective was to simplify grant applications for researchers and businesses. Estonia created the Estonian Research Council in 2012 by consolidating the functions of three agencies to reduce fragmentation in public research funding.

Figure 9.3. Number of public agencies in charge of project-based funding allocations in countries with agencies in place



Note: The figure corresponds to question 1.2.c of the OECD survey on the governance of research policy ("Name of the institution in charge of project-based funding"). Information is displayed for 31 countries where at least 1 national agency allocates project-based funding. * The Swiss funding agency Innosuisse started operating in 2018.
Source: Borowiecki and Paunov (2018).

Agencies specialised in evaluation and monitoring

Specialised agencies in charge of evaluating and monitoring the performance of HEIs and PRIs are in place in 19 (56%) of 34 countries, in Wallonia in Belgium, and in Massachusetts in the United States. The agencies' objective is to conduct high-quality, independent

evaluations, to inform policy on funding programmes for HEIs and PRIs. The High Council for the Evaluation of Research and Higher Education (HCERES) in France is one such agency. In Ireland, the Higher Education Authority (HEA) is responsible for system governance and institutional block funding for HEIs, whereas the Quality and Qualifications Ireland (QQI) oversees quality assurance. Both the HEA and QQI conduct quality and strategic evaluations of HEIs and PRIs, based on criteria set by the government. In the Netherlands, the Higher Education and Research Review Committee is an independent committee that evaluates the attainment of performance targets set in performance contracts. Evaluation and monitoring is performed by ministries in 11 (32%) of 34 countries; and by HEI\PRIs in the Netherlands and Spain. In Belgium and the United States, regions/federal states are in charge of evaluations of HEIs and PRIs.[2]

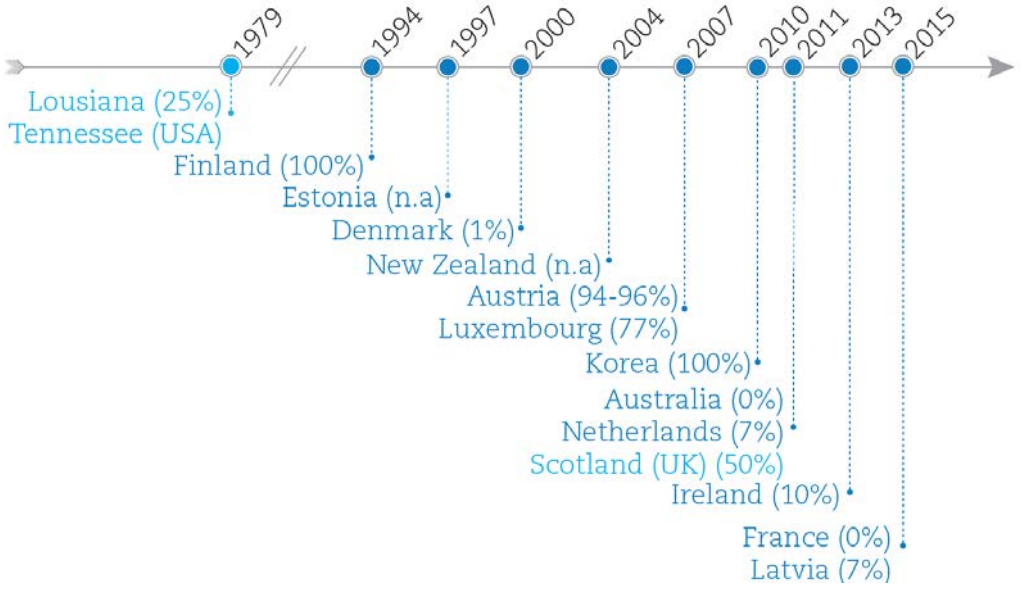
Examples of recently established agencies and independent committees for evaluation and monitoring include the Agency for Assessment and Accreditation of Higher Education (A3ES) in Portugal (2007); the Higher Education and Research Review Committee in the Netherlands (2012); and the National Agency for Evaluation of Universities and Research Institutes (ANVUR) in Italy (2010).

Performance contracts

The move towards stronger performance evaluation has also increased the importance of performance contracts and performance-based funding instruments. Performance contracts are set up between national ministries/agencies and individual HEIs; they define goals and link them to block funding of HEIs. Performance contracts are in place in 13 (37%) of 35 OECD countries and several regions/federal states (e.g. Scotland in the United Kingdom; and Baden Württemberg, Brandenburg and North Rhine-Westphalia, among other federal states in Germany). Nine countries introduced performance contracts during the past decade (Figure 9.4).

Performance contracts vary across countries in several respects, including the shares of HEI budgets they cover. Among the nine countries and four regions/federal states for which such information is currently available, the shares subject to performance contracts vary from 1% in Denmark and 7% in Latvia and the Netherlands, to 94-96% in Austria and 100% in Finland and Korea. At the regional/federal level, performance contracts affect 50% of institutional funding of HEIs in Scotland, for instance. In the German federal states for which information is available, performance contracts apply to 2% of HEIs institutional funding in Brandenburg and 23% of block funding of HEIs in North Rhine-Westphalia.

Figure 9.4. Year of introduction of performance contracts and shares of HEI institutional block funding involved



Note: This figure corresponds to questions 1.3.a ("Do performance contracts determine institutional block funding of HEIs?") and 1.3.b. ("Share of HEI budget subject to performance contracts") of the OECD survey on the governance of research policy. Values in parentheses show the share of institutional block funding of HEIs subject to performance contracts. Information on the year of introduction of performance contracts is missing for Japan. Information on the share of the budget of HEIs subject to performance contracts is missing for Estonia, Japan and New Zealand. At the regional/federal state level, Scotland; the US states of Louisiana and Tennessee; and several German federal states, including Baden Wurttemberg, Brandenburg, and North Rhine-Westphalia have performance contracts in place. Performance contracts are in place in most Federal States in Germany, e.g. Brandenburg and North Rhine Westphalia. Some Federal States introduced them in the 2000s while others had introduced them earlier. The share of HEI institutional block funding involved also varies, e.g. 2% in Brandenburg and 23% in North Rhine Westphalia.
Source: Borowiecki and Paunov (2018).

Other differences in performance contracts relate to their targets. Targets are used to monitor the performance of HEIs and assess whether they have met their objectives. As expected, education and research targets are the main criteria, used in the 12 countries and 2 regions (Scotland and North Rhine-Westphalia) with performance contracts in place and for which target-related information is available; 10 of these countries and 2 regions (Scotland and North Rhine-Westphalia) focus on the role of HEIs in supporting innovation performance; 5 countries and Scotland address socio-economic challenges and include targets to support the local economy. Differences also exist in how targets are defined. Some countries use qualitative indicators, while others rely more on quantitative indicators. Table 9.2 describes the cases of Austria, Finland and Scotland.

Table 9.2. Performance contracts in Austria, Finland and Scotland

Country	Targets	Process
Austria	Qualitative and quantitative criteria used in performance contracts set education, research and innovation targets for universities. Education indicators include the number of students who complete full credits per academic year, the number of graduates and the quality of teaching. Research indicators pay specific attention to the generation of basic research, as well as young academics' career paths. Innovation-outcome indicators vary across institutions. The University of Vienna, for instance, commits to increasing the number of patents and providing courses on technology transfer (University of Vienna, 2015).	Each of the 22 Austrian institutions signs a specific performance agreement for a period of 3 years, based on institutional development plans. The National Development Plan for Higher Education, formulated by the Federal Ministry of Science, Research and Economics for a period of six years, sets national objectives that inform the universities' development plans. These goals include increasing the number of students in different disciplines, increasing the number of graduates, and improving student-staff ratios. The University Act (2002) also fixes a set of issues to be addressed in institutional plans, such as strategic goals, co-operation with other universities and knowledge transfers.
Finland	Quantitative indicators for education include: • the number of bachelor's, master's and PhD degrees awarded • the percentage of students awarded more than 55 study credits per academic year • the number of employed graduates. Research indicators include: • scientific publications • the percentage of competitive funding in the institution's total funding. Several indicators focus on the degree of internationalisation, including: • the number of international teaching and research personnel • the number of master's degrees awarded to foreign nationals • student mobility to and from Finland. Other education-and-science policy indicators include strategic development efforts, field-specific funding and contributions to "national duties" (e.g. teacher-training schools). A different formula applies to universities of applied science, with criteria focusing on education (79%), R&D (15%) and strategic development (6%).	A funding formula serves as a basis for each university to negotiate its performance agreement with the Ministry of Education and Culture (MEC) at the beginning of every four-year term. Each performance agreement contains specific institutional targets. Universities participate in the monitoring and evaluation process. The evaluation process also involves on-site visits by MEC staff. Performance reviews are conducted jointly by representatives from the MEC and individual institutions. To enable the MEC to monitor performance, HEIs provide information to a central statistical database maintained by the Ministry. An assessment of the performance of HEIs is published every year.
Scotland	Qualitative and quantitative criteria used in performance contracts include: • equality: admission targets for students from diverse backgrounds. • innovation: the number of research grants and contract income received; the share of income from the UK Competitive Research Council; and the use of innovation vouchers for specific science-to-business collaborations. • graduate employability: the number of first-degree qualifiers; the number of undergraduate entrants in science, technology, engineering and mathematics curricula; the development of an on-campus "employability and enterprise hub"; and the development of an employability award as part of an alumni mentoring programme.	Outcome agreements are made between the Scottish Funding Council and individual HEIs, and run for three years. These agreements also set annual targets for institutional priority areas. In 2014-15, four main priority areas were selected: equality (opportunity); innovation; graduate employability and enterprise; and sustainable institutions. Universities have defined quantitative indicators to help monitor their performance.

Source: De Boer, H. et al. (2015), "Performance-based funding and performance agreements in fourteen higher education systems, *http://doc.utwente.nl/93619/7/jongbloed%20ea%20performance-based-funding-and-performance-agreements-in-fourteen-higher-education-systems.pdf*.

Performance contracts are only one measure introduced over the past decade. Among other reforms, 9 (27%) of 33 countries introduced performance indicators in the formula for allocating university block grants.

Several countries have also strengthened their programmes for research excellence. In 2005, Germany established the "Excellence Initiative", a competition among German research universities for top-up funds from the Federal Government to make German universities more competitive internationally. In 2007, three "excellence universities" were selected, based on criteria of research excellence. Each university received USD 26 million (US dollars) (EUR 21 million [euros]) annually. Another 18 universities received funding to establish international graduate schools and "excellence clusters", i.e. research hubs bringing together different research groups from within and across universities in the region. The competition's second round in 2012 expanded funding to 11 elite universities. In 2018, the Initiative for Excellence was renamed the "Excellence Strategy", providing support only for created excellence clusters and the selected excellence universities.

Autonomy of HEIs and PRIs

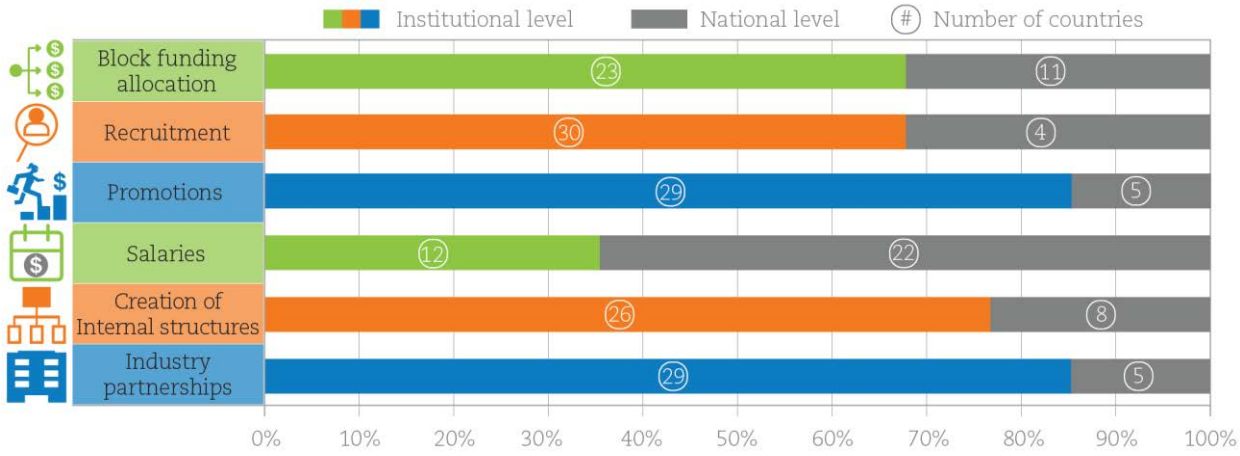
Institutional autonomy is an important, much-discussed issue in the governance of public research. Institutional autonomy allows HEIs and PRIs to decide for themselves how best to meet the objectives set in national STI strategies and to select the most relevant funding criteria for their specific contexts. This can be useful, for example, when considering the commercialisation of public research, since their opportunities to collaborate with industry differ according to the type of research conducted, the relations with industry, their local economic context, etc.

Reforms implemented over the past decades have increased the autonomy of HEIs. In many OECD countries, HEIs can take their own decisions regarding industry relations, budget allocation, recruitment and promoting researchers (Figure 9.5). In 29 (85%) of 34 OECD countries, HEIs are free to create legal entities, such as technology offices and spinoffs, and decide on the conditions for collaborating with industry. In many cases, autonomy is the outcome of the reforms implemented over 2005-17. In France, for instance, HEIs have been free to establish their own for-profit entities and joint R&D ventures with industry since 2011 (Freedom and Responsibilities for Universities Act 2011). In Portugal, Law 62/2007 of 10 September 2007 on Higher Education Institutes (RJIES) granted some HEIs more autonomy.

HEIs do not have full autonomy, however, to decide salaries, which also depend on the funding sources and institutional conditions. HEIs can decide on the salaries of their academic staff in 12 (34%) of 35 OECD countries. In some countries (e.g. Denmark and France), national laws regulate salary bands for academic personnel; in other countries (e.g. Austria and the Netherlands), collective bargaining agreements are in place.

When it comes to internal budget allocation decisions, public HEIs in 23 (68%) of 34 OECD countries can decide on the share of institutional block funding to allocate to teaching, research and innovation activities. PRIs in 23 (79%) of 29 countries providing this information can freely decide their budget allocations.

Figure 9.5. Autonomy of HEIs across the OECD-34



Note: The figure corresponds to questions 3.4.a of the OECD survey on the governance of research policy ("Who decides about allocations of institutional block funding for teaching, research and innovation activities in HEIs?"); 3.5.a ("Who decides about recruitment of academic staff in HEIs?"); 3.5.c ("Who decides about salaries of academic staff in HEIs?"); 3.5.e ("Who decides about reassignments and promotions of academic staff in HEIs?"); 3.6.a ("Who decides about the creation of academic departments, such as research centres in specific fields, and functional units, e.g. technology transfer offices in HEIs?"); and 3.6.c ("Who decides about the creation of legal entities and industry partnerships in HEIs?"). Information on HEI autonomy is missing for New Zealand.

Source: Data on university autonomy for Australia, Canada, Chile, Israel, Japan, Korea, Mexico, New Zealand and the United States, as well as data on the autonomy of PRIs, were collected by the authors (Borowiecki and Paunov, 2018). Data on university autonomy for Austria, Czech Republic, Denmark, Estonia, Finland, France, Germany (BB, Hesse and NRW), Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey and the United Kingdom are based on a survey conducted by the European University Association (EUA) between 2010 and 2011. The answers were provided by the secretaries general of national rectors' conferences and can be found in the EUA report (Estermann et al., 2015).

Stakeholder involvement in policy decision-making

The final structural dimension strongly shaping governance is how HEIs and PRIs themselves, as well as civil society (including citizens, labour unions, NGOs and foundations) and industry, participate in decision-making on research policy.

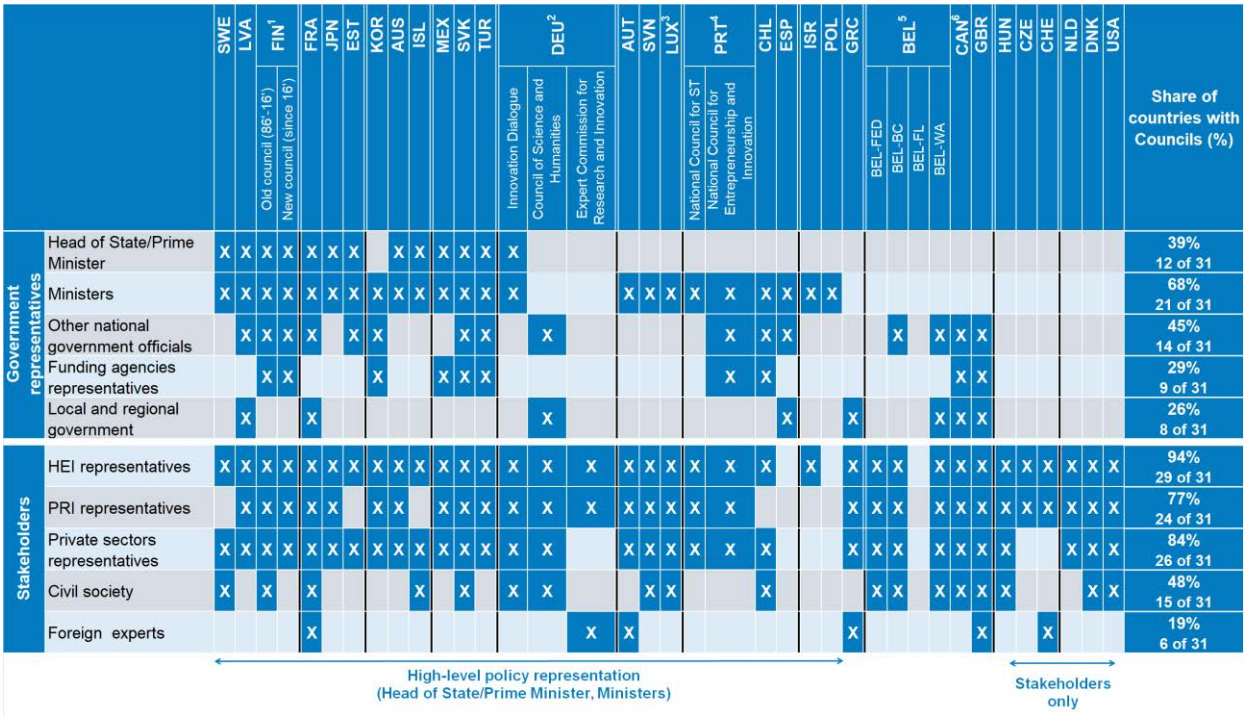
Stakeholder participation in research councils and university boards

The first important way for stakeholders to shape research and innovation policy is to participate in research and innovation councils (particularly those with strong policy mandates), which are in place in 31 of 35 OECD countries. Councils are permanent public bodies outside of ministries and agencies, which are mandated to engage in one or several of the following activities: provide policy advice (28 of the 31 countries, i.e. 90%); develop strategic priorities (23 countries, 74%); evaluate policy reforms (15 countries, 48%); co-ordinate within both government and non-public stakeholders (15 countries, 48%); and allocate research and innovation budgets (7 countries, 23%).

Stakeholders outside of government are often represented in research and innovation councils. Civil society (including members of labour unions and NGOs) is active in 15 (48%) of the existing 31 councils. Private-sector representatives – often large firms, but also some small and medium-sized enterprises (SMEs) – are present in 26 councils (84%).

Foreign experts participate in 6 (19%) of the 31 OECD countries with councils, i.e. Austria, France, Germany, Greece, Switzerland and the United Kingdom. Foreign experts come mostly from academia; a few (e.g. in Austria and the United Kingdom) come from industry or the public sector (Figure 9.6).

Figure 9.6. Who formally participates in the research and innovation council?



Note: This figure corresponds to question 2.3 of the OECD survey on the governance of research policy ("Who formally participates in the research and innovation council?"). Ireland, Italy, Norway and New Zealand do not have a research and innovation council. Percentages are expressed as a share of countries with a council in place (N=31).

1. The Finnish Research and Innovation Council was dissolved in 2016, and a new council was established under the same name in the same year. Owing to changes to the composition and mandate of the Council, this analysis treats them as two separate entities.

2. Germany has three main councils: the Council of Science and Humanities, the Expert Commission for Research and Innovation, and the Innovation Dialogue. Information provided by all three councils was used for the cross-country comparison. All three councils' mandates include policy co-ordination and policy advice. The mandates of the Council of Science and Humanities, and the Expert Commission for Research and Innovation, also include developing strategic priorities and policy evaluation.

3. In Luxembourg, the Superior Committee for Research and Innovation has not convened since 2014.

4. Portugal has two main councils: the National Council for Science and Technology, and the National Council for Entrepreneurship and Innovation. They have not convened since 2015.

5. Belgium has a federal council (Federal Science Policy Council), a council for the Brussels-Capital Region (Council of Science Policy), a council for the Flemish Community (Flemish Council for Science and Innovation), and a council for the Walloon Region (Science Policy Pole).The Federal Science Policy Council comprises experts from academia, the private sector and policy circles, who participate in their own capacity.

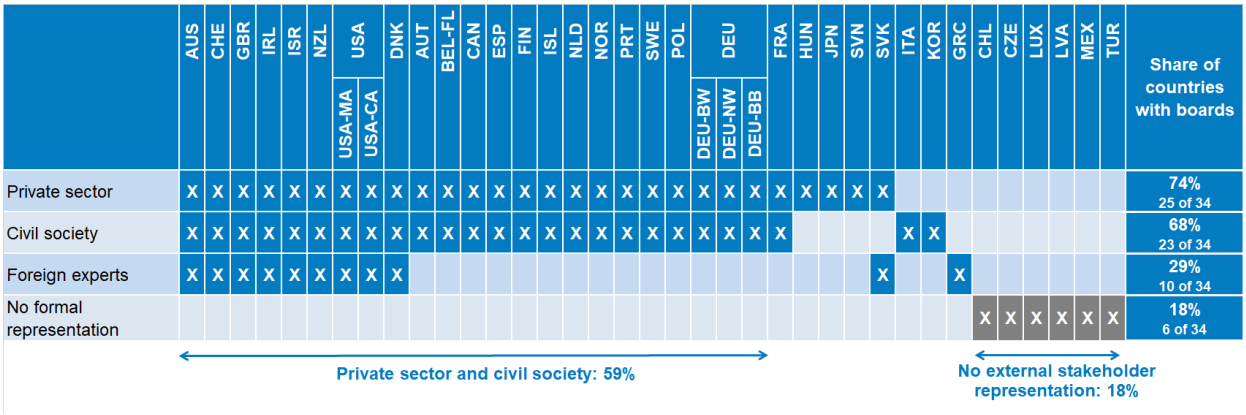
6. In Canada, the Minister of Science and Sport has announced that the Science, Technology and Innovation Council, which provided confidential advice to the government on issues related to science, technology and innovation policy, is being replaced by a new council that will be more open and transparent. Interpretation of the figure: the last row shows that in France, Austria, Greece, Switzerland, the United Kingdom and Germany, the Expert Council for Research and Innovation includes foreign experts.

Source: Borowiecki and Paunov (2018).

A second way for stakeholders from civil society and industry to shape the policy decisions of HEIs (particularly those with substantial autonomy) is to sit on their governing boards or councils. In most OECD countries, the university governance structure include a board (also known as a senate). The university board is the main decision-making body and is responsible for setting priorities. Stakeholder representation is important, in that it helps HEIs understand and answer public demands on their teaching and research activities.

University boards in 28 (82%) of 34 countries have outside stakeholder representation (Figure 9.7). In 25 (90%) of these 28 countries, the boards include private-sector representatives – mostly from large firms, but sometimes from SMEs. University boards in 23 (68%) of 34 countries include representatives from civil society – i.e. citizens, NGOs and foundations. In 21 (62%) of the 34 countries, the boards include representatives from both the private sector and civil society. In 10 (29%) of these countries, foreign experts sit on university boards. In 4 (12%) of these 34 countries, only the private sector is represented (Figure 9.7).

Figure 9.7. Who formally participates in public university boards?



Note: This figure corresponds to question 3.1 of the OECD survey on the governance of research policy ("Do stakeholders participate as formal members in governing boards of HEIs?"). There is no formal stakeholder participation in HEI boards in Chile, the Czech Republic, Luxembourg, Latvia, Mexico or Turkey. Information on participation in university boards is missing for Estonia. Percentages are expressed as a share of countries with information on the composition of HEI boards (N=34). Interpretation of the figure: the first row shows that in all countries except Italy, Korea, Greece, Chile, the Czech Republic, Luxembourg, Latvia, Mexico and Turkey, the private sector is represented in HEI boards.
Source: Borowiecki and Paunov (2018).

In some countries, external stakeholder representation on university boards is fairly new. In Portugal, for instance, university reforms introduced stakeholder representation on the governing boards of HEIs in 2007. In France, the Law on Higher Education and Research introduced the representation of business and local actors in the governing bodies of HEIs and PRIs in 2013.

New forms of stakeholder involvement

Online public consultations are a new policy instrument, devised to include civil society more fully in policy formulation (see Chapter 10 on technology governance). Online platforms were used to develop national STI plans in Australia (National Research Infrastructure Roadmap 2016); Canada (Innovation and Skills Plan 2017); France (National Research Strategy 2015); Japan (Fifth Science and Technology Basic Plan 2016-20);

Mexico (National Development Plan 2013-18); and the Netherlands (Dutch National Research Agenda, 2016). In 2016, the UK Department for Business, Energy and Industrial Strategy issued an online consultation to prepare for the National Innovation Strategy. In 2017, Finland introduced an online consultation to develop the national Vision for Higher Education and Research 2030, along with a roadmap.

Other more traditional, yet still important stakeholder-investment methods include working groups, roundtables and calls for inputs. Like online consultations, these temporary methods allow broader consultation and sectoral targeting. For example, the Scientific and Technological Research Council of Turkey (TÜBITAK) conducted an open-ended survey to identify priorities in the biomedical technology sector, gathering over 1 200 ideas from 300 researchers and experts. Technology roadmaps and policy programmes were developed based on these inputs (OECD, 2016a). New and established mechanisms were used jointly to engage stakeholders in the development of a 'Made-in-Canada' Athena SWAN programme. It will be aimed at supporting the careers of under-represented groups, including women, Indigenous peoples, members of visible minorities, and persons with disabilities, across all disciplines in higher education and research. Similarly, the Estonian Ministry of Education and Research formed a strategy preparation committee, convening over 200 specialists from research, business (including entrepreneurs) and government, to help prepare the Estonian Research and Development and Innovation Strategy 2014-20, "Knowledge-based Estonia". These exercises are flexible instruments that engage stakeholders in policy making, complementing the more permanent consultations already in place.

Future outlook

This chapter described some of the characteristics of public research policy across OECD member countries and recent trends in its organisation. The evidence shows OECD countries use formal instruments to evaluate the performance and contributions of HEIs and PRIs to achieving national STI priorities. Specialised agencies in charge of evaluating and monitoring the performance of HEIs and PRIs are an important component, together with strong stakeholder involvement in the policy process governing the publicly funded research conducted in these institutions. Reforms implemented over the past decades have increased the autonomy of HEIs and PRIs, allowing them to take their own decisions regarding industry relations, budget allocation and recruitment, and promotions.

Based on the trends evidenced by the data, the following four factors are expected to shape the future organisation of public research policy:

- National STI strategies will increasingly solicit the contributions of HEIs and PRIs to achieve a wider set of socio-economic objectives, including technology development (e.g. digital technologies) and the societal priorities described in the Sustainable Development Goals. National STI strategies are also likely to go beyond traditional R&D intensity targets, with new objectives placing HEIs and PRIs at the core of policy attention. These will include raising funding for doctoral students, and securing job placements in industry for researchers and PhDs.
- With increased pressure on public budgets and demands to account for spending, OECD countries will likely further invest in and consolidate the evaluation and monitoring structures for HEIs and PRIs. Specialised agencies are already in place in many OECD countries. New forms of evaluation, exploiting big-data analysis

and digital platforms, will play an important role in these efforts (see discussion in Chapter 12).

- Efforts to expand and enhance multi-stakeholder consultations will greatly contribute to organising public research policy and identifying societal needs. National research and innovation councils, which provide platforms for engaging with civil society and industry, are already part of the standard national policy toolkit. University outreach already takes the form of stakeholder engagement in university boards, and linkages between HEIs and PRIs and wider society will grow stronger. Online consultations soliciting input from the population at large will likely expand further. The use of big-data and semantic-analysis tools will also increase, making it possible to process unstructured stakeholder inputs.[3]
- HEIs and PRIs will become more autonomous. This will afford them more opportunities to decide how they can best meet the objectives of national STI strategies, likely resulting in a diversification of approaches. More autonomy also means that the contributions of HEIs and PRIs to national STI strategies will increasingly depend on the amounts and modalities of the public funding contracts established between them and their government.

Notes

[1] The resulting database is publicly available at https://stip.oecd.org/resgov.

[2] There are regional agencies in place in Wallonia (Belgium), and in Massachusetts and California (United States), while there is a regional Ministry in charge of evaluations of HEIs and PRIs in Flanders (Belgium).

[3] For a discussion of the potential of semantic analysis for innovation policy analysis, see: www.innovationpolicyplatform.org/semantics.

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