

## Internationalisation of universities and public research

### Rationale and objectives

Internationalisation is an increasingly important dimension of higher education and public research in OECD and partner countries. In line with economic globalisation, research co-operation and academic mobility have internationalised sharply in recent decades. With new technologies, collaborators in different countries can communicate easily and cheaply, and it is easier than ever before to obtain information about research communities in other countries. Financing from abroad – through initiatives such as the EU Framework Programme – has become a more important part of the research funding of many institutions. While internationalisation has increased opportunities for co-operation, it has also increased the competitive pressures on research and higher education, as universities are now being ranked on a worldwide basis. Some rankings even focus on the level of internationalisation of universities.

Internationalisation can benefit public research in various ways. First, it can improve the flow of information and exposure to new ideas and thus boost a country's science and innovation system. Second, when it includes people mobility, it offers countries opportunities to attract and retain high-quality human capital for their research system and for the economy. It allows both domestic and international researchers to gain experience and enhance their skills, and this mobility helps boost knowledge flows.

The internationalisation of public research is both a driver and an outcome of the internationalisation of higher education, which takes two forms: internationalisation “at home” through changes in university curricula and the reception of international students and scholars; internationalisation through the outbound mobility of students and faculty, but also, increasingly, the mobility of education programmes and institutions. The internationalisation of higher education yields many benefits for countries: it increases the quality of higher education by confronting institutions with international practices; it creates “soft diplomatic” networks, including in research communities; it allows countries to attract talent to their economy and facilitates skilled migration policies; finally, it generates revenues for the economy and the higher education sector, e.g. through international students' tuition fees and other expenses in the host country (Vincent-Lancrin, 2014). Incidentally, these revenues can help support the costs of expensive research infrastructures and thus enhance the quality of research in the host countries.

Government policies to encourage internationalisation of public research and universities seek to capture these benefits. They aim to facilitate co-operation with partners around the world but also to ensure that their countries are able to compete in a global environment through world class research and human resources.

### Major aspects and instruments

Countries have long used international agreements to encourage the internationalisation of public research, and institutions often establish their own cross-border research agreements and projects. Country-level multilateral or bilateral research agreements typically promote co-operation on science, technology and innovation (STI) and knowledge sharing, often through co-financing, joint research projects or researcher exchange programmes. These agreements are often motivated by historical ties or by the strategic importance of partner countries. For instance, OECD countries have been actively undertaking co-operation on science and innovation with emerging economies such as the People's Republic of China, India and Brazil. The outcomes of such agreements are hard to discern and their scale and ambition vary considerably. The most concrete partnerships may be those undertaken between specific institutions or research centres



with clear research aims; Canada and Japan, for example, signed a two-year collaborative research agreement in 2013 to perform aeronautic damage assessment. In another example, seed funds were used to foster joint research between Chilean universities and four leading US universities between 2011 and 2013.

International research centres also encourage the internationalisation of public research through formal or informal joint research partnerships. Denmark and China have collaborated to create the Centre for Education and Research, which brings together researchers in the higher education and government sectors in five major research areas. Partnership arrangements can also be forged around large research infrastructures, which provide a highly visible example of international co-operation in science. The Korea-United States Collaboration Center for Accelerator Science (KUCC), based at Fermilab in the United States, for example, was opened in 2012 to serve as a base for Korea to collaborate with experts on particle acceleration and to promote exchanges of technology and personnel between the two countries. Finally, foreign institutions can locate in a country to collaborate and help build capacity. As a result of a Portuguese initiative several leading US universities offer master's and doctorate programmes in partnership with Portuguese institutions to reinforce the quality of training and research, notably in engineering. A similar partnership has been established with the Fraunhofer-Gesellschaft, the German research centre company. And the trend continues, with China inviting universities to open campuses with doctoral programmes on their soil (e.g. University of Groningen in Yantai) and other countries having similar "transnational" arrangements.

The internationalisation of public research has commonly been fostered through research funding. Performance-based funding for institutions or grant funding for research projects can include criteria that favour or stimulate international co-operation. Norway's performance-based institutional funding for higher education institutions (HEIs) and public research institutes (PRIs), for example, includes incentives for international collaboration. Countries can also promote collaborative research directly through policy levers such as joint calls for research, while research excellence initiatives often have a strong international component (OECD, 2014). To promote more international collaboration, research funding arrangements must be flexible enough to allow for proposals that include international partners. Australia's National Health and Medical Research Council allows research grants to be used overseas if an equivalent outcome could not be achieved domestically, while some Austrian funding schemes facilitate the portability of grants if a researcher wishes to pursue part of a project abroad. Through its Catalyst Fund, which simplifies and streamlines its former International Relationships Fund, New Zealand supports high quality science international collaborations involving and relevant to New Zealand.

Many countries' internationalisation efforts include promotion and information campaigns to increase opportunities for research co-operation as well as to improve awareness of a country's R&D capabilities abroad and increase foreign direct investment. Belgium (Wallonia) has established a network of regional STI representatives charged with promoting and implementing collaborative projects with a number of countries. Germany hosts an Internet portal that lists opportunities for international collaboration with German researchers. Japan, Sweden and Switzerland operate overseas liaison offices to promote their R&D activity.

Researcher and student mobility is closely linked to the growing international co-operation in higher education as programme and institution mobility imply people mobility. Moreover, it is often because of research ties that double or joint degrees are put in place, or other forms of educational collaboration between universities. The internationalisation of public research and universities goes hand in hand with researcher and student mobility, and support to mobility is the core of most internationalisation policies (Vincent-Lancrin, 2010) (see also the Policy Profile on the International Mobility of Highly Skilled).

Promoting the international mobility of scholars and students is thus part of a number of OECD country strategies for the internationalisation of higher education and public research (See also the *Policy Profile on International Mobility of the Highly Skilled*). In addition to national policies, many countries promote international mobility through various regional programmes. In Europe, the Bologna Process promotes international co-operation and academic exchange among signatory countries. The European Commission's mobility initiatives, such as EURAXESS, include measures to share information on funding opportunities and job vacancies for researchers in Europe, while the ERASMUS programme focuses on university students. In the Nordic and Baltic countries, the Nordplus Higher Education Programme includes grants for student and teacher mobility.

The policy options most commonly adopted in OECD and partner countries to increase inward mobility of researchers and students are shown in Table 1. The most frequently used instruments include funding and financial incentives. In view of the competitive global market for researchers, some of these initiatives specifically target high-performing scientists (e.g. Invitation Fellowships for Research in Japan). Some countries, such as the Czech Republic and Germany offer grant programmes for students from developing



countries; this helps to internationalise domestic higher education and simultaneously helps build research capacity in developing countries (e.g. Graduate School Scholarship Programme to gain admission to structured PhD programmes in Germany).

Student mobility is also encouraged through the recognition of foreign degrees and the creation of double degrees. In 2012, the Russian Federation addressed this issue by streamlining the process for the recognition of foreign qualifications for graduates of 210 leading world universities.

Immigration policies can sometimes be a barrier, but various institutional and whole-of-government means can be employed to encourage inward international mobility.

**Table 1.** Internationalisation of public research: typology of national policy initiatives and country examples

Types of instrument			Country examples
Institutions and governance	Guiding documents	Dedicated national strategy or plan	Croatia (Action Plan for the Internalisation of Education), Denmark (Action Plan for an increased Internationalisation of Danish Higher Education), Finland (Academy of Finland International Strategy), Germany (Strategy for the Internationalisation of Higher Education Institutions), Ireland (International Education Strategy), Lithuania (Action Plan for promoting the internationalisation of higher education), Netherlands (Higher Education Internationalisation Agenda), Norway (Research Council of Norway's Internationalisation Strategy, strategy for research and innovation cooperation with the EU, "Panorama" strategy for cooperation in research and higher education), Spain (Strategy for the Internationalization of Spanish Universities).
		Part of broader national strategies or plans	Croatia (Strategy for Education, Science and Technology), France (National Research Strategy), Germany (BMBF Framework Programme for the Humanities, Cultural Sciences and Social Sciences), Ireland (National Strategy for Higher Education), Lithuania (Smart Specialisation Strategy), Poland (Strategy for the Development of Human Capital).
	Agencies		Germany Academic Exchange Service (DAAD), Nordic countries (NordForsk).
	Coordination arrangements		Belgium (International Coordination Action), France (National Research Alliances), Portugal (Protocol with AICEP Global Trade & Investment Agency).
	Multilevel contracts		
	Cross-border research agreements	At national level	Chile (CONICYT International Cooperation Programme), Czech Rep. (Kontakt II), Greece, Ireland, Mexico (CONACYT agreements), Netherlands (MoU), Norway, Slovenia, South Africa, Sweden.
		At institution level	Colombia, Ireland, Sweden (Research Councils and agencies).
	Cross-border education agreements	Foreign campus	China (University of Groningen in Yantai).
		Dual degrees	Portugal-US, Colombia-Germany (Young Engineering programme), Germany (Integrated International Double Degree Programme), China-Japan-Korea (Campus Asia).
		Compulsory year(s) of study abroad	Germany (Bachelor Plus)
		Foreign offices, exchange of students and academic staff	Germany (International Study and Training Partnerships), Ireland (at institutional level), Italy-Germany (Joint Mobility Programme), Portugal (Portugal International Partnerships Programmes, Faculty Exchange Programme)
	Evaluation and assessment	Performance agreements	Austria (universities), France (PRIs),
		Evaluation exercises, criteria, labels	Mexico (National Programme of Quality Graduate Programmes), Norway (indicators of international cooperation and activity in performance assessment), Russian Fed. (National Research University label)
Reform and regulation	Degree/ qualification recognition	Mutual agreements and rules for the recognition of foreign degrees (or credits acquired abroad)	Europe (Bologna process), Russian Fed. (Federal Law No. 385_FZ)
		Recognition of overseas qualifications	Germany (Recognition of Qualifications Act 2012), Switzerland.
	Revision of curriculum/ teaching methods	Teaching in English or a foreign language	Italy (University Reform 2010), Slovenia (National Programme for Higher Education, 2011-20), Poland (Research & Go! POLAND).
		Massive Open Online Courses (MOOCs)	
	Admission rules to higher education	Rules concerning access of foreign students to domestic cursus	Portugal (Status of International Students)
	Working regulation and conditions	Rules concerning sabbaticals	



<b>Financial support</b>	<b>Joint research programming</b>		EU Horizon 2020, Argentina (Argentina-Brazil-Israel-South Africa joint calls), Finland (Academy of Finland).
	<b>Participation in international research programmes</b>		Colombia (EU H2020 Framework Programme), Czech Rep. (COST programme, H2020), Ireland (Educational Research Centre -ERC- support programme), Lithuania (H2020, COST), Mexico (H2020), Netherlands (COST), Norway (PES, STIM_EU), Poland, South Africa (COST), Turkey (International R&D Funding programme).
	<b>Funding of international R&amp;D projects</b>		Finland (Academy of Finland grants), France (National Research Agency), Japan (international joint research programme), Mexico (FONCICYT), Poland (Harmonia), Russian Fed. (Federal Targeted Programmes), Sweden (Swedish Research Council Fund for International Research Collaboration), Turkey (International R&D Funding programme).
	<b>Funding of internationalisation activities</b>		Germany (IPID4all), Japan (international joint research programme), New Zealand (Catalyst Fund), Poland (KNOW Programme), Russian Fed. (Fund for the international competitiveness of Russian leading universities, Federal Universities programme).
	<b>Revision of public R&amp;D funding mechanisms</b>	Revised eligibility and allocation criteria	Finland (new funding model for universities), Netherlands (eligibility of foreign researchers to NWO R&D grants), Norway (eligibility of foreign PRLs to domestic funding programmes), Poland (additional funding granted for internationally co-funded projects), Russian Fed. (National Research University label and funding programme).
<b>Non-financial support</b>	<b>Promotion activities and networking services</b>	Campaign, events, web-based information portal and databases	Germany (Research in Germany, Research Map, Kooperation International portal), Ireland (Education in Ireland), Netherlands (NUFFIC), Poland (promotional campaigns), Sweden (foreign offices).
	<b>Participation in international research programmes</b>	Networking support, awareness and training events, one-stop shop	Czech Rep. (H2020), France (H2020 national contact point), Ireland (National Support Network), Turkey (H2020 National Coordination Office).
		Staff detachment, new job positions	Ireland (new staff in research offices).
	<b>Training services</b>		Poland (Top 500 Innovators training programme).
<b>Platforms and infrastructure</b>	<b>International research centres</b>		Argentina (Scientific and Technological Pole), Denmark-China (Centre for Education and Research).
	<b>Centres of Excellence</b>		Korea (Institute for Basic Science), Peru (Centers of Excellence).
	<b>Large research infrastructures</b>		Belgium (FWO Big Science programme), CERN, Korea-United States Collaboration Center for Accelerator Science (KUCC), Russian Fed. (6 major research installations), ESFRI roadmap.
	<b>Clusters</b>		France (Higher Education and Research clusters).
	<b>Networking infrastructures</b>		GÉANT high-speed network, BIOTECSUR Biotechnology Platform (MERCOSUR), UK (Knowledge Transfer Networks).

Note: This table draws upon recent analytical works on the innovation policy mix carried out for the OECD STI Outlook under the aegis of the OECD Committee for Scientific and Technological Policy. Country information is drawn from the EC/OECD International Science, Technology and Innovation Policy (STIP) Database, edition 2016, <https://www.innovationpolicyplatform.org/topic-menu/sti-policy-database>.

Source: Kergroach, S., J. Chicot, C. Petroli, J. Pruess, C. van Ooijen, N. Ono, I. Perianez-Forte, T. Watanabe, S. Fraccola and B. Serve (forthcoming), "Mapping the policy mix for innovation: the OECD STI Outlook and the EC/OECD International STIP Database", OECD Science, Technology and Industry Working Papers.

Many countries recognise the potential benefits from outflows of students and researchers as well as those from student inflows. Outward mobility can allow researchers to develop new skills and acquire new knowledge, although evaluation programmes need to ensure that policies are designed to maximise these benefits. A number of countries support outward mobility through funding: In Austria, the DOC-team Programme supports trans-disciplinary research teams and requires team members to spend at least six months at an overseas institution. The Brazil Scientific Mobility Programme provides 100 000 scholarships to undergraduate and graduate students in science, technology, engineering and mathematics to study in the United States and return to Brazil after an academic year to complete their degrees. France provides international mobility scholarships. Japan's Postdoctoral Fellowship for Research Abroad allows young researchers to spend time at an overseas university or research institution. National Research Foundation scholarships in South Africa fund foreign doctoral students and post-doctorates to visit overseas institutions. Switzerland has promoted the international recognition of its university courses (thereby facilitating the outward mobility of Swiss nationals). Moreover, even without any specific policy or financial support, researchers commonly go abroad during sabbaticals where these exist.

To benefit from researcher mobility while avoiding the possible negative effects of brain drain, many countries encourage researchers based abroad to return to their home country. In Argentina, the Scientists and Researchers Overseas Network (RAICES) establishes links with Argentine researchers located abroad and



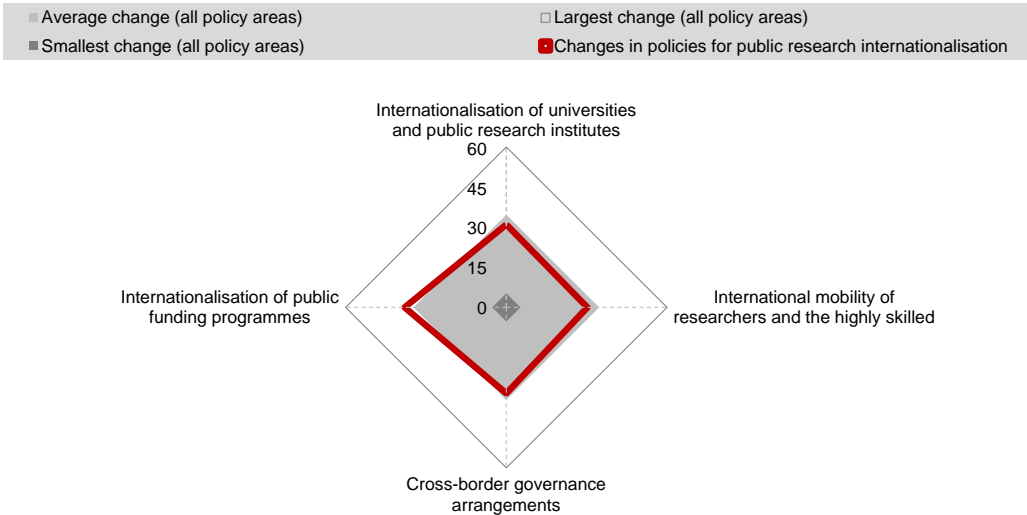
encourages their return to Argentina through job opportunities. China's Thousand Talents Programme offers relocation stipends to world-renowned Chinese researchers working abroad. Belgium, Finland, France, Germany, Slovenia, Sweden and Switzerland provide funding or assistance for expatriate researchers to return to their home country. The Momentum Programme in Hungary provides funds and domestic career opportunities to reduce emigration of young researchers. Israel aims to compensate for a recent brain drain by recruiting Israeli researchers working abroad for 30 new centres of excellence (ICORE) in universities. The structure of international mobility programmes may also encourage repatriation. Australia's early career fellowships in science and medicine fund researchers to travel abroad for two years but they must then return home for two years. The Researchers' Mobility Portal was replaced by the Connecting Australian and European Science and Innovation Excellence, and provides information to Australians who have pursued international careers in research but want to explore opportunities in their home country. In South Africa, the Research Chairs Initiative aims to attract highly skilled South Africans who may be in industry or abroad back into academia.

## Recent policy trends

In recent years, the internationalisation of public research has increasingly been fostered through research funding. Experimental indicators on changes in national STI policy portfolios show an average rate of change in STI policies for international mobility as compared to other STI policy areas. Yet, governments seem to have been slightly more active in revising their research funding mechanisms for adjusting to growing internationalisation than in other policy areas (Figure 1) (see also the Policy Profile on "Financing public research").

**Figure 1.** Internationalisation of public research among other areas of STI policy change, 2014-16

Percentage of policy initiatives that have been newly introduced, revised or repealed over the period



Source: Based on EC/OECD (forthcoming), *International Database on STI Policies (STIP)*; and Kergroach et al. (forthcoming-b).

Note: The EC/OECD STI Policy survey 2016 aims to review major changes in national policy portfolio and governance arrangements for STI. The survey builds on the conceptual work carried on under the aegis of the OECD Committee for Scientific and Technological Policy (CSTP) for mapping the policy mix for innovation and therefore covers a broad range of policy areas (Kergroach et al., forthcoming-a). 52 economies participated in 2016, including OECD countries, key emerging economies (e.g. Argentina, Brazil, the People's Republic of China, Colombia, Costa Rica, Egypt, Indonesia, Malaysia, Peru, the Russian Federation, South Africa and Thailand), non-OECD EU Member States, and the European Commission. Taken together, the countries covered in the STIP survey 2016 account for an estimated 98% of global R&D. The responses are provided by CSTP Delegates and European Research and Innovation Committee (ERAC) Delegates for EU non-OECD countries.







This is an experimental indicator that accounts for the number of major policy initiatives implemented, repealed or substantially revised during 2014-16 as a share of total policy initiatives active at the beginning of the period. Although simple counts do not account for the magnitude and impact of policy changes, this ratio reflects STI policy focus and activity in specific policy areas and over specific periods of time. The chart above shows the intensity of changes in the policy area(s) under review as compared to the whole policy mix for innovation. Changes in the whole mapping are represented by the smallest, the largest and the average changes observed in all policy areas taken together.

StatLink  <http://dx.doi.org/10.1787/888933434229>

Several countries have recently adopted national strategies for the internationalisation of higher education and public research that give the issue of international mobility high priority. Canada launched the International Education Strategy in early 2014 to attract more international researchers and students and to deepen research links between Canadian and foreign educational institutions. In 2013, Denmark initiated the first phase of an action plan for the internationalisation of higher education programmes. The initiative aims to increase the number of students studying abroad (including in non-English speaking and high-growth countries) and to increase co-operation on joint degrees with international institutions. France's research and innovation strategy, France 2020, was launched in 2013; it envisions the opening of joint research centres abroad and aims to increase inward and outward researcher mobility. The internationalisation of higher education is also one of the five strategic goals of France's first national strategy for higher education issued in 2015. In Germany, the new internationalisation of higher education strategy, released in 2013, contains measures to increase research co-operation and transnational courses. In the United Kingdom, the higher education system is developing a publicly funded strategy in 2014 to help promote outward student mobility.

The internationalisation of public research also reflects the internationalisation of higher education at large. While the international mobility of students has existed for a long time, it has increased significantly in the OECD area in the past two decades: the share of foreign or international students in an OECD country has increased from 5% to 9% on average between 1998 and 2013 (OECD, 2015 EaG). This is a clear metric showing the internationalisation of higher education. However, the internationalisation of higher education has also taken new forms. From the 2000s, the international mobility of education programmes and institutions has risen. Between 2002 and 2011, the number of branch campuses has increased from 24 to 200, and about 40 are currently being developed; some countries have grouped foreign university providers in "cities", "zones" as is the case in Hong Kong, Malaysia, Singapore, the United Arab Emirates or South Korea (Knight, 2014). Korea has for example developed two international hubs: the Incheon Global Campus (formerly known as the Songdo Global University Campus) is located in the Incheon Free Economic Zone, near Seoul, and attracted 4 branch campuses and one foreign research centre in 2016; the Jeju Global Education City aims to similarly attract foreign institutions and become Korea's second international education hub.

New forms of universities such as bi-national universities have also emerged. Germany is a good case in point in this area with bi-national universities with Egypt, France, Kazakhstan, Jordan, Oman, Turkey and Vietnam. France has bi-national universities with Germany and Vietnam. The eight countries of the South Asian Association for Regional Co-operation (SAARC), including India, have set up a joint university in 2010 focused on doctoral programmes: the South Asia University. The opening of branch campuses abroad or the provision of courses abroad, be it face-to-face or online, increasingly becomes part of higher education strategies and of governmental policies in higher education (or foreign affairs).

A final growing trend showing the internationalisation of higher education lies in the increase of joint and double degrees, that is, educational programmes jointly elaborated and recognised by two or more institutions. As several institutions take full responsibility in the design and delivery of the education, this minimises the risks of quality that may come with programme mobility. More generally speaking, programme mobility mainly takes the form of students enrolling in online learning programmes offered by an institution abroad, of franchises (a domestic institution delivers the programme of the foreign institution, generally in partnership), or of an articulation programme (students study the two first years in their home country and the final year in the country of the institution delivering the degree).

While not primarily targeted to research, the OECD and UNESCO have developed *Guidelines for quality provision in cross-border higher education*, highlighting a number of good practices to make higher education systems more transparent and secure for all stakeholders in a globalised world. The implementation of these guidelines should allow countries to continue to reap the benefits of internationalisation, including in research (OECD, 2015).





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