THE ROYAL SOCIETY

Monday 20 July 2020

Submission to the British Council APPG inquiry into Opportunities for Britain's global vision – influence and the integrated review

The Royal Society is the independent scientific academy of the UK. A self-governing fellowship of many of the world's most distinguished scientists, it draws on the expertise of Fellows and Foreign Members to provide independent and authoritative scientific advice to UK and international decision-makers. This is a written response to the British Council All-Party Parliamentary Group (APPG) Inquiry on 'opportunities for Britain's global vision – influence and the integrated review' and relates specifically to the role of science and R&D in realising the UK's international ambitions post-COVID and the country's exit from the European Union.

1) Science and soft power

- **Science is essential for UK jobs, health and wellbeing, and improving quality of life for us and people around the world – it also has a role in shaping the UK's relationship with other countries, bringing benefits that flow both ways.** While science has always played a role in the development of military and other hard power capabilities, it is also a source of soft power because of its attractiveness both as a national asset and as a universal activity that transcends individual country interests.[1]
- The scientific values of rationality, transparency and universality enable science to be used to build constructive international relations and should be considered a key component of the UK's Integrated Defence, Security and Foreign Policy Review.

2) Current status of UK-international scientific collaboration and R&D investment – a snapshot

- **The UK has a higher level of foreign direct investment in R&D than any other G7 nation,** has seen significant growth in this area over the last two decades and is the top foreign direct investment destination for China in Europe. Between 2007 and 2017, US owned businesses increased R&D expenditure in the UK by 22%, EU owned businesses by 42%, and other internationally owned businesses by more than 300%. [2]
- **Europe is by some distance the UK's largest and fastest growing academic collaborator**. As Table 1 shows, more than a third of UK research papers are co-authored with other EU and associated countries, compared with 17.6% with the USA.[3]

  Table 1: The UK's top research collaborators across all fields 2014-2018

[1] Royal Society (2013), 'Response to House of Lords Committee on Soft Power and the UK's influence' available at: https://royalsociety.org/topics-policy/publications/2013/house-of-lords-committee-soft-power-uk-influence/

[2] Adrian Smith and Graeme Reid (2019), 'Changes and choices: advice on future frameworks for international collaboration on research and innovation commissioned by the Minister of State for Universities, Science, Research and Innovation', available at: https://www.gov.uk/government/publications/future-frameworks-for-international-collaboration-on-research-and-innovation-independent-advice

[3] Royal Society (2019), 'Submission to the Sir Adrian Smith call for evidence on future frameworks for international collaboration on research and innovation', available at: https://royalsociety.org/topics-policy/publications/2019/consultation-response-sir-adrian-smith-international-collaboration/

Country/bloc	Total number of papers published by country/bloc (2014-2018)	Number of papers co-authored between the UK and the partner country/bloc (2014-2018)	Percentage of UK papers co-authored with the partner country/bloc (2014-2018) UK total = 682,414
Horizon 2020 bloc*	2,783,573	228,773	33.5%
USA	2,225,226	120,406	17.6%
Germany	586,406	64,199	9.4%
France	398,716	45,452	6.7%
China	1,591,646	43,723	6.4%
Italy	367,438	43,474	6.4%
Australia	352,256	42,655	6.3%
Netherlands	219,229	37,286	5.5%
Spain	314,807	35,787	5.2%
Canada	374,297	31,028	4.5%
Switzerland	167,301	27,138	4.0%

Source: Clarivate Analytics data and analysis for the Royal Society (May 2019)

*'Horizon 2020 bloc' is shorthand for European Union Member States and countries associated to the current EU Framework Programme for research and innovation Horizon 2020

- **The UK's involvement in the EU Framework Programmes has been essential for international scientific collaboration.** Although the UK has various bilateral research agreements in place with countries like the USA and India, there are no existing multilateral arrangements or mechanisms that are comparable to the Framework Programmes in size and scope.[4]

- **The UK benefits from a highly international and mobile R&D workforce**. Non-UK nationals comprise two-fifths of the UK's academic workforce in science, technology and engineering and more than half of the postgraduate student population.[5] The ability of researchers to move to and from the UK with minimal barriers is fundamental to increasing the volume of R&D undertaken in the UK and the economic and societal benefits that derive from it.

- **Government funding for UK research activity in low and middle income countries has grown in recent years** with an increasing volume of aid spending on research and knowledge exchange being channelled through departments, agencies and partner organisations outside the Department for International Development (DfID). The Official Development Assistance (ODA) budget

[4] Royal Society (2019), 'Why the UK must associate to Horizon Europe', available at: https://royalsociety.org/topics-policy/publications/2019/why-the-uk-must-associate-to-horizon-europe/

[5] Royal Society (2019), 'UK science and immigration: why the UK needs an internationally competitive visa offer', available at: https://royalsociety.org/topics-policy/publications/2019/uk-science-and-immigration-why-the-uk-needs-an-internationally-competitive-visa-offer/

distributed by UK Research and Innovation, for example, increased by 52% from 2017/18 to 2019/20.[6]

3) What are the principal opportunities for a global UK post-COVID and following the UK's departure from the European Union?

- **Scientific leadership**
  The UK is in a strong place scientifically to take a global leadership role on common challenges such as climate change, energy security and biodiversity loss, and harnessing the benefits of data and machine learning. Having previously led the way on difficult and controversial regulatory issues, it has the opportunity post-Brexit to develop safe and ambitious regulations in areas such as genetic technologies which set the global standard.

- **Multilateral and bilateral research partnerships around the world**
  The UK can refresh its international research and innovation strategy with a focus on creating ambitious new deals with leading and established science nations across Europe and further afield as well as emerging science nations. There is scope for broadening the range of available instruments for international collaboration and to think strategically about how to deploy them alongside existing multilateral, bilateral and national/regional mechanisms. The optimal platform on which to build these new arrangements will be securing full UK access to the next EU Framework Programme, Horizon Europe, through an association agreement (see below). The UK also plays a lead role in convening a number of multilateral networks and opportunities exist in the coming year to use science as a soft power asset (COP and G7 to give a couple of examples).

- **Increasing the UK's attractiveness to foreign-owned R&D businesses**
  With foreign direct investment already making up around 50% of UK private R&D expenditure, the UK should focus on becoming the R&D investment capital of the world, with regulation and institutional architecture geared to drive this as effectively as possible. A foreign direct investment strategy should open up opportunities to UK R&D firms overseas and could also have a regional dimension consistent with the government's 'levelling up' agenda.

4) What are the principal challenges for a global UK post-COVID and following the UK's departure from the European Union?

- **Global political uncertainty**
  The UK is exposed to growing turbulence in global politics including the rise of populism and nationalism which undermines international scientific collaboration and can also have a serious impact on foreign direct investment opportunities. There will be situations where the UK must balance the pursuit of high value science and innovation deals with the need to protect the national interest on matters of security or intellectual property.

- **Brexit disruption**
  Failure to remain part of EU schemes such as Horizon Europe will impact negatively on UK science. Although the UK government has committed to provide funding options in all scenarios, the many intangible benefits of full and close cooperation through an association agreement will be difficult or impossible to replicate in a domestic context. In general, the lack of clarity around the UK's future relationship with the EU in areas affecting science, including security cooperation, cross-border data flows, and space and nuclear policy, remains a significant concern.

- **UK immigration policy and need for reciprocal arrangements with other countries**
  Ending free movement with the EU will act as barrier to scientists carrying out their research. As a reciprocal arrangement, the existence of visa-free work and study rights was invaluable to the UK's

[6] Academy of Medical Sciences, British Academy, Royal Academy of Engineering and Royal Society (2019), 'UK Research and Innovation: explainer', available at https://royalsociety.org/topics-policy/publications/2019/ukri-explainer/

internationally mobile research community and its removal represents a significant loss. Agreeing reciprocal arrangements on international mobility should be a priority focus of the future trade strategy and the UK must also reconsider the upfront costs of work and study visas, which are up to six times more expensive than in other leading science nations.[7]

- **Vulnerabilities in the higher education and research base**
  The government has recognised that interventions are needed in response to COVID-19 to protect research and innovation in universities and research organisations and move towards more sustainable funding models.[8] A negative outcome for university research will also impact on the UK's higher education student offer which has an export value of more than £13 billion.[9]

- **Machinery of government changes**
  With the planned merger of DfiD into the Foreign and Commonwealth Office, there is currently a lot of uncertainty over the future of existing ODA research funding schemes.

For further information on any of the above issues please contact public.affairs@royalsociety.org.

[7] Royal Society (2019), 'UK science and immigration: why the UK needs an internationally competitive visa offer', available at: https://royalsociety.org/topics-policy/publications/2019/uk-science-and-immigration-why-the-uk-needs-an-internationally-competitive-visa-offer/

[8] Department for Business, Energy and Industrial Strategy (2020), 'University research support package: explanatory notes', available at: https://www.gov.uk/government/publications/support-for-university-research-and-innovation-during-coronavirus-covid-19/university-research-support-package-explanatory-notes

[9] Department for Education (2019), 'UK revenue from education related exports and transnational education activity in 2016', available at: https://www.gov.uk/government/statistics/uk-revenue-from-education-related-exports-and-tne-activity