

EVIDENCE FROM BRITISH INFLUENCE

REVIEW OF THE BALANCE OF COMPETENCES: RESPONSE ON RESEARCH & DEVELOPMENT

Introduction

The BIS consultation paper on the balance of competences in research and development provides an excellent basis on which to respond. It correctly identifies the crucial role of research and innovation for the UK economy and society and the considerable benefits that the UK derives from EU policies and impact in these areas. The support of science is crucial not only to the strength of our education system, but to economic recovery and the solution of global problems.

The UK has a key interest in a strong and growing EU economy, in which innovation is a critical component, and has been a major gainer from the EU's framework programmes for research and development (R & D) funding. The UK was the second largest recipient of funds under the sixth framework (2000-06) for example and has been just as successful under the current seventh framework¹ - under which the three top universities in winning awards are all from the UK (Cambridge, Oxford and Imperial). Of all the areas of the EU budget, this appears to offer one of the highest returns in terms of its positive impact on growth.

The UK is widely, and rightly, seen as one of the leading European nations in science and research ('science' in the broadest sense: ie including the social sciences and humanities, to which the comments which follow also apply). This provides us with substantial opportunities to exercise a constructive influence on EU research and innovation policy, and indeed more widely.

As the consultation paper notes, the UK has valuable assets on which to build and we perform strongly in research compared with our peers. However, it would be unwise to assume that, with the current lower than average investment in R & D (and a flat cash outlook for the UK research base), the UK will necessarily continue to perform better than average over the longer term. Moreover, economic research – for example, by the Nobel Laureate Robert Solow, but more recently also from the OECD – shows that over time there is a consistently positive correlation between a country's economic performance and its levels of R & D expenditure.² In these circumstances, it is vital to maximise the leverage of our participation in the much larger programme of EU research and development and of the benefits which accrue from it, not least through scientific collaboration.

¹ Background to the framework programmes described in a Parliamentary Office of Science & Technology briefing, *EU Science & Technology Funding*, 2010.

² The economic background is discussed in a useful note, *Innovation & Growth: The Role of R & D*, David Dent, published by Dent Associates, 2011.



British Influence's evidence is based on our discussions with academics, members of UK Research Councils and business people working in research or on whom R & D impacts. We have not attempted a quantitative survey but instead sought feedback from those with sufficient understanding of the EU's programmes to be able to comment constructively.



Questions:

1. Where has EU action had a positive impact for the UK on research, technological development, innovation or space? What evidence is there for this? Has EU action encouraged national action in any areas?

In our view, the EU's R & D policy is an excellent example of what the EU should do. It:

- is focused on an area where the value-added of EU action over and above purely national efforts is evident;
- complements national action, works with the grain of existing practice in the science area and is based on extensive consultation;
- provides a framework within which national actors can choose the options which best suit them rather than imposing obligations;
- provides wide-ranging benefits for innovation and society which are not confined to those directly involved alone;
- is thus an investment in the underpinnings of future growth.

The opportunities offered by EU research for UK researchers (business, universities, research institutes) are attractive for a number of specific reasons:

- The budget is increasing and guaranteed over several years, ensuring the stability from which long-term research can benefit;
- The conditions for applicants are fully transparent and have benefited from experience over several programmes; this includes the selection criteria and the emphasis on scientific excellence;
- The selection process is conducted in English and based on criteria familiar to the UK community;
- The UK research community tends to have more experience in applying individually for funding than in other countries.

There is thus a level playing field on which UK researchers have been able to demonstrate their competitive qualities, becoming favoured partners for other researchers across Europe and more widely, and consistently winning a disproportionate share of funding.

The free movement of persons has been of great benefit to British research because it has enabled UK universities to recruit talented people from across the EU. The UK research community has been strengthened by that and by the Marie Curie fellowships, because they enabled talented researchers in other Member States to relocate to the UK. These awards are so highly competitive that they are in themselves a good indicator of the excellence of the Fellow in question: many Fellows are retained on further employment contracts in the UK (to the enhancement of our science base) after their Fellowship has finished. Many leading UK universities are widely seen as the best in Europe and have become magnets for European talent, further strengthening the UK's research base and ensuring that commercialisation of discoveries takes place here. A recent example is graphene: Novoselov and Geim moved to Manchester from the Netherlands to pursue this research and the benefits will accrue to the UK. We have not seen any significant 'brain drain' of researchers leaving the UK to work elsewhere in Europe.



EU research furthermore offers a number of benefits for individual researchers which (any) purely national research scheme would have difficulty in matching. It:

- offers wider contacts and opportunities, enlarging research horizons and building international networks, including for innovation and for business opportunities in the shorter or longer term;
- provides individual researchers with invaluable international experience as well as a boost for CVs – a Marie Curie fellowship or a bursary from the European Research Council provides recognised status as well as attractive funding.

These schemes for individual early-career researchers are usefully complementary to UK national support which tends to focus more on established university groups. EU actions in the area of research and innovation have greatly benefited UK research institutes, businesses and individual researchers, as numerous evaluation reports and anecdotal accounts confirm. At the policy level, discussions have facilitated coordination on key issues such as future investment in research infrastructures; the UK played a major role in these discussions.

The gearing effect of the UK's investment in EU research action has been considerable. Our "return" from the 5th and 6th Framework Programmes was in percentage terms larger than the UK net budgetary contribution. The 15.1% "return" to UK research under the 7th Framework Programme quoted in the BIS paper compares with a UK net budgetary contribution of around 11%, and even this takes no account of the wider and longer term benefits in terms of access to research results and markets. For the UK, maintaining this favourable position means continuing to support a strong national R & D effort, as the essential foundation on which all our international research partnerships must be built, as well as continuing to guide the evolution of EU research and innovation policy.

2. Where has EU action had a negative impact for the UK in these fields? What evidence is there for this? Has EU action prevented potentially useful national action in any areas?

EU research policy is an area where the UK has had significant influence and has ensured that negative impacts have not occurred or been minimised. We are unaware of any diversion of funds or priorities from what would be in the UK interest. On the contrary, EU research can offer some useful models – such as the recently introduced provision under the Marie Curie fellowship scheme that early career women returning to their research careers after parental leave will be assessed on their performance before they left to start their families. Discussions at the EU level have also cast light on such factors as those affecting researcher mobility and which remain under national competence, such as visa and immigration rules, social security and impacts on accompanying families more generally. The UK has successfully lobbied to ensure that EU funding for research remains focused on excellence rather than other criteria (such as building up research in the newer member states).

3. How and where has UK engagement with partner countries or international bodies, both within and outside the EU, been helped or hindered by EU involvement?



As much of the framework funding depends on an applicant in the UK working with research teams in other Member States, the programme has promoted and enabled international research collaboration. This in turn enables the bringing together of complementary research so that different but related aspects of research can be developed together, potentially increasing the impact of the research undertaken. Engagement with partner countries also prevents individual member states from independently reinventing the wheel, and thus helps to rule out one risk of wasting national funding.

The UK has engaged strongly with European research organisations - for example CERN and the European Space Agency – to ensure that they are delivering both excellent science and value for money. In both cases UK citizens hold or have held senior leadership roles. We are members of a number of intergovernmental multidisciplinary research organisations based in Europe, such as the European Synchrotron Research Facility, the ILL research reactor, and the European Molecular Biology Laboratory; these deliver unique and world-class science capabilities to UK researchers in a cost-effective manner. We have also engaged strongly with the process of co-ordinated thinking about future large science facilities through ESFRI, the European Strategy Forum on Research Infrastructures, which advises the commission and the council of ministers.

The EU has, through the entry into force of the Treaty on the Functioning of the European Union, become one of the three key participants in European space policy, together with ESA and Member States. Space research is also identified within the Framework Programmes. Involvement with and influence upon the inter-relationships between the EC and ESA is important for the UK science community and the generally successful UK Space Industry.

4. What benefits or difficulties has the objective of a European research area (ERA) 25 delivered for the UK?

The concept of the European Research Area has been useful in expressing an overarching philosophy but at a practical level remains “work in progress”. While the parallels with the single market concept are inspiring, the practical steps to achieve that level of openness and flexibility in a complex field like R & D are not always clear. In many respects, the ERA concept actually reflects other countries’ need to adopt best practices that are already in place in the UK. Other aspects of the EU’s role and activities are of considerable benefit to those working in R & D, notably the free movement of persons and the mutual recognition of qualifications (hard though the latter is to implement in practice). The UK has received greater benefit from free movement of scientists and researchers than other Member States because it fits well with the more open culture of British research in which talented people are welcomed and recruited regardless of origin.



5. How has the EU sought to coordinate the policy instruments at its disposal across different policy areas to create an enabling environment for researchers and innovators? How successful has this been?

The combined benefit of free movement of persons and the Marie Curie fellowships have already been mentioned and is a good example of different EU policy instruments working together to the benefit of R & D. However, EU regulation of clinical trials in medicine and the impact of proposed EU regulations on data protection on medical research are two examples cited to us of a failure of the EU on occasion to understand the unintended impact of policy in other areas on research and development.

Future opportunities and challenges:

6. What could the EU most helpfully do to promote scientific and technological progress and innovation (including in the space sector)?

- How could the EU use its existing competence differently to deliver more in your area?
- How might a greater or lesser degree of EU competence deliver more in your area?
- How could improvements to existing EU activities make them more effective and efficient?

The EU's research strength rests in the excellent research facilities in Member States and in its researchers. These should continue to be the main beneficiaries of EU research investment, not least in order to help prevent further brain drain to the USA. On the other hand, more focused projects or programmes at the EU level should be limited to specific areas where there is demonstrable need for collective EU effort; space is an example of this.

Large national science facilities in the UK, such as the Diamond Light Source and the ISIS neutron scattering facility, host research by a significant number of non-UK users. This is a sign of their scientific quality and attractiveness. A concrete step that the EU could therefore take would be to pay for a defined fraction – perhaps 10% - of the access time on such facilities and devote this to European users, which would help to promote European collaboration and also relieve the cost burden of supporting non-national scientists.

It must be recognised that the spin-offs from research, including commercial benefits, are often unforeseen and longer term. Therefore the focus must be on the excellence of research and the accumulation of know-how in the minds of an increasingly mobile workforce rather than in the expectation of short-term profits. This argument has successfully been made in the formulation of priorities for Horizon 2020 which contains many new elements – not least the increase in funding directed through the European Research Council and the more strategic focus – for which UK stakeholders and the Government have argued. It will be important to work with the Commission and research community to make the programme a success.

The EU must continue to let its research and innovation policy evolve as it has successfully done hitherto; it has been right to avoid more directive efforts – to which neither the



research community nor the complex issue of innovation would have been likely to respond well.

The EU and in particular the European Commission have rightly reacted to concerns about unnecessary bureaucracy. The Commission bears ultimate responsibility for the proper administration of public money and for ensuring that all the conditions for the award of research money are transparent, including to those outside the main research countries who may be less familiar with procedures for peer review, etc. The Commission should, however, continue their efforts to minimise the impact on researchers. While it must be accepted that an application for EU research funding will necessarily be fuller than a comparable application at the simpler, national level, every effort should be made to ensure that administrative burdens for researchers are kept to a minimum when the actual research is under way. The need to prevent fraud against the EU budget is recognised but this must be balanced against the deterrent effect on under-funded researchers of having to comply with overly bureaucratic procedures.

The EC needs work with ESA to ensure coherence, convergence and complementarities in operating and procuring space programmes for which it has responsibility such as Galileo and GMES. British influence in ensuring this happens is crucial as there are considerable R&D implications in the development of programmes and procurement policies.

7. Where might future EU level action be detrimental to your work in this area?

No examples of the EU acting in a way that would be detrimental were identified in our research save for concerns about the regulation of clinical trials and the potential impact of data protection legislation on data sharing. What would be detrimental in the opinion of academics is if the EU became prescriptive about the research it was commissioning. Flagging a priority is reasonable but being specific about what is required could well be detrimental.

The UK has successfully pushed back on a number of areas to ensure that priorities remain well-aligned with ours in the Horizon 2020 programme, so for the next seven years this is unlikely to be an issue, subject to close attention being paid.

8. Where might action at national rather than EU level be more appropriate / effective?

It is important to note that the vast bulk of research funding in the UK (and indeed across Europe as a whole) is disbursed through national funding agencies and research councils. This is appropriate, as the recipients of the funding are predominantly universities and research institutes within each country. This should remain the case.

Action at a European level makes sense for very large projects that require pooling of effort, such as CERN and Space, and in the coordination of planning for very large investments in future science facilities, as done by ESFRI.



It is worth recalling that EU action on research is complementary to national action, not a substitute for it. Researchers expressed the view even if research is primarily about a local or national issue it would often benefit from comparison with other countries. In the UK, if research is not compared or shared within the EU it is often compared or shared with other Commonwealth countries, notably Australia, Canada and New Zealand, for example in the social sciences. Researchers are increasingly collaborating across frontiers in research. EU-based authors were involved on 67% of the world's internationally co-authored articles in 2009.³

9. How could EU and national policies and funding streams interact better?

It was generally felt that there was a positive interaction of UK and EU funding streams in this country, partly because the research councils aimed to ensure that this was so.

10. What impact would any future enlargement of the EU have on this area of competence?

We could identify no obvious impact on *competence* in this area of enlargement. There maybe an impact on EU budgets and the amount available to existing Member States as newer Member States may wish to focus spending on the development of capacity rather than on funding research in existing institutions, but this would reflect a change from the agreed priorities of Horizon 2020 which are to focus on excellence.

A key factor which makes EU involvement in R & D valuable is that it, by bringing together researchers from Member States, increases the global impact of European research at a time when it is challenged by the highly successful US research community and the developing research base in China. Enlargement widens the pool of EU research talent available to participate in EU funded programmes and so contributes to the development and global impact of European research.

11. Are there any other points you wish to make which are not captured above?

Science is an area where the UK can reasonably claim to lead Europe. We do not need to fear European interference in science – in many respects developments like the European Research Council and the European Research Area reflect UK influence on European science rather than vice versa. In fact we have not always been as assertive as we might be in using our 'soft power' to influence European policy in this area – for example, the relative lack of major European research facilities and laboratories located in the UK reflects this.

The UK has been exceptionally successful in obtaining research grants for individual researchers; since 2007 828 researchers in British institutions have been awarded one of the

³ <http://www.nsf.gov/statistics/seind12/c0/c0s7.htm>;
<http://blog.universitiesuk.ac.uk/2013/07/05/international-research-coauthorship-trends-and-implications/>



EU's grants.⁴ This is a better record than any other Member State, including Germany (528) and France (492). The European Research Council's approach of allowing, after careful evaluation, a researcher to undertake his or her own programme of work fits with the British preparedness to give early career researchers the chance to develop and test their own theories. EU support for longitudinal and cross-country data collection both is immensely valuable for the UK research community and provides a very useful source of relevant evidence for policy-makers on a wide variety of social issues.

Part of the value of EU fellowship funds is that they have the potential to attract back European researchers who have left EU countries to work elsewhere. This is particularly important now after the cuts in R & D funding which followed the fiscal cliff in the US.

It is important to be clear that the European Research Council funds truly innovative, high risk/high gain blue skies research, and is the only source of such funding on this scale in Europe (ie it cannot be matched by national funds, so is an additional and important resource for UK researchers).

Finally, in the wider international context, contacts between scientists of different countries can make some contribution to wider understanding – one form of science diplomacy – and indeed, as the experience of EU enlargement and association agreement negotiations show, research is generally one of the easier “chapters” to conclude and on which further progress can to some extent be built.

⁴ http://erc.europa.eu/sites/default/files/content/ERC_in_a_nutshell_%20July_2013.pdf