
Review of UK and EU balance of competences: research and development

Institute of Physics response to a BIS
consultation.

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6 August 2013

Department of Business, Innovation and Skills
1 George Street
London
SW1H 0ET

6 August 2013

IOP Institute of Physics

Dear Sir/Madam,

Review of UK and EU balance of competences: research and development

The Institute of Physics (IOP) is a leading scientific society. We are a charitable organisation with a worldwide membership of more than 50 000, working together to advance physics education, research and application. We engage with policymakers and the general public to develop awareness and understanding of the value of physics and, through IOP Publishing, we are world leaders in professional scientific communications.

The IOP welcomes the opportunity to provide input to inform the BIS consultation: 'Review of UK and EU balance of competences: research and development'.

If you need any further information on the points raised, please do not hesitate to contact me.

Yours faithfully,



**Dr Frances Saunders CB FREng CEng CPhys FInstP
President Elect**



**John Brindley
Director, Membership and Business**

Review of UK and EU balance of competences: research and development

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?

As an area of 'shared competence', European funding of research and development (R&D) in the UK generally adds to the work already supported by the national governments. In this model, initiatives such as the Framework Programmes have provided significant additional funding for UK science and innovation.

It should be noted however that the sums of money allocated to, for example, the 7th Framework Programme, represented around 5% of total R&D funding in EU nations in the period that it ran. A significant investment, but less than the funding provided through both national governments and businesses.

Arguably the greater contribution to R&D from the EU is through the movement of people and the creation of networks. For example, the nature of the collaborative Framework Programmes has meant that a different approach is taken to funding, the funding priorities and decision making process and the composition of the collaborating teams, from that available through exclusively UK research funding streams. The roles of the individual partners in such collaborations can develop during the collaboration, something which is a particular benefit to small- and medium-sized enterprises (SMEs), as such mutual working can enable the development of trust and allow further contract work to develop as a result of the partnership. The benefits can also be felt by larger and more established companies, with collaborations providing a forum to gain a greater understanding of the market and to achieve R&D outcomes that would not have been possible with a smaller budget. For university-based researchers, in addition to the scientific advantages, membership of such collaborations offers a valuable window onto the commercial R&D world. This can lead to employment in the industrial sector at the end of the project, or provide the researcher with better insights into research impacts and large programme management constraints which are essential to developing the research leaders of the future. The European dimension is important; all partners benefit in gaining personal confidence in working with people from different countries, this builds trust and a better inter-cultural awareness. The R&D support available through the EU also provides a diverse range of streams that has given a measure of security to many UK-based researchers and promoted flexibility and innovation in UK businesses in a time of relatively uncertain budgets.

Collaborative EU funding for areas such as infrastructure can act as a multiplier for domestic R&D funding, bringing the kind of scalability inaccessible to all but the USA. For example, CERN, while no longer a purely European project, started in that vein and remains a project of a scale that few nations if any, and certainly no European nation, would even consider taking on alone. It is noteworthy that a number of non-EU nations are now developing mechanisms to partner EU projects, reinforcing the benefits of such a funding structure.

The platforms for collaboration provided by the EU enable the UK to engage fully with broader European projects, allowing UK science and innovation to benefit from collective action. To take one example, through the European Space Agency (ESA) the UK is able to engage with the broader EU space community and beyond. The UK's strength in small satellite production and space science enables it to contribute to these programmes within the ESA at a high level, and to benefit at a similar level. This, together with the opportunities that such high-level, high-technology international collaborations bring, suggests in fact that the UK receives a significant return on its investments. For example, investment through the Advanced Research in Telecommunications Systems (ARTES) has been reported to have produced returns of 7:1.¹ As a full EU member of ESA, the UK is able to drive the organisation into areas where the UK has strength. The recently secured funding for the International Space Innovation Centre (ISIC) in Harwell, and the decision to base new telecoms satellite monitoring headquarters in the UK is a vindication of approach and an illustration of the advantages to the UK of the current governance structures.

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?

The nature of the shared competence has meant that there are few cases of action at an EU level preventing action at a nation level in terms of research and innovation support. However, there remain some areas where conflicts of priorities between European and national funding streams can result in challenges for UK researchers and innovative companies. The House of Lords European Union Sub-Committee in its report on the Effectiveness of EU Research and Innovation Proposals² noted the difficulties experienced by companies applying for funding from two streams – one national, one European – when each scheme is pursuing different strategic priorities. This is a situation which may be exacerbated by the recently-announced additional funding for the strategic priorities of the UK industrial strategy. We would recommend that more attention is given to the interaction between the national and European priorities – it is the case currently that different sectors have a very different experience of the interactions between UK and European bodies (something that may in part explain the differing SME

¹ <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmbis/173/173.pdf>

² <http://www.publications.parliament.uk/pa/ld201213/ldselect/ldcom/162/162.pdf>

engagement levels in the different streams of the 7th Framework Programme³).

Additionally, in areas of research where large collaborative or hardware programmes are involved there can be an aspect of ‘double jeopardy’ in competitive funding, where funding may be secured through one council, for example, at European level for a large hardware programme, but not at the domestic level for the exploitation and interpretation of the data generated.

At the more applied end of R&D support, there are areas of the ‘state aid’ directives and procurement regulations that affect the provision of support to UK-based R&D. For example, in the USA the Small Business Innovation Research (SBIR) programme can be targeted specifically at “small” businesses, while in the UK, there are limits to such stipulations in a funding call issued through the Small Business Research Initiative (SBRI). Such innovative procurement schemes have shown great success in supporting and driving innovation in SMEs. It may be that there is limited material difference in outcome if steps are taken such as ensuring larger business involve SMEs in their supply chains, but it would be useful exercise for the UK government clearly articulate what is and is not allowed under these regulations.

As noted, the shared competence status of R&D allows the UK to adjust its own schemes to cope with changes to EU programmes, however, in the recent past, areas of sole EU competence outside the R&D stream have had the potential to impact UK research. For example, the development of the Physical Agents Directive presented a threat to continued research in magnetic resonance imaging in the UK and across the European Union.⁴ In this case, action at a member state level through learned societies, professional bodies and other scientific organisations, together with other European bodies, enabled a re-drafting of the legislation which has recently been voted through.⁵ This is an area where the involvement of a European Chief Scientific Advisor (CSA) role at an early stage may have been advantageous.

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 already mentioned, a major benefit to UK science and innovation is the promotion of connections and collaborations by both funding schemes and also the broader platform of the EU. This platform can act as a stepping stone to collaborations with nations further afield. This may be due to an increased understanding of the requirements for collaborative work but also the increased opportunities that can come from being part of a larger collaboration.

³ http://ec.europa.eu/research/sme-techweb/pdf/sme_participaton_in_fp7_oct_2012.pdf

⁴ http://www.iop.org/publications/iop/2008/page_38214.html

⁵ <http://register.consilium.europa.eu/pdf/en/13/pe00/pe00019.en13.pdf>

The freedom of movement provided within the EU is critical to this success, particularly when contrasted with the challenges presented in obtaining visas for non-EU researchers and visiting academics to attend UK facilities and meetings.

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

The ERA, building on existing EU principles and opportunities has many potential advantages, but is perceived in some areas as ill-defined in terms of activities and objectives. The Institute has previously outlined some areas of concern in the development of the ERA.⁶ At this stage it is not clear what the overall effect on UK research and innovation might be. Within the UK, preparation for engaging with the ERA has had some positive effects within universities and research institutions.

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 role of the European CSA was a welcome addition, bringing together these functions at the level of the EU President. This is still a relatively new post, and it will take time to embed this level of scientific advice and coordination at the higher decision making levels. There are policy areas of sole EU competences which would benefit greatly from a broader engagement with the science and evidence base, which include the MRI issues already mentioned. This is something that the UK benefits from through the CSA and DCSEA networks (and the CSAs in the devolved administrations). This is arguably an area where the EU could learn from the UK approach.

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?

The shared competence in the area of R&D means more resource provided at EU level results in a general increase in resource for UK R&D, assuming that the national resource is not decreased in concert.

⁶ http://www.iop.org/policy/consultations/research/file_52969.pdf

- How could improvements to existing EU activities make them more effective and efficient?

A reduced level of bureaucracy is desirable, but it is understood that any large organisation will have a commensurate increase in procedures, particularly where international collaborations are concerned. Larger UK-based companies such as BT and BAE Systems, companies with the time and resource to engage with the programmes, have shown considerable success in developing networks across Europe to promote and develop innovative products and technologies. In some areas, larger UK companies can struggle to fit within the confines of a typical multi-national framework consortium which will typically require working with competitors. There is perhaps an opportunity in greater flexibility here, allowing the larger partners time and space to develop a mutually advantageous project. However, it is still the case that innovative SMEs have achieved less success in accessing the funding and networks available through the Framework Programmes.

Over the many iterations of the Framework Programmes, companies with previous experience of applications to similar programmes have achieved greater success than first-time applications, a situation that will naturally favour those with greater resources – whether in terms of staffing, experience, or processes, such as internal ‘quality control’ for applications. There has been a steady improvement in accessibility to both first time entrants, and also to company-led applications, though the engagement particularly of SMEs remains a concern. The dedicated SME strand introduced in the Horizon 2020 programme is welcome, but mere focus will not be enough, and may be counterproductive. The steps taken in previous programmes to engage and support SMEs should continue.

The limited SME engagement is by no means a problem for the European innovation funding programmes alone – increased SME engagement is a stated aim of innovation programmes across the UK and it may be that greater strategic cooperation between European SME programmes and those operated by organisations such as the Technology Strategy Board (TSB) would be beneficial. There may also be value in understanding how other nations achieve higher levels of SME engagement with the Framework Programmes.

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

The recent amendments to EU space policy⁷ will need to be carefully managed to not adversely affect the success of the ESA through a desire to tie it more closely with other EU science programmes. Membership of the ESA is of significant current benefit to the UK, and the space science and technology sector is one that will likely grow significantly in the near future.

⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0671:FIN:EN:PDF>

The ESA currently works well for UK space technology, and any moves to bring its governance under more of an EU umbrella should be monitored to ensure that this is not damaged.

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

There should be greater cooperation and coordination between national and European bodies to ensure that science and innovation is supported effectively at all levels.

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

As described above, there are currently gaps in the support available to UK innovative businesses due to perhaps unavoidable mismatches between the focus and intention of European programmes and the science and innovation priorities of national governments. As such companies that might be eligible for European funding, but lacking a natural domestic supporter, may be disadvantaged. The House of Lords European Union Sub-Committee noted the mismatches that can occur between national and European funding priorities. Their report² recommended that BIS continue its efforts to reform, NCPs and to ensure that they are focused on the priorities at EU level. We would endorse this recommendation and add that greater thought should perhaps be given to how the priorities of the UK industrial strategic map onto the areas of activity of the 7th Framework Programme, and the developing Horizon 2020 initiative. It may be that through the introduction of focused funding streams aimed at bridging the gaps between the two strategies, European funding could act as multipliers on UK industrial strategy investment.

Similarly, in areas of research which require both funding from European collaborations and also from national research councils, there have been recent cases where UK researchers have been involved at a high level in the design and commissioning of programmes, but were unable to access the results of the missions due to funding not being awarded by national research councils. For such an arrangement to be efficient and functional, both the UK and European bodies should endeavour to work together at an early stage to promote a cohesive arrangement, on the understanding that funding will be awarded on a competitive, peer reviewed basis.

Additionally, in areas where European research funding is received by universities, the level of overheads supported is often below that typically allocated by UK research councils, which support the full economic costs (FEC) of research. This can result in a situation where a university incurs a cost when winning a research grant from a European body, with the shortfall needing to be covered from other income streams. We would recommend

that European bodies adopt the approach of UK funding bodies in covering FEC.

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

No comment.

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

No comment.

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