

Response to the House of Commons Science and Technology Select Committee inquiry on the impact of the science budget allocations

1. The Royal Society welcomes the opportunity to respond to the Select Committee's important and timely inquiry into the health of the science and innovation system in the wake of last year's Spending Review and the March 2011 Budget announcements. The Society has argued consistently over the last year that, whatever short-term measures are necessary, over the medium to longer term the UK must retain its scientific excellence, its leading scientists and the foreign investment they attract. Any cuts must be administered carefully so that they do not cause lasting damage and can be reversed when the public finances allow.
2. The Royal Society has welcomed the relative protection afforded to budgets for scientific research¹. However, we have also expressed concerns about cuts to key investments that threaten to destabilise the science and innovation system. It is still too early to say what the impact of these cuts will be, but we can offer some pointers towards issues of particular vulnerability.
3. There are a number of other current policy decisions which could have unpredictable impacts on the UK research system, in particular in relation to reforms to higher education. It is unclear how these reforms might affect individual disciplines and institutions, or how they may alter the choices of future career cohorts.
4. Many impacts of recent funding settlements and other policy decisions will not be felt until we are well into the Spending Review period. It will be important to identify how any adverse impacts might be addressed or reversed in future Spending Reviews.

Background

5. During the Spending Review process, the Society was one of seven bodies, alongside the British Academy, the Royal Academy of Engineering, the Academy of Medical Sciences, the Council for Science and Technology, the CBI and the Chief Scientific Advisers Committee, invited to advise on investments in science. Our submissions drew on our report, *The Scientific Century*² published in March 2010. This report argued that Government's continued investment in science is vital for sustainable economic growth by underpinning corporate R&D, training a skilled workforce and developing new products and services.
6. A first letter was sent from the President of the Royal Society to Adrian Smith FRS on 11 June 2010. This reiterated the argument and evidence from *The Scientific Century* in support of sustained funding for scientific research and called for maintenance of the dual-support mechanism for research funding.

¹ <http://royalsociety.org/news/spending-review-2010-response/>

² <http://royalsociety.org/The-scientific-century/>

7. A second letter followed the June 2010 emergency budget³, at which an average cut in public spending of 25% across non-ringfenced departments was announced. The headline messages of this submission were:
 - a) Investment in science is vital for economic growth and international competitiveness. Our ability to attract the best talent and R&D investment is highly vulnerable to overseas competition.
 - b) Short-term budget cuts will put our long-term prosperity at risk. We oppose any budget cuts, but if necessary, they must be reversible, and followed by sustained investment once finances allow.
 - c) The UK should maintain its breadth of research, and prioritisation should remain in the hands of funding bodies and universities.
 - d) The balance of the current system (e.g. between Research Councils and quality-related (QR) funding) should be preserved where possible.
 - e) A 10% cash cut will be damaging but may be reversible, while a 20% cut will be catastrophic for the future of UK science and economic growth.
8. The Spending Review announced flat cash for much of the existing science budget. David Willets, Minister for Universities and Science, appeared on radio on the afternoon of the spending review praising the science and research community for their role in this good result: “The scientific community has assembled very powerful evidence, such as in that Royal Society report, *The Scientific Century*, about what the benefits are of scientific research... that’s really strong evidence and we deployed it.”
9. But this level of funding is still a cut in real terms – greater than 10% over the four years of the Spending Review period. In the Society’s July 2010 Spending Review submission to Adrian Smith FRS (then Director General, Science and Research, Department for Business, Innovation and Skills) the Royal Society argued that such a cut would be ‘painful but manageable’. The protected budget includes funding from the UK’s Research Councils and funding for research allocated through higher education funding councils. It no longer includes capital expenditure, which has been subject to much deeper cuts, putting strain on the UK’s ability to maintain international subscriptions and large scale facilities. Structural changes to higher education funding for teaching – in response to the Browne review – are also likely to impact on research. Following rapid and disruptive changes to funding models, universities are entering a period of great uncertainty. University scientists are not just researchers. They may also be teachers, supervisors, administrators or entrepreneurs. There are likely to be unintended consequences for scientific research and training, which will demand close observation in the coming months.
10. Following the Spending Review announcement in October 2010, we were subsequently asked to comment on how this budget might be divided up. The Society declined to offer detailed advice on allocations. Our 11 November submission⁴ described our ongoing concerns with capital investment, university funding and departmental research and reiterated our recommendation that the balance between Research Councils and Hefce’s QR funding should remain the same. We did not feel that, given new and existing uncertainties within the higher education sector and the apparent productivity of current arrangements, there was any reason to alter the balance of funding between the two legs of the dual support system. To do so would risk destabilising parts of universities that are particularly dependent on either stream.

³ <http://royalsociety.org/policy/reports/spending-review-submission/>

⁴ <http://royalsociety.org/policy/reports/follow-up-spending-review/>

11. We also expressed concern about the distribution of capital investments for research. In the short-term, cuts to capital expenditure will present acute problems for those Research Councils that are committed to long-term capital projects. In the long-term, while cuts to infrastructure are less visible than cuts to jobs and student numbers, they can be just as damaging to the UK's research base. We know from a similar trend in the 1980s that cuts to labs and equipment can be expensive to reverse if left for too long. We therefore urged that capital investment is prioritised as soon as the public finances improve.
12. We expressed our concern about the research expenditure of government departments. Although Sir John Beddington has improved BIS's oversight of departmental R&D, the long-term trend of decline demands careful observation. We welcome the ongoing review of departmental R&D budgets being undertaken jointly by Sir John and Sir Nicholas Macpherson (HM Treasury) and look forward to its conclusions. Parts of the research base have built up strong links with particular departments. Cuts to budgets will put university departments and possibly higher education institutions at risk while also reducing the UK's strategic research capacity in key areas. Departmental R&D and the Public Sector Research Establishments have enormous potential to complement other parts of the research base and provide demonstrable economic and public value. There is a danger that Research Councils are expected to compensate for cuts to other funding streams, which will put pressure on their existing programmes.

Research Council allocations and capital expenditure

13. Budgets for individual Research Councils and Funding Councils were announced on 20 December 2010. The picture of UK science funding looks similar to previous years, and we received some more clarity on Government priorities for science funding, including emphases on promoting the impact of research, supporting economic growth, concentration of resources in centres of excellence, developing cross-council research programmes and delivering efficiency savings. Medical Research was given a boost with rising budgets for the MRC and capital investment for the new UKCMRI.
14. Cuts to capital spending in other areas will, however, be difficult to manage. While these cuts may be optimistically viewed as delays to new infrastructure on some projects, in other areas this will affect the maintenance and usability of existing facilities, with knock-on effects on research and technician staff numbers.
15. Budget restrictions are likely to force higher education institutes and Research Councils to focus on 'core business'. This prioritisation runs the risk of squeezing out some of the more 'creative' and cutting-edge activities which have often fostered profitable innovation. Funding for interdisciplinary research, public engagement, international collaboration, and PhD studentships are all at disproportionately high risk of being cut to preserve the 'priority' core. Such changes, coupled with the drive for efficiency savings, would alter the landscape of UK research quite markedly.
16. The Society welcomed the £100 million of new capital expenditure for science announced in the March 2011 Budget alongside the Government's *Plan for Growth*, and expressed a hope that it would be a first step in plugging the gap in funding for equipment and facilities.

Global comparisons

17. The UK has traditionally been a hub for international science, but we are in an increasingly competitive market place.⁵ The global economic downturn saw a range of countries choosing to use stimulus

⁵ See <http://royalsociety.org/policy/reports/knowledge-networks-nations/> for recent data and analysis

packages to invest in science and innovation. The USA made substantial extra research funds available, Germany increased the education and research budget by €12billion by 2013, and France invested €35billion in the knowledge and green economy.

18. Post stimulus policies are now being forged. The Royal Society has been made aware of the difficult situations for scientific communities in certain countries (particularly in Eastern Europe) faced with significant cuts to their science budgets. However, the trend in those nations that are the UK's closest competitors and collaborators in research has been to maintain support. US science investments fared relatively well during the tense budgetary negotiations in April 2011, although the trajectory set by President Obama's administration to rapidly scale up spending now looks doubtful.
19. In the emerging 'BRIC' nations, commitments to science and innovation investment remain strong and are increasing. China remains committed to increasing its spend on R&D to 2.5% of GDP by 2020, at a time while GDP is still increasing at a swifter rate than most other parts of the world. President Medvedev has promised increased investment for Russian science. President Rousseff's 'Blue Book' confirmed in January 2011 Brazil's target of reaching 2.5% of GDP spend on R&D by 2022 (although the 2011 science budget was actually a reduction on the previous year). In India the 2011/12 science budget was increased by 14% on the previous year.
20. The EU Industrial R&D Scoreboard 2010 showed that in 2009 in Europe and the USA leading companies' investment in R&D decreased, while it increased by over 20% in India and 40% in China. The emerging economies are increasingly viable competitors for industrial investment in R&D; certain countries, notably Singapore and South Korea, have specific policies to proactively attract researchers and R&D investment to their shores.
21. While UK investment in science falls in real terms over the coming years, it will be important to ensure that any retrenchment in the UK's global scientific position is reversible.

Brain Circulation

22. One of the scientific community's most pressing concerns at a time of budget cuts is the possibility of a new brain drain. The House of Lords Science and Technology Committee pointed to this issue in its consultation with the Vice-Chancellors of six leading UK research universities in 2010.⁶
23. Looking internationally, there is a trend for elite scientists to migrate towards countries with higher R&D spending. But this hides a more important trend towards faster brain *circulation*. Scientists and innovators move increasingly easily between countries in search of opportunities.
24. It is therefore important that the flow of talent is not interrupted by immigration rules. Changes to visa regulations threaten to prevent the immigration of scientists such as Konstantin Novoselov who, with Royal Society funding, moved to the UK, to Manchester University, where his work with Andre Geim recently won the Nobel Prize for physics. The Royal Society is currently discussing with the UK Border Agency how new regulations relating to Tiers 1 and 2 may be improved so that they do not damage the UK science base.

⁶ Letter from Lord Krebs, Chairman of the Science and Technology Committee, to the Rt Hon David Willetts MP
<http://www.parliament.uk/documents/lords-committees/science-technology/Researchfunding/LtrBIS220910.pdf>

Monitoring the health of science and innovation in the UK

25. The Royal Society has publicly welcomed the Government's continued support for excellent scientific research. But we are in no doubt that, as science and innovation budgets continue to rise in other parts of the world, our situation is precarious. The coming years will be difficult for the UK science and innovation system. If current squeezes on budgets are a short-term necessity, we look forward to increased investment as public finances improve.
26. The announced closure of Pfizer's large R&D facility in Sandwich reminds us that talent and investment are increasingly mobile in the competitive global economy. Over the coming years, there will be a clear need for close monitoring of the inevitable changes to UK science. In particular, Government must be alert to unintended consequences of policy and budgetary actions. Above all, changes must be reversible to ensure that intellectual and physical capital and the opportunities that come with them are not permanently lost.
27. The Royal Society will play its part in maintaining a close watch on the vitality of the science and innovation system in the coming years. The Society's Council has approved a series of 'Healthchecks'-targeted pieces of work to keep abreast of trends, changes and emerging risks in the science and innovation system. We will write to the Committee and the Minister with fuller details as the project takes shape.
28. In recent debates, the UK research community has been consistent in stressing the importance of a broad and diverse research base. The 2010 Spending Review achieved a cross Party consensus on the importance of research as a whole, rather than resorting to trade offs between the STEM and arts and humanities, or basic versus applied research. The Royal Society applauds this, and hopes that this perspective can be maintained throughout this Parliament and beyond.
29. Although the impacts of the last Spending Review are yet to emerge, it is not too early to think strategically about the next Spending Review. Despite the relative protection afforded to scientific research, there have been few clear signs from the Government about a long-term vision for science and innovation. A clear statement of intent will help the UK is to demonstrate and fulfil its ambitions to maintain scientific leadership and attract the best scientists, innovators and research-intensive companies.

Further information

For further information please contact:

Dr. Jack Stilgoe, Senior Policy Adviser, The Royal Society Science Policy Centre

E: jack.stilgoe@royalsociety.org T: 020 7451 2530