CaSE briefing on UK and European investment in science and engineering

This briefing outlines the importance of science and engineering to the future of the UK economy, how the UK compares internationally and how EU membership and European funding impacts UK success.

Science and innovation are some of the UK's world leading strengths and are at the heart of the UK's future success. However, evidence shows we are at risk of falling behind our international competition through structural underinvestment in R&D with knock on effects to our skills base and attractiveness as a place for industry to invest. The UK disproportionately benefits from European funding for research.

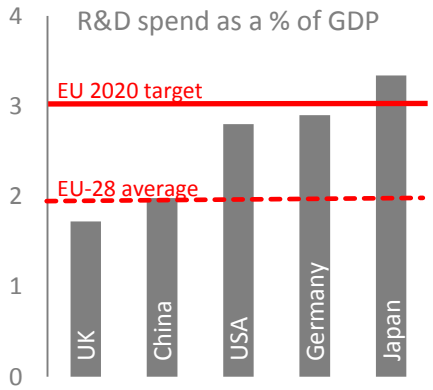
The UK currently needs to increase investment in Research and Development to remain competitive

A recent UK Government report concluded that underinvestment in R&D is structural and at 1.8%, now 1.7%. GDP is low compared to international competitors. It stated that this static and low R&D investment is a lost opportunity, risking jeopardising the breadth and depth of science excellence leading to reduced absorptive capacity of firms and missing out on benefits of global investment in science and innovation.[1]

Gross Expenditure on R&D (GERD) in the UK is below EU-28 average and falling

International comparisons show that UK R&D expenditure in 2012 was below the EU-28 average of 1.97%, the EU2020 target of 3% and other key international competitors (Figure 1).

Figure 1 : R&D as % of GDP 2012[2]

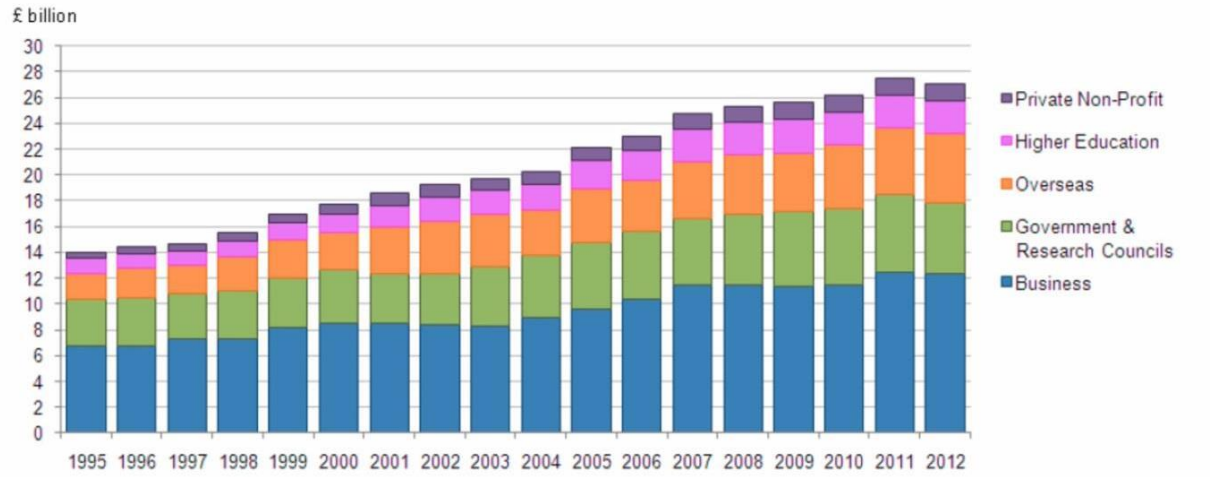


In monetary terms UK GERD decreased from $37.2b in 2008 to $36.5b in 2011, and extrapolation to 2012 suggests that it decreased to $36.1b in 2012. By contrast, in 2011 Germany spent more than twice as much (at $80.4b) on GERD than the UK. UK GERD represents just 3.2% of the global total GERD expenditure of over $1.14 trillion in 2011[3].

In 2012, the UK spent 1.72% of Gross Domestic Product (GDP) on R&D which is a decrease from 1.77% in 2011[4], including a reduction in both Government and Business investment. The reduction in 2012 was the reversal of an historic upwards trend (Figure 2).

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277090/bis-14-544-insights-from-international-benchmarking-of-the-UK-science-and-innovation-system-bis-analysis-paper-03.pdf
[2] http://stats.oecd.org/BrandedView.aspx?oecd_bv_id=strd-data-en&doi=data-00182-en#
[3] https://www.gov.uk/government/publications/performance-of-the-uk-research-base-international-comparison-2013
[4] http://www.ons.gov.uk/ons/dcp171778_355583.pdf

Figure 2: Composition of UK GERD by funding sector, 1995 to 2012:



Source: Office for National Statistics

The UK should capitalise on their current position and commit to an ambitious long-term target for increasing the level of investment in UK science

Unlike our international competitors, the UK currently has no target for increasing investment in R&D[5]. In fact as Figure 2 shows the UK is sliding backwards and is not set to reach the EU target of investing 3% of GDP in R&D by 2020. In Germany, the Federal Ministry of Education and Research's 2013 budget has increased by 6.2% compared to last year – placing it at a total of 13.7 billion euros (£11.6 billion) and has nearly reached the 3% target[6].

European Funding is crucial to UK research

In this context of low and reducing levels of investment in UK science from the UK Government, European funding is increasingly crucial to UK research. If the UK's historical performance in attracting EU framework funding[7] is maintained, UK universities, research centres and businesses could expect to receive **£2bn in the first two years of Horizon 2020**[8], which would equate to just over a fifth of the total British government spend on science. Further, while UK funding for Research councils is decreasing in real terms, the European Research Council (ERC) has seen a funding increase of 60% to £10.7bn[9].

The increase in ERC funding is likely to disproportionately benefit UK scientists. Like the UK's Research Councils, the ERC funds research based on quality. The UK receives by far and away the highest number of grants of any EU member state by virtue of our ability to attract the world's top researchers

[5] http://sciencecampaign.org.uk/?p=13867
[6] http://www.bmbf.de/en/96.php
[7] Horizon 2020 follows Framework Programme 7, and is a €79bn funding programme aimed at supporting research and innovation across the European Union. Competitions for funding will run from 2014 to 2020.
[8] http://www.bbc.co.uk/news/science-environment-25961243
[9] http://www.bbc.co.uk/news/science-environment-25961243

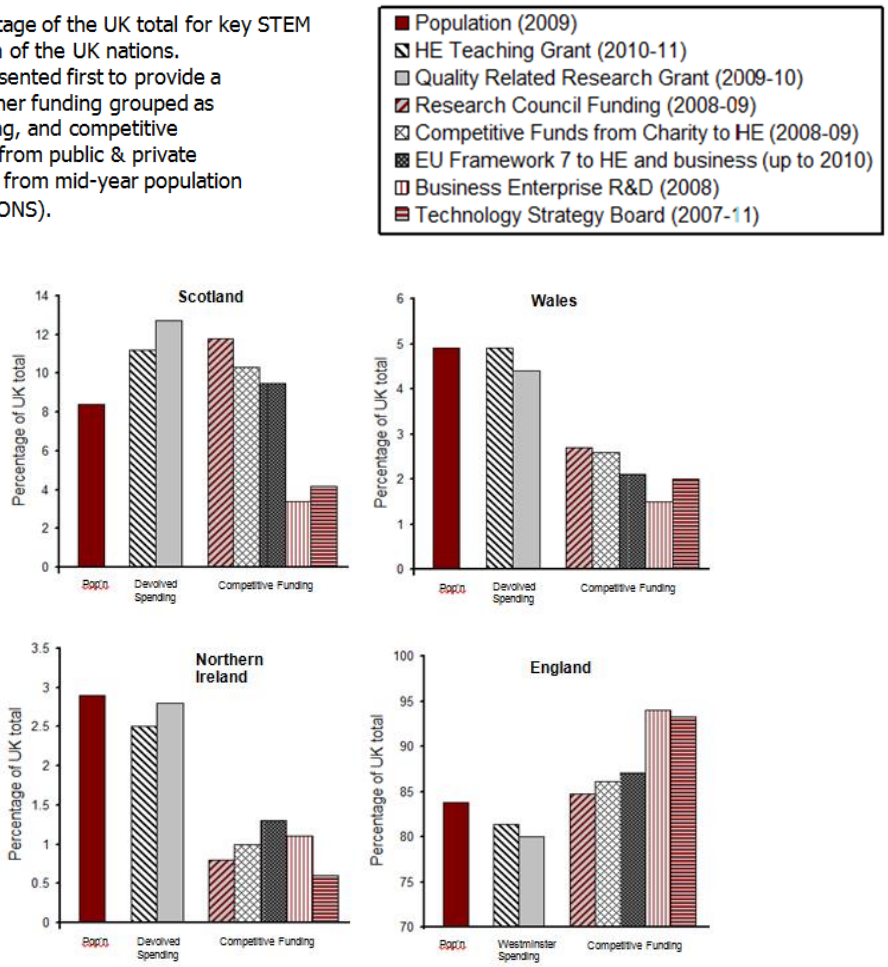
to our leading institutions. UK-based scientists have been by far the biggest beneficiaries of its awards with a fifth of all the grants have gone to British science, representing an investment of some £1.4bn to date.

The 7th Framework Programme for Research and Technological Development (FP7) ran from 2007 until 2013 and had a total budget of over €50 billion. The UK has done well in winning European funding for science and research through the FP7 framework, receiving the second largest share of funding of €6,643m. Furthermore, the UK has been involved more successful projects than either France or Germany, 41.3% of all grant agreements in FP7 to date. UK academia lead the way in FP7 accounting for 60.0% of all UK participations, receiving 10.9 % of all FP7 funding[10].

Scotland punches above its weight but is highly dependent on external funding

Scotland has an excellent research base but, whilst business investment has helped its GERD remain static in cash terms[11], it secures a high rate of competitive funding from UK research councils and the EU.[12]

Figure 5: Percentage of the UK total for key STEM statistics for each of the UK nations. Population is presented first to provide a baseline, with other funding grouped as devolved spending, and competitive funding for R&D from public & private sources (Derived from mid-year population estimates 2009, ONS).



[10] Analysis of FP7 data from the latest update to the eCORDA database, released 1 March 2014.

[11] http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/RD

[12] http://www.sciencecampaign.org.uk/documents/2011/ScienceEngineering&DevolvedRegions2011.pdf