

Plugging the gap

BREXIT AND RESEARCH FUNDING IN UK UNIVERSITIES



The link between scientific research, knowledge investments and economic performance was illustrated in detail for the UK by case studies Frontier recently carried out for the business department. This link has heightened universities' funding concerns following the Brexit vote, since although the UK is a net contributor to the EU overall, it receives a disproportionate share of EU research funds. In this bulletin, we examine the extent of this dependence, and identify some pinch points – where the demands will be greatest for post-Brexit national funding to make up the difference.

The UK has a strong international reputation for the quality of its science base, and has punched above its weight in terms of research results. This has contributed significantly to the country's economic performance. Frontier carried out a number of [case studies](#) for the Department for Business, Innovation and Skills (as it was then called), examining the use firms within the strategically-important aerospace and life sciences industries had made of publicly-funded research. We found that the strength of the UK science base was a key reason why many global firms had chosen to locate their research and production activities here.

EU research funding, Europe-wide collaboration and the free movement of researchers around the EU have all played their part in the development of the UK's science base. This bulletin examines the extent of the threat posed by Brexit to each of these elements, and seeks to identify the areas where the potential impact is greatest.

SCANNING THE HORIZON

EU funding supporting research comes from two main sources:

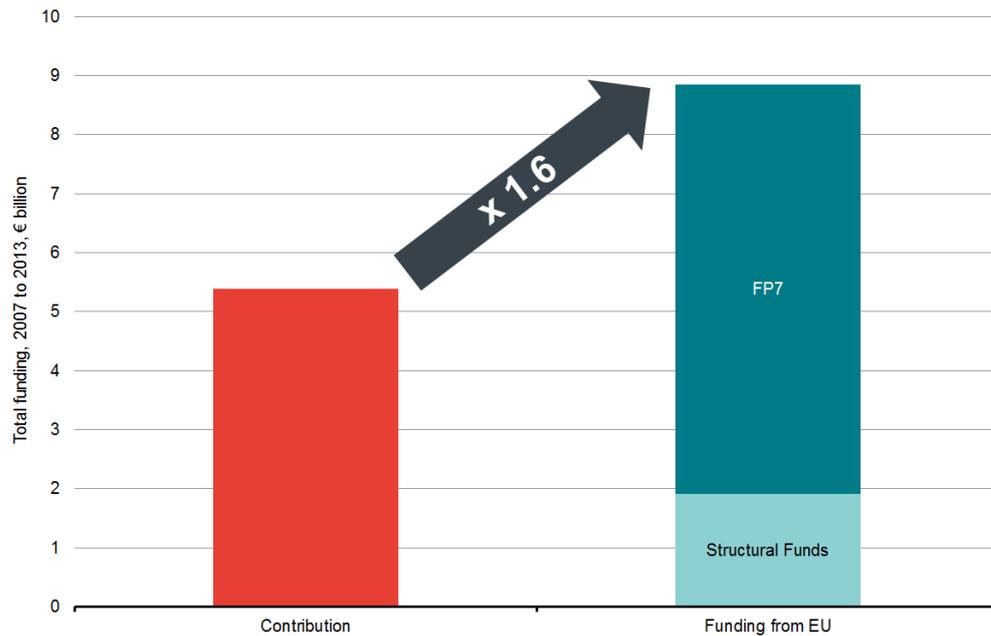
- Horizon 2020 (running from 2014 to 2020), which replaced the 7th Framework Programme (FP7, 2007 to 2013); and
- structural funds, supporting research conducted in more disadvantaged regions of the EU.

The UK has been a net beneficiary from these research funding flows. Comparing estimates of the amounts contributed by the UK to the EU's research budget with the amounts received between 2007 and 2013 indicates that the UK got back about 1.6 times what it put in.



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Figure 1: UK contributions/receipts to/from EU research budget, 2007-13

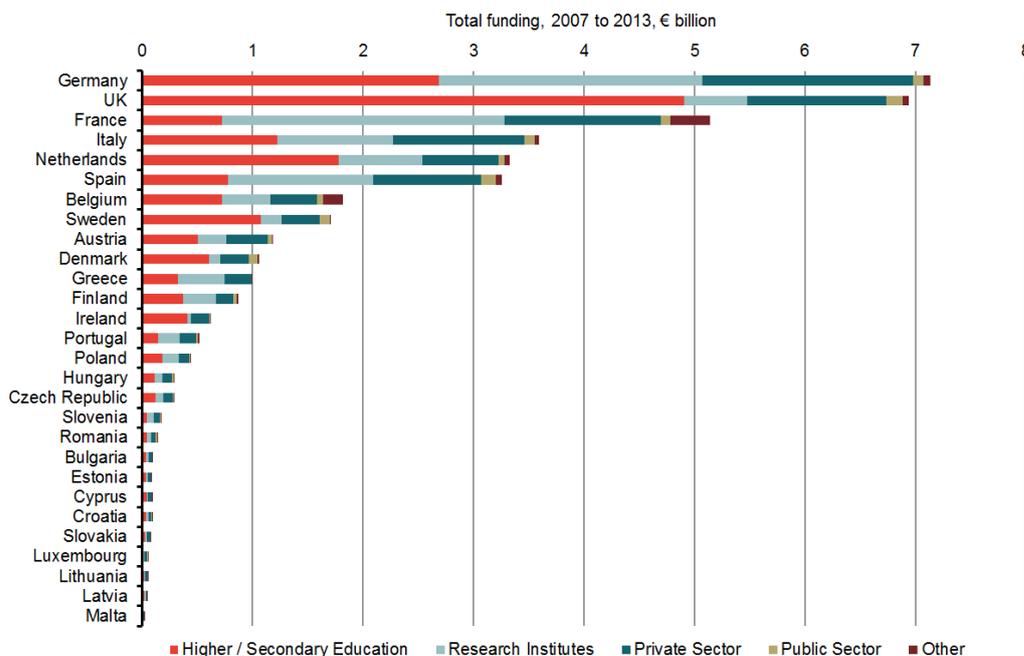


Source: FP7 Monitoring Report, Structural and Cohesion Fund Data, BEIS SET statistics, Frontier analysis.

Note: UK contribution to EU research budget is estimated as a proportion of the UK's total contribution apportioned by the share of EU funds spent on research. UK contributions are converted to Euro at an annual average exchange rate (source: Bank of England).

The UK has been a particular beneficiary of funds won through FP7. Between 2007 and 2013, the UK was second in the EU, slightly behind Germany, in the league table for funding through FP7 (€6.9 billion). The bulk of this, almost €5 billion, went to Higher Education Institutions (HEIs) to support research.

Figure 2: UK receipts from FP7 funding, 2007 to 2013



Source: FP7 Monitoring Report, Frontier analysis.

Plainly, the extent to which the UK can continue to access EU funding will depend on the nature of the deal hammered out between the British government and other Member States. But the level of

anxiety in HEIs has already obliged ministers to give some reassurance about the flow of funds in the short term. The Chancellor [announced](#) last summer that Horizon 2020 funds won while the UK remains a Member State would be underwritten by the UK government even after Brexit, and the [Autumn Statement](#) pledged an additional £2 billion per year of government-funded R&D by 2020-21.

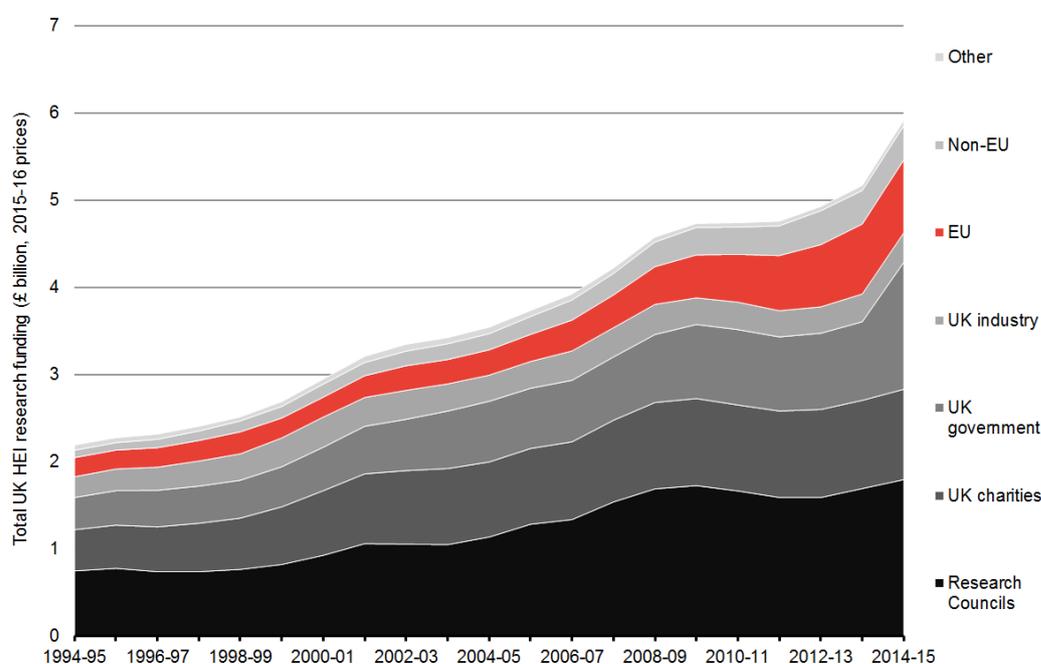
REPEAL AND REPLACE?

EU research funding forms only a relatively modest part of overall HEI resources. But its significance has been increasing. Over the last 20 years, research funding in UK HEIs has more than doubled in real terms, from £2.2 billion (1994-95) to £5.9 billion (2014-15). Over the same period, total funding from EU sources has almost quadrupled, from just over £200 million to more than £800 million.

To put this into context: total funds from all sources for HEIs (including tuition fees, HEFCE grants and investment income) grew from £15.1 billion to £33.2 billion. So total income grew by around 119%, research income by 170% and EU-funded research income by 282%.

As a share of total research funding, EU sources have therefore grown from about 8-10% in the period 1994-95 to 2009-10, to 14-16% today, while the proportion coming from the UK (government, industry, charities and Research Councils) has fallen from 82-84% to 76-78 per cent.

Figure 3: Total research funding, UK HEIs, by source, 1994-95 to 2014-15

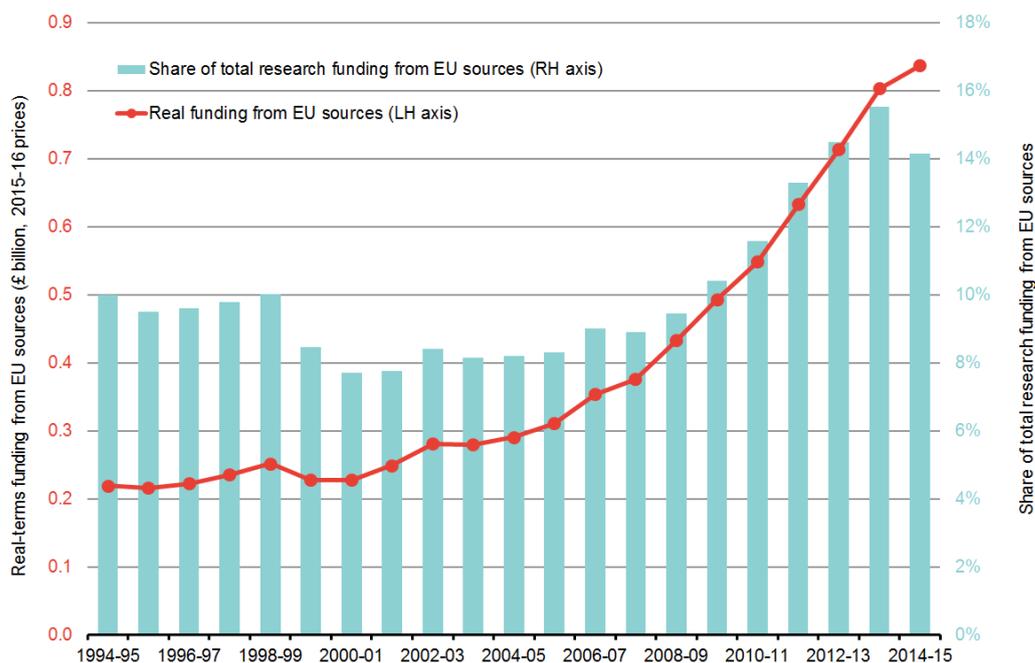


Source: HESA, Frontier analysis. Note: values in 2015-16 terms using GDP deflator. The large increase in UK government research funding in 2014-15 is due to R&D tax credits being included in the total for the first time, which accounted for 34.1% of total UK government research funds for HEIs that year.

To the extent that the additional £2 billion of UK government-funded R&D flows to HEIs, this will certainly help to soften the blow of Brexit, but the longer-term picture remains unclear.

Universities UK, the industry body representing academic institutions, has [called for](#) the government to prioritise continued access to Horizon 2020 even after Brexit, but whether the UK will also be able to access successor programmes after 2020 will almost certainly depend on the government's willingness to commit to paying into them. Even if they do, the UK will lose some influence in setting the agenda for future EU-wide research programmes – and the UK has historically had a loud voice. Evidence from the House of Lords select committee [inquiry](#) into how EU membership affects UK science found that 46 UK nationals were members of the advisory groups which input into the Horizon 2020 research programme. This total amounted to just over 10% of the groups' membership – the highest proportion for any country in the EU. Right now it seems hard to imagine that this potential to steer funding in directions of particular interest to the UK could be maintained under any of the varieties of Brexit that appear to be desired, or achievable, by politicians.

Figure 4: EU contribution to UK HEI research funding, in cash terms and as a share of total funding, 1994-95 to 2014-15



Source: HESA, Frontier analysis. Note: values in 2015-16 terms using GDP deflator.

A SUBJECTIVE MATTER

The big picture is that the EU is a large and increasingly important part of research funding in HEIs: EU sources contributed on average 15.1% of their academic research funding in 2014-15.¹ But this masks huge variation between different subject areas, which therefore vary in their vulnerability to the drying-up of EU money. EU sources provided more than 20% of research funding in business, architecture, humanities and social sciences, but less than 10% of the funding in medicine.

The specific disciplines most reliant on EU funding in 2014-15 were a mixed bunch: computer science (31%), catering and hospitality (32%), archaeology (39%), classics (35%) and continuing education (36%). But it is also notable that the EU was an above-average contributor right across the strategically-important maths and science departments. Some 17.9% of all research funding in biological, mathematical and physical sciences came from the EU in 2014-15, including:

- 22.0% in earth, marine and environmental sciences;
- 24.8% in chemistry; and
- 20.7% in mathematics.

The research priorities selected to date for support by the UK government look rather different. For example, it has heavily funded research in medicine, education and agriculture. But whether this was in some way a response to EU funding in other areas, or reflects a different view of the world, is, perhaps inevitably, not entirely clear. So even if the UK government decides to make good losses in research funding overall, there will be a good deal of uncertainty for universities to contend with before a new pattern of funding emerges. The recent Industrial Strategy [Green Paper](#) sought evidence on how additional R&D promised by the UK government should be invested – clearly some departments will have a much stronger interest in making the case they will be affected by Brexit.

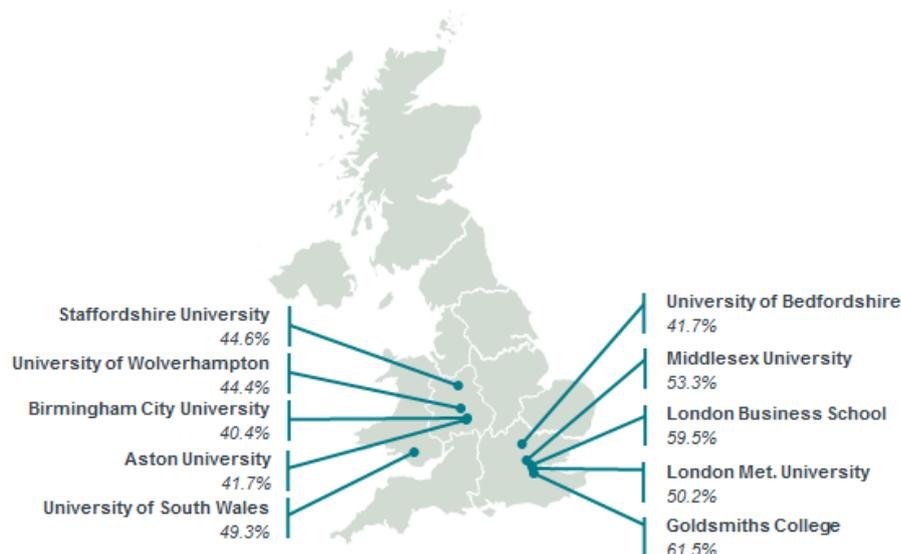
LOCATION, LOCATION

Nor is it just about subject areas. In 2014-15, there were 116 HEIs that secured at least £1 million in academic research funds. Of these, 10 received at least 40% of that funding from EU sources, and 8

¹ The 14.1% share shown in Figure 4 also includes non-academic funding.

received at least a third. These institutions were geographically concentrated around London, in the West Midlands and South Wales. Again, even if total additional UK investment in R&D compensates, or more than compensates, for lost EU research funding by 2020-21, there are likely to be winners and losers from this change of funding source.

Figure 5: HEIs receiving at least 40% of research funds from EU sources, 2014-15



Source: HESA, Frontier analysis. Note: Excludes HEIs with less than £1m total academic research funding.

DIVIDED WE FAIL?

Meanwhile, there are perhaps even greater uncertainties about the future for cross-border research partnerships. The UK has shown itself to be good at collaborating. Increased reliance on EU research grants, which are often dependent on commitment to cross-border co-authorship, has provided a stimulant.

But collaboration has increased even faster than this incentive would explain. Analysis published by Mike Galsworthy, Rob Davidson and Jonathan Adams of the London School of Economics (LSE) before the EU referendum found that between 1981 and 2012, the proportion of UK scientific papers that were internationally co-authored rose from around 15% to more than 50%.

Moreover, this is not just a matter of fashion or convenience: cross-border collaboration appears to increase the impact of research. The same analysis demonstrated that internationally co-authored papers were more often cited by subsequent researchers than those which were purely domestically-produced.

This link may not be causal, but at the very least suggests that the best researchers are more likely to collaborate across borders. And although, of course, UK scholars work with universities worldwide, the LSE study indicated that 80% of the international collaborations over the period under review included an EU partner. This does at least raise questions as to whether the extent of international research collaboration in the UK may decline post Brexit, and what the impact may be on the quality as well as the quantity of UK scientific research.



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PEOPLE AND PLACES

There is a strong concentration of EU researchers working in UK academia. From the latest available data provided by the Higher Education Statistics Authority (HESA), we estimate that – on a full-time equivalent (FTE) basis – 12.1% of academic staff in UK HEIs in 2014-15 were from the rest of the EU (71.5% were from the UK and 16.4% from the rest of the world).

The “rest of the EU” share of workers is substantially higher than across the economy as a whole. ONS estimates for the fourth quarter of 2015 suggest that 6.5% of all UK workers were from the rest of the EU, 89.8% from the UK and 3.7% from the rest of the world.

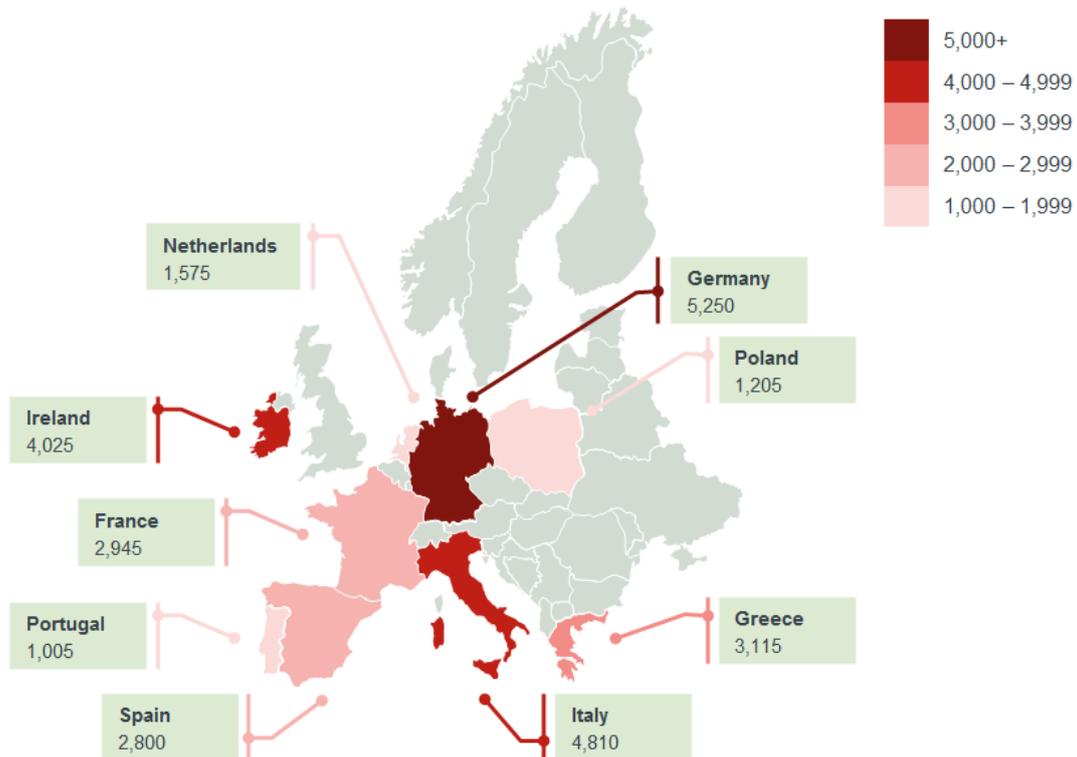


If it becomes harder for UK HEIs to recruit from the EU, this may have a significant impact on the subjects that support the UK’s industrial strategy ambitions

The HEI figures indicate that in 2014-15 there were around 31,400 FTEs from the rest of the EU amongst a total academic workforce of 195,440. Germany, Ireland, Italy and Greece were the most common home countries for these academics, and EU academic staff were particularly concentrated in sciences, humanities, engineering and social sciences.

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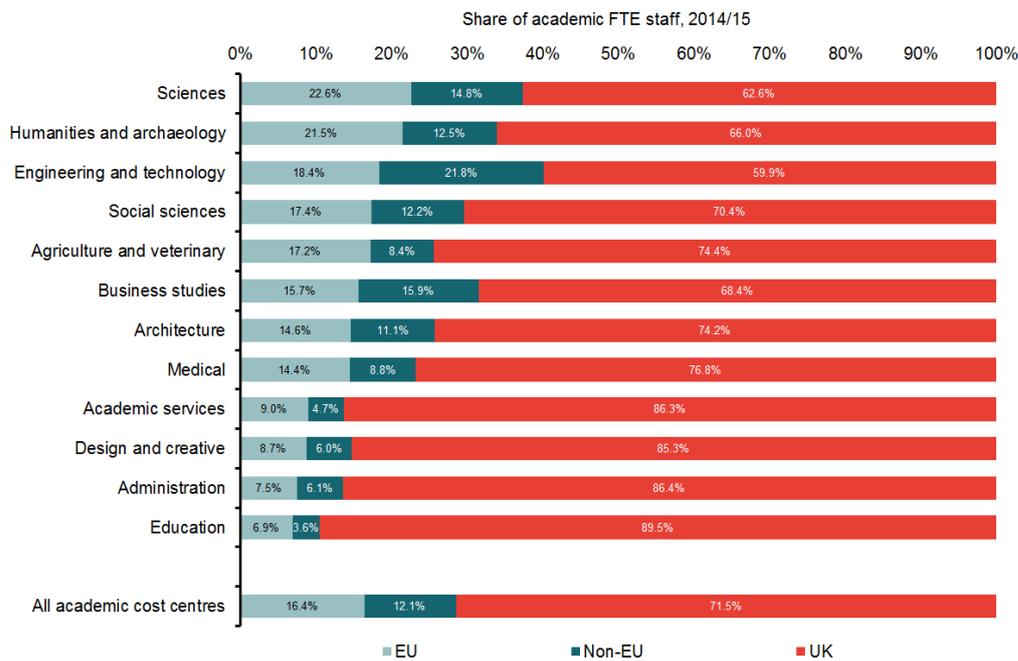
Figure 6: Nationalities of EU academics working in the UK, 2014-15



Source: HESA, Frontier analysis.

Note: chart shows all countries with 1,000 or more FTE academics in the UK

Figure 7: Breakdown of academic staff by discipline and origin, 2014-15



Source: HESA, Frontier analysis.

SO, WHAT NEXT?

The UK’s international reputation for a strong science base, focused on its academic institutions, is a powerful draw for many research-heavy businesses. Brexit poses a threat both in terms of the quality and quantity of research done in Britain if leaving the EU means that UK academics struggle to access funding or form collaborations with European researchers. The country’s strong reputation has also been a draw for EU academics to come and live and work in the UK.

The UK government has responded, both with reassurances about funding won before Brexit and promising that additional research funding will be made available in the next few years – though the longer-term picture is much less clear, and much is left to be resolved about the workforce both for academia and the wider economy. These will be critical areas to address early in Brexit negotiations. Scientific research is often a long-term process and decisions made now will have significant future repercussions.

In terms of funding, even if the UK government does step in to replace any EU funds that are lost, there will be winners and losers in terms of subject area and institutions. It is right and proper that the UK and EU will have different priorities for research based on different needs and different relative strengths. But these priorities need to be acknowledged and based on clear evidence about UK needs and strengths, rather than an unhappy and unintentional consequence of Brexit.



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