



Department for
Business, Energy
& Industrial Strategy

INTERNATIONAL COMPARISON OF THE UK RESEARCH BASE, 2019

Accompanying note



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Introduction

This note summarises key findings from the ‘International comparison of the UK research base’ statistical release, with a focus on the UK.¹ The release compares the UK’s research output with those from a range of countries.

The release includes all G7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States), as well as Brazil, China, India, Russia, and South Korea. The EU 27, the OECD, and the world are included as benchmarks.² These countries will be referred to as ‘comparators’ throughout this note. While the group is by no means comprehensive, it does help identify key global trends.

The data has been drawn from Scopus, an abstract and citation database provided by Elsevier. Scopus data has been previously analysed in reports published by the department for Business, Energy and Industrial Strategy.³ The database covers multi-lingual and global peer-reviewed literature, published in journals, book series and conference proceedings.⁴

The Scopus database is live and updated monthly. Certain indicators, especially those linked to citations, may therefore retrospectively change and the values within this release may differ to values published in any future releases.

¹ <https://www.gov.uk/government/publications/international-comparison-of-the-uk-research-base-2019>

² EU 27 entry represents all current European Union countries apart from the UK.

³ The most recent of which was published in 2017 and can be found here:

<https://www.gov.uk/government/publications/performance-of-the-uk-research-base-international-comparison-2016>

⁴ The database is drawn from approximately 5,000 publishers and 70 million core records. For further information, see: <https://www.elsevier.com/solutions/scopus/how-scopus-works/content>

Citation impact

The UK's **field-weighted citation impact** has ranked

1st

in the **G7** every year since **2007**.

In 2018 the UK's field-weighted citation impact (FWCI), an established measure of research impact, was highest in the G7 and higher than all other comparator countries.⁵ This has remained the case since 2007, when the UK initially overtook the US to become the highest ranked comparator. With a value of 1.56 in 2018 the UK's FWCI remains over 50% higher than the world average and 30% higher than the EU 27 average. Figure 1 shows that the UK's FWCI fell slightly by one per cent between 2014 and 2018.⁶ This compares with larger falls in other developed countries; the US and OECD average both registered a five per cent decrease over the same period. The gap between the UK and both the US and OECD has therefore slightly increased, with the UK's FWCI now a third higher than the OECD average and 11% higher than that of the US.

This has taken place against the backdrop of a particularly large increase in China's FWCI. Figure 1 highlights the extent of China's growth, with an increase of 24% over the five years from 2014 to 2018. Despite this growth, China's FWCI remains over ten per cent below the OECD and EU 27 averages.

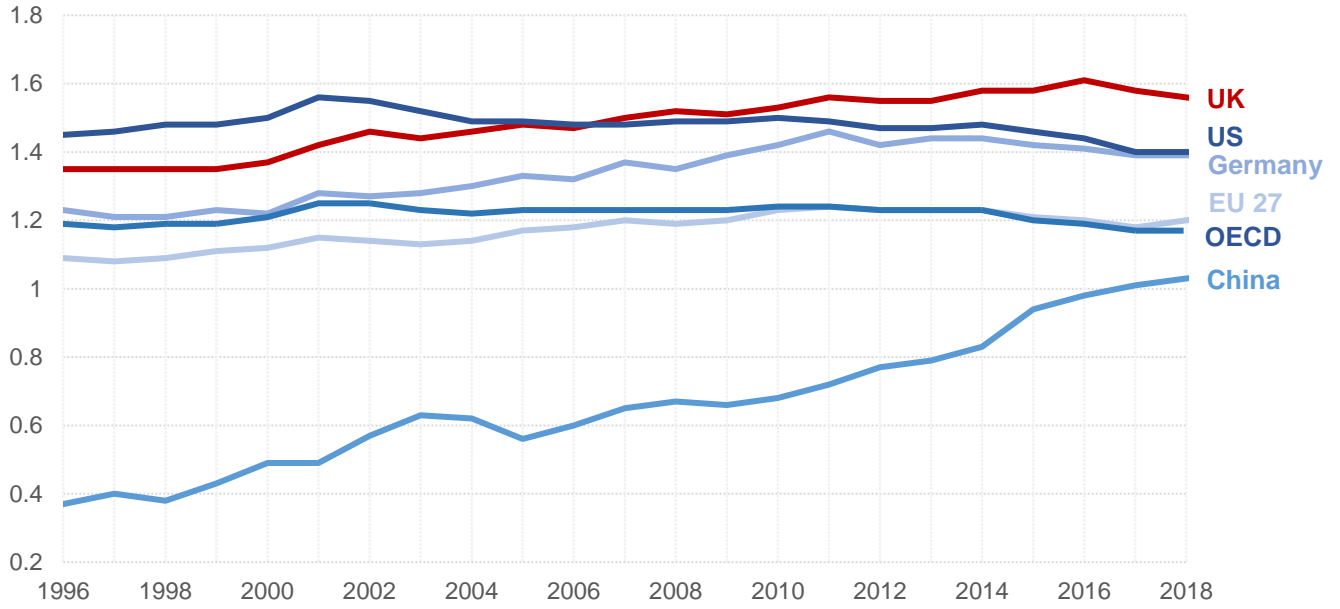
⁵ Field-weighted citation impact is a measure of how much impact a set of publications have had. It compares the actual number of citations received by publications with the average number of citations a publication published in the same year, discipline, and format (book, article, review, conference paper) receives. A value of 1.0 represents the world average. The overall FWCI for a set of publications, in this case all of the UK's 2018 publications, is therefore the average of the FWCI for each specific UK publication; For a comprehensive explanation of all technical terms within this note see the Glossary tab within the statistical release:

<https://www.gov.uk/government/publications/international-comparison-of-the-uk-research-base-2019>

⁶ For ease of comparison all graphs contain a select group of countries. Please see the statistical release for the full dataset.

Leadership from UK, strong growth from China

Figure 1: Field-weighted citation impact



Source: Scopus

Publication shares

In 2018 the UK produced:



Share of the world's publications

In 2018 the UK published 212,876 publications, an 11% increase on the 191,626 produced in 2014.⁷ This was the third highest number of publications among comparator countries, behind China (606,219) and the US (686,263). The US, China and the UK have been the three largest producers of publications each year since 2004, when China overtook Japan. In 2018, the US produced 22%, China 19%, and the UK 7% of the world's publications. Over the past five years the UK has maintained its seven per cent share of all global publications despite the significant increase in output from China. China's share of world publications has increased from three per cent in 1998 to 19% in 2018.

Share of the world's most highly-cited publications

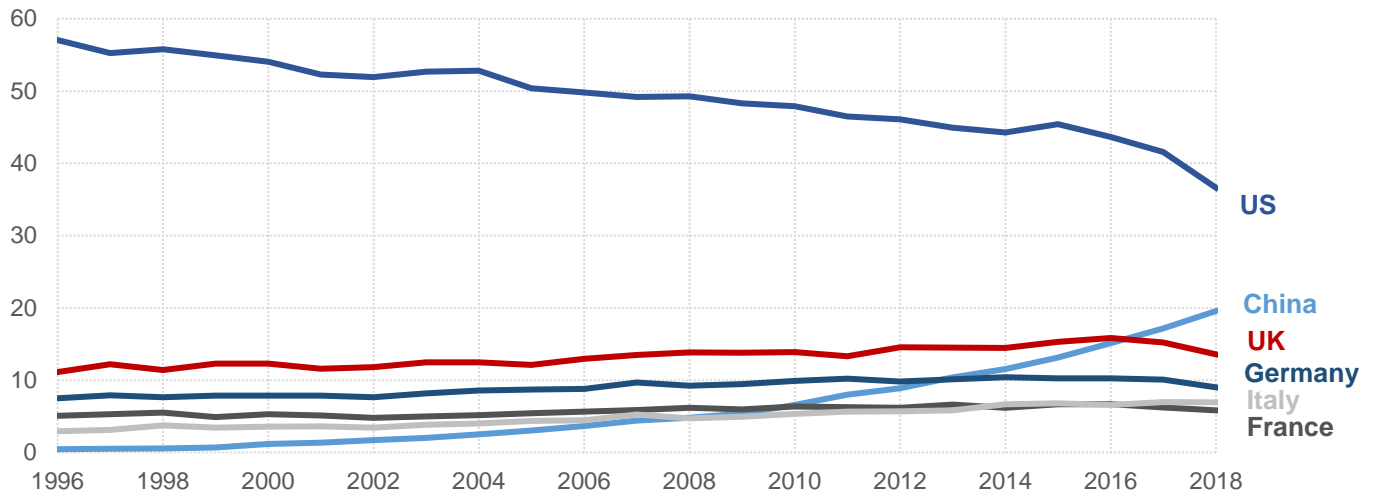
Figure 2 shows that the three countries with the largest shares of the world's most highly-cited publications are the US (37%), China (20%), and the UK (14%).⁸ In 2017 China overtook the UK and now has the second largest share among comparators of the world's most highly-cited publications. The UK's 14% share is double its overall article share and remains the same as in 2014.

⁷ Articles, reviews, conference papers, and books are all classed as publications.

⁸ Highly-cited publications in this release are classed as those in the top-cited 1% of all publications. Data has been field-weighted to account for differences in citation accrual over time (older publications have more time to be cited than recent publications), as well as differences in citation rates across disciplines and types of document.

UK 'punches above its weight' but has been overtaken by China

Figure 2: Share of the world's most highly-cited publications. %



Source: Scopus

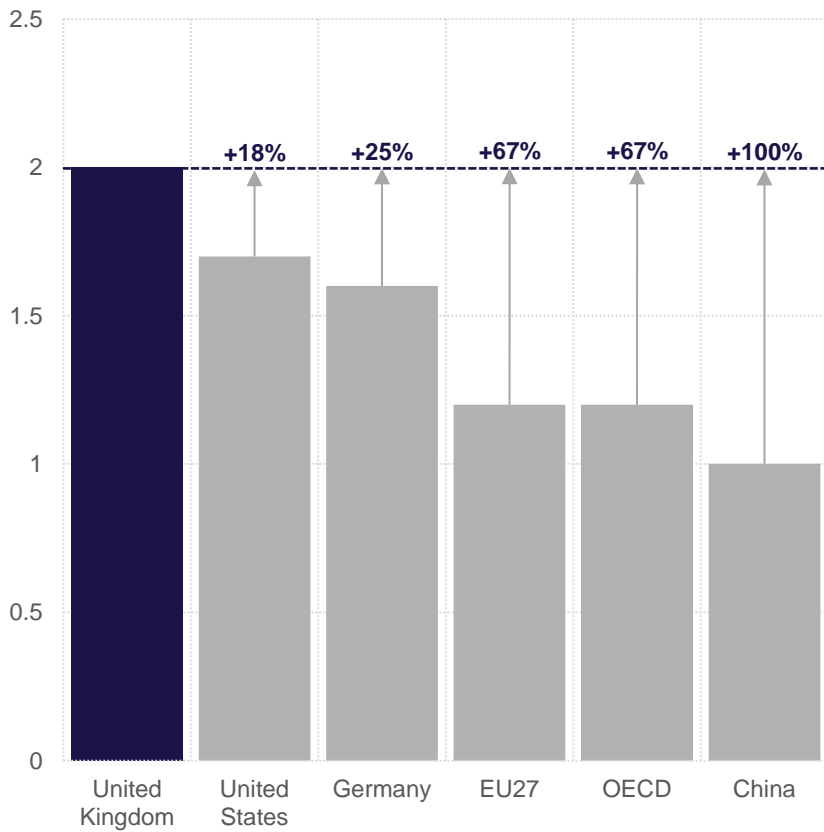
Share of own research among the world's most highly-cited publications

The US and China both have large shares of the world's highly-cited publications partly because they produce significantly more publications overall than other countries. Figure 3 adjusts for this size effect and shows the proportion of a comparator's own research that is among the world's most highly-cited. In 2018, the UK had 2% of its publications among the most highly-cited in the world. This was double China's share (1%), over two thirds higher than both the EU and OECD's 1.2% shares, and a quarter higher than Germany's 1.6%. Since 2010, the UK has had a larger proportion of its research among the most widely cited in the world than any other comparator.

UK publications more likely to be highly-cited

Figure 3: Share of own research among the world's most highly-cited publications. 2018. %

% increase required for comparator to equal UK shown in **blue**



Source: Scopus

International collaboration

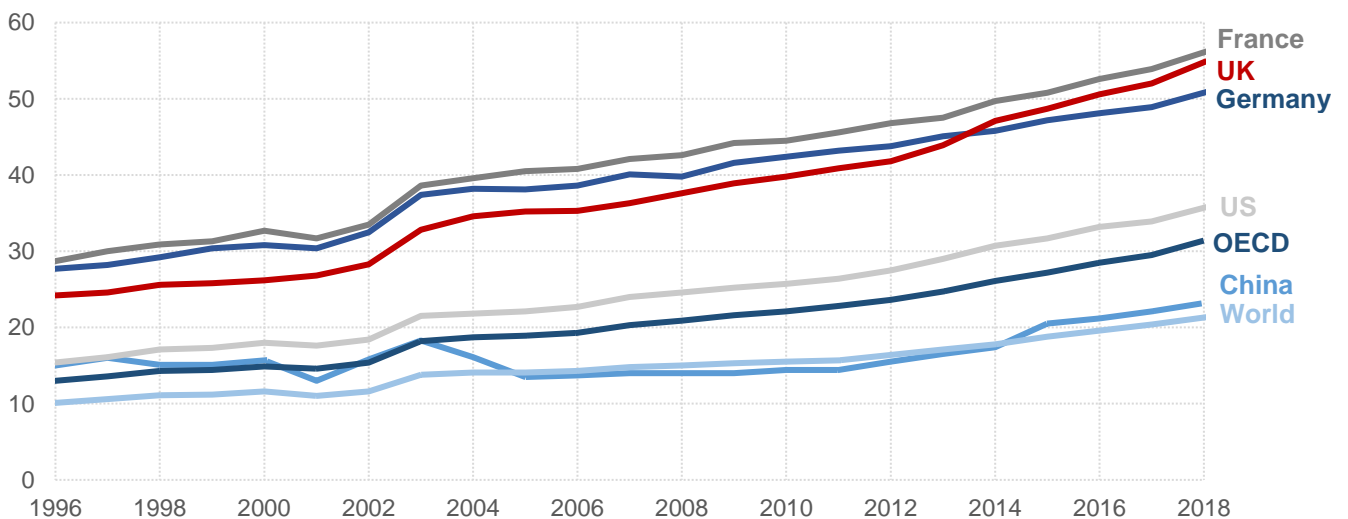
55%

of UK publications were the result of **international collaboration** in **2018**, compared with **26%** in **1998**.

Figure 4 shows that countries across the world have seen the proportion of their publications which resulted from international collaboration rise over the past two decades.⁹ In 2018, 21% of the world’s publications were internationally co-authored, compared with 11% in 1998. Since 2016, the UK has seen over half its publications result from international collaboration each year. In 2018, 55% of UK publications were the result of international collaboration. This makes the UK the second most internationally collaborative country in the G7, second to France (56%) and significantly higher than the OECD average (31%).

Rising international collaboration

Figure 4: Share of publications which resulted from international collaboration. %



Source: Scopus

⁹ For a publication to have resulted from international collaboration it must have been co-authored by at least two researchers affiliated to institutions in different countries.

This publication is available from: <https://www.gov.uk/government/publications/international-comparison-of-the-uk-research-base-2019>

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