

# Measuring R&D – a case study

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# Why this case study

In 2022, the United Kingdom Office for National Statistics changed the methods it uses to produce estimates of R&D spending which led to a substantial increase in the figures.

For example, the estimate for R&D spending in 2019 increased from **£38.5 billion** using the old method to **£59.7 billion under the new method**.

The UK government has said this equates to R&D spending around **2.9% to 3%** of GDP.

3% is the average for high income nations.

Before the change, UK spending on R&D was around **1.7%** of GDP. This was something of an anomaly as on other measures (such as % share of research publications), the UK outperforms its peer group.

Sources: House of Commons Library - 11 September 2023:

<https://researchbriefings.files.parliament.uk/documents/SN04223/SN04223.pdf>

UK Department for Business, Energy and Industrial Strategy -

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1078073/international-comparison-uk-research-base-2022-accompanying-note.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1078073/international-comparison-uk-research-base-2022-accompanying-note.pdf)

# Reasons why the change matters

- It affects a UK government target of R&D to reach 2.4% of GDP. In short: the target has now been achieved without any new funding required.
- There are implications for R&D measurement methodology (as a field of research)

# Why did the change happen?

ONS and HMRC compared their respective estimates of R&D.

Their findings revealed **undercounting of R&D by SMEs**

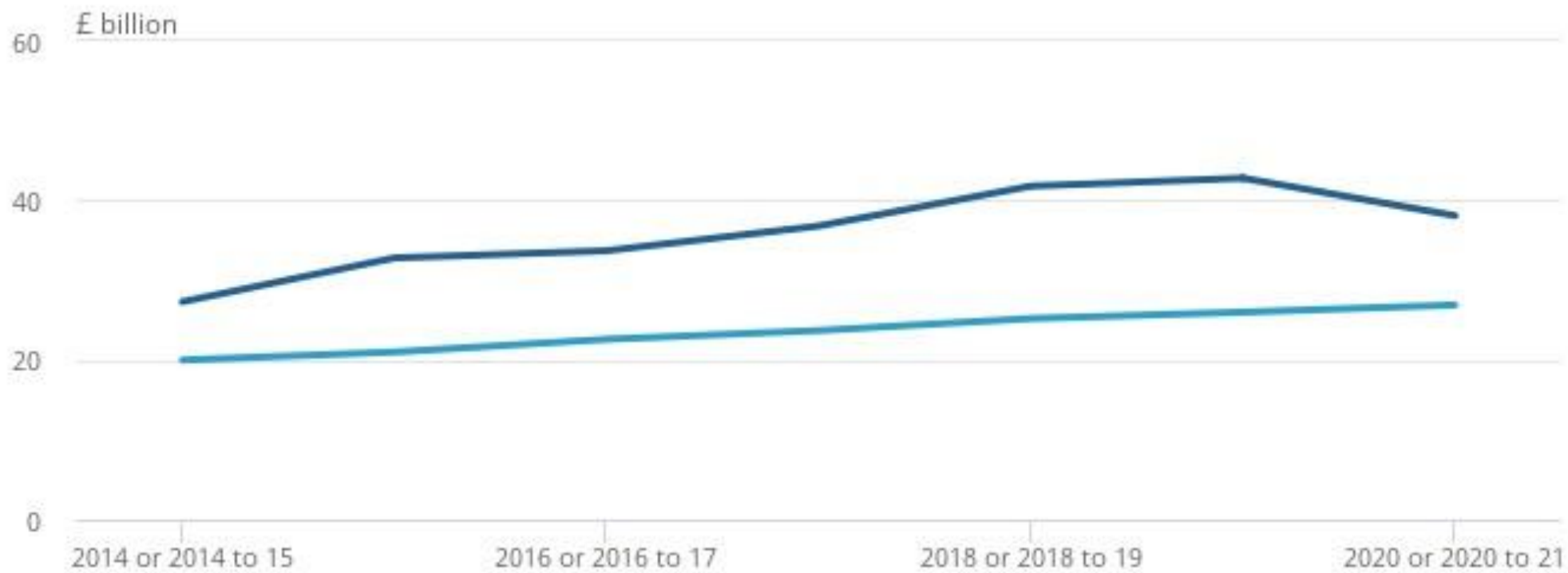
Early findings were published 29 September 2022.

This prompted ONS to change R&D statistics published 22 November 2022.

# How did ONS explain the difference

- ONS measures Business Expenditure on R&D (BERD) is based on regular business surveys
- HMRC measures business R&D using data from R&D tax credit claims
- The next slide shows how the two sets of numbers are different
- They are not expected to align – but should be closer
- ONS recalculated BERD based on additional sources for the numbers of businesses doing R&D
- ONS says that “HMRC R&D Tax credit data was not used in the calculation of our uplift factors”.

Source: ‘Comparison of ONS business enterprise research and development statistics with HMRC research and development tax credit statistics’ – ONS – 29 September 2022.



— Total expenditure used to claim tax credits (HMRC) - financial years

— Total R&D expenditure (BERD) - calendar years

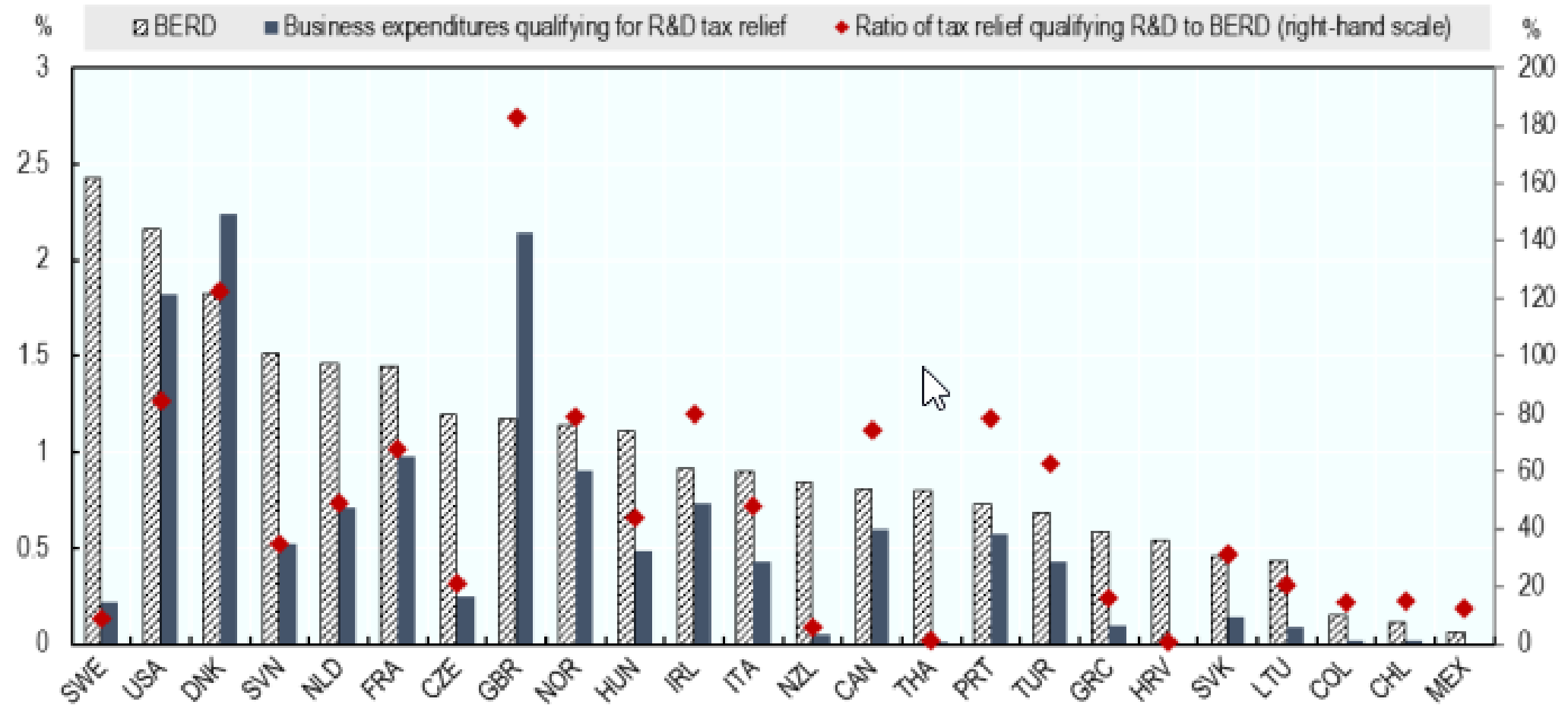
# How do other countries calculate business R&D?

The next slide is a chart from the OECD which compares BERD (calculated from surveys) with R&D tax credit data for selected member states.

If you look at the UK (**GBR in the table**), it is something of an outlier.

Figure 1. Business expenditures qualifying for R&D tax relief compared to BERD, 2019

As percentage of GDP (left-hand scale); ratio of tax relief qualifying R&D to BERD (right-hand scale)



Note: This chart provides a comparison of two conceptually and empirically distinct indicators.

Source: Report on the OECD R&D Tax Incentives Database (2021 edition, December 2021; updated February 2022) <https://www.oecd.org/sti/rd-tax-stats-database.pdf> ; <http://oe.cd/rntax>



# Why does the UK appear to be an outlier?

The House of Lords Economic Affairs Committee investigated R&D tax relief and expenditure credit. They published *Research and development tax relief and expenditure credit* on 31 January 2023.

The next slide is a table from this report showing the extent to which businesses are succeeding at obtaining R&D relief from government.

# Trends in businesses qualifying for R&D tax credits

Year	Qualifying R&D expenditure (£b)	R&D relief (£b)
2014/15	27.3	3.02
2020/21	38.1	6.59
2027/28*	60	9.5

\*forecast

Source: 'Research and development tax relief and expenditure credit' – House of Lords - 31 January 2023

# The HMRC is concerned at the levels of error and fraud

The agency has updated its guidance to businesses in a document called 'HMRC's approach to Research and Development tax reliefs' published 17 July 2023

# R&D expenditure, error and fraud 2020 to 2021

	Expenditure £b	Error & Fraud £b	Error & Fraud % of expenditure
SME scheme	4.25	1.04 (303m previous estimate)	24.4%
RDEC	2.5	0.09 (33m)	3.6%
Combined	6.75	1.13 (336m)	16.7%

# What does OECD say?

The OECD issued rapid guidance to member states shortly after the UK change. This is what the agency says:

“Revised R&D data for the United Kingdom has been flagged by the OECD as provisional (flag ‘P’) pending the completion of the ONS R&D statistical transformation programme. Data breaks (flag ‘B’) have been identified at relevant points.”

“The definition of R&D used in surveys by OECD countries and those included in OECD R&D statistics is consistent with the OECD ‘Frascati’ definition.”

“With that proviso, the official R&D survey-based estimate of BERD is under normal circumstances the preferred indicator for international comparisons of the R&D expenditures.”

Source: OECD Main Science and Technology Indicators for March 2023 and ‘What drives revisions to business R&D statistics in OECD countries and how does the OECD deal with them’ – 8 December 2022 – OECD Working Party of National Experts on Science and Technology Indicators.

# Some questions for the **Lievesley Review**

- Could the ONS have done anything more before publishing its recalculated figures?
- When a change to a number is so large, should there be a role for pre-publication independent peer review?
- Should the ONS have liaised with the OECD/its working group on R&D indicators; or with the United Nations Statistics Division before publishing its change.
- What should be the role of the regulator in such a situation?
- Methodological transparency, consistency and data quality are all important principles in official statistics – not least for public trust. Were these followed?

**Thank you!**

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