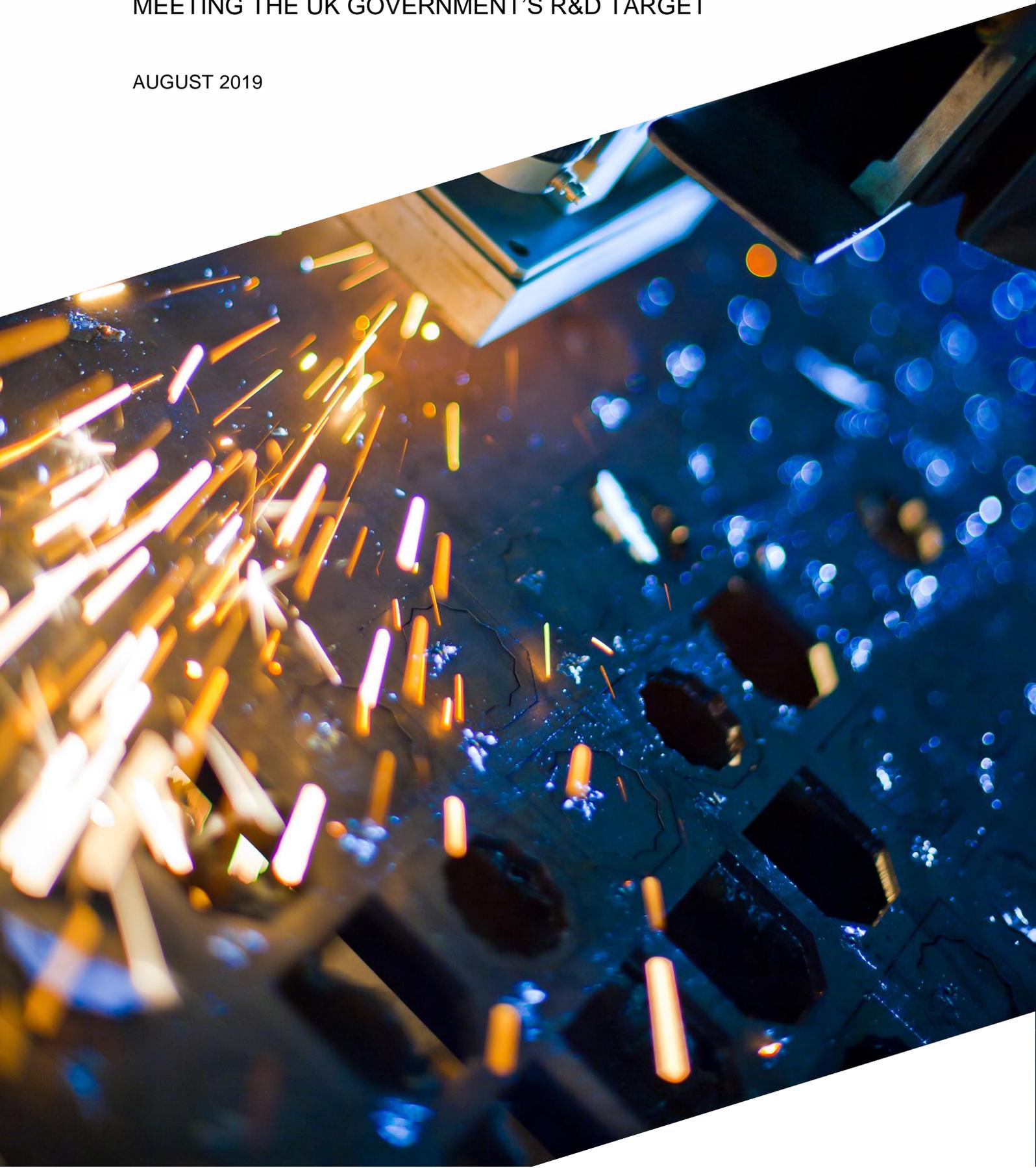


# UNTAPPED INVESTMENT

THE IMPORTANCE OF THE UK'S R&D TAX INCENTIVE REGIME IN MEETING THE UK GOVERNMENT'S R&D TARGET

AUGUST 2019



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# Executive summary

Since the global financial crisis, the UK has experienced a sustained stagnation in productivity growth, lagging behind the majority of its G7 counterparts. Growth in productivity is vital to an economy as it leads to more sustainable growth, better living standards and increased global competitiveness.

Business investment is a key enabler of productivity growth. But, as shown in the CBI's *Catching the Peloton* report, the UK has sat at the bottom of the G7 league table for business investment since 2001. This weakness in business investment is limiting the UK's ability to reach productivity growth rates observed prior to the financial crisis.

The uncertainty surrounding Brexit is a clear near-term constraint impacting business investment decisions. But as shown in the *Catching the Peloton* report, the UK likely faces a number of structural barriers to investment in addition to Brexit. Further examination of what both government and business can do to increase business investment is therefore critical.

At the 2018 Autumn Budget, the last government took some important steps in addressing these challenges by introducing the Structures and Buildings Allowance and temporarily increasing the Annual Investment Allowance. While these are two significant policies for helping to boost business investment, alone they are not the solution. The government needs to also consider other areas where business investment could be better incentivised.

One area with huge potential, and the focus of this report, is research and development (R&D). As an enabler of productivity growth, investment in R&D brings with it enormous benefits to the economy both now and in the future. The last government recognised this by committing to a target for R&D spending to reach 2.4% of GDP by 2027 and 3% in the long-term. But it also must acknowledge that at the current pace of R&D investment, the UK is estimated to miss this target by £19 billion, and risks missing out on the enormous benefits R&D can realise.

The path to achieving this target involves turbo charging both public and private sector R&D investment. For this to happen, it is important that the new government uses upcoming fiscal events to send a strong signal that the UK is committed to reaching the target and becoming a world leader in innovation.

Providing further government funding is one part of the puzzle, and business will be looking to the government at the next spending review to ensure the target is reflected in departmental settlements. But there is also a role for government to play in shaping the tax incentive environment and ensuring businesses, both domestic and from across the globe, choose to locate their R&D investment in the UK.

There are many policy levers at the government's disposal but one that is often cited as being particularly effective in stimulating business R&D investment is the R&D tax credit. Its simplicity and ease of use makes it a popular policy with the business community and evidence shows that £ for £ it drives more investment by business than it costs the government.

However, the R&D landscape is changing, bringing with it new challenges for both business and government in achieving the 2.4% target. Businesses are changing the way they conduct R&D, from an increasing use of data and analytics, to outsourcing R&D activity to specialists. And to do this they require certain skills. At the same time, R&D

investment typically involves significant up-front capital costs that can deter investment in R&D from taking place.

All four of these areas are critical to the innovation ecosystem and in establishing the UK as a centre for excellence for innovation. Capital investment in R&D facilities and equipment help to anchor R&D investment. Data and analytics are increasingly playing a significant role in R&D. Outsourcing is an efficient way for business to access other markets by spreading the cost over multiple businesses. And finally, upskilling and retraining is crucial in tackling the skills shortage in the UK.

At the same time, governments around the world are refining their own R&D tax incentive regimes. To remain internationally competitive, it is therefore critical for the UK's R&D tax credit to keep pace with these modern practices and to policy changes elsewhere. This will guarantee it is the UK that secures private sector R&D investment and its associated benefits.

### **The CBI's recommendations**

1. The government should widen the scope of eligibility for the R&D tax credit to ensure it keeps pace with modern R&D practices. The scope should be broadened to include the following:
  - Capital expenditure,
  - Data-driven innovation,
  - Outsourced R&D activities that do not currently qualify, and
  - Upskilling and retraining of staff.
2. The government should review the availability of data on R&D expenditure to ensure the effectiveness of the R&D tax credit continues to be monitored appropriately.
3. The government should ensure the R&D tax credit is internationally recognised as world-class by regularly benchmarking the UK's regime against international peers.

# The UK's R&D landscape

*The UK's R&D tax incentive regime has a critical role to play in unlocking the significant untapped potential of increased investment in R&D by the private sector.*

## R&D is a key driver of productivity growth

Since the global financial crisis, the UK has experienced a sustained stagnation in productivity growth. Despite seeing the second-fastest average growth rate in productivity (measured as output per hour) in the G7 from 1995-2007, the UK has subsequently seen a material slowdown in productivity growth. Average growth in productivity from 2010-2016 was less than a third of the pre-crisis rate (0.6% compared to 2.1%), placing the UK second-to-last in the G7 table.<sup>1</sup> Output per hour in Q1 2019 was 18.8% lower than it would have been if it had continued to grow at the pre-crisis (1997-2007) rate.<sup>2</sup>

Growth in productivity is vital as it leads to more sustainable growth, increased living standards, and greater global competitiveness. Meanwhile, weak productivity growth, as observed in the UK since the financial crisis, limits the ability for inputs such as labour and investment to drive economic output.

## Business investment and its relationship with productivity growth

One of the most cited factors behind the recent weakness in UK productivity growth has been a lack of business investment compared to the rest of the G7. Business investment is a key enabler of future productivity growth. But, as shown by the CBI's Catching the Peloton report<sup>3</sup>, the UK underperforms relative to its international peers. The UK has been at the bottom of the G7 league table for business investment as a percentage of GDP since 2001.<sup>4</sup>

Investment in R&D is a key component of overall business investment and productivity growth. It is well documented in the economic literature that R&D investment increases the technological potential of an economy.<sup>5</sup> The CBI's Unlocking Regional Growth report found that companies who plan to invest in R&D are significantly more productive than firms that did not, and firms that spent a greater share of their turnover on software development similarly experienced productivity gains.<sup>6</sup>

Productivity matters for business because it determines how much they can pay their staff, how quickly they can grow and what they can invest in. This means that productivity growth is not only key to long-term growth but is also needed to drive sustainable increases in pay and better opportunities for everyone in society. By boosting innovation and productivity, R&D is therefore a key driver of economic growth and long-term prosperity.

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<sup>1</sup> ONS (April 2018), International comparisons of UK productivity

<sup>2</sup> ONS (July 2019), Labour productivity, UK: January to March 2019

<sup>3</sup> CBI (July 2019), Catching the Peloton

<sup>4</sup> CBI calculations based on Oxford Economics Global Model

<sup>5</sup> Bayarcelik, Ebru & Taşel, Fulya. (2012), Research and Development: Source of Economic Growth. Procedia - Social and Behavioral Sciences. 58. 744–753.

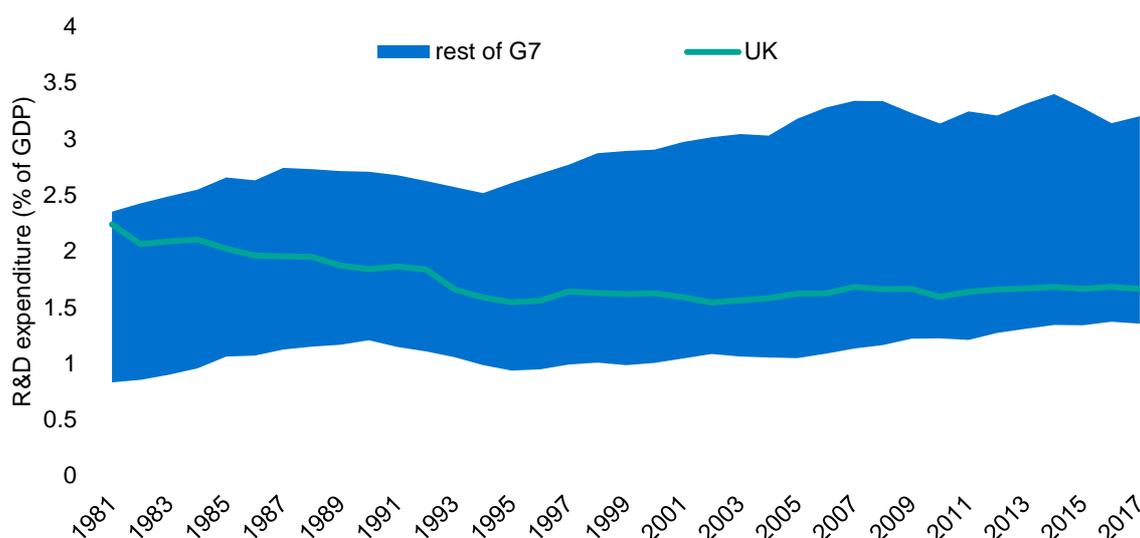
<sup>6</sup> CBI (2017), Unlocking Regional Growth

## The UK should exploit its untapped R&D investment potential

The UK is already renowned for its excellence in R&D. Through its first-rate universities and businesses, and with talent from across the globe, the CBI's Ostrich to Magpie report shows the UK is already in a good place to deliver a world-class innovation ecosystem.<sup>7</sup>

However, investment in R&D is also an area of untapped potential. As shown by Exhibit 1, investment in R&D in the UK has stagnated at around 1.7% of GDP for the past 30 years and is significantly below the G7 average of 2.4% of GDP.<sup>8</sup>

**Exhibit 1: R&D investment as a % of GDP**



Source: OECD (2019), *Research and Development Statistics, Gross domestic expenditure on R&D by sector of performance and source of funds* (Accessed on 23 July 2019)

The last government recognised the importance of R&D in addressing the UK's productivity challenge. Committing to a target for R&D investment to reach 2.4% of GDP by 2027 and 3% in the long term will help to ensure the UK can realise the enormous benefits of R&D.

However, at the current pace of R&D investment, the UK is estimated to miss the target by £19 billion in 2027 in nominal terms, with R&D as a % of GDP only expected to marginally increase above the current 1.7% of GDP.<sup>9</sup> This emphasises the critical need for policy action to turbo charge R&D investment and ensure the UK does not miss out on the enormous economic benefits of R&D investment. This will demonstrate the government's willingness to reach this ambitious target by sending a strong signal globally.

But action is not only needed by the government, business also has a significant role to play. Achieving this target will require action by both the private and the public sectors, both of which are currently lagging international peers. As shown in Exhibit 2, public R&D

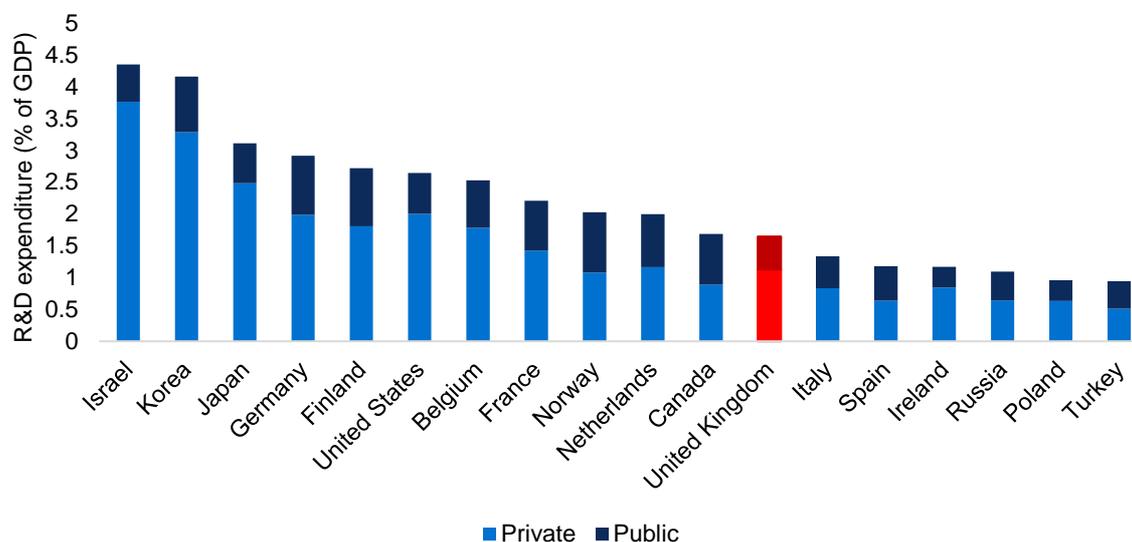
<sup>7</sup> CBI (2017), *From Ostrich to Magpie*

<sup>8</sup> OECD (2019), *Research and Development Statistics, Gross domestic expenditure on R&D by sector of performance and source of funds* (Accessed on 23 July 2019)

<sup>9</sup> Based on CBI analysis, which includes spending announcements already pledged up to 2021/22 and public spending up to 2027 is assumed to be maintained as a % of GDP. Business investment in R&D is assumed to increase in line with nominal GDP (as per the OBR's forecast) and is assumed to increase further as a result of public spending using a multiplier on induced private sector investment to public spending. The shortfall is then calculated based on the gap between the level of R&D investment at 2.4% and that under the current plans.

in the UK is currently 0.5% of GDP compared to the G7 average of 0.7%, and a similar story is true for private sector R&D, with figures of 1.1% of and 1.6% of GDP respectively.<sup>10</sup>

## Exhibit 2: Private and public R&D, 2016<sup>11</sup>



Source: CBI analysis based on OECD (2019) Research and Development Statistics, Gross domestic expenditure on R&D by sector of performance and source of funds (Accessed on 24 July 2019)

## Reaching the 2.4% target will be challenging

The government has already taken some important steps to increase public spending on R&D through the creation of the National Productivity Investment Fund (NPIF), an important vehicle for delivering R&D funding in the UK. Since its announcement at the Autumn Statement 2016, the government has committed further funding for the NPIF, with over £7 billion of funding allocated for R&D in total.<sup>12</sup>

The economic literature finds that greater public R&D spending is correlated with greater private sector investment: a study by BEIS found that for every £1 of public sector funding, private sector investment increases by £1.36.<sup>13</sup> But as well as increasing its own R&D spending, the government also has a vital role to play in creating an environment that incentivises private sector investment in R&D.

When scaling up the pace of investment in R&D to meet the 2.4% target, there are three key challenges which government policy should seek to address:

- **R&D funding from overseas is falling.** While inward investment in UK R&D has been steadily growing in real terms since 2010, for the last three consecutive years it has been falling by an average of 5%.<sup>14</sup> This is the lowest level of inward R&D investment since 2006. The government has a role to play in ensuring the policy environment incentivises both British and foreign businesses to locate their R&D

<sup>10</sup> CBI analysis based on OECD (2019) Research and Development Statistics, Gross domestic expenditure on R&D by sector of performance and source of funds (Accessed on 24 July 2019)

<sup>11</sup> To note, for the purposes of this analysis, public expenditure includes government and higher education

<sup>12</sup> Autumn Statement 2016, Autumn Budget 2017 and 2018 documents

<sup>13</sup> Economic Insight (2015), What is the relationship between public and private investment in science, research and innovation?

<sup>14</sup> ONS (2019), Gross expenditure on Research and Development statistics, Table 4: Expenditure on R&D in the UK by sector of funding, constant prices

investment in the UK. The government's International Research and Innovation Strategy serves as a good communications tool for the promotion of the UK research and innovation offering to overseas audiences, but the next step is for the government to provide more detail and specificity on its plans.<sup>15</sup>

- **The changing nature of R&D.** A recent CBI and Nexus report explored how advances in data and analytics are changing the way firms approach research and innovation, with innovation becoming increasingly more data-driven.<sup>16</sup> However only a minority of businesses are leading the way on this type of innovation, with many grappling with how to use these modern practices. Many businesses do not understand the value of the data they hold and are unsure how to use it. As recommended in the CBI report, the UK needs to take action to harness the potential of new innovation trends, ensuring the policy landscape keeps pace.
- **Limited support for later stage development.** Almost 40% of R&D investment in the UK is early-stage R&D, compared to over 60% in Japan.<sup>17</sup> Through its world-leading universities and businesses, the UK has built up a well-renowned research base. Whilst this early stage R&D is vital, the value to the UK economy can be strengthened by the commercial exploitation of these discoveries through the creation of new jobs in sectors from manufacturing to professional services. However, there is currently limited support available for later stage development activity.

### **How to tackle the challenge**

To incentivise private sector spending on R&D, the government has various policy levers at its disposal. These include, but are not limited to, direct support via grants, buying R&D services, and providing tax incentives. It is important that the government has a range of different tools to incentivise and deliver investment in R&D because the choice of tool will have an impact on the type of R&D that is delivered. Direct spending provides the government with greater control over the type of R&D investment carried out, whereas tax incentives such as the R&D tax credit are market driven, with the market determining the most efficient outcome for R&D investment.

Previous CBI reports have looked at the public spending environment, and this report focuses on the other part of the puzzle: how the tax environment can help to incentivise investment in R&D by the private sector.

While the uncertainty surrounding Brexit is a clear near-term constraint to business investment, the overall tax landscape also plays a crucial role. A low, stable and predictable tax regime is of great importance to business investment decisions. The tax incentive environment, in particular, impacts long-term investment decisions such as R&D. R&D tax incentives must work alongside other levers, and the Government's own Industrial Strategy, to reach 2.4% of GDP by 2027.

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<sup>15</sup> Department for Business, Energy and Industrial Strategy (2019), International Research and Innovation Strategy

<sup>16</sup> CBI and Nexus – University of Leeds (2019), The changing nature of R&D

<sup>17</sup> OECD (2019), Research and Development Statistics, Gross domestic expenditure on R&D by sector of performance and type of R&D, OECD (Accessed on 5 August 2019)

# Making the case for R&D tax incentives

*Evidence demonstrates that the R&D tax credit is effective at delivering its objectives and is a popular policy with the business community. But, measurement of R&D investment could be improved to better inform future policymaking.*

## The R&D tax incentive regime in the UK

Investment in R&D results in knowledge spillovers which go beyond the direct benefit to the business or organisation undertaking the R&D.<sup>18</sup> That means that without incentivisation the market will demand less R&D than is socially optimal due to the significant up-front costs that financially constrain businesses. This is the founding economic principle behind government intervention in the market for R&D investment and the current set of R&D tax incentives in the UK.

Tax incentives represent a significant part of the UK government's support for private sector R&D investment, accounting for 61% of government support for business R&D in the UK in 2015.<sup>19</sup> The UK offers a suite of tax incentives for R&D investment including the R&D tax credit, Research and Development Allowances (RDAs) and the patent box. These three tax incentives incentivise different parts of the R&D process: the R&D tax credit is used to incentivise businesses undertaking R&D activity, RDAs are used to incentivise capital R&D investment and the patent box is used to incentivise the commercialisation of R&D.

The CBI's Catching the Peloton report examined the overall tax incentive environment for business investment in the UK, including the patent box and the R&D tax credit. Given the R&D tax credit is one of the most widely used tax incentives for R&D investment specifically, the remainder of this report will examine this specific policy in more detail.

It will consider the effectiveness of the R&D tax credit in its current form (for both SMEs and large businesses), how the UK R&D tax incentive regime fares internationally and where the UK's R&D tax credit could be improved to further incentivise investment in R&D by business to contribute towards the 2.4% target.

### The UK R&D tax credit

In the UK, R&D tax incentives either provide an extra corporation tax deduction or a repayable credit. This reduces the overall cost to a business of undertaking R&D, increasing the returns on that investment, thereby encouraging greater investment in R&D. The impact of this is that the overall expenditure on R&D should increase as the tax incentive increases the commercial viability of marginal projects.

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<sup>18</sup> Innovation depends on the exchange of ideas among individuals, known as knowledge spillovers. For example, a given company's innovation may stimulate related inventions and technical improvements by other companies.

<sup>19</sup> OECD (2019), R&D tax incentive database, R&D tax expenditure and direct government funding of BERD (Accessed 29 July 2019)

## The UK's R&D tax incentive regime

In the UK, R&D tax relief or credits are available via two government schemes:

- The Small or Medium-sized (SME) scheme; and
- Research and Development Expenditure Credits (RDEC).

R&D relief allows companies that carry out qualifying R&D related to their trade to claim an extra Corporation Tax deduction or repayable credit for certain qualifying expenditure. The level of relief available depends upon which scheme the company qualifies for.

The SME scheme was the first to be introduced in the UK in 2000. It was intended to support SME investment in R&D on the grounds that smaller firms find it harder to access the finance needed for R&D. The tax relief a company can get via the SME scheme is 230% on their qualifying costs. Loss-making companies can, in certain circumstances, surrender their losses in return for a payable R&D tax credit, worth up to 14.5% of the surrenderable loss (equating to 33.35% of the qualifying R&D spend).

The large company scheme was originally introduced in 2002 as a super-deduction scheme. Following consultation, the large company scheme was changed to a repayable credit (initially introduced from 2013). The RDEC scheme was introduced to support wider business investment in R&D and to support the international competitiveness of the UK's tax regime. The RDEC offers a taxable credit available at 12% of qualifying R&D expenditure. For loss-making companies, the credit is fully payable net of corporation tax (10% cash value). The credit is accounted for 'above the line' in operating profits (similar to a grant).

Our article [here](#) examines the benefits of claiming R&D tax relief, what expenditure qualifies for R&D tax relief and how claims can be made.

## Does the R&D tax credit meet its objective?

The effectiveness of R&D tax incentives in driving business investment in R&D is coming under increasing scrutiny as successive governments seek to balance the public finances whilst supporting economic growth. It is the right approach to continually assess the value for money of the tax incentive regime to ensure it is delivering on its stated objectives in the most efficient way.

It is clear from the evidence that the UK's R&D tax credit is delivering on its objectives. In 2016/17, the latest year for which data is available, R&D tax incentives cost the government £3.4 billion but £24.9 billion of R&D expenditure was realised, the equivalent of over 7 times the cost to the government.<sup>20</sup> A study by HMRC on the effectiveness of the R&D tax credit also found that between £1.53 and £2.35 of R&D expenditure is induced for each £1 of tax forgone.<sup>21</sup> Whilst this implies that there is a level of deadweight loss associated with R&D tax incentives, this level of induced spending is high compared to

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<sup>20</sup> HMRC (September 2018), Research and Development Tax Credit Statistics

<sup>21</sup> HMRC (2015), Evaluation of Research and Development Tax Credit, HMRC Working Paper 17

other types of government spending. The economic literature finds that fiscal multipliers generally lie between 0 and 1.<sup>22</sup>

Over the past 30 years, as R&D tax incentives have become more commonplace, there has been an increase in the number of economic studies estimating their effectiveness. A large proportion of those have found that R&D tax incentives do increase investment in R&D by business.<sup>23</sup>

One IMF study in 2019 used corporation tax filings in the UK to understand the impact of reforms that increased the generosity of the UK's R&D tax credit in 2008.<sup>24</sup> The results of this study added to the evidence base that R&D tax incentives have a strong positive effect on stimulating investment in R&D by business. The study found that on average R&D investment increased by 33% as a result of the increased generosity of the UK's R&D tax credit. They also found it to be cost-effective: for each £1 of foregone revenue, over £1 of investment in R&D is realised, slightly lower than the HMRC study.<sup>25</sup>

### **Which businesses are using the R&D tax credit?**

HMRC data also shows that the use of the UK's R&D tax incentive regime has been increasing over time. Almost 40,000 claims were made in 2016/17 compared to almost 11,000 in 2010/11, with 85% of claims in 2016/17 made via the SME scheme.<sup>26</sup> SMEs are increasingly making use of the regime with only 8,200 claims made by SMEs in 2010/11 compared to over 34,000 in 2016/17. The total value of claims made in 2016/17 through the SME scheme was £1.8 billion and £1.6 billion by large companies under the RDEC scheme. SMEs have claimed £0.2 billion through the RDEC scheme.<sup>27</sup> This highlights that the R&D tax credit is not only accessed by a handful of larger firms via RDEC.

As shown in Exhibit 3 there is also a strong correlation between the tax subsidy rate for SMEs and the level of overall business expenditure on R&D, since its introduction in 2000.<sup>28</sup> Whilst there are likely other factors at play supporting the growth of business investment in R&D, such as the wider macroeconomic environment or other changes to the UK's R&D ecosystem during this time, combining this with the studies mentioned above it is clear that there is a compelling case that R&D tax incentives in the UK are an important component of SME investment decisions. As there has been very little change to the subsidy rate for larger businesses via RDEC it is not possible to observe a correlation for these firms.

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<sup>22</sup> IMF (2014), Fiscal Multipliers: Size, Determinants, and use in Macroeconomic Projections, Fiscal Affairs Department

<sup>23</sup> Irem Guceri and Li Liu (2019), Effectiveness of fiscal incentives for R&D: Quasi-experimental evidence, American Economic Journal: Economic Policy, Vol. 11, no.1

<sup>24</sup> Ibid.

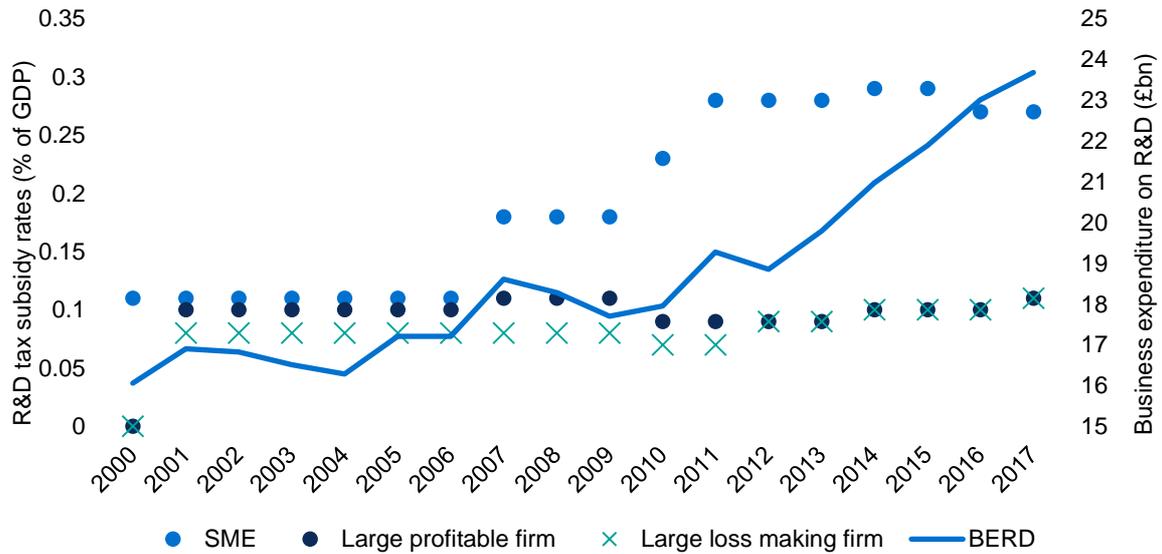
<sup>25</sup> Ibid.

<sup>26</sup> HMRC (September 2018), Research and Development Tax Credit Statistics

<sup>27</sup> HMRC (September 2018), Research and Development Tax Credit Statistics

<sup>28</sup> There are limited data points available for the tax subsidy rate.

**Exhibit 3: UK implied R&D tax subsidy rates and business expenditure on R&D**



Source: OECD (2019), R&D tax incentive database, Implied tax subsidy rates on R&D expenditures (Accessed 29 July 2019) and ONS (November 2018), Business Expenditure on Research and Development statistics

Another criticism often directed at the R&D tax incentive regime is that claims are concentrated in sectors that already do a high level of R&D and are based in London and the South East. However, evidence shows that the regime is used by a wide range of sectors and regions of the UK economy. According to HMRC, manufacturing (25%), IT and professional (26%), and scientific and technical services (19%) together make up over 70% of claims, and companies in the East of England make the highest number of claims, accounting for 20% of all claims.<sup>29</sup> However, it is difficult to ascertain the exact location and industry of the R&D activity from these figures as the industry classification and region is based on the registered company. Therefore, caution must be taken when interpreting these numbers.

**Measurement of business R&D investment is inconsistent creating difficulties for policy evaluation**

There are significant differences in the measurement of business R&D expenditure between different sources. CBI analysis finds that due to definitional differences the value that businesses themselves believe they spend on R&D and the value of expenditure recorded by HMRC through tax incentives differ significantly, and again these values vary substantially from ONS data on Business Expenditure on Research & Development (BERD).

For example, one business estimated that their ‘real’ R&D investment was around ten times the value on which they based their RDEC claims, whereas the amount declared for the purposes of the ONS survey was only around one-tenth of the value on which they based their RDEC claim.

<sup>29</sup> HMRC (September 2018), Research and Development Tax Credit Statistics

## Differences in how business R&D is measured

There are two official sources for measuring R&D investment by business, in addition to R&D investment recorded directly by the business themselves:

1. **ONS Business Expenditure on Research and Development.** This is based on the Frascati Manual, an internationally recognised standard for measuring R&D. To be classified as R&D, the expenditure must meet five tests (novel, creative, uncertain, systemic and transferable). Data is collected via a survey which covers estimates from UK businesses that are known to carry out R&D.
2. **HMRC R&D expenditure used to claim R&D tax credits.** According to HMRC's guidance, to qualify for the R&D tax credit, the expenditure must be part of a specific project to make an advance in science or technology.
3. **Business measure of R&D expenditure:** Internal business measurements of actual R&D undertaken will be better adapted to what constitutes R&D in the particular sector in which they operate. They tend to far exceed both HMRC's R&D expenditure estimates and the ONS BERD.

These three sources provide very different estimates of business R&D investment. There are a few potential reasons for the differences:

- **Different definitions of R&D:** It can be difficult to interpret what is included within the definition of R&D. Both the ONS and HMRC definitions can be difficult to apply to different sectors and are not well adapted to the new economy.
- **Qualifying expenditure:** The HMRC dataset only measures qualifying expenditure, and therefore does not capture R&D expenditure that does not qualify for the R&D tax credit. The ONS dataset is more likely to capture this.
- **Different sample of businesses:** The ONS dataset is constructed from 10% of the firms they believe carry out R&D and then scaled up, whereas the HMRC dataset will include only the firms that claim the R&D tax credit.
- **Overseas R&D:** Overseas expenditure is not included in the ONS measure but may qualify for tax relief.
- **Different treatment of higher education and private non-profit:** The HMRC dataset will also include some R&D expenditure by higher education institutions and charities if a business has collaborated and made a payment to them. The ONS, on the other hand, records this expenditure separately from BERD. Expenditure by higher education institutions and the private non-profit sector is captured by the higher education expenditure on R&D and private non-profit R&D datasets.
- **Outsourced R&D:** The ONS collects data on "extramural R&D", which is defined as R&D conducted outside the business, in the UK and overseas, but is funded by the business. This is not included in the BERD dataset but will be captured by HMRC's dataset.
- **Different accounting periods:** The HMRC dataset is based on the financial year accruals concept whereas the ONS dataset is based on actual cash flow spend during the calendar year.

The relationship between business expenditure on R&D as recorded by HMRC data and that of the ONS has changed over time. Most notably, in recent years the amount of R&D expenditure on which R&D tax credits have been successfully claimed has overtaken the ONS figures. Since 2010/11, expenditure used to claim R&D tax incentives has more than doubled, whereas BERD has only increased by over 40% since 2010.<sup>30</sup>

There is a combination of factors that are likely contributing towards this difference. As explained in more detail in the box above, the HMRC dataset captures R&D expenditure that the BERD dataset does not. The definition of R&D is stricter for the purposes of the BERD dataset and it will also not include overseas R&D or investment in R&D by the higher education and private non-profit sectors.

Official statistics are useful for understanding the effectiveness of government policy and informing future policy decisions, but inconsistencies across data sources can make this more challenging.

### **R&D tax incentives are popular with the business community, but there are areas where improvements could be made**

The R&D tax credit is a popular policy with the business community because it creates a tax incentive that provides real value to businesses that undertake qualifying R&D activities. Businesses continually cite its importance when they are deciding not only the level of R&D investment in the UK but also the jurisdiction in which to locate R&D investment.

In particular, businesses have highlighted the certainty of R&D tax incentives as a key element of their success. This is certainty in terms of the permanence of R&D tax incentives, ease of access in comparison to grants and other forms of R&D funding and certainty as to R&D activities and investments qualifying for support. These factors play a crucial role for business when considering undertaking long-term R&D investment decisions in the UK.

*“As a business, we are actively engaging with the R&D tax credit from an early stage of the R&D investment decision-making process.”*

#### **CBI member**

The availability of the R&D tax credit as a payable credit also enables the R&D tax incentive to be measurable for specific R&D projects. Businesses have highlighted that the R&D tax credit is a vital factor at an earlier stage of the investment decision-making process than it used to be. This is where tax incentives work at their best as they can positively impact the R&D decision-making process, particularly for marginal investment

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<sup>30</sup> To note, the HMRC dataset is recorded based on the financial year, whereas the ONS dataset is recorded based on the calendar year.

projects. This is a significant shift from tax incentives historically being considered at the backend of a project.

However, the administration of the R&D tax incentive regime is a key area of concern for the business community. For instance, businesses have been particularly disappointed with the delay from HMRC in settling R&D tax credit claims, with some claims taking up to 6 months to be processed. Delays in receiving payments can have cash flow implications and in some instances can disrupt the day-to-day running of some businesses – particularly SMEs. It is therefore important for HMRC to be sufficiently resourced to mitigate this impact to business.

In addition, HMRC guidance on qualifying R&D activities and investments can sometimes be insufficient. Businesses have highlighted that there is insufficient guidance around what qualifies as R&D in the digital and technology sectors, and the modern economy more generally. For example, a technology business generates most of its innovation by applying and adapting existing algorithms to new use cases, rather than creating a new algorithm. However, the rules are unclear as to what extent this activity would qualify for the R&D tax credit. R&D tax incentives and related HMRC guidance must continue to be updated to incorporate new ways of working and new R&D practices, keeping pace with the changing nature of R&D in the UK.

While effective administration is important for a well-functioning R&D tax incentive regime, this report will focus on the impact of the policy design in incentivising R&D investment by business. The CBI will be making recommendations on the administration of the R&D tax credit ahead of the Autumn Budget.

# Internationally competitive R&D

*Keeping pace with reform to R&D tax incentives around the world is critical to ensuring businesses choose to locate their R&D investment in the UK.*

## **The UK's R&D tax regime is world leading in many ways, but is less generous when only considering large businesses**

For the UK R&D tax regime to evolve and be at the forefront of innovation, there are a number of lessons to learn from our international competitors. As well as being an important part of the UK's tax regime for driving domestic business investment, it is vital that the R&D tax incentive regime is internationally competitive. Whilst tax is never the sole factor driving a businesses' decision about where to locate its activities it can factor into the calculation of an investment's rate of return. Having a competitive tax regime will therefore act to encourage investment to be located in the UK rather than in other countries with similar economic characteristics.

This is an important part of the story in helping the UK reach its 2.4% target and enabling the UK to realise the enormous economic benefits R&D can bring to an economy.

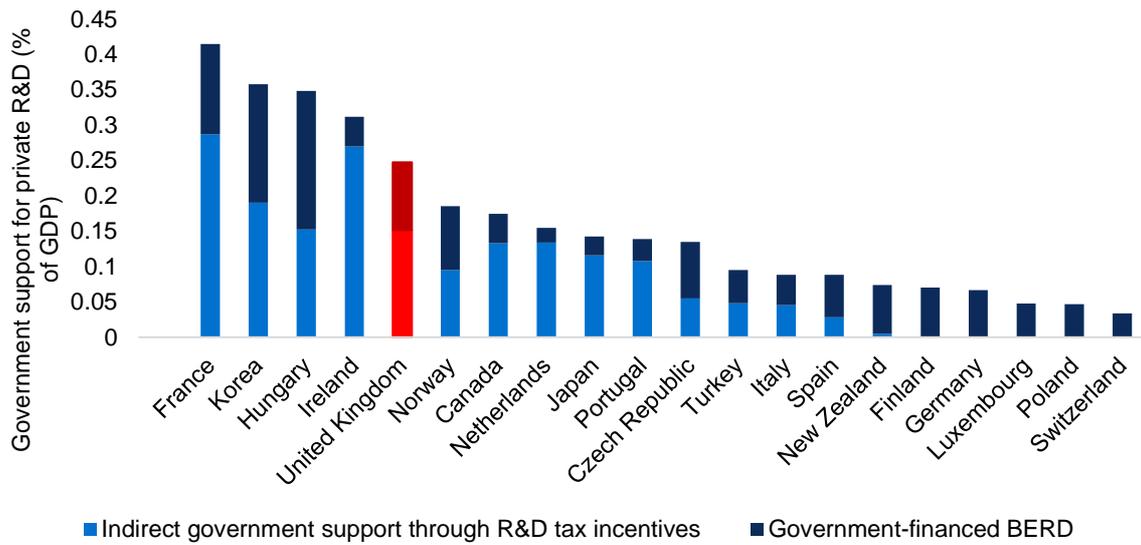
### **Support for private sector R&D investment fares well internationally**

R&D tax incentive support provided in the UK is relatively generous compared to other OECD countries. As shown in Exhibit 4, indirect government support through R&D tax incentives is around 0.2% of GDP, compared to an average of 0.1% of GDP for OECD countries with an R&D tax incentive.<sup>31</sup> It also shows that compared to some countries (including Ireland, France or Japan) the split of government support for private sector R&D is more balanced between tax incentives and direct spending.

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<sup>31</sup> OECD (2019), R&D tax incentive database, R&D tax expenditure and direct government funding of BERD (Accessed 29 July 2019). This database provides a set of indicators that reflect the level and structure of central government support for business R&D in form of R&D tax incentives and direct funding across OECD member countries and other non-member economies. This includes time-series indicators of tax expenditures for R&D, based on the latest 2018 OECD data collection on tax incentive support for R&D expenditures that was completed in September 2018. These estimates of the cost of R&D tax relief have been combined with data on direct R&D funding, as compiled by National Statistical Offices based on reports from firms, in order to provide a more complete picture of government efforts to promote business R&D.

**Exhibit 4: Public support for private R&D for selected countries, 2015**



Source: OECD (2019), R&D tax incentive database, R&D tax expenditure and direct government funding of BERD (Accessed 29 July 2019)

**The UK regime is less generous for large businesses**

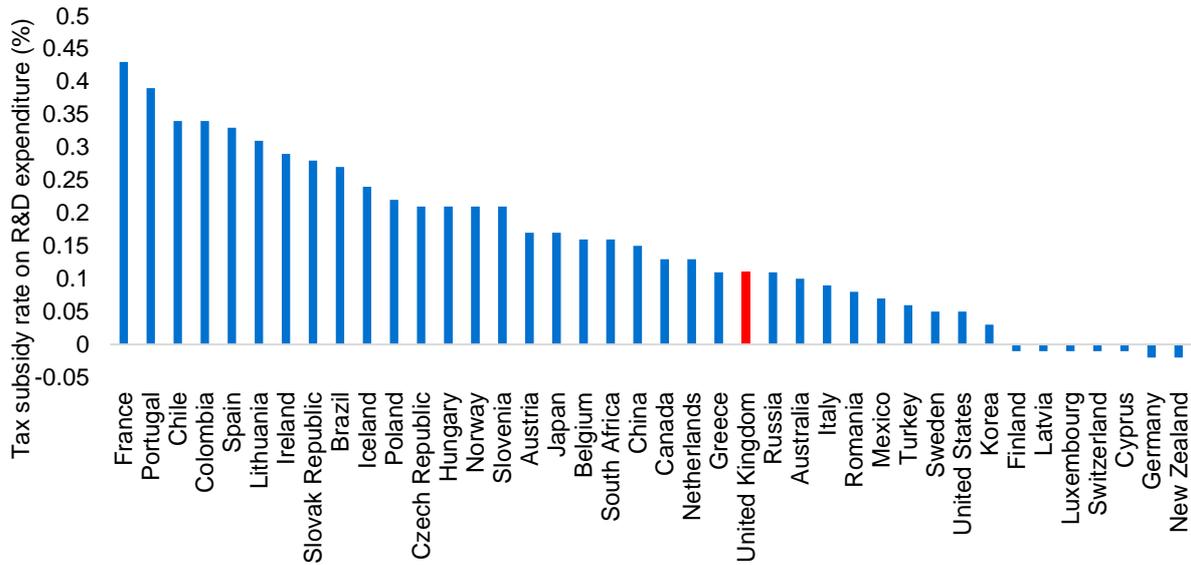
However, this differs by the size of the business. For SME’s operating in the UK, R&D tax incentives are relatively generous by OECD standards, whereas for larger firms, they lag behind. As shown in Exhibit 5, for large profitable firms the R&D tax credit is less than half as generous as some of the UK’s international competitors.<sup>32</sup> This is despite the large company rate being increased from 11% to 12% at Budget 2017.

*“As a global business, the UK’s R&D tax credit is an important factor for our business when making international R&D investment decisions.”*

**CBI member, GlaxoSmithKline, Multinational Pharmaceutical Company**

<sup>32</sup> OECD (2019), R&D tax incentive database, Implied tax subsidy rates on R&D expenditures (Accessed 29 July 2019)

**Exhibit 5: Implied tax subsidy rates on R&D expenditures for large profit-making firms, 2018**



Source: OECD (2019), R&D tax incentive database, Implied tax subsidy rates on R&D expenditures (Accessed 29 July 2019)

**R&D tax incentives are becoming more favourable across the globe**

Beyond the headline rate of R&D tax relief or credit, the treatment of R&D by the tax system varies significantly between countries and over time. Most OECD countries offer some form of preferential tax treatment for R&D expenditure. However, in some countries the incentive is provided via corporation tax deductions, while in others a payable R&D credit is provided.<sup>33</sup>

Most countries, including Canada, France, and Norway, apply a maximum limit on tax incentive claims, which may limit the effectiveness of R&D tax incentives. The UK R&D tax incentive regime allows companies that carry out qualifying R&D related to their trade to claim an extra corporation tax deduction or repayable credit for certain qualifying expenditure.

The UK does limit R&D relief claims in some circumstances. If a company is loss-making and claiming RDEC, the cash credit is capped at an amount equal to the payroll taxes and social security costs associated with the employees whose costs are included in the claim. It is proposed that as from 1 April 2020, the tax credit payable for SMEs will be restricted to three times the company’s total cost of staff working on R&D for that year. These restrictions are likely to harm the R&D support for SMEs and impact the effectiveness of the SME scheme.

<sup>33</sup> Other countries include Austria, Belgium, Canada, France, Ireland, The Netherlands and Spain.

### Case study: Ireland's R&D tax incentive regime

The generosity of R&D tax incentives in Ireland has increased in recent years. Since the introduction of the R&D tax credit in 2004, the importance of R&D tax support has significantly increased in Ireland, both in absolute and relative terms. The tax subsidy rate for large enterprises is well above the OECD median. It is estimated that of the R&D conducted by firms since 2009, 60% is additional R&D that has been undertaken due to the generosity of the R&D tax credit.

*Sources: OECD; Economic Evaluation of the R&D tax credit, Department of Finance, October 2016; An Economic Approach to Evaluate the R&D Tax Credit in Ireland, Working Paper, May 2014.*

### Stability, simplicity and predictability matter in the tax system

An IMF study argues that the UK's R&D tax credit alleviates some complexity of other R&D tax incentives internationally.<sup>34</sup> It is permanent, which provides certainty to businesses for planning purposes. It is relatively simple, with claims applying to total R&D investments during the year and not on an incremental basis, meaning it is straightforward for businesses to make claims, as evidenced by the increased uptake observed over the past decade. Finally, the administration cost involved in claiming R&D incentives in the UK is relatively low, increasing the likelihood of businesses using the schemes.

These features present a sharp contrast to other systems. For instance, in the US the R&D tax credit was only made permanent in December 2015 and had previously expired periodically since its introduction in 1981.<sup>35</sup>

Other countries are recognising the importance of having a competitive R&D tax regime through reform that not only provides a competitive headline rate, but also creates a system that is simple and easy to use. France has increased the competitiveness of its subsidy rate for both large businesses and SMEs.

Over 20 countries in the OECD, including Japan, France and Ireland, include third party outsourcing as a qualifying R&D expense for large business R&D relief claims. In the UK, qualifying expenditure includes payments to qualifying bodies (such as charities, universities, scientific research organisations or a health service bodies) but not for other third-party collaborations. Outsourcing is particularly important for businesses to access capital assets, such as plant and machinery used in the R&D process, and to access specific expertise and specialist skill sets.

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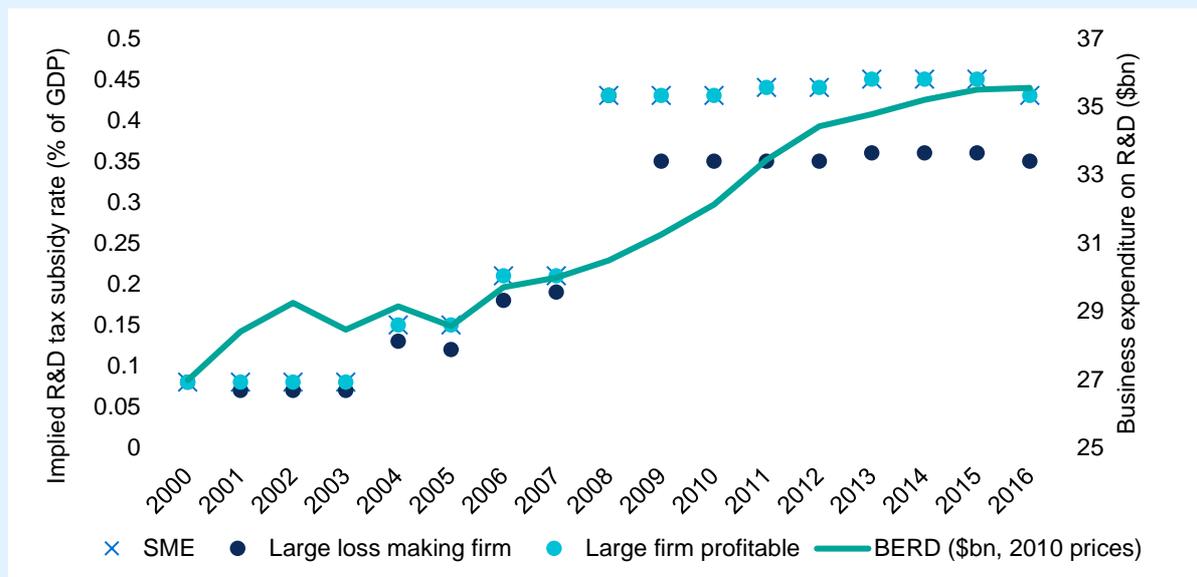
<sup>34</sup> Irem Gucer and Li Liu (2019), Effectiveness of fiscal incentives for R&D: Quasi-experimental evidence, American Economic Journal: Economic Policy, Vol. 11, no.1

<sup>35</sup> The R&D tax credit was made permanent by The Protecting Americans from Tax Hikes Act of 2015 in December 2015.

### Case study: France's R&D tax incentive regime

The French R&D tax regime was historically very complex. The French R&D tax credit was designed as an incremental credit, but has gradually shifted towards a simpler system, becoming a volume-based scheme in 2008. Unlike in the UK, the evidence in Exhibit 6 indicates a strong positive relationship between government support offered to business through the French R&D tax credit and business spending on R&D for both large businesses and SMEs.

### Exhibit 6: France implied R&D tax subsidy rates and business expenditure on R&D



Source: OECD (2019), R&D tax incentive database, Implied tax subsidy rates on R&D expenditures (Accessed 29 July 2019) and OECD (2019), Business enterprise R&D expenditure by main activity (focussed) and type of expenditure.

One vital element for the R&D tax credit is the question of what qualifies as R&D. This is not only the scope of the R&D tax credit but, importantly, HMRC's interpretation of what qualifies as R&D. HMRC's interpretation of R&D can be comparatively narrow for defining qualifying expenditure. Countries differ in their interpretation of what qualifies as R&D expenditure. One business noted that it is easier to qualify for a Dutch WBSO certificate than it is to claim RDEC on the equivalent expenditure.<sup>36</sup>

Comparing the UK's tax incentive regime internationally shows that the UK still has some way to go in offering the most internationally competitive R&D tax regime. There are a number of lessons that can be learned from other jurisdictions that offer more favourable support than the UK and as the international R&D tax landscape evolves over time, it will be important for the UK to keep pace with this to be at the forefront of innovation.

<sup>36</sup> A business in the Netherlands that carries out R&D, may be eligible for compensation of wage costs and additional costs under the WBSO (Wet bevordering speur- en ontwikkelingswerk) scheme. A business may pay lower wage tax and lower national insurance contributions, and self-employed entrepreneurs can deduct an (annually set) fixed amount for R&D when filing their income tax return.

# Driving increased R&D in the UK

*Improvements to the current R&D tax credit could further boost R&D investment in the UK and contribute towards achieving the 2.4% target.*

## Improving the UK's R&D tax incentive regime

The chapters above set out how the economic evidence and business experience of the UK's R&D tax incentive regime shows that it plays a vital role in the UK's R&D ecosystem. We have also shown that the current set of incentives are effective at meeting their objective of driving investment in R&D and that the UK's regime is one of the best in the world.

However, as set out in the first chapter, the challenge of meeting the government's target for R&D investment to reach 2.4% of GDP by 2027, and the longer-term ambition of reaching 3%, is significant. Increased public spending alone is unlikely to close the gap or be the most efficient and effective way to do so. Instead businesses will play an important role, and the incentives that government puts in place to foster business investment in R&D will be crucial.

Given the pace of change in innovation practices and the importance of maintaining an internationally competitive R&D tax incentive regime, the UK's R&D tax credit must also keep pace. This is critical in ensuring that the UK can become one of best places in the world for businesses to invest in R&D.

## Turbo charging the R&D tax credit

There are several ways in which the UK's R&D tax incentive regime could be enhanced to drive greater levels of business investment in R&D.

Following consultation with CBI members, the following four areas have been identified where the UK's current R&D tax incentive regime does not cover the full scope of R&D expenditure that businesses incur:

- 1. Capital expenditure** – Engaging in R&D can often require significant capital investment in facilities and equipment before further qualifying expenditure (such as staff costs) can be incurred;
- 2. Big Data and Advanced Analytics** – Innovation is increasingly becoming more data-driven, with the cliché of scientists conducting R&D in laboratories far less important for today's innovations than in the past.
- 3. Outsourcing** – R&D is often delivered by extensive collaboration between business, universities, public sector bodies and other research organisations. This often includes subcontracting or outsourcing different R&D activities by businesses to access expertise and specialist skills; and
- 4. Upskilling and training** – R&D investment requires highly skilled researchers and other professionals and the cost of ensuring staff have the right levels of training can be a significant cost for businesses undertaking R&D.

## Capital investment acts as an anchor for R&D

Capital investment by business is crucial to the long-term potential of an economy. Investment in capital for R&D purposes anchors R&D activity in the UK, boosting both

productivity and economic growth over the longer term. However, often the significant up-front cost of capital required to conduct R&D can be a barrier for many businesses wishing to invest in R&D.

The current tax incentive for R&D capital investments are RDAs. RDAs provide a full tax deduction on capital assets used for R&D purposes.<sup>37,38</sup> The ability to claim RDAs are valued by some businesses and this form of R&D tax incentive can have a positive impact on incentivising capital investment. However, the effectiveness of RDAs in their current form is limited:

- A tax deduction is a particularly limiting tax incentive for loss-making businesses, as this tax relief cannot be utilised immediately. Where tax losses are carried forward, these tax losses may also be restricted following the recent implementation of carried-forward loss restrictions.
- When businesses make R&D investment decisions, RDAs can be difficult to identify and include within the investment decision-making process, meaning the relief is less effective in influencing R&D investment decisions.

By comparison, the R&D tax credit is a relatively simple tax incentive to estimate and businesses find the tax incentive easier to explain (due to the ‘above the line’ nature of the credit) within the business when R&D investment decisions are being undertaken. As discussed in the second chapter, where tax incentives are considered at the investment decision-making stage this is where tax incentives work most effectively. The identifiable nature of the R&D tax credit for specific investment projects has enabled more businesses to consider the R&D tax incentive at an earlier stage of the investment decision-making process, rather than at the backend of a project.

Expanding the R&D tax credit to include capital expenditure would bring the two tax incentives together, creating an R&D tax incentive regime that is more effective at impacting marginal R&D investment decisions. It would also help to increase the commercial viability of investing in capital for R&D purposes, which in turn would drive further R&D investment in the UK.

*“Including capital expenditure within the current R&D tax credit will have a significant impact on our R&D investment decisions. Investment in capital infrastructure in the UK contributes to anchoring future R&D activities there.”*

**CBI member, QinetiQ, defence technology contractor**

#### **Recommendation**

Widen the scope of eligibility for the R&D tax credit to include capital expenditure as a qualifying expense.

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<sup>37</sup> PwC (2017), Global Research and Development Incentives Group

<sup>38</sup> Deloitte (2018), Survey of Global Investment and Innovation Incentives

## **Data and analytics as an important part of R&D**

There is an increasing focus on data and analytics for R&D. The CBI and Nexus's Changing Nature of R&D report highlighted the importance of data in R&D.<sup>39</sup> Businesses are increasingly using data as a key raw material in their R&D activities, contributing over £46 billion a year to the UK economy by 2020, some 2% of GDP.<sup>40</sup> In addition, data and analytics is increasingly forming part of the output of R&D activity.

While software acquisitions and their maintenance costs qualify for the R&D tax credit, businesses adopting more data-driven R&D practices will not be able to claim the R&D tax credit for the full cost of the R&D they undertake. This creates a perverse incentive in the regime, whereby traditional forms of R&D receive a greater level of government subsidy than more novel and innovative methods.

The government should therefore consider amending the definitions of eligible activities to include the costs of purchasing, storing, using and analysing data which have been used in driving R&D and innovation, as well as data and analytics as an output of R&D activity. Data has been shown to be of significant importance in the modern economy, and the R&D tax credit should keep pace with this to encourage this type of investment in R&D.

### **Recommendation**

Widen the scope of eligibility for the R&D tax credit to reflect the reality of modern technologies and data-driven innovation.

## **Outsourcing helps to make R&D more efficient**

Outsourcing and partnering R&D activities has been a growing trend, with more businesses outsourcing to access specialist skills, increase operational flexibility or to reduce fixed costs. Through specialisation, outsourcing provides businesses with a more efficient way to access other markets and other products.

This is particularly important for capital investments such as developing an R&D facility that involve significant up-front costs. For example, it would not be efficient for a pharmaceuticals company to have an in-house device making facility, instead they would outsource to a specialist product development and technology firm. In this way the up-front costs are spread across multiple businesses.

Outsourcing is also used when businesses are working on a project by project basis and it is more efficient to outsource specialist skills as and when they are needed rather than developing these in-house. This is particularly common for the development of specialist systems or technology where outsourcing is used for testing or accessing manufacturing specialists.

Currently companies cannot claim on the R&D activity they outsource, unless they are an SME. It may be possible for the business performing the R&D on their behalf to claim. However, there are instances where neither party can claim because of restrictive rules about what constitutes part of their normal business activity or R&D specific activity. The principle should remain that the credit should be claimable where the knowledge is created helping these businesses to recruit and retain talented engineers and scientists. But, in

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<sup>39</sup> CBI and Nexus – University of Leeds (2019), The changing nature of R&D

<sup>40</sup> CEBR (2016), The Value of Big Data and the Internet of Things to the UK Economy, report for SAS

cases where no claim is currently being made the government should explore how and if this expenditure can be captured so that outsourcing continues to be incentivised.

#### **Recommendation**

The government should explore widening the scope of the RDEC to include outsourced activities that do not currently qualify.

#### **Upskilling and retraining staff to deliver R&D of the future**

With the pace of technological change and the introduction of new technologies, businesses often need to retrain or upskill their researchers and other professionals. For example, in the CBI's Delivering Skills for the New Economy report, one business stated that they require analysts to manage large datasets and turn these into insights, meaning they are increasingly looking for a highly digitised or engineering background. However, they are struggling to find the people they need as candidates either have the engineering skills required or the data skills, but rarely both.<sup>41</sup>

It is well evidenced that there is a skills shortage in the UK. CBI surveys show that this challenge remains elevated, with all sectors across the economy still reporting concerns.<sup>42</sup> In addition, the CBI's Catching the Peloton report also showed that business investment in training has been declining, falling from over £15 billion in 1999 to under £12 billion by 2014. This is despite the growing importance of human capital in the production process for a lot of businesses.

While expenditure on the wages and salaries of staff undertaking R&D qualifies for the R&D tax credit, expenditure on training and upskilling would not qualify. Broadening the R&D tax credit to include upskilling and retraining would support these wider objectives as well as ensuring staff for R&D have the necessary skills.

#### **Recommendation**

Review widening the scope for eligibility of the R&D tax credit to include upskilling and retraining staff.

### **Monitoring the impact of the UK's R&D tax incentive regime**

Government should continue to evaluate the impact its tax regime is having on the UK economy and whether the tax incentives in place continue to deliver on their stated objectives and are value for money for the taxpayer.

In the case of the R&D tax incentive regime there are two areas where the government could increase the level of information and reporting:

- 1. Availability of data:** Ensuring the appropriate data is available is important to be able to robustly measure the effectiveness of the R&D tax credit; and
- 2. International benchmarking:** For the UK to maintain its competitiveness for attracting R&D investment, it is important to keep pace with policy changes in other countries.

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<sup>41</sup> CBI (2019), Delivering Skills for the New Economy

<sup>42</sup> 2019 Q3 CBI ITS, SSS and FSS survey.

### **Data to drive better policymaking**

As explained in the second chapter, there are significant differences between the two official datasets on business R&D investment, and these are different again to the figure businesses themselves believe to be their true R&D investment. Furthermore, there are difficulties in ascertaining the mix of capital and current expenditure from these data sources.

There are several reasons for this, but one of the most significant is that both the ONS and HMRC datasets can be difficult to interpret, with businesses citing that the definitions do not accurately reflect the way businesses carry out R&D activity. Up to date and relevant guidance from HMRC on qualifying expenditure for the R&D tax credit and better linking this to the ONS survey would help to improve this.

A number of recent academic studies have also identified that there can be challenges when trying to estimate the effectiveness of the R&D tax credit in incentivising R&D spending. One challenge is the availability of administrative data that accurately reflects the choices made by businesses when considering making R&D investments.<sup>43</sup> According to one IMF study, better availability of administrative data would enable more robust analysis on the impact of R&D tax incentives on R&D investment by businesses.<sup>44</sup>

These challenges make it more difficult to understand the current R&D landscape in the UK and how the R&D tax incentive regime feeds into this. The availability of more information on this would help the government to make more informed policy decisions about the balance of its incentive regime.

#### **Recommendation**

The government should review the availability of data on R&D expenditure and the methods for data collection to ensure the effectiveness of the R&D tax credit continues to be monitored appropriately.

### **International benchmarking for a competitive R&D regime**

It is clear from the international comparison in the third chapter that R&D tax incentive regimes vary across countries. Differences can be observed in both the design and the generosity of the regimes, which are also evolving over time. For example, Ireland and France currently offer a more generous regime than the UK, with Ireland extending their R&D tax credit to include capital expenditure just recently.

With some jurisdictions offering more favourable tax incentives on R&D and others increasing the generosity of theirs more recently, it is important that the government continues to monitor the R&D tax landscape internationally, benchmarking the effectiveness of other regimes against the UK's and adapting the UK's offering accordingly. This will help maintain the UK's competitiveness so that it is the first-choice location for R&D investment.

#### **Recommendation**

The government should ensure that UK R&D tax incentives are internationally recognised as world-class by regularly benchmarking the UK's regime against international peers.

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<sup>43</sup> Irem Guceri and Li Liu (2019), Effectiveness of fiscal incentives for R&D: Quasi-experimental evidence, *American Economic Journal: Economic Policy*, Vol. 11, no.1

<sup>44</sup> *Ibid.*



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