

# Written Evidence Submitted by the Department for Business, Energy and Industrial Strategy

(CRV0036)

**What role can technology, research and innovation play in supporting the UK's economic recovery from COVID-19 and how can it best be supported in this?**

Research and development will be critical to economic and social recovery from the impacts of COVID-19, enabling us to build a greener, healthier, and more resilient UK. The COVID-19 pandemic has shown all of us the vital importance of science and innovation. British researchers are at the forefront of global efforts to find a vaccine and are working hard to map out the impact of the pandemic on our lives and livelihoods. Organisations of all shapes and sizes have worked tirelessly to respond to the crisis in innovative new ways. Our goal is to further strengthen science, research and innovation across the UK, making them central to tackling the major challenges we face, including achieving net zero carbon emissions, building resilience to the impacts of climate change, closing the productivity gap and embracing the transformative potential of new technologies to improve the quality of life.

Research and development are central to igniting the UK's economic recovery, boosting productivity, creating new jobs and improving people's quality of life. To achieve this, the Government published its ambitious Research and Development Roadmap to ensure the UK is the best place in the world for scientists, researchers and entrepreneurs to live and work. Over the coming months we will take forward the proposals in the Roadmap, along with the outputs of other engagement activities including the recovery roundtables and work undertaken through the Industrial Strategy, to develop a comprehensive R&D plan. At the comprehensive spending review in Autumn 2020, we will set out our plans for reaching our ambition to increase R&D spending to £22bn per year by 2024-25.

The Research and Development Roadmap sets out the important role that knowledge exchange will play in capturing the economic and social benefit of research. Knowledge exchange has far reaching spill-over benefits including new public knowledge, use of knowledge to develop better products and services within firms and bringing new products or services to market that are based on university IP and knowledge, all of which supports a broader agenda related to the economic and societal impact of research. The Government currently supports Knowledge Exchange activities through the Higher Education Innovation Fund (HEIF), Connecting Capability Fund (CCF) and Research England Development (RED) fund (which are all delivered through UKRI). Technology has been integral to our immediate response to the pandemic and will be crucial for the economic recovery due to the benefits advances in technology can provide for productivity both in business and research settings. For example, growth of the UK Artificial Intelligence ecosystem also has already played an important role in the initial response; from use of AI to model the structure of the virus or identify promising drug candidates to treat COVID-19, to AI in EdTech allowing students to continue learning during the crisis. The independent AI Council, which advises government, is working on a roadmap for growth of the AI ecosystem to accelerate recovery.

## **Does the current or post-COVID situation lead to any particular opportunities or challenges for economic growth driven by technology, research and innovation?**

Private sector investment in R&D may be impacted by the economic consequences of COVID-19. We expect a significant decrease in R&D investment and its growth to coincide with the recent major reductions in GDP. It is hard to estimate the full impact because changes in business profitability and macroeconomic conditions take time to trickle down to business investment decisions.

However, stimulating private sector R&D investments will be critical to our economic and social recovery and future productivity gains. The Government is taking action to support businesses through the impacts of COVID-19 and encourage investment, including the £1.25 billion government support package for UK businesses driving innovation and development.

Intelligence from Innovate UK suggests markets for certain technologies may have benefited from the current crisis. Pump engineering, for example, has experienced unprecedented demand for its products and services within the health and energy sectors.

## **What lessons can be learnt from the role of technology, research and innovation in recoveries from previous economic downturns, and how relevant are these to the current situation?**

The impacts of COVID-19 on R&D will be different to relationships observed in previous recessions due to the restriction on movement and disruptions in the global supply chain, but they can still help us understand the possible impacts of the current situation.

Historically, contractions in the business expenditure on R&D (BERD) tend to occur when there are contractions in the economy, with financial crises tend to leave long lasting negative impacts<sup>1</sup> on innovation. The impact across the sectors also differed, with some sectors increased their R&D investment while others decreased their investments—in 2008 recession Pharma increase its R&D activity while Aerospace experienced significant drop. The largest falls in BERD were in 1990, when GDP fell 1% and BERD fell 8%, and 2009, when GDP fell 4% and BERD fell 3%<sup>2</sup>. Recent ONS figures show the UK experienced a 20.4% contraction of GDP in April-June 2020<sup>3</sup>, which is a much greater contraction than those in 1990 or 2009, but lower than forecasts predicted<sup>4</sup>. With this major reduction in GDP, we can expect a significant decrease in R&D investment and its growth.

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<sup>1</sup> Financial Crisis and Innovation, Bank of International Settlements Working paper. Accessed online [here](#).

<sup>2</sup> BERD data is from ONS as are GDP growth figures. GDP growth figures from: <https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/ihyp/pn2>

<sup>3</sup> ONS quarterly estimate of UK GDP, April-June 2020 (Q2). Accessed online [here](#).

<sup>4</sup> OBR April reference scenario predicted real GDP would fall by 35% in Q2. Office for Budget Responsibility (OBR). Coronavirus reference scenario. 14 April 2020. Accessed online [here](#)  
Bank of England estimated UK economy would shrink by 25% in Q2. Bank of England (BOE). Monetary Policy Report. 6 May 2020. Accessed online [here](#).

Productivity growth has remained significantly below the level it was at before the post-2008 economic downturn. Productivity is strongly correlated with innovation and investments in R&D; investments in intangible assets contributed 33% to UK labour productivity growth between 2000-2013. Total expenditure on R&D in 2018 was 1.7% of GDP, with a target set to increase this to 2.4% by 2027. Through this target to increase R&D spending and our wider plans to strengthen the UK science and research base, one of our major objectives will be to boost productivity and close the gap.

In previous recessions, global venture capital investment declined and took time to recover. In the previous two recessions (2000-2001 and 2007-2009) the total drops in global VC investments were between 21.6 and 29.3 percent over twelve months. After the past two recessions, global VC investments took one (2007-2008) and three (2000-2001) years to recover to pre-contraction levels. Although investment was lower, more companies received funding.

On the other hand, it was during the previous recession that some of the most innovative companies of the subsequent decade were established, such as Airbnb, Uber and GroupOn.

### **How have research and innovation in UK universities, businesses and other settings been affected by the COVID-19 pandemic, and how might they be affected by any lasting changes post-COVID?**

Approximately one third of all research activity in universities is currently funded through surpluses that universities accrue from other revenue generating activities. This includes revenue generated from international students and commercial activities, amounting to around £4.7bn per year. Much of this funding is at risk from summer 2020 because of the impact of COVID-19; from a drop in international students, reduction in commercial income and in research income from charities, businesses and other sources.

International student recruitment is at risk under current and likely future measures to manage and respond to COVID-19, including travel restrictions. Any impact on International Students numbers would have a 3-4 year impact on surpluses for research.

Financial issues facing some charities and industry can also be expected to depress university research incomes for the duration of any economic downturn. Ministers and officials in BEIS have met with charities and businesses regularly to understand these impacts and this is being factored in as the details of the University Research Stabilisation package are developed.

Most research and innovation settings have been impacted in some way by the lockdown and social distancing measures. Co-working spaces are key parts of local innovation ecosystems but have faced loss of income from a reduction in users and in events, leading to some closures. BEIS provided guidance on safely conducting laboratory-based research in May.

The pandemic also created an exceptionally challenging environment for innovative UK start-ups and scale-ups. The investment environment became more difficult due to write-downs in company values, issues with carrying out due diligence remotely, and the effect of the wider economic decline on investors' portfolios and risk appetite. Funding for UK start-ups raising investment for the first time fell by 83% between 23 March and 17 May compared to the same period in 2019.

Falls in market demand also created cashflow problems, although business impacts varied heavily by sector.

Generally, however, the equity market is being buoyed by companies that have previously received fundraisings, with equity funding at a similar level as before the crisis. The amount of equity funding raised by UK technology companies between April and July 2020 was only 11% lower than during the same period in 2019<sup>5</sup>.

**How effective have measures adopted by the Government to support research and innovation, such as the support packages for innovative firms and university researchers, and the ‘Ministerial University Research and Knowledge Exchange Sustainability Taskforce’, been?**

Support for Innovative Firms:

BEIS has had a significant role in developing the £1.25bn package to protect firms driving innovation in the UK, which was announced by the Chancellor on 20 April 2020. This includes the £500 million Future Fund for high-growth companies impacted by the crisis (delivered by the British Business Bank), and £750 million of grants and loans for businesses focusing on research and development (delivered by Innovate UK).

The Future Fund, which would match private sector investment in companies that were unable to access other government business support programmes, such as CBILS, because they were either pre-revenue or pre-profit and typically relied on equity investment. The initial size of the fund was set at £500m (including both public and private funding) to be kept under review. This allocation was increased in light of demand. By 16 August 2020, a total of 590 applications had been approved representing public investment of £588 million. An analysis of these applications has been published by the British Business Bank<sup>6</sup>.

Eligibility for the Future Fund is based on the firm’s track record of investment and the willingness of investors to commit further funds. There is no specific requirement to demonstrate innovation. Nonetheless, innovative firms are well-represented in the cohort of Future Fund companies and the Fund has enabled these to continue their growth trajectory rather than being forced to suspend their operations during the pandemic. The fund is currently expected to close for new applications on 30 September 2020.

The Innovate UK package objectives were to shore up the critical cash position for existing customers, to enable those businesses to continue to survive during this disruptive period and also continue to innovate where possible. The support for new projects has been designed to incentivise new forms of innovation with Innovate UK accelerating and adapting processes to speed up the delivery of support to those with the best ideas and needing it most.

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<sup>5</sup> BEIS analysis of Beauhurst data, extracted 27/08/2019.

<sup>6</sup> Published on 18 August and available at <https://www.british-business-bank.co.uk/future-fund-publishes-diversity-data-of-companies-receiving-convertible-loan-agreements-3/>

The Innovate UK element was a combination of grant and loans support, predominantly to SMEs, with the first payments made in May 2020. Further details of the package were then announced: on 15 May 2020, in relation to continuity grants, loans and business advisory support valued at up to £340m; on the 20<sup>th</sup> May, funding for the first fast-response grant scheme was doubled to £40m to fund over 800 projects as part of this package; and on the 27<sup>th</sup> June, the announcement of the launch of the £191m Sustainable Innovation Fund completed the package of programmes first announced on 20<sup>th</sup> April.

Innovate UK has seen unprecedented demand from businesses seeking support during the period of COVID-19 disruption. The fast response (£50k) grant call attracted 8,600 applications in a 2-week period, as many as have applied over the previous year to Innovate UK. This has since been supplemented by: over 1,075 applications from existing funding recipients for continuity grants and loans to date, worth over £90m; over 3,400 SMEs have been contacted and 1,265 to date are in receipt of specialist business advisory support from the Enterprise Europe Network; and over 2,500 applications to the first rounds of the Sustainable Innovation Fund which are currently under assessment. Separately from the COVID package, the latest round of Smart grants saw 2,440 project applications seeking £700m of support for projects worth over £1bn.

Innovate UK has necessarily adapted processes to manage the additional demand and react to businesses' cash flow need. Businesses received cash payments from the Fast Response call within 6 weeks of competition launch, having undergone technical and financial due diligence checks. Innovate UK built on existing programme delivery mechanisms for grants, loans and advisory services and increased capacity to manage the end-to-end processes, drawing on some outsourced support to manage peak flows, compliant with government grant standards, procurement and subsidy control regulations.

With the first Continuity grants round now concluding, interest in larger loans is picking up but the demand from the existing Innovate UK portfolio is now not expected to reach the full £150m allocation before the end of December 2020, the Temporary Framework Period, using the current approach. Options to broaden the eligibility are being considered.

To date in-excess of £200m of cash support has been provided to over 1500 businesses, predominantly SMEs. This support is spread throughout the UK and across a diverse group of organisations. For example, the Fast Response successful application rate for businesses in Scotland was proportionately higher than London; almost 22% of fast response winners were female led businesses (this is in line with the levels we have seen since the growth of woman-led applications following the Women in Innovation focus reports suggest women and their working lives may have been disproportionately impacted by the COVID-19 working restrictions); with 3500 companies coming forward with interest and have already actively started advisory services with over 1200 of them.

Impact evaluation activity is currently underway to assess how the support provided has enabled businesses to survive and stabilise through the pandemic and prepare for and drive economic recovery. The Quarter 1 (April-June) round of business surveys undertaken by Innovate UK has identified that 3 out of 4 businesses see financial support offered by Innovate UK and other government initiatives such as Bounce-Back Loans as helpful. It also showed that 72% of businesses perceive they would benefit from additional financial support and the preference on extensions for current funded projects (735 such requests have been made and accepted by Innovate UK to date) and additional grant funding corroborates the scale of demand for the

Innovate UK package. There is also a clear appetite from businesses - particularly small and micros- for continuity loans, with 90% of respondents citing them as beneficial.

#### University Research and Knowledge Exchange Sustainability:

Recognising the importance of university research in the UK research ecosystem, we announced the joint BEIS/DFE Ministerial Task Force on the sustainability of university research to identify and assess impacts facing universities and consider approaches to help address them.

This taskforce has sought to gain insight from a wide range of stakeholders. The focus of the group has been sustainability of university research, but this has included consideration of the interplay of challenges across the wider research ecosystem.

The input and intelligence gained from the URS taskforce has aided in the development of the Government's support for the sector, including the University Research Stabilisation package. This aims to address the broad set of issues facing the university research base and will give affected universities access to:

- a series of government grants and long-term, low interest loans covering up to 80% of their income losses caused by an expected decline in international students, ensuring that their crucial research can continue
- around £280 million government funding, which will fund extensions to grants (including researcher salaries, laboratory and fieldwork costs).

This package will ensure that the UK university research and knowledge exchange base, capacity, capabilities, and facilities are retained to contribute to the UK's economic recovery post-COVID-19 and that the wider societal benefits of university research are realised. We continue to engage with a wide range of stakeholders both through the taskforce and bilaterally as further details of this package are developed.

#### UKRI research grant extensions:

As part of our wider support for the research sector, we announced the provision of costed extensions for post graduate researchers supported through UKRI and the National Academies in June, to:

- secure the key talent pipeline of research and technical staff, securing short-term employment and maintaining the talent pool essential for the long-term recovery and growth of the sector.
- ensure that UKRI grant outcomes continue to be met, and the value of grant investments is realised by enabling research projects to complete.

Many of the research contracts supported through UKRI and National Academies were on fixed term contracts tied to the academic year, meaning many would have been put on notice for redundancy had this intervention not been made. Acting swiftly to intervene before this happened has offset the risk of a considerable loss to UK R&D talent, which would have had a negative impact on the government's ambition to increase total R&D expenditure to 2.4% of GDP by 2027 and the overall economic recovery from the COVID-19 crisis.

**In the context of the Government's 'Research and Development Roadmap', what shorter-term measures can best support UK research and innovation in recovering from the disruption of the COVID-19 pandemic and adapting to the post-COVID environment?**

The Roadmap recognises that following the COVID-19 crisis, we will need to be even more creative and innovative to adapt to the "new normal", and to build a future which is greener, fairer, healthier and more resilient than ever before. We are working closely with the Department for Education, UKRI and Universities UK, to consider the risks and implications for the UK science base and we will continue to monitor the impact of COVID-19 on businesses and universities.

The Government is taking action to support both universities and businesses through the impacts of COVID-19:

- Over £200 million of funding will be made available to sustain UKRI and National Academy grant-funded research and fellowships affected by the COVID-19 pandemic
- From the Autumn, Government will provide a package of grants and no/ low-interest loans to cover up to 80% of a university's income losses from international students for the academic year 20/21, up to the value of their non-publicly funded research activity
- And we have established:
  - The University Research Sustainability Taskforce jointly with DfE; and brought forward £100m of public funding to this academic year to help protect vital university research activities
  - The Coronavirus Business Interruption Loan Scheme for all SMEs and large businesses affected by COVID-19
  - A £1.25 billion government support package for UK businesses driving innovation and development. This includes a £500 million investment fund for high-growth companies impacted by the crisis - made up of funding from government and the private sector, and SMEs focusing on research and development will also benefit from £750 million of Innovate UK grants and loans

The roadmap is the start of a conversation about how we recover swiftly from COVID-19 and build a better and stronger system in the UK. This plan will only be effective if it is developed with people and organisations across the UK. We therefore welcomed responses to the Roadmap through a survey. We are currently analysing the survey responses in detail to help inform the next steps of the Roadmap. Alongside this we are continuing a broad programme of engagement.

***(September 2020)***