Written evidence submitted by the National Centre for Universities and Business (NCUB)

About the NCUB

The National Centre for Universities and Business (NCUB) represents the collective voice of leaders across higher education and business and aims to tackle issues of shared interest. The NCUB is an independent and not-for-profit membership organisation that promotes, develops and supports university-business collaboration across the UK. NCUB was established in 2013.

Overview

The Covid-19 pandemic has had a significant impact on businesses across many sectors of the UK economy. Almost all businesses have had to make changes to how they operate and how they interact with customers, with many experiencing significant changes in demand as well as disruption to their supply chains. Measures taken to suppress the Covid-19 virus, including national lockdowns to restrict interaction and transmission, have had immediate impacts on business' trading and revenue.

Throughout the pandemic, many business leaders have had to focus on business continuity, including cutting costs, driving productivity and implementing costly Covid-19 safety measures. As the UK looks towards longer-term recovery, there is important evidence that suggests that companies that are able to continue investing in R&D and innovation through a crisis are more likely to be resilient, more likely to expand into new markets during disruptions and more likely to be able to hold on to staff and grow in difficult trading conditions. However, there is also early but mounting evidence to suggest that the pandemic has hampered business research and development (R&D) and innovation activities.

NCUB welcomes the timing of the Treasury Select Committee's call for evidence. We believe, as the Government's R&D Roadmap and Plan for Growth set out, that research, innovation and skills development has a central role to play in the UK's economic and social recovery from Covid-19, as well as its response to the Fourth Industrial Revolution and climate change.

Decisions made by business leaders in the months and years ahead will have a profound impact on the speed and shape of the UK's recovery. Business leaders will have difficult decisions to make on whether to invest in R&D and innovation over other priorities. As the Government further develops its R&D and innovation strategies and looks towards realising the ambitions set out within the R&D Roadmap, understanding and addressing the barriers that businesses are facing when conducting R&D and innovation activities here in the UK will be important to inform the design of effective policies to attract and retain these types of activities, and capture value from them, in the years ahead.

Research jointly carried out by the Universities Commercialisation and Innovation (UCI) Policy Evidence Unit based at the University of Cambridge and NCUB looked at how Covid-19 has affected businesses' and universities' ability to carry out and contribute to innovation activity in the UK and provides a firm evidence base for understanding what more is needed and where the UK must concentrate its efforts in an innovation-led recovery. Both reports are referred to throughout our response.

Due to the wide ranging nature of the consultation, we have provided answers only to the questions within our remit. We have therefore not responded to question four or to the questions related to macroeconomic policy.

Question 1: How much difference can government policy make to economic growth?

The Covid-19 pandemic has demonstrated how important research, development (R&D) and innovation are to our society, our health, and our economy. Long-term investment in R&D continues

to be vital to achieving economic growth. **Public investment and policy has an important part to play in shaping the more R&D intensive, innovation-led economy conducive to economic growth.**

For businesses in many sectors of the economy, investing in R&D and innovation will be a necessity to remaining competitive and building back better in a fast-changing world. The Government's contribution to research is well-documented, but equally Government has a significant and important role to play to support innovation.

First, **governments affect how markets operate and can either encourage or stifle innovation through regulation. Second, governments are important investors in innovation.** Many economists argue that innovation investments tend to have large spill-overs, meaning that the benefits of innovation investment are not solely felt by the company investing.

Government policy in the form of public funding commitments directly support economic recovery post-Covid. These commitments to recovery are an important foundation for future growth. If research, development and innovation are to guide us not only out of the pandemic, but also towards a healthier, more prosperous future, now is the time for the Government and business to invest towards, not away from, R&D and innovation. In light of this, **the Government's commitment to boost annual public research spending to £22 billion by 2024-25, up from £14.9bn in 2021-22, is very welcome.**

Besides supporting R&D through policymaking and funding, the Government can directly support economic growth through skills development. **Providing the right support to develop in-demand skills as well as policies that support the retraining and reskilling of the current workforce are vital in order to close the current skills gap in the UK economy, and will significantly improve economic growth at large.** The UK urgently needs to prepare for greater automation, net zero and the fourth industrial revolution and in order to do so, there is an urgent need to develop clear policies and funding to support retraining and upskilling into sectors that are predicted to grow in the next few decades.

Question 2: What are the causes of the gap in the UK's level of productivity compared to other advanced economies, and why has productivity growth been persistently weak in the aftermath of the 2007-09 financial crisis?

The UK economic slowdown has been greater than in other advanced economies, with the UK ranking 31st out of 35 OECD countries in growth of output per hour from 2008 to 2017. Researchers at the LSE reported that growth of output per worker declined dramatically since the global financial crisis of 2008-09 with output per hour and real wages now no higher than they were beforehand.

The UK's productivity gap has rightly been subject to significant debate and NCUB strongly supports the work of the ESRC supported Productivity Institute, based at the University of Manchester, to provide academic evidence and insight. Evidence suggests that the productivity gap is likely to be driven by a range of factors, however NCUB wants to specifically focus on those areas related to research, innovation and skills.

The R&D Roadmap and Plan for Growth rightly sets out that R&D and innovation can lead to productivity improvements, as evidence from other countries has clearly shown.

The UK has underinvested in R&D in the last 15 years compared to other OECD countries, which has left a one billion-pound gap in spending in R&D. OECD figures show that UK public spending in R&D is currently around 0.5% of GDP, which is much lower than the levels of 0.7%-0.8% invested by the US, Germany and France. The Government's target to increase total spending on R&D to 2.4% of GDP by 2027 is a sign of its commitment to creating a knowledge-intensive economy

and recognition of the important role that R&D and innovation plays in helping to grow the nation's economy. NCUB's Research to Recovery report showed that **had the UK invested at the OECD spending average on R&D for the past 10 years, UK research would have benefited from an additional £44 billion.** This shows how much difference government policy could have made and will make in the future. To start to rectify this, the 2.4% target is ambitious but essential.

Besides comparatively sluggish investment in R&D over a long period of time, a report from the OECD showed that the UK ranks amongst the lowest in Europe in terms of mismatch between skills and field of employment. This must be countered by investing in education and worker training, reskilling, and upskilling.

Question 3: How successful has the Government's pandemic response been in protecting jobs to date, and how can it help reduce and mitigate the economic scarring effects of the pandemic going forward?

The Government's response to the pandemic, including protecting jobs through the furlough scheme and implementing the Kickstart Scheme, are welcome initiatives that will go far to aid the UK in its recovery. However, there is a need to better promote the Kickstart Scheme, Restart Scheme and Lifetime Skills Guarantee, particularly to SMEs.

Covid-19 and the subsequent lockdowns have had a disproportionate impact on youth employment. The ONS labour market statistics for April 2021 showed that while the headline unemployment figure has stabilised at 4.9%, unemployment amongst under 25s is now at 14.3%. Unemployment would have been higher had it not coincided with a large increase in 16 to 25 year olds in education. ONS statistics suggested that people aged under 35 accounted for 635,000 payroll jobs lost in the year to March, with 436,000 of those positions held by people under 25. Most concerning is the increase in young people in long-term unemployment, with 247,000 unemployed for more than six months. Twelve months earlier, 145,000 young people were unemployed for more than six months. **NCUB recommends that the government can do more to support young people by supporting the upskilling and retraining of the workforce and by investing in youth unemployment.**

NCUB recommends that the UK could and should go further in encouraging businesses to hire young people. Firstly, by introducing a 50% wage subsidy for people under the age of 25 undertaking an apprenticeship, including a degree apprenticeship, in response to rapidly falling apprenticeship opportunities. Secondly, to help employers to retain talent and valuable entry level jobs, the Government should temporarily abolish National Insurance Contributions for young people under the age of 25. Employers should no longer have to pay secondary Class 1 (employer) National Insurance contributions (NICs) on earnings up to the Upper Earnings Limit (UEL), for employees under the age of 25. This enhances existing exemptions that apply to young people under the age of 21.

To mitigate the scarring effects of the pandemic going forward, NCUB recommends the Government needs to invest in young people in the long-term and support them in the immediate and short-term through the crisis. While young people are over-represented in those sectors that are hardest hit by the pandemic to date, they tend to also be over-represented in the sectors that are forecasted to see lower employment in the long term and under-represented in occupations which are likely to see the strongest job growth at the same time. These long-term structural changes to the labour market will reduce the current and future employment opportunities of young people even further.

Although the Government has rightly focussed on the immediate employment issues caused by the pandemic, there is an urgent need to now develop policies aimed at the longer term. Many of the greatest long-term challenges facing the labour market pre-date the pandemic. **NCUB strongly recommends an approach that looks at the labour market and our economy in the long-term.** This includes increasing levels of collaboration between universities and businesses to

ensure that universities deliver the skills that businesses require now and in the future. Skilled graduates in particular, are the pipeline of future talent that businesses need.

Question 5: What policies are effective in helping people to reskill, move between occupations and sectors and take advantage of new opportunities? How could these be best implemented in the aftermath of the pandemic, and as technological developments such as artificial intelligence change the nature of work?

The Kickstart Scheme, Restart Scheme, Lifetime Skills Guarantee and the apprenticeship levy are all welcome initiatives that have helped to reduce unemployment overall and enabled people to reskill and rejoin the workforce. However, as mentioned above, these initiatives need to go further and should be promoted more to employers. In addition, **investing in more flexible learning, digital skills, employability and soft skills are important targets that will enable people to have access to more opportunities.**

While the digital and soft skills of young people entering the labour market must be improved through joint efforts from universities, business and the government, retraining the current workforce is equally important to closing the skills gap.

Providing soft skills and employability skills will increase access to job opportunities. The World Economic Forum found that the top skills and skill groups that employers see rising in prominence in 2025 includes analytical and critical thinking as well as problem-solving, and skills in self-management such as active learning, resilience, stress tolerance and flexibility. It is especially important for universities therefore, to engage local employers to ensure that they develop the 'soft' skills deemed important to enhancing employability.

While employer demand for digital skills is set to continue to grow, participation in digital skills training has declined. The number of young people taking IT subjects at GCSE level has fallen by 40% since 2015, with the number taking A Levels, further education courses and apprenticeships all declining. World Skills UK showed that less than half of UK employers (48%) believe that young people are leaving full-time education with sufficient advanced digital skills. **NCUB recommends that increasing the digital skills of the UK workforce across the board will be essential to enabling them to move between sectors and to taking advantage of new opportunities.**

While providing the necessary skills is essential, creating one body to address and coordinate skills needs in the UK will facilitate the provision of those skills. A coordinated, cross-cutting approach needs to be taken to develop, upskill, retain and retrain domestic talent. **NCUB recommends that the remit of the Office for Talent should be expanded to include domestic talent to create a more strategic and evidence-based approach to understanding current and future skills needs.** The Office for Talent would recommend policy solutions to the Government across education, training, research, immigration and diversity and inclusion policy.

Addressing the need to incentivise and support those seeking to reskill later in life, NCUB recommends that loan restrictions regarding Equivalent and Lower Qualifications (ELQ) should be lifted, and that loans to study individual modules be introduced.

Workers switching between sectors is a lot more complicated than is sometimes considered, not to mention the stress caused by this move. A recent Resolution Foundation report highlighted that while there is a strong association between training and returning to work, the association between most forms of training and changing industry is much smaller. Within their sample, people aged between 25-59 years who were most likely to make a career change were those engaged in *full-time education*. Despite this, only 1% of 25- to 59-year-olds participate in full-time education each year, in

part because of longstanding practical and financial barriers that prevent adults from returning to intensive education and training.

It is very hard for people to move sectors due to a lack of technical and employability skills, and to keep up with changing sector demands. Currently, only a small percentage of businesses report being able to make use of public funds to support their employees through reskilling and upskilling. Universities, businesses and the government all have an active role to play. Universities need to reach out to more adult learners and recognise that they will need to be flexible in their approach with mature learners. **NCUB recommends that the Government should provide financial support for placements at SMEs in sectors that are struggling due to the pandemic, but which are strategically important in the long run.** Equally, businesses need to support and enable the retraining and upskilling of their employees.

Question 6: Does the Government have the right mix of policies and a coherent strategy to promote long-term productivity growth and create new high-quality jobs?

The R&D Roadmap and Plan for Growth clearly set out the Government's ambitions to improve productivity and create new, high-quality jobs by building R&D and innovation intensity. NCUB strongly supports the ambitions of the R&D Roadmap and the development of an Innovation Strategy to this aim. To achieve the ambitions, the Government needs to develop a clear strategy and the right mix of policies to specifically encourage private sector R&D investment and business innovation.

Research and innovation are affected by many different factors – from the availability of skills, datasets, buildings and laboratories, to regulation, tax and funding. A combined offer from Government, involving trade, education, health and treasury would, therefore, appeal to businesses and motivate them to invest both time and money in research and innovation. Such an offer should seek to untangle the web of tax incentives, regulation and funding pots to make them easier for businesses to access.

Successful innovation requires agile, responsive, risk-driven approaches with a clear focus on a purpose defined by demand led signals and user needs. UKRI, in partnership with devolved funding bodies, should review the foundational components of their research and innovation funding systems and actively identify where a more joined up approach can be developed. The Government also has a critical role to play in joining up, and promoting, wider fiscal and regulatory initiatives to business designed to encourage research and innovation. NCUB's report Research to Recovery offers a number of recommendations on how this could be achieved. An important function of the UK's Plan for Growth should be to create a framework to focus the UK's economy and define priorities for the research and innovation agenda so it can deliver greater opportunities, not just for UK research, but also for UK manufacturing, design and for sectors that have traditionally engaged less in R&D and innovation.

Since the publication of the R&D Roadmap, the Government has made a number of policy decisions that should help drive private sector investment and innovation – including the introduction of a new Super Deduction and review of pensions regulation. However, these benefits are likely to be offset by steep tax rises. The IFS has estimated that the budget will mean nearly £30 billion of tax rises by 2025/26 in the form of frozen allowances and significant increases in corporation tax. Cumulatively, this would represent the steepest tax rises announced since the 1993 Budget.

Corporation tax is set to rise from 19% to 25% for more profitable companies. Smaller businesses are likely to be hit too, with the re-introduction of a small profits rate of 19% on profits up to £50,000. For many businesses, investment in research and innovation remains a discretionary spend. Therefore there is a real risk that business investment could be hampered, despite the variety of initiatives taken in the 2021 Budget, if income from profits reduce.

In delivering the Plan for Growth, the Government needs to recognise that the pandemic has had an impact on research and innovation activities that could affect the ability of the innovation system to realise the ambitions. While public funding for R&D, innovation and commercialisation projects –

COVID and non-COVID-related - was sustained during lockdown, funding availability from industry and charitable sources for non-COVID-related projects decreased for many. Further, a joint Universities Commercialisation and Innovation (UCI) study with NCUB found that many universities reported a decreased availability of funding for providing the services and support to initiate and deliver non-COVID-related projects, and for building capabilities of staff to lead and deliver such projects. NCUB recommends that funding for non-Covid related research and development projects, particularly in sectors that have been the most affected by economic impacts, should be sustained.

Question 7: Is the Government doing enough to encourage corporate investment?

To achieve the vision set out in the R&D Roadmap and Plan for Growth and to become a more research intensive, innovation-led economy, more businesses will have to invest more financial and human resources in R&D across the UK. To succeed, there is a need to prioritise efforts to seize strategic commercial opportunities, create synergies in the system, strengthen the enablers of the R&D and innovation system, and attract global investment. While the government has taken steps to encourage corporate investment, it needs to do more.

For the UK to achieve its target of R&D investment reaching 2.4% of GDP by 2027, the private sector will need to invest £17.4 billion more in UK R&D in 2027 than it did in 2017.

Prior to the pandemic in 2020, R&D funding in the UK from private sources had steadily grown in real terms every year since 2009. Private funding of R&D had also increased as a percentage of GDP every year since 2013.

However, the UK's target of 2.4% is bold and ambitious. This requires equally ambitious, holistic policy making to succeed. There are three particularly important components that we wish to highlight:

1. Drive sustainable investment in research
2. Enhance fiscal incentives to encourage private investment, R&D and innovation
3. Promote the UK's offer globally

It is important to remember that the UK's drive to boost private R&D investment comes at a difficult time. The pandemic has created a more challenging environment for many businesses to invest. The effects of the Covid-19 pandemic on the ability of businesses to contribute to R&D and innovation have been substantial. A survey of 500 businesses jointly conducted by NCUB and the University Commercialisation and Innovation (UCI) Policy Unit at the University of Cambridge found that **91% of businesses reported some disruption to their R&D and innovation activities between March and August 2020**. 96% of businesses responding to the survey reported that their collaborative engagements with universities had also been affected by the pandemic.

Strategic business-university research collaborations provide a myriad of benefits to their participants and there is extensive research documenting the ways in which university-collaborations can add value and drive forward economic productivity. The Dowling Review suggests that companies that invest in R&D with universities can improve business performance through developing new techniques or technologies, de-risking investment in research, and extending the capabilities and expertise available to the firm. Investment in collaborative R&D also delivers benefits to the UK, driving growth and productivity improvements for firms and high-quality research outputs. Of concern is that future collaborations between universities and businesses are also likely to suffer due to the impacts of the pandemic on resources and spending. The NCUB/UCI survey suggested that a majority of business respondents stated a reluctance to increase their internal R&D activity between September 2020 to August 2021, while an even smaller percentage of businesses planned to increase R&D and innovation activities with universities.

To counter the challenges posed by the pandemic to innovation, the UK Government must develop a coordinated national innovation strategy. This must take into account the full range of factors that affect business innovation.

1. **Drive sustainable investment in research**

There is strong evidence that public funding for R&D helps leverage private investment, so the Government's commitment to boost public research spending to £22 billion is incredibly important. Business R&D spending depends on a range of factors, but the foundations of the system, underpinned by public funding, are among the most important. Not only is the quantum of public funding important, but so too is the timing. Steep rises in public research spending as we near 2027 will do much less to leverage private investment than patient, steady investment over a number of years. **The Government must therefore set out a clear plan to grow public investment steadily in the next six years to leverage private investment, alongside the other measures to encourage business innovation outlined in this response.**

2. **Enhance fiscal incentives to encourage private investment, R&D and innovation**

Fiscal policies and incentives can play an important part in driving private R&D and innovation investment. The decision to significant increase corporation tax (as noted under our response to question 5) will impact the ability of businesses to invest, and could equally impact on the UK's ability to attract inward investment.

Despite this, the Government has sent important signals to business that it wishes to incentivise R&D expenditure with both an increase to R&D tax credits from 12 to 13% (announced at the Budget in March 2020) as well as a review of the current R&D tax credit system. NCUB recommends a critical outcome from this consultation is to ensure the tax credit system continues to modernise and keeps pace with advances in research and development approaches while enabling more businesses to take advantage of what is on offer.

For many corporates – investing in start-ups and spin-outs is an important vehicle to access new ideas and innovations. Through Corporate Venturing arms, businesses are able to make targeted investments in R&D by investing in research-intensive businesses to aid proof of concept work and identify first to market opportunities. It is also often very beneficial to small companies to be working with major corporates as they provide a more guaranteed first customer as well as access to know-how and expertise not commonly available to small companies. This activity is growing and a number of corporates are investing more funds into this activity. To scale this up, NCUB recommends that the Government considers equivalent incentives to R&D tax credits to encourage greater corporate venturing activity. The opportunity presents a win-win, enabling large corporates to invest in translational capability in the UK to increase jobs and growth for start-ups and the economy more generally.

Improving incentives is important, but it is equally important to make it as easy as possible for the benefits to be accessed. The replacement of the large company scheme in 2013 with the Research and Development Expenditure (RDEC) has been welcomed by businesses eligible to access the scheme. At a time the UK is looking to support and nurture the next generation of companies, **NCUB recommends that Treasury consider an RDEC-type scheme for SMEs (especially for R&D-driven start-ups), which would both reduce the bureaucracy that SMEs face and encourage more R&D and innovation.**

3. **Promote the UK's offer globally**

As the UK establishes priorities, delivers synergies and scales up its R&D and innovation system, it will create new opportunities to compete in the global market. Simply having attractive framework conditions is not enough. To capitalise on them, the UK needs to promote and constantly evaluate the competitiveness of its offer. **The UK must start behaving as a competitor in the global market for R&D investment to retain existing business investment and attract higher levels of globally mobile business research.**

The global market opportunity is significant. The NCUB Research to Recovery report found that around the world, 1,000 multinationals spent $781.8 billion on R&D in 2017. Just a 1 percentage point increase in the UK's share of the global R&D market would mean an extra £8 billion in foreign direct investment. While multinational enterprises (MNEs) used to carry out most of their R&D activities in their home countries R&D investments by MNEs abroad now account for an estimated 20% of all

private R&D investments globally. One implication is that countries or regions have new opportunities to attract high value-added activities linked to global innovation value chains. The UK already attracts an exceptional share of research intensive FDI disproportionate to its size. In 2018, 53% of business-based R&D was funded and performed by foreign-owned businesses, a higher share than any country in the G7.

Therefore, in order to attract more foreign direct investment into the UK and to increase business R&D investment, **NCUB recommends that the Government, through UKRI, BEIS, the Home Office, Treasury and the Department for International Trade, should develop a foreign direct investment (FDI) in R&D strategy to retain and attract a higher level of globally mobile business investment in R&D to the UK**. Several organisations, including the Royal Society, have made similar proposals to help professionalise the UK's approach to attracting FDI in R&D, setting clear priorities, targets and ambitions. The FDI in R&D strategy would help set the priorities of the recently announced Office for Investment and could align its focus to determined commercial missions.

In order to level up across the UK, create simpler mechanisms to support businesses to innovate, and to galvanise industry and academia around specific, defined commercial challenges, NCUB recommends the establishment of Innovation Collaboration Zones. The purpose of the Innovation Collaboration Zones would be to join up possible levers to maximise R&D investment amongst start-ups and SMEs as well as large multi-national companies, and to make it simple and effective for a business to invest in R&D and to capitalise on the different opportunities available. Importantly, the levers deployed could be tailored to the specific focus of the Zone.

Question 8: Is the "Plan for Growth" an adequate replacement for the "Industrial Strategy"?

NCUB welcomes the Plan for Growth. In Autumn 2020, we called on the Government to unite its twin aims of developing a more productive, resilient economy with its aspirations to grow research intensity and innovation, by refreshing the Industrial Strategy. The UK has changed significantly since the Industrial Strategy was developed in 2017, with the impact of Covid-19, the UK's withdrawal from the European Union and a renewed emphasis on carbon neutrality affecting policy priorities. To drive these, the UK needs national coordination rather than individual interventions.

The Plan for Growth helps to define business R&D and innovation as a critical driver of competitiveness. It also recognises that there are a variety of public levers, fiscal and regulatory, that could have a combined positive impact on business investment. The expected Innovation Strategy should provide a detailed plan to create the right conditions to encourage greater business investment in research, development and innovation. Together, we believe that the Plan for Growth and Innovation Strategy will set direction and priority, that should also be reflected in the decisions taken at the 2021 Comprehensive Spending Review.

Although the aspirations of the Plan for Growth, and the direction that it sets, are incredibly important, the Government must carefully consider delivery and implementation of the Plan. Specifically, there is a need to coordinate and champion actions across Government and Departments to deliver the Strategy, including in its local application. The Industrial Strategy Council played an important part in the delivery of the Industrial Strategy, and there is a need for similar mechanisms to be constructed to help delivery of the Plan for Growth. Arguably, a case could also be made for the development of a cross-cutting Economic Transformation Government Department.

The Government's Plan for Growth recognises that there are a variety of public levers, fiscal and regulatory, that could have a combined positive impact on business investment. It is, however, noticeable that there is little mention of Innovate UK in both the Budget and Plan for Growth, despite the focus both documents place on innovation.

NCUB does believe that that Plan for Growth should have developed thinking on the future of skills further. Although the Plan recognises that delivering a low-carbon, high-tech economy will require a highly skilled workforce, there are few new announcements related to adapting to the UK's future

skills needs. Although reforms to the immigration system must be welcomed, there is little mention of how to prepare the domestic workforce for a rapidly changing labour market. NCUB's Taskforce-led Research to Recovery report, made recommendations that the UK needs to fundamentally rethink research careers, and would welcome more skills announcements that propose to go further in the expected R&D People and Culture Strategy later this year.

Question 9: Are we in a period characterised by long-term low economic growth (secular stagnation), and if so, what are the implications for Government economic policy?

The UK is at risk of being caught in a period of long-term low economic growth due to the long-lasting impacts of the financial crisis in 2008 described above, cumulative investment shortfalls in R&D and skills behind other OECD nations, impacts of Covid-19 and the economic uncertainties for businesses and investors since the UK withdrew from the European Union.

However, NCUB believes that a focused Government approach on policy and financial investment designed to stimulate and encourage R&D and innovation, education and skills development could reduce these risks significantly. The R&D Roadmap is a rallying cry to the drivers of the R&D system and all actors who are, or should be, invested in the importance of R&D. For government, for businesses and for universities, it raises the expectations as to the scale of ambitions for R&D in the UK. The private sector invests around £25 billion per annum in R&D. Achieving the 2.4% target, will require businesses to spend an estimated £17.5 billion more on R&D in 2027 than they did in 2017.

In this context, the NCUB Taskforce recommended that:

- Setting out a new vision for R&D in the UK requires a commitment from business as much as it does from universities and government. This stems from viewing businesses as fundamental partners in the R&D ecosystem, rather than just beneficiaries.
- The Government's target to double R&D investment will not be achieved through greater investment by existing R&D investors in UK research alone. The UK will also need to capture a greater share of the global R&D market and attract R&D investment from UK businesses that do not traditionally engage in R&D.
- The UK is world-leading at research, but the greatest challenge and opportunity of the R&D plan is translating this success in basic research into greater business driven research, development and innovation.
- UK universities, which are dispersed across all parts of the UK, have a fundamental role to play, individually and with their partners, in levelling up the UK through research and education.

To realise the aspirations of the R&D Roadmap, there is a need to develop an exciting and compelling case for UK PLC across all parts of the UK. The R&D Plan should speak more directly to businesses by articulating the market opportunities that greater R&D and innovation can present to those in R&D intensive and less R&D intensive industries and focusing on establishing the enabling infrastructures that encourage business investment. Developing an exciting case will require a better understanding of the drivers that shape the decision making for those that approve investment decisions in businesses. Reaching beyond the converted requires an understanding of the factors that influence their thinking and priorities. The case needs to be framed in ways that demonstrate and deliver value, benefit and return comparable to other competing investment priorities.

NCUB recommends that the government needs to commit to continued long-term funding and longer-term policymaking. This will enable the UK economy to come out of the crisis more quickly. The challenge therefore is not to understand what initiatives are needed, but rather how the existing framework can be made to work better together to achieve the required scale and be more responsive to economic and societal changes.

The March 2021 Budget already commits to £3 billion for the National Skills Fund, improving the technical skills of adults across the country. However, more could be done to address future skills needs. The Budget included limited reflection on the skills needs of an advanced knowledge economy, with far greater investment in R&D likely requiring more people with PhDs.

The role of universities has also not been fully acknowledged as a key driver in supporting economic recovery and growth. **NCUB recommends that future policy-making and funding decisions need to include the vital role of the higher education sector.** The businesses engaged in the Taskforce all emphasised that fundamental research performed in universities and research labs underpins the R&D and innovation system. **To provide a sustainable foundation to a more research-intensive, innovative economy, NCUB recommends that the UK Government should invest more in discovery-led research across the Research Councils and, in particular, increase Quality Related research funding.** There is a need to increase Quality Related funding to help universities build and maintain capacity, and take on more research grants without making a financial loss. Universities have delivered on generating the efficiencies that the practice of funding research far below cost aimed to incentivise. However, this has led to a reliance on other sources of income to support research activity. The consequences of this dependence have threatened the research base during the Covid crisis at a time when research is most needed.

Building a system that allows more institutions to engage in R&D and innovation activity increases opportunities for growth, which can generate high returns for the UK and local areas. The current system of funding research below cost also limits the opportunities for institutions to engage in commercialisation and other knowledge exchange activities that do not generate returns to the institution.

Question 10: Is the UK well placed to take advantage of future technological breakthroughs and translate them into economic opportunities?

As the UK begins to move from recovery to rejuvenation, it needs a bold economic plan to seize the opportunities of the Fourth Industrial Revolution. **NCUB recommends that R&D and innovation should not be seen as one of a series of important cogs in the system, but as the critical engine that will power a bold economic plan.** At the heart of this is the vital role of researchers themselves.

The UK has a world-leading research base, which puts the UK in a strong position to take advantage of technological breakthroughs. Policy interventions should be designed to (1) maintain the UK's research strengths sustainably, and (2) redouble efforts to drive innovation.

To maintain research strengths sustainably, UKRI must invest more in discovery-led science across the Research Councils and, in particular, increase Quality Related research funding. This is the cornerstone of the research base and underpins business R&D and innovation. Simultaneously there is a need to invest in the UK's R&D capital and digital infrastructure to remain at the forefront of emerging capabilities.

To deliver more private sector R&D and innovation activities, the UK needs a strong Innovation Strategy that considers the range of factors that affect business R&D and innovation investments – from fiscal incentives, through to regulation and skills. Importantly, the Innovation Strategy should consider measures to both strengthen the UK's innovation offer to businesses, and to promote its strengths globally.

NCUB further recommends that in order to take full advantage of future technological breakthroughs and turn them into economic opportunities, the UK must act as a competitor in a global R&D and innovation market.

Simply having attractive framework conditions is not enough. To capitalise on them, the UK needs to promote and constantly evaluate the competitiveness of its offer. The UK must start behaving as a

competitor in the global market for R&D investment to retain existing business investment and attract higher levels of globally mobile business research.

This means that the UK must not only invest in R&D and innovation, but create a system that enables and incentivises research commercialisation, academic spin-outs and start-ups, attracting and retaining a diverse research workforce, and building on the network of business incubators, accelerators, and catapults.

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