

PUBLIC SECTOR RISK EQUITY CAPITAL TO KICK-START SCIENTIFIC VENTURES



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“Public Sector Research Establishments provide untapped potential”
 Sir Patrick Vallance, CaSE lecture, January 2020

This is a decade when overall UK R&D investment could increase by almost 50%. In the 2020 budget, the Chancellor announced that public R&D investment will increase to £22 billion per year by 2024-25, as part of reaching a target of 2.4% of GDP being spent on R&D by 2027. Cross-Party political consensus on this is high, with the COVID-19 pandemic highlighting the importance of science and spurring long-term support for R&D.

The science community has welcomed the positive signals, not least as they come against a worrying economic backdrop. In recent weeks, there have been a flurry of upbeat announcements. Support for university research; a Road Map towards the UK being ‘a science superpower’; intent to unlock and embrace talent, diversity, resilience and adaptability, and to tackle our biggest challenges. Nevertheless there remain uncertainties caused by the difficult state of university finances, the relative newness of UK Research & Innovation (UKRI) as a central body delivering the majority of public funding for research and innovation, the probable loss of Horizon Europe collaboration (even if some equivalent funding is promised), an emerging crisis in charitable funding for medical research, and the potential emergence of the “ARPA” initiative, all complicating factors. Government Budget increases are welcome, yet there needs to be careful analysis as to how

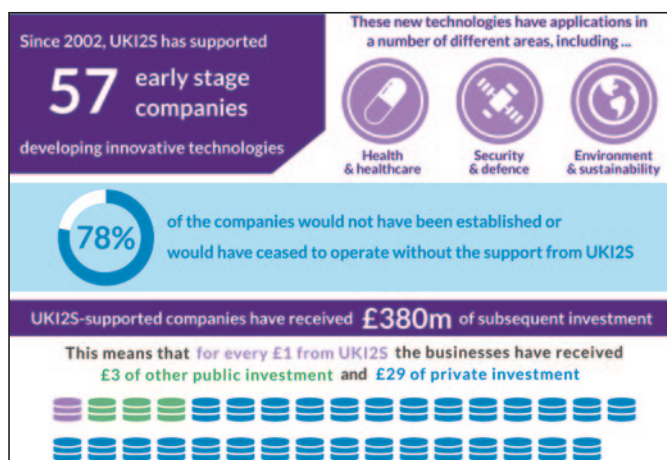
they are allocated and prioritised.

It has been the ambition of successive Governments, at least since my time as Minister for Science, to drive up the UK’s mid-league table level of spending on R&D. The admirable challenge of reaching the target of 2.4% from the current level of 1.7% is still considerable (even whilst GDP is temporarily shrinking). This is not least because Government R&D expenditure remains stubbornly well behind the quantum of

science, on the assumption that there will be translation of the outcomes into economic/social benefit, with industry leading the way on applied R&D.

Secondly, the belief that effective translation and exploitation of this investment is essential and can lead to a transformation of our productivity, the shape of our economy and our well-being.

But delivering on this translation is not straightforward. Government has a difficult but



private sector investment, the level of which is itself in the current climate difficult to predict. Public funding for R&D was £9.6 billion in 2018, 26% of the total and, notwithstanding the recent announcement of a 19% increase in BEIS’ research budget, across Government as a whole R&D budget growth is still sluggish.

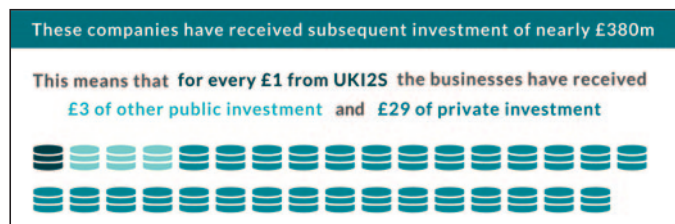
Two things look unlikely to change, though. First, that Governments should continue to lead in the funding of basic

key role to play in identifying and supporting those approaches that work best. Coming back to Sir Patrick’s quote at the top of this piece, one benefit UK science possesses is the existence of our excellent Public Sector Research Establishments (PSREs), owned and run by public bodies such as UKRI (via STFC, BBSRC, NERC), Dstl, NPL, UKAEA and others. These combine a range of in-house research programmes, alliances with UK and international universities and

other bodies such as CERN & ITER and, increasingly, a role as economic forces in a manner that is often overlooked. There was an important recent pledge in the R&D Road Map to consider opportunities in PSREs and other publicly funded research institutes, including establishing how government can best drive innovation through these organisations.

company's life, often as founders and well before private investors usually become interested. To date the Fund has invested in 65 companies and is, I believe, clear evidence of how public funds, sensibly managed, can deliver high levels of economic return within a sustainable financial model.

One focus for UKI2S is Synthetic Biology, identified as a



I contend that the PSREs should be a focus of greater support and attention. STFC & BBSRC, for example, have established science and technology excellence around their world leading centres, attracting high-tech companies to locate at Harwell and Babraham and, importantly, sites such as Daresbury in the North West and Norwich Research Park, both cornerstones of their local economies. Their own laboratories produce start-up companies with breakthrough technologies that compare very favourably with University spin-outs. These innovative companies are an opportunity to capture value from the public investment in science funding, to create jobs and economic growth, and we should take the opportunity to build on this with more public sector funding.

Fortunately, there is an existing and proven vehicle for public investment in the companies emerging from the labs and campuses of the PSREs. The **UK Innovation and Science Seed Fund (UKI2S)**, for which I chair the advisory board, has partnered with the leading PSREs on this unique investment mandate since its creation in 2002. The Fund invests in the earliest and riskiest stages of a technology

crucial area applicable to a wide range of industries. In healthcare, SynBio has the capability to create curative, rather than palliative, therapies so we have invested in cell & gene therapy companies such as Quethera, a company with a potential breakthrough treatment for glaucoma that is now being taken to market by Astellas of Japan. In agriculture, we were an early backer of Norwich Research Park's Tropic Biosciences which has just raised £23m to use their gene-editing technology to develop bananas capable of resisting the devastating Panama fungus.

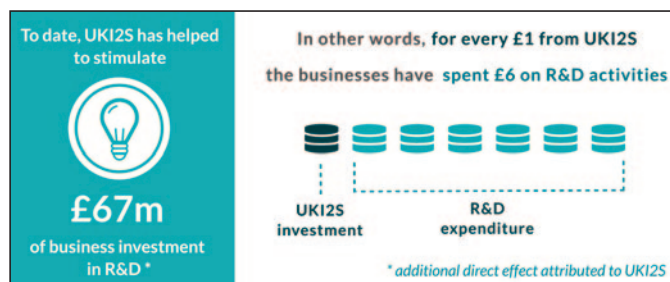
Portfolio companies have also turned their capabilities to the fight against COVID-19. Ag Plus Diagnostics and its electrochemistry technology is based on National Physical Laboratory's patented measurement invention in 2009. AgPlus has completed successful initial feasibility of a rapid IgG COVID-19 test with specificity > 98% and sensitivity > 92%. The test can be utilised in all medical settings and give results in less than 15 minutes. This adds value by establishing those that have already been exposed to virus and those that are still susceptible. The test is

quasi-quantitative and can therefore help determine patients with low immune response to virus. AgPlus has been awarded 2 grants to support the COVID-19 work and are also developing a quantitative viral assay to support the test, track and trace initiative. This will allow targeted isolation and help prevent viral spread. In addition, there are two UKI2S portfolio companies collaborating under an Innovate UK-funded programme to improve the swab testing for COVID-19.

On the economic front, UKI2S has a strong record of achievement in key areas such as leverage of private investment, job creation and R&D spend. According to an independent review (SQW, March 2020) UKI2S investment of £15m has been followed by over £500m of private investment ranging from angels to VCs and large multi-national corporate investors, a great example of how public

during a period when private investors are likely to focus on supporting their existing investments and identifying opportunities in later stage companies recovering from the pandemic. To avoid young companies failing and the innovation pipeline coming to a halt we need to step up our investment and ensure that we can provide the finance and mentoring needed to grow and attract later, follow-on investment from VCs and angels, and deliver tangible economic impact to the UK.

Investment in science now goes beyond the immediate need for economic recovery. It is a question of national resilience to the next global pandemic or other crises. Parliamentarians from all parties agree on the essential importance of delivering a substantial increase in UK R&D investment, and as part of that, capturing the value of the great science taking place in the public



sector funding can leverage private investment by taking the first risk! Portfolio companies generated around 700 jobs, and over 50% of the portfolio companies' total funding (i.e. over £250m) is spent on R&D. A crucial finding was the level of "additionality", that more than 75% of the companies simply would not have existed without UKI2S finance and mentoring at the earliest stages. In addition, though much of the partners' activity is located in the South East, half of companies are based outside the Golden Triangle, assisting levelling up.

The role of UKI2S in investing in early-stage ventures will become even more important

sector. We in UKI2S are now examining sources to secure a step-change boost in financial capacity in order to increase the scale of the opportunity which we identify as being greater than the resources we have at present. Government can take credit for the establishment of the initial UKI2S fund and the positive results derived; it should now take the opportunity to go one step further and provide greater risk capital funding able to – as Sir Patrick puts it – realise the exciting scientific commercial potential of our public sector research establishments. □