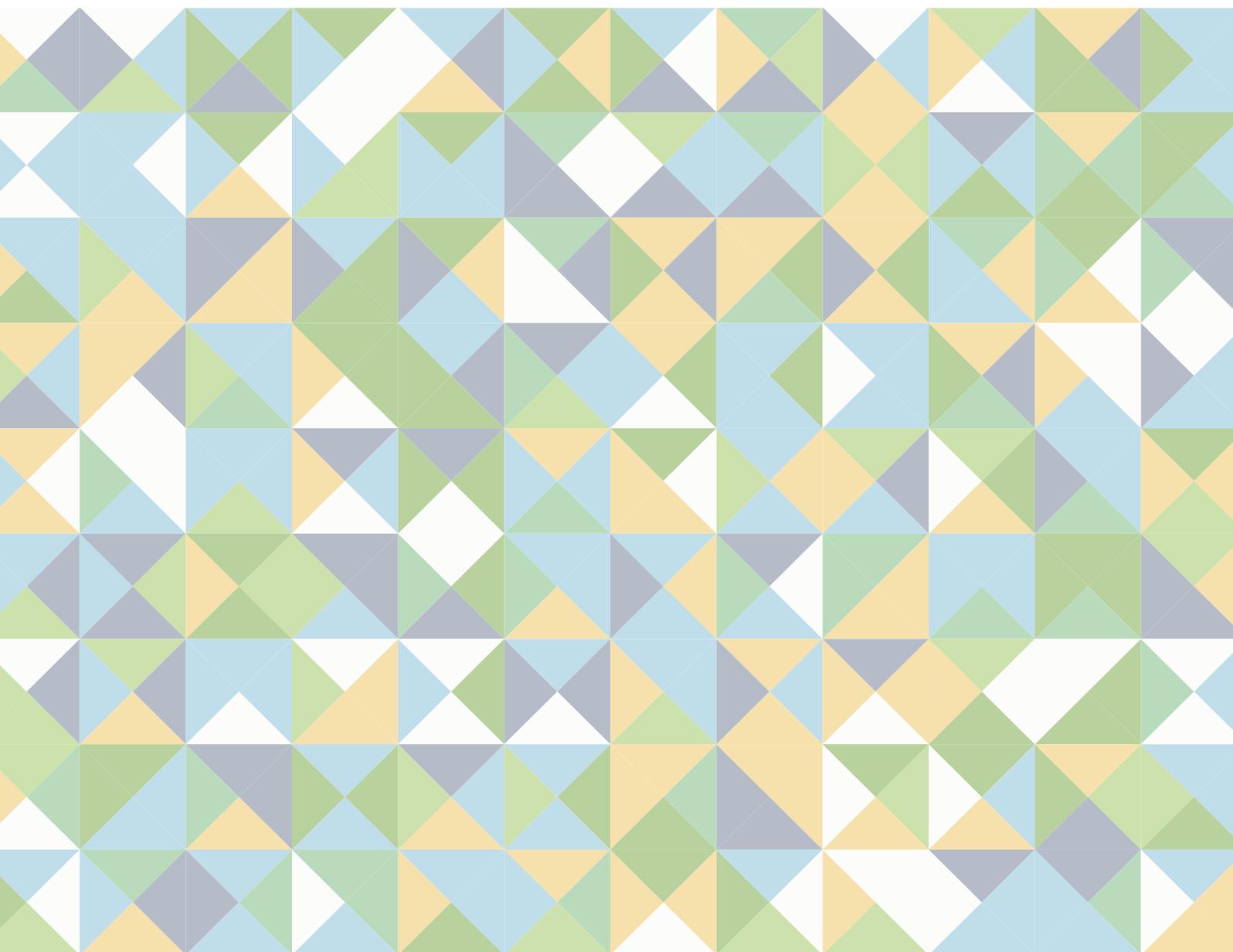


# Advice on university-investor links

**Independent advice from Mike Rees for David Sweeney, Executive Chair, Research England**

Report presented at a launch event organised by the National Centre for Universities and Business (NCUB) on 29th July 2019 at the London Campus of the University of Liverpool in the City of London





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# Executive summary

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## **1. The good news is that the model is not broken and has significant upside opportunity.**

- a) The global economy is becoming increasingly knowledge based, playing to the strengths of the UK.
- b) The UK university sector has a long standing, leading global reputation for the quality of its research in Science and Technology.
- c) There is underlying positive momentum with many examples of good practice being implemented and a developing “ecosystem” (wider conditions of entrepreneurship).
- d) Government policy interventions are having a positive impact.
- e) The situation requires both building on the strengths of the past, and anticipating the future.
- f) One size does not fit all, so detailed national policies on terms, for example, of Intellectual Property (IP) transfer between universities and investors or businesses, are not appropriate.

## **2. The bad news is that the model is not broken, which means implementing change is hard.**

- a) Crises always create a better environment for change, and command priority attention.
- b) There is complexity, which means there is not one solution - the range of opportunities varies by technology/industry sector, maturity of processes etc.
- c) The UK ecosystem is developing but it is not consistent or being leveraged to the full.
- d) Access to capital is improving, but there are very real structural issues related to its source, amount and concentration.
- e) There are a number of initiatives underway which create the danger of “too many chefs in the kitchen”. A few focussed initiatives which can deliver are required to accelerate momentum.

## **3. Seizing the opportunity will need change and alignment.**

- a) Water flows down-hill, so change has to start at the top (that is Government and funders) and flow down. The formation of UK Research and Innovation (UKRI) was a start but needs building upon.
- b) In general, both Universities and Investors can point to the strengths and value they bring, and historic successes. To accelerate, there is a need

for reflection on both sides, retaining strengths, but also acknowledging what needs to be different. On balance, the challenges on access to investment are probably greatest.

- c) In addition, there is the question of better alignment at multiple levels, where the issue of scale is a critical component.

## **4. The term “investors” needs a broad definition in order to ensure the focus is on the breadth of pools of capital liquidity available.**

- a) The traditional, narrower focus area of venture capital is presently highly concentrated and has increasing structural challenges, reducing the availability of capital.
- b) A broader definition includes corporate venture funds and pensions (both domestic and international). Each of these has different challenges but are emerging, growing and very large pools of capital.

## **5. The bulk of the observations in this paper are general in nature. This does not recognise that there are outliers - the leaders of good practice.**

## **6. The structure of this paper includes observations generally about spin-out company formation, but the recommendations narrow the focus to the remit of the review (see Annex A) on university-investor links. The remit was also focussed on universities with large scale investor links, or university collaborations currently seeking those links.**

## **7. The focus of the recommendations is to identify the few issues which can accelerate the speed of change and build momentum for further change, specifically:**

- a) To create a sense of what success looks like (focussing on outputs rather than inputs)
- b) To improve alignment of both processes and access to capital, leveraging strong capabilities into a stronger ecosystem.
- c) To create scale which facilitates the improvement in alignment and skills and capabilities.
- d) To communicate and share best practice and capabilities, together with success stories. Success breeds success.

# Background

1. The Fourth Industrial Revolution represents a fundamental change in the way we live, work, and relate to one another. It is a new chapter in human development, enabled by scientific and technology advances that are commensurate with those of the first, second and third industrial revolutions, and which are merging the physical, digital, and biological worlds. The World Economic Forum is one body that has recently discussed this opportunity, and its related challenges<sup>2</sup>.
2. The UK is a fundamentally strong economy, with widely admired institutions and some of the world's leading businesses and universities. However, it is not enough just to look at the economy we have. We need to anticipate and prepare for the economy of our future. The Government's Industrial Strategy is part of that preparation<sup>3</sup>.
3. Historically, the UK has been viewed as a global centre of trade and investment, largely because of business and investor confidence in the "rule of law".
4. The UK has a relatively small domestic business to consumer - B2C -market. But because of the nation's role as a centre of global trade and commerce it is a global hub for business to business - B2B - markets. This is good news for the Industrial Strategy's focus on commercialisation, because university research tends to be more applicable to B2B.
5. Universities are major contributors to society and to the economy at local, national and international levels. These are important contributions in their own right, but they also provide foundations for success in commercialisation, evidenced as example by over £4.5 billion in income from knowledge services to businesses and other enterprises generated annually by UK universities<sup>4</sup>. The development of graduates and postgraduates as potential entrepreneurs for business or social start up is vitally important, with over 4,000 graduate start-ups created per year<sup>5</sup>. Universities support development of entrepreneurial ecosystems around the country, with prospects for improved growth, productivity and living standards. University research and teaching help the UK and global development more generally, through cultural, health and wellbeing, environmental, political, diplomatic and the like contributions. This is illustrated, as example, in case studies for the 2014 Research Excellence Framework.
6. The UK's excellence in research is the result of decades even centuries of development, and today this excellence is sustained by a complex funding mix which combines tuition fees, government and research grants and industrial and commercial contributions, each of which play an important role, and with strong interdependencies. This is further complicated by the different discipline/technology portfolios of different universities, and the multi-disciplinary interplay which is an important feature to commercialisation.
7. UKRI grants are a critical part of the financial model of universities, and, as noted above, there are key interdependencies between various UKRI funds and other sources, including tuition fees and Government grant for university teaching and commercial and investment sources. There could be unintended and potentially perverse consequences from changing policies that have financial implications for universities, research, commercialisation or seed stage for start-ups. A simple example of interdependencies is the contribution made by overseas tuition fees to funding research, which in turn affects the recruitment and retention of high quality academic staff, which affects the quality of research, and hence the reputation of the institution - and hence its ability to attract commercial partners.
8. Significant progress is being made, leading to the UK being one of the leaders in research commercialisation. The accompanying data report to this review (described in paragraph 13) sets out evidence on international comparisons in detail<sup>6</sup>, which includes:
  - a) Five UK universities are in the top ten worldwide by value of the capital raised by their spin-out companies.
  - b) The UK consistently places at the top of worldwide rankings for reputation for university-industry R&D links, such as those of the World Economic Forum<sup>7</sup>.
  - c) On US-UK comparisons, UK typically performs comparably with the American university system on attracting research income from industry, efficiency in commercialisation and revenues from spinning out, though behind the curve on overall IP income.

<sup>1</sup> Defined in UK in Higher Education Statistics Agency's (HESA) Higher Education Business and Community Interaction (HEBCI) survey as new companies formed from university IP.

<sup>2</sup> [http://www3.weforum.org/docs/WEF\\_Dialogue\\_Series\\_on\\_New\\_Economic\\_and\\_Social\\_Frontiers.pdf](http://www3.weforum.org/docs/WEF_Dialogue_Series_on_New_Economic_and_Social_Frontiers.pdf)

<sup>3</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf)

<sup>4</sup> <https://www.hesa.ac.uk/data-and-analysis/providers/business-community>

<sup>5</sup> Source see FN 4.

<sup>6</sup> See data report section 9.

<sup>7</sup> Figure 36 to data report, page 52.

<sup>8</sup> As example, the United Kingdom ranked 6th in the world for university/industry research collaboration in the 2018 Global Innovation Index report

<sup>9</sup> Table 26 to data report, page 47.

<sup>10</sup> Pages 45-47 of data report on spin-out survival rates.

<sup>11</sup> Extract from Table 23 to data report, page 44. Note earliest available for external investment in HE-BCI survey is 2008

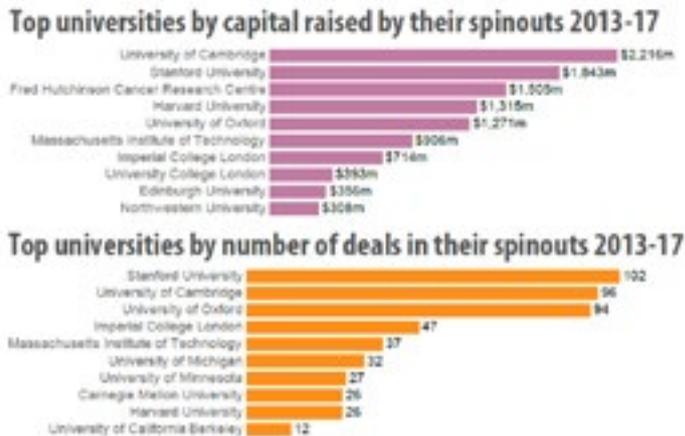


Figure 17 Top universities globally by capital raised by, and number of deals in, their spin-outs, 2013 – 2017  
Source: Global University Venturing 2013-17 Data Review

Metric	USA (AUTM)	UK (HE-BCI & HESA finance record)
	FY 2015	AY 2015-16
Total research resource (£M)	39,620	7,845
IP income including sale of shares in spin-outs (£M)	1,224	176
<b>IP income as percentage of total research resource</b>	3.1	2.2
Spin-out companies formed	946	168
<b>Spin-outs per £100 million research resource</b>	2.4	2.1
Patents granted	6,124	1,219
Patents granted per £100 million research resource)	15	16
Industrial contribution (£M)	2,961	603
<b>% industrial research</b>	7.47	7.69
US cashed-in equity/UK sale of spin-off shares (£M)	45	36

Table 19: Commercialisation activity for the US and UK, 2014-15 and 2015-16  
Source: HEBCI surveys 2003/04 – 2017/18 Note: 'FY' = 'Financial year'; 'AY' = 'Academic year'; 'IP' = 'intellectual

d) Performance of UK spin-out companies is improving, including in relation to investment, turnover and employment in active companies, as in Table 2, and with a 76% five year survival rate of spin-outs formed in 2014<sup>10</sup>.

External investment raised (£000s)		Turnover of active firms (£000s)		Employment of active firms	
Total raised		Average for all active firms	Average for all active firms	Average for all active firms	Average for all active firms
2016-18	2008-11	2016-18	2004-06	2016-18	2004-06
3,772,200	2,977,500	2,030,300	661,700	23,300	16,500

Table 211 Key UK university sector spin-out (USO) performance metrics  
Source: HEBCI surveys 2003/04 – 2017/18

- e) It is important to focus on measures that suggest value created rather than volume. It is relatively easy to incorporate a company, and national policy signals can drive up numbers of spin-outs, with the danger that these will not deliver impact. Evidence in paragraph 15 below shows positive trends in quality indicators.
9. The model is not broken, but accelerating existing momentum would offer significant opportunity, particularly to build on opportunities from increasing research and innovation resources and the establishment of UKRI and to contribute to delivery of the Government's commitment to 2.4%.
10. The overall opportunity and challenge for the UK has resulted in a number of reviews of university commercialisation, as well as follow-up programmes. It requires a joined up vision of success to get maximum impact from these various initiatives, tying them together and identifying synergies. Important reviews and initiatives include the Government's commitment to a target to spend 2.4% of UK GDP on R&D, its industrial strategy and specific sector strategies, such as the Life Sciences review<sup>12</sup> and its Scale-Up Task force, HM Treasury's Patient Capital review<sup>13</sup>, the reviews of the Council for Science and Technology into the role of public markets in helping the UK's science and technology companies and into entrepreneurship education<sup>14</sup>, the universities/HEFCE McMillan review of good practice in technology transfer<sup>15</sup> and novel developments of UK Research and Innovation and its nine Councils<sup>16</sup>, such as the Investment Accelerator.
11. Specifically, this report should be read in conjunction with the McMillan review, and with the follow up work to that review - the proposed knowledge exchange concordat and Research England's knowledge exchange framework<sup>17</sup>.
12. This report has been compiled following interviews with informed parties from across government, public and other research funders, university leadership, academic entrepreneurs, investors, businesses, university research and technology transfer offices and related organisations: listed at Annex B.
13. It has also been compiled drawing on a data report commissioned by Research England specifically to support this review "Developing University Spinouts in the UK: Key Trends in Spinout Activity, Investments and Investor Involvement" authored by Tomas Coates Ulrichsen, Centre for Science, Technology and Innovation (CSTI), University of Cambridge, which is published separately. Tables and Figures in this report are taken from the data report, and that report provides further contextual information, as well as presenting additional evidence and analyses, including commenting on robustness of data sources.
14. Any comments or queries on this report should be addressed to [KEPolicy@re.ukri.org](mailto:KEPolicy@re.ukri.org).

## Universities and spin-outs

### 15. Significant progress has been made in the context and approaches to research commercialisation.

- a) Since the mid-1980s, UK universities have taken lead responsibility for commercialising the results of their research supported from public sources. Over the last 30 years, many universities have gained experience of managing their technology transfer (and wider knowledge exchange) activities, either in-house or through a subsidiary company, or in some cases in partnership with external companies.
- b) In 2014, a further boost was given to the commercialization of university research when the Research Excellence Framework (REF) introduced assessment of impact, with Research England consequently building drivers of impact performance into its university research funding.
- c) In 2018, UK Research and Innovation (UKRI) was newly formed, combining the seven research councils, Innovate UK and Research England, with a combined budget for research and innovation of over £6.5 billion per annum.
- d) Based on evidence in the accompanying data report and other analyses<sup>18</sup>.

<sup>12</sup> <https://www.gov.uk/government/publications/life-sciences-industrial-strategy>

<sup>13</sup> <https://www.gov.uk/government/publications/patient-capital-review>

<sup>14</sup> <https://www.gov.uk/government/organisations/council-for-science-and-technology>

<sup>15</sup> [https://webarchive.nationalarchives.gov.uk/20170110115535/http://www.hefce.ac.uk/pubs/rereports/Year/2016/ketech/Title\\_109539\\_en.html](https://webarchive.nationalarchives.gov.uk/20170110115535/http://www.hefce.ac.uk/pubs/rereports/Year/2016/ketech/Title_109539_en.html)

<sup>16</sup> <https://www.ukri.org/>

<sup>17</sup> <https://re.ukri.org/knowledge-exchange/knowledge-exchange-framework/>

<sup>18</sup> <http://www.andlaw.eu/wp-content/uploads/2018/04/Anderson-Law-University-Spinouts-report-April-2018.pdf>

<sup>19</sup> Figure 10 to data report, page 25.

<sup>20</sup> Table 15 to data report, page 31.

<sup>21</sup> Figure 16 to data report, page 31.

i) Although annual output of spin-outs has fluctuated (discussed in section 5 to data report), the stock of spin outs from UK universities has grown:

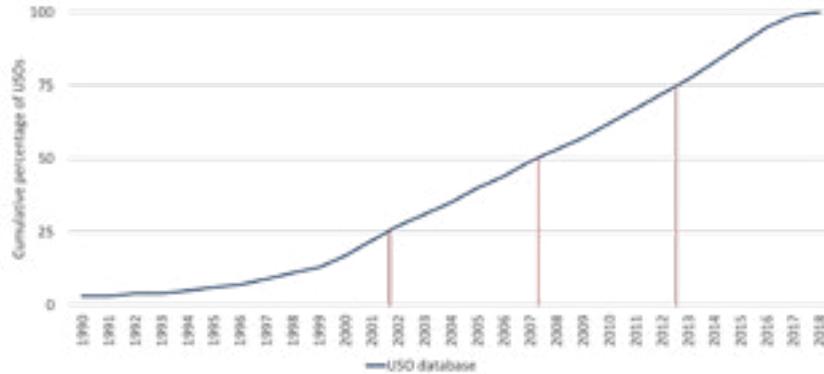


Figure 2<sup>19</sup> Cumulative percentage of UK USO formation by year of incorporation (%)  
 Source: analysis of USO database, based on year of incorporation of all USOs identified in Beauhurst, Spinouts UK and Gateway to Research

ii) The number of deals and amounts of private investment have also grown:

	Company stage at point of deal	2011	2012	2013	2014	2015	2016	2017	2018	Absolute change 2011-18 (%)
Number of deals	Seed	86	104	97	125	137	154	166	154	68
	Venture	68	85	84	113	125	112	143	130	62
	Growth	14	20	31	22	39	36	38	32	18
Total investment raised (£millions)	Seed	63	59	49	82	164	183	222	288	226
	Venture	148	147	162	323	392	379	591	566	418
	Growth	395	192	152	116	222	426	314	499	104

Table 3<sup>20</sup> Trends in the number of deals and scale of investments in UK USOs  
 Source: author's analysis of Beauhurst database

iii) And deal sizes have also increased at seed and venture stages, but with more volatility at growth stage (probably due to smaller number of investments at this stage):

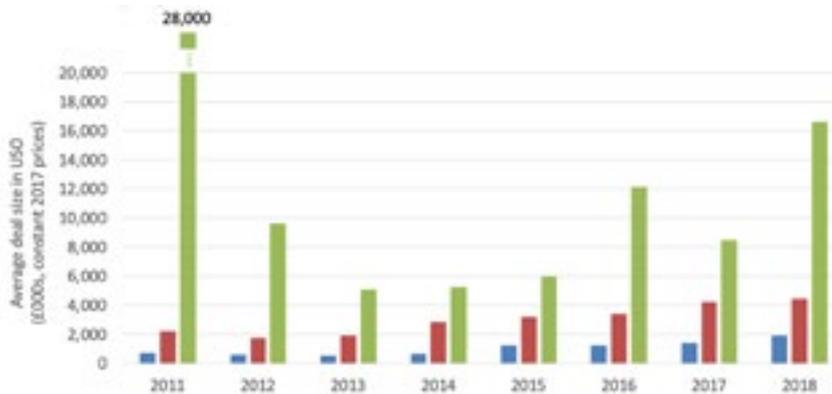


Figure 3<sup>21</sup> Trends in the average size of investment deals in UK USOs, 2011 - 2018  
 Source: author's analysis of Beauhurst database

## 16. Creating spin-out companies with high survival rate.

- a) Evidence in the accompanying data report (section 8) shows that spin-outs from UK universities are doing well. Around three-quarters of spin-outs which have received private investment between 2011 and 2015 have survived. This is a high rate of success. When looking at new companies formed in general, not just those related to universities, around only two in ten survive beyond their fifth year.
- b) The data report notes though that comparisons between survival rates of spin-outs and high tech companies may be more appropriate than with all companies. Up to date evidence on high tech companies is not available, which should be sought to make better comparisons in future.
- c) This high success/survival rates can be seen as a double-edged sword. Are too many patents being filed by universities – and not commercialised? If the number of firms created were larger would the high survival rate be maintained? And what does this say about the degree of risk being taken? If the UK should be increasing the volume of its commercialisation, to maximise the likelihood of supporting the most valuable opportunities, what is the source of risk finance for this? Ultimately though, this a positive story for innovation in the UK, and the question should be how to do more.

## 17. Developing an underlying capability and ecosystem

- a) There is broad agreement that the UK has an increasingly well developed “ecosystem”<sup>23</sup> - the environment for development of new, innovative companies. These conditions are increasingly expanding outside of some of the recognised areas of expertise, such as the “golden triangle” of Oxford, Cambridge and London, particularly University College London and Imperial College. Entrepreneurial ecosystems are being developed more widely, for example through projects from the Research England (RE) Connecting Capability Fund (CCF)<sup>24</sup>. This includes the Northern Triangle Initiative (NTI) in the North West, the Northern Accelerator in the North East and Midlands Innovation Commercialisation of Research Accelerator (MICRA) across the Midlands.
- b) This widening of entrepreneurial capacity has resulted in a body of expertise and capabilities that are increasingly being leveraged. Examples of these broader ecosystems developments include the creation of new forms of university venture funds, such as Oxford Science Innovation (OSI) or Frontier IP (a partner, as example, with Plymouth University),

new private or public accelerator programmes, such as iCure or Deep Science Ventures, new or improved partnerships, such as the combined forces of Praxis and AURIL or the increased role of Innovate UK within UKRI to support university commercialisation, including through the Knowledge Transfer Network (KTN). While much is made of the profile and success within the golden triangle, less is talked about successes elsewhere, for example of the SETsquared university partnership. The question then is how to accelerate the rate of leveraging off these assets to speed up the rate of spin-out formation and value creation?

## 18. There is an opportunity to build on momentum and success.

- a) The speed of development of research, and the changing world environment for innovation and enterprise, means staying at the forefront is a continuous challenge for any developed country. This requires building from strengths, learning from the past, but also anticipating the needs of the future. For example, the creation of OSI in Oxford led to the revamp of spin-out processes within Oxford University Innovation (OUI) (Oxford University's technology transfer office) to be able to support the greater volume of transactions. The CCF initiatives will further assist this process if projects can build from learnings of others.
- b) Whilst the range of capabilities and opportunities varies significantly, building on the foundations of success to support a broader ecosystem is critical, and this can be developed by continuous sharing and learnings of best practice. This in turn makes it easier and more consistent for engagement with investors. The success of initiatives such as the pilot Investment Accelerator set up by Innovate UK highlights the benefits of such an approach.

## 19. However simple solutions are not appropriate.

- a) It is highly unlikely that there is a “one size fits all” policy that works for every technology, university or location. Individual universities have to develop an approach that fits their characteristics and circumstances. Section 3 to the data report presents detailed evidence on the diversity of universities in terms of their research, technology transfer and place characteristics, all of which factors affect commercialisation. In particular, spin-out performance is underpinned by research activity that leads to the generation of novel technologies to be exploited, and hence the data report shows that spin-outs

<sup>22</sup> The UK five-year survival rate for businesses born in 2012 and still active in 2017 was 43.2%. <https://www.ons.gov.uk/businessindustryandtrade/business/activitiesizeandlocation/bulletins/businessdemography/2017>

<sup>23</sup> See for example McMillan review on definition and discussion of the university eco-system.

<sup>24</sup> <https://re.ukri.org/knowledge-exchange/the-connecting-capability-fund-ccf/>

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are concentrated in universities with larger scale research activity.

- b) Currently, too much energy and noise is being spent on trying to identify a common solution, which is creating negative, defensive energy, at the expense of talking up success, which could inspire greater innovation and effort.
- c) Most of this tends to revolve around issues such as policies on terms of IP exploitation with academic entrepreneurs and investors, and the role and competence of technology transfer offices (TTOs)<sup>25</sup>, which for universities with established track record seem to work well (examples include OUI, Cambridge Enterprise, Imperial Innovations and UCLB at University College London).
- d) On IP policy, a central issue is ensuring that universities devise terms that support academic entrepreneurs appropriately for their institution. Most recently, the Imperial Founders Choice<sup>26</sup> scheme seems to represent best practice, though it has at its foundation elements common in other universities' schemes, such as academic opt out options, but perhaps not articulated in such a transparent manner. The key here is rather than "one size fits all", an approach that provides both choice and greater transparency on policies.

**20. The roles and capabilities of TTOs tend to be a focal point for much criticism**, particularly from academic entrepreneurs and to a lesser extent from investors. However, in general they face a number of challenges:

- a) First, the remit of a TTO is not always consistent. In the more effective ones, they are run and funded primarily as an enabler/supporter to the university's wider objectives. In others they appear to be run to generate revenues, for example from licensing fees.
- b) Second, the funding of a TTO is largely from Research England's Higher Education Innovation Funding (HEIF). Whilst technically this is only confirmed as one-year funding (in RE's annual funding round), in practice it is fairly predictable for a much longer period. In the better led and more experienced universities they anticipate the future funding and hire staff accordingly, in others they treat it strictly as annual and hire against that criterion with obvious impact on the quality of staff attracted and retention. This can lead to a huge difference in quality of staff in TTOs.

- c) The role of the TTO by its nature is full of conflicts and with multiple and complex processes to perform - form-filing of patents prior to publication of research, negotiating on terms of opportunities for exploitation, identifying spinning out or licensing routes, valuations with investors, and long-term licensing of technology to spin-outs. These are all difficult and complex issues, and all are subject to negotiation. Specialist help and support from resources such as the iCure programme developed by Setsquared, or Frontier IP, undoubtedly helps create better alignment and less friction.

**21. This is a long-term process and building a reputation is important to universities.**

- a) The success of university spin-outs is a long-term process and success can take up five to seven years or longer. Consistency of strategy and maintaining focus are key to supporting the success of businesses and the confidence of investors. Short term, often national policy motivated initiatives can create confusion and distraction and potentially undermine confidence.
- b) Much of the growing momentum is driven by need. The various revenue streams from commercialisation activities are drivers of reputation in important areas that build the overall brand and offer of universities. In of themselves, spin-outs do not contribute in the short term to revenues, and in the longer term are often significantly diluted, but they build the reputation which supports broader research, innovation and enterprise activities, including collaborative and postgraduate research/taught working. Disciplinary mix and strengths though make a difference on the significance of this agenda to any particular institution.
- c) Related to sustaining reputation, Brexit uncertainty has an impact that will feed through into outcomes of our commercialisation. For the UK to achieve the Government's stated goal of continuing to welcome the brightest and the best, it is imperative that the migration system for scientists, researchers and scientific technicians recognises the need for mobility, including the benefits for scientists moving between research organisations. Research and commercialisation require the best talent and only the best talent will sustain UK's excellence in research.

<sup>25</sup>Technology transfer is defined here as in the McMillan review as the processes of exploitation of IP through licensing and spinning off new companies. The term "technology transfer office (TTO)" is used as short hand for the various individual experts, functional units, divisions or incorporated vehicles that handle licensing and spinning off for universities.

<sup>26</sup> <https://www.imperialinnovations.co.uk/venture-support/founders-choice/>. This is an Imperial College pilot which offers academics two options: the Founder Driven route and the Jointly Driven route. The Founder Driven route receives the basic support package from Imperial Innovations and the Jointly Driven route receives an Enhanced level of Support, with greater/lesser consequent shares in founding equity of the spin-off for the academic.

## 22. Scale matters.

- a) Developing talent in TTOs to manage creating spin-outs and dealing with commercial and legal work is vitally important. This is often nurtured through experience, which in turn comes from the scale of deals being handled. The opportunity to handle great scale and diversity of deals is most likely in large TTOs, where there is also scale of IP pipeline in the related university to fuel the opportunity. Projects supported under the Research England CCF programme are an example of building on this momentum, to create scale. The question is how to replicate this approach, for example across London universities and others.
- b) Similarly, it is difficult for investors to know about, and engage with, the deal flow (IP opportunities) coming out of, say, over 100 universities that may produce some IP. To the extent that the opportunities becomes channelled through consolidating intermediaries (such as a CCF collaboration) it is easier for investors to engage and to gain better confidence of the quality of process and more consistency in the structure of terms. In addition, meaningful relationships develop which foster both trust and understanding. Sub-scale approaches to investor engagement result in a more transactional approach which usually manifests in more short term and often adversarial relationships.
- c) The same argument applies to attracting experienced talent to lead and work in management teams of spin-out companies. These people are taking a career risk to join a start-up, and that risk is reduced if the spin-out has better access to capital and is supported by specialised and experienced TTO staff. Getting this right creates a virtuous circle, which at its heart has scale and experience.

- d) To take one example to illustrate the benefits of this scale, OSI is now worldwide the single largest dedicated University venturing fund, attracting significant co-investors brought into Oxford spin-outs for the first time including GV, Syncona, GT Healthcare, F-Prime, Foresite and Sequoia China. It has also attracted major entrepreneurs and high level management (including Simon Henry, Pete Hutton and Sir Andrew Witty) to work with Oxford companies, and also spurred investment in infrastructure, such as property, to support spin-out companies and build ecosystem.

## Investors

### 23. Public markets are undergoing significant change and there is increasing investment into private capital.

- a) There is a significant change underway in the focus of investors, with attention moving away from publicly listed companies and with public markets increasingly dominated by passive index funds. As a result, there is a growing amount of institutional and private capital focussing on private markets.
- b) In recent years, successful government policy interventions such as the Enterprise Investment Scheme (EIS), Seed Enterprise Investment Scheme (SEIS), Venture Capital Trusts (VCTs) and initiatives announced as part of the Patient Capital review<sup>27</sup> have helped develop access to capital to support the start-up and growth of innovative companies.
- c) The data report shows (section 6) that investment in UK spin-outs from private sources has increased:

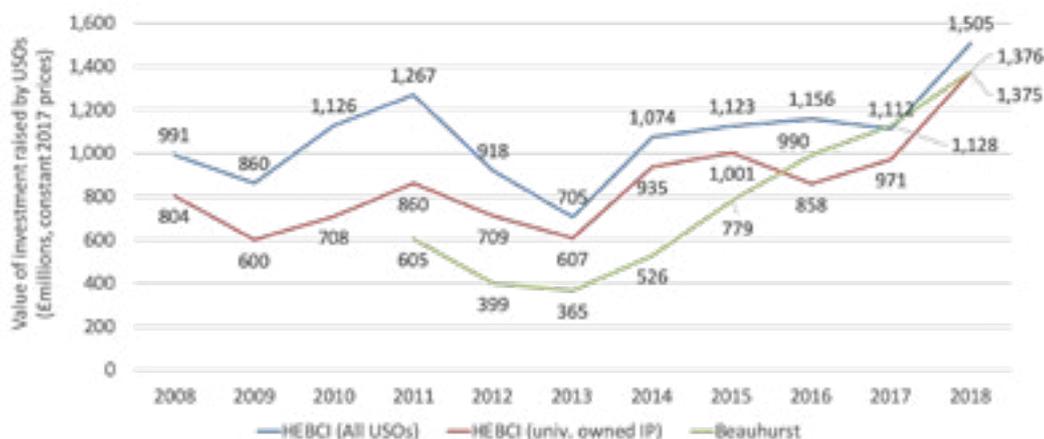


Figure 4<sup>28</sup> External investments in UK USOs, 2008 – 2018 Source: author's analysis of Beauhurst database  
Source: author's analysis of Beauhurst database and HEBCI surveys

<sup>27</sup> <https://www.gov.uk/government/publications/financing-growth-in-innovative-firms-one-year-on>

<sup>28</sup> Figure 12 to data report, page 26.

## 24. Funding at seed stage for spin-out companies is important and Innovate UK plays a critical role.

a) The data report analyses private equity and venture capital trends. Evidence from the British Business Bank shows equity finance into small companies overall in the UK has been increasing rapidly in recent years. British Venture Capital Association data shows growth at seed stage, and at all other stages other than start-up.

b) Just over 1 in 5 equity deals made in the UK are with university spin-outs:

	2015	2016	2017
USO equity deals in UK	306	350	324
Number of equity deals in UK	1,692	1,470	1,458
USO deals as % total equity deals	18	24	22

**Table 4<sup>29</sup> Proportion of equity finance deals in UK secured by USOs**

Sources: British Business Bank (2019a), author's analysis of Beauhurst

c) The amount of capital investing in spin-outs at the seed stage and venture stage respectively is 23% and 35%, compared to 15% and 30% for wider economy start-ups. This reflects that university spin-outs are very early stage companies and hence need a lot of early investment to develop.

d) EIS and SEIS are key government investment schemes to encourage investment in young, small companies. However, university spin-outs form only a small proportion of the companies benefitting from SEIS/EIS funds:

Year	Number of USOs		Share USOs receiving EIS funding	Number of companies receiving EIS funding	USOs as share of companies receiving EIS (%)
	Raised EIS funds in year	No EIS funds raised in year			
2011	129	24	84	2,025	6.4
2012	157	31	84	2,680	5.9
2013	166	30	85	2,475	6.7
2014	197	41	83	2,845	6.9
2015	210	59	78	3,380	6.2
2016	202	75	73	3,545	5.7
2017	215	95	69	3,470	6.2
2018	202	89	69		

**Table 5<sup>31</sup> Involvement of USOs in Enterprise Investment Scheme funding, 2011 – 2018**

Source: author's analysis of Beauhurst database, analysis of HMRC (2018)

e) A new knowledge-intensive (KI) EIS approved fund structure announced as part of the Government's October 2018 Finance Bill is starting to address the gap for spin-outs. Only time will tell who will set up these vehicles, and how successful they will be. The benefits of scale discussed earlier will play a critical role in their success.

<sup>29</sup> Table 19 to data report, page 38.

<sup>30</sup> Pennington Manches <https://www.penningtons.co.uk/media/1314304/academic-spinouts-a-report-on-the-funding-of-uk-spinouts-2016-2017.pdf>

<sup>31</sup> Table 22 to data report, page 43.

- f) Innovate UK plays a significant role in the early development of spin-outs. The data report suggests that approximately 26% of spin-outs have been involved in some form of Innovate UK grant, securing £357.9 million over the period 2011 – 2018. Table 6 breaks down the Innovate UK programmes to identify those most relevant to spin-outs.

Innovate UK programme	Number of companies receiving Innovate UK funding between 2011 – 2018			Total funding received by USOs (£000s)	Funding per USO (£000s)
	USOs	All companies	Proportion of USOs in all companies		
Collaborative R&D	476	5,572	8.5	216,800	455
Feasibility Studies	352	2,995	11.8	34,800	99
GRD Proof of Concept	104	724	14.4	11,300	109
Vouchers	99	2,982	3.3	500	5
GRD Development of Prototype	97	682	14.2	20,700	213
EU-Funded	75	438	17.1	15,800	211
GRD Proof of Market	63	542	11.6	1,600	25
Knowledge Transfer Partnership	41	507	8.1	4,700	115
Small Business Research Initiative	36	442	8.1	15,600	433
BIS-Funded Programmes	34	593	5.7	26,300	774
Investment Accelerator	20	36	55.6	1,800	90
Study	16	127	12.6	4,500	281
Launchpad	16	113	14.2	1,400	88
Other	51	586	8.7	2,100	41
Any Innovate UK programme	801	9,805	8.2	357,900	447

**Table 6<sup>32</sup> Involvement of UK USOs in Innovate UK funding programmes between 2011 – 2018**

Sources: author's analysis of the USO database, publicly available Innovate UK project data available at <https://www.gov.uk/government/publications/innovate-uk-funded-projects> (accessed in April 2019)

- g) Innovate UK's mission is to drive "productivity and growth by supporting businesses to realise the potential of new technologies, develop ideas and make them a commercial success". Clearer guidance about what exactly Innovate UK is meant to fund in terms of spin-outs would leverage these capabilities across UKRI. As an example, Innovate UK ran a pilot Investment Accelerator, involving six institutional investors. The outcome was very successful from the point of view of both investors and Investee companies, as a result of the sound processes put in place. Table 6 shows that Investment Accelerator is a particularly important vehicle for spin-outs, with 55% of companies benefitting being university spin-outs.
- h) UKi2s, which is backed by the Department for Business, Energy and Industrial Strategy (BEIS) and a number of research councils and other research bodies, is another interesting model, focussed on the research base outside of the university sector. It has a strong track record having helped to create over 30 high technology start-up companies in sectors such as health, environmental services, international development and security, and having leveraged over £190m of private investment into portfolio companies. Its challenge is to build on success by identifying a sensible growth strategy, accessing greater funds and widening its remit.

<sup>32</sup> Table 21 to data report, page 42.

- i) Some evidence<sup>33</sup> suggests that there is variability in availability of funding at seed stage across disciplines, with limited opportunity for, as example, arts and humanities, where there is less obvious route to market. Detailed evidence on spin-outs broken down by disciplines or industry/technology sectors is though limited. The data report provides some analysis<sup>34</sup> suggesting that the number of spin-outs currently formed by universities is concentrated, with the greatest numbers in the pharmaceutical sector. The need for capital will vary significantly by technology sector<sup>35</sup>, again making comparisons difficult.

**25. Venture and growth funding for spin-outs relies on institutional funds<sup>36</sup>. The Patient Capital review identified an issue of a shortage of these, but there is also currently a high concentration, which is a strategic risk.**

- a) Table 3 above shows that the amount being invested at these stages in spin-outs is growing<sup>37</sup>.
- b) As discussed in the Patient Capital Review<sup>38</sup>, the historically low level of returns in UK venture capital (VC) investing has made it difficult for VC funds to reach scale, and this has stifled the amount of capital available for investments in scale-ups and science-based start-ups, thereby diminishing entrepreneurial ambitions and exit strategies.
- c) In order to be attractive to investors, VC returns need to show a premium over equities listed on the stock market of at least 2-3%, to compensate for the lack of liquidity and lack of control. Historically, the average UK VC fund has been unable to achieve this, and the common perception across the UK investment community is that overall returns remain too low to justify sizeable investment.
- d) The outcome of the above is a lack of sufficient capital available for spin-outs, and high concentration of funds and inter-relationship of available capital. This is illustrated in Table 7 and Figure 5:

Rank	Investor	Investor type	Number of deals
1	IP Group	Commercialisation Company	157
2	Scottish Enterprise	Devolved Government	141
3	Business Angel(s)	Business Angels / Angel Networks	135
4	University of Cambridge	University	84
5	Parkwalk (pre-2017)	Commercialisation Company	73
6	Touchstone Innovations (pre-2018)	Commercialisation Company	64
7	Mercia Fund Managers	Private Equity and Venture Capital	58
8	Management participation	(no value)	48
9	Archangels	Business Angels / Angel Networks	41
10	Start Up and Early Stage Capital	Devolved Government	40
11	SyndicateRoom	Crowd funding	39
12	Oxford Sciences Innovation	Commercialisation Company	33
13	The North West Fund	Local and Regional Government	30
14	Woodford Investment Management	Private Equity and Venture Capital	29
15	24Haymarket	Business Angels / Angel Networks	25

**Table 7<sup>39</sup>Top 15 most active investors investing in USOs**

Source: author's analysis of the Beauhurst database

<sup>33</sup> <http://www.andlaw.eu/wp-content/uploads/2018/04/Anderson-Law-University-Spinouts-report-April-2018-1.pdf>

<sup>34</sup> Section 2 of data report, particularly Figure 5 on page 15.

<sup>35</sup> Discussed in section 6.4, including Table 14, on pages 29-30 to data report.

<sup>36</sup> Institutional funds = set up for large scale investors, not for the public as in retail banking.

<sup>37</sup> Discussed further in sections 6 and 7 of data report.

<sup>38</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661397/PCR\\_Industry\\_panel\\_response.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/661397/PCR_Industry_panel_response.pdf)

<sup>39</sup> Table 18 to data report, page 35.



Figure 5<sup>40</sup> Proportion of deals top five investors are involved in over the period 2011 – 2012 and 2017 – 2018 (percentage)

Source: author's analysis of Beauhurst data

- e) IP Group has been historically the most active investor in university spin-outs, and it also now owns other active investors - Parkwalk and Touchstone, and also owns stakes in major university vehicles - OSI and Cambridge Innovation Capital. Woodford Investment Management is also a significant later stage investor in university spin-outs, and there are various inter-connections with IP Group and university funds and spin-outs.
- f) Recent events have highlighted the vulnerability from the concentration of funding sources, with IP group focussing on its existing portfolio following the acquisition of Touchstone, with less focus on new spin- outs, and Woodford Investment Management recently disposing of its stake in OSI following the reduction of its aggregate funds under management.
- g) Increased competition among investors, would bring a number of benefits, including more consistent and reliable access to capital for spin-outs, better development of skills into the investment community, and less prevalence of pre-emption type structured deals (where an investor has first claim on all IP opportunities).

<sup>40</sup> Figure 21 to data report, page 37.

**26. Corporate venture capital is an increasingly important source of capital but faces some structural challenges.**

- a) Corporate venturing is an increasingly important part of the innovation strategy for large companies, and is likely to be a key component of the means to achieve the Government’s 2.4% R&D target:



Figure 6<sup>42</sup> Annualised disclosed corporate venture capital funding to the UK, 2013 - 2018  
Source: CB Insights (2018)

- b) It is also a source of funding for university/research spin-outs, though these are a small but growing proportion of companies that receive this source of funding – see Table 8 below. There is also an important wider dimension of corporates working with universities in, for example, investing in research facilities, which may provide a platform for deepening corporate venture capital links with spin-outs.

	2013	2014	2015	2016	2017	2018
USO deals involving corporates	14	20	11	23	25	25
Number CVC deals	31	48	57	74	87	121
USO deals involving corporates as % of total CVC deals	45	42	19	31	29	21

Table 8<sup>43</sup> Proportion of corporate venture capital deals made with UK USOs  
Source: author’s analysis of Beauhurst, CB Insights (2018)

- c) For Corporates, this type of activity is somewhat constrained by accounting and tax rules. As example, the accounting treatment for a start-up where a corporate venture arm owns over 25% is very burdensome for the start-up. Similarly, a lot of regulation that applies to large companies ends up also applying to the start-ups that they invest in. These issues restrict Corporate Venture investment and discourage start-ups from working with Corporate Venture arms.
- d) The Venture Capital unit of the Department for International Trade (DIT) has significant relationships, directly with corporate venture arms, and indirectly through Global Corporate Venturing (GVC). They invest
- e) Examples exist of good practise, such as Ten X where BP work as the Corporate partner with OGTC and Deep Science Ventures, running an investment accelerator.

<sup>41</sup> Corporate venture capital = eg where a large R&D company sets up a fund to acquire external companies/technologies

<sup>42</sup> Figure 25 on page 41 of data report.

<sup>43</sup> Table 20 to data report, page 41.

## 27. And there are other important sources of funds.

- a) As part of the Patient Capital review it was announced that the Pensions Regulator will clarify guidance on how trustees can invest in assets with long-term investment horizons, such as venture capital, infrastructure, market - returning investments that have a social side benefit and other illiquid assets in a diverse portfolio. This will give pension funds confidence that they can invest in assets supporting innovative firms as part of a diverse portfolio. With over £2 trillion in UK pension funds, small changes in investment have the potential to transform the supply of capital to innovative firms. This would also help the development of the availability of capital in parts of the UK outside the golden triangle/UK greater south east, where the need to improve growth and productivity is highest, working alongside CCF and UKRI's and other's initiatives on place. An example of a recent development in this is the formation of Coast to Borders Pension Partners. Figure 7 illustrates this potential gap in capital by comparing numbers of university spin-outs per region with investment raised.

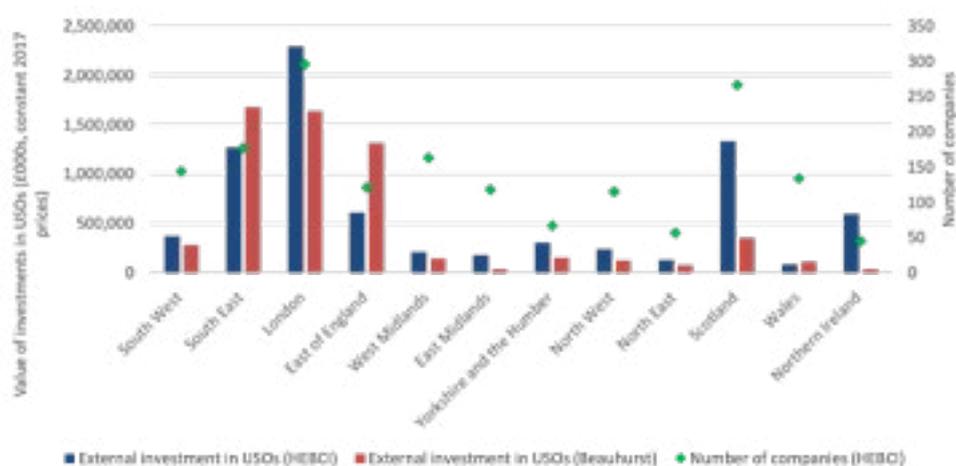


Figure 7<sup>44</sup> Regional variations in investments in UK USOs and number of USOs formed over the period 2011 – 2018  
Source: author's analysis of Beaughurst database and HEBCI surveys

- b) Foreign investors were involved in 15% of all UK spin-outs investments in 2016, which represented 37% of the amount raised<sup>45</sup>. This is an important source of capital, attracted by the UK's leading reputation for quality of university research. The recently announced initiative between BEIS and DIT, which expects to unlock £1 billion of investment into UK venture capital, is an important development. There are issues around interpretation of State Aid rules which need to be clarified, for which BEIS has the responsibility.

## 28. But it is not just about the availability of funds.

- a) A recent Glasgow University study<sup>46</sup>, suggested that American use of more entrepreneur-friendly terms in investment deals versus investor-friendly terms in Europe likely reflects the more competitive finance environment in the US and entirely rational approach to protecting the downside in Europe. The Patient Capital review was aware of such practices and noted that it continued to monitor this. However, consideration should be given to the use of appropriate structures by funds applying for co-investment of Patient capital funds.

<sup>44</sup> Figure 14 to data report, page 28.

<sup>45</sup> <https://www.penningtonslaw.com/media/1314304/academic-spinouts-a-report-on-the-funding-of-uk-spinouts-2016-2017.pdf>

<sup>46</sup> <https://www.bvca.co.uk/Portals/0/Library/Exploring-VC-Difference.pdf>

- b) The same study concluded that there are also differences in the backgrounds of VC investment executives in American versus Europe. US VC firms had proportionately more partners with operational and, to a lesser extent, entrepreneurial backgrounds. European VC firms had a greater proportion of partners with a financial, investment or consultancy background.
- c) In general, the sophistication, objectives and experience of VC investors in the UK are less developed than the US, with a predominant focus on revenue through fees, and a less developed understanding of the human capital aspects of investing. This is reflected in the comparative historical performance across the two countries.
- d) One of the critical issues is that the brand strength of US VC firms aids quality deal flow and optimal exits through relationships with big corporates. Brand strength is built on many of the attributes noted above, focussed on being good sustainable businesses and not just being run to maximise exit value. The same good, long-term values need to be present in investors as in universities/TTOs.

### 29. And scale matters here too.

- a) Many of the arguments made above about scale in universities/TTOs also apply to investors. Investing is a risk business and managing and reducing risk has a consequence in terms of likelihood of success.
- b) Experienced TTO staff, robust processes, continuous access to capital and experienced investors all help reduce risks, all create better alignment and, at the end, a better chance of success. Success breeds further success.
- c) As discussed above, scale also tends to build longer term and deeper relationships between the parties involved, with obvious benefits, rather than more short-term transactional approaches that can be frictional.

## Observations

### 30. To gain further success, the UK needs a long-term and outcome focussed direction, with appetite for risk.

- a) In general, further success in creating value from university/research spin-outs (including tackling the need for maturity of UK VC funds) is a challenge where the outcome can only be measured over the medium to long term time frame (a minimum of five to seven years).
- b) It is very important therefore to try to be as clear as possible on what success could look like, so that without being too prescriptive, a strong sense of

direction is present to align efforts. The Industrial Strategy makes a start on this with the four grand challenges, but the majority of the focus of that strategy is on input driven initiatives, rather than on outcome driven. The 2.4% R&D target itself is an example of an input not outcome goal.

- c) This points to the value of the Knowledge Exchange Framework (KEF) exercise, which Government asked Research England to progress, following the McMillan review. An appropriate metrics framework to monitor progress needs a sense of the desired shape of outcomes, otherwise this is like driving a car with no sense of destination. Such a framework should be aspirational in terms of outcomes, grounded in core capabilities and anticipatory of the future. Generally a greater balance toward outputs over inputs is important.
- d) In addition, on this journey, inevitably mistakes will be made. These are very valuable learning experiences, but all too often a culture of blame and criticism drowns out the ability to air and learn from these opportunities. In the USA in comparison, mistakes are seen in many respects as a virtue.

### 31. Alignment is important.

- a) Starting a commercial business venture and investing in such ventures are both risky activities. These risks can be reduced if there is strong alignment between all the parties involved. These include:

#### i) Across Government/BEIS and UKRI

- (1) As noted above there are many parts of BEIS and UKRI which have proven expertise and capabilities. In particular, UKRI was formed from nine legacy organisations which all have strengths. To earn the right to ask others to do things differently, it is important to be seen to be doing the same. An absence of leadership in the form of purpose and vision could result in wasted time and effort spent on the back foot trying to justify irrelevant issues.
- (2) An example of this would be clarity and involvement of Innovate UK in research/university spin-outs, including CCF projects and UKi2s. There are also opportunities to align processes to improve connectivity and minimise bureaucratic burden and cost.
- (3) Within BEIS, the alignment of British Business Bank could be improved if there was a greater clarity in overall national destination for success, allowing better alignment with implementation of the Patient Capital review initiatives.
- (4) Similarly, the agreement with DIT would benefit from clarification and specificity as it relates to universities, including the interest/involvement of the DIT Venture Capital team with the university spin-out agenda.

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## ii) Within universities

- (1) There is a growing trend within universities for better alignment with the external commercial world. Initiatives at universities such as Oxford, Imperial, UCL, Birmingham, Southampton and Leeds to name but a few are improving the internal university leadership/management structures and including commercial achievements in promotion criterion for academics. This is in part due to the importance of commercialisation in the overall brand strength of universities, as well as a result of the implementation of the REF, but it is also due to different experience and backgrounds of university leaders.
- (2) The initiative taken forward by vice-chancellors following the McMillan review to develop a 'Concordat for the advancement of knowledge exchange in Universities' will reinforce important principles that underpin successful commercialisation, particularly the leadership, strategy and capabilities aspects. The Concordat recognises that it is not possible to provide a precise recipe for knowledge exchange in all institutions, nor should it, given the range of capabilities and specialisms of different institutions. However, the Concordat development needs greater clarity on how best practice will be shared and progress monitored.
- (3) On the issue of TTOs, the critical issue is not so much the level of funding available, though more investment would be helpful, but to be clear on how to set and manage the objectives of the TTO (as an enabler rather than profit centre), and to create scale to facilitate specialist skills.
- (4) The skills and capabilities in TTOs, which play a critical role in the commercialisation process, and in particular in helping create successful spin-outs, are critically dependent on funding from Higher Education Innovation Fund (HEIF), and funding from the Research Councils for impact is also important. (Concentrations of fundamental research are also vital to produce the technologies that can be spun-out, with QR grants key here.) Increasing both the amounts available and the tenor of the funding would have a beneficial impact on the attraction and retention on these key capabilities.

## iii) Across universities

- (1) It is clear from observations set out earlier in this paper that scale matters, as well as consistency over time in approach. For the potential opportunity to be realised it is critical that initiatives such as those in the CCF programme, as examples NTI, Northern Accelerator and MICRA, are given the best support

to succeed. That may involve utilising wider expertise and capabilities. For example, both BBB and Innovate UK have roles to play and bring different attributes. BBB bring access to finance through the implementation of the Patient Capital review, while Innovate UK add proven skills and capabilities.

- (2) In addition, there may be areas where an extension to CCF or similar initiatives should be encouraged, which could be around a geographical region, such as in London, or with a sector theme, for example, satellites, agriculture and food or creative industries. Sectoral approaches give commercial problem/pull connectivity, and this is an important part of accessing corporate venture capital, where there is an opportunity.
- (3) The range of skills and expertise required to build a successful start-up are extensive. These include the capabilities to file patents, develop a business plan, identify licensing opportunities, structure and manage the spin-out company, attract investors in a series of funding rounds, attract the right commercial talent and deliver on the business plan. And on top of all that, there are additional skills required to scale up a company. This is a very broad set of capabilities, and the ability to access specialist support is critical. That is why the work done for example by PraxisAuril or Setsquared in iCure is critical to success.
- (4) Existing strong capabilities need to be leveraged further as strengths need to be expanded and gaps filled. Gaps could include, for example, improving the skills of VC investors, which need to be developed further along the US model. A new development project by the London Business School on skills of UK venture capitalists, funded from the Research England Development Fund, is very important on this.

## iv) With Investors

- (1) Clearly to succeed a start-up needs access to capital funding at various stages of growth. This can be for pre-seed, seed, 'series A and B' rounds and scale up. Typically, each of these stages of funding comes from different sources and types of investors. At the early stage it may be public funds, then angel investors, followed by institutional VCs or family offices (of high net worth families). In addition, start-ups are also trying to access the commercial skills and experience of investors, as well as seeking their assistance in attracting top talent. There is a mutuality of interest to succeed in this, so the key issue is alignment of the relationship. This starts from negotiation of the terms and value of investment, but

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then has to develop into a working partnership with aligned goals and objectives. Amongst other things, key to this is alignment of the time horizon for stages of growth and of the vision for what success looks like.

- (2) Often, by the time several rounds of funding have been completed universities end up with relatively small percentages of shareholdings in these companies, but the reputation it builds for the university is often of more importance than the economic value.
- (3) The critical issue here is the process of alignment and the meeting and ongoing relationship of like-minded parties. Some universities such as Cambridge, Oxford and Imperial have established these reputations and consequent relationships over a period of time, and others such as Surrey University have established specific initiatives such as the Surrey100 club. The use of alumni to build such relationships is valuable. These developments also play into the virtues of scale and leveraging existing capabilities.
- (4) The recent Treasury development on EIS funds for KI businesses is another important initiative but still at an early stage.

#### **v) Human Capital**

- (1) Whilst financial capital is often the focus as the most vital and scarce resource, turning an idea into a successful and sustainable commercial venture requires a significant amount of quality and relevant human capital. The need occurs at various stages of evolution of the venture.
- (2) TTO staff are required to cover a broad church of skills, discussed above. The problem is that they are broad in scope but with little depth of experience. When they are dealing with some experienced academic entrepreneurs and investors, they appear less sophisticated and less experienced, and this is in a situation which is fraught with competing conflicts. This can only be solved by using scale to build depth of capability and being clear on the role and objectives of the TTO with appropriate funding structures.
- (3) To build successful businesses, investors need to add more than just financial capital. Advice on strategic insights, commercial connections and commercial experience are critical to support the development of spin-outs. At the early stage, such as EIS investors, who invest as individuals, are more focussed on the financial aspects of the venture

than the commercial. At the later stages, these skills are far more common in US VCs than UK VCs. The development project noted above from the London Business School focussed on identifying skills needed in new Fund Managers is a key long-term initiative in helping to resolve this.

- (4) Quality of management in investee companies is obviously another key issue. For experienced individuals to join such companies there is clearly a career risk. This becomes circular - the more capital a company can raise, the better the support from investors, which reduces the risk and hence allows companies to attract better qualified and experienced management teams, which then increases the chance of success.
- (5) Whilst the broader short-term uncertainty from Brexit does affect investors, the biggest impact is likely on human not financial capital.

#### **vi) Communication**

- (1) Creating a successful business out of a spin-out is a challenging and risky process. Most of the lessons are learned painfully through experience and mistakes. This then evolves into best practice which reduces risk and hence increases investor confidence. The more experience can be shared, there will be more encouragement of success and also greater insights and learnings. Clearly, this also has a connection to scale, as sharing between parties in a collaboration with greater depth and knowledge facilitates this.
- (2) Success creates success and story-telling about successful start-ups both motivates more to try and gives greater confidence to investors. It also allows perceptions and negativity, which can take substantial energy and time to negate, to be put into context with real facts.

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## Recommendations

### 32. Universities

- a) As described in past reviews, the role of university leadership is crucial. This includes taking a strategic approach to developing and sustaining developmental projects supported by UKRI and others in various forms.
- b) As part of leadership, increased collaboration between universities is important to create scale and the associated benefits that come with that. Historically, universities have competed against one another, and a change in mind-set is needed to foster collaboration, both by geographic region and by sector expertise.
- c) Clarity and consistency on the 'enabler' role of TTOs and sustainable support to tech transfer units is critical to attract and retain the right talent to work in TTOs. This is a responsibility that needs to be backed up by UKRI/funders. This should also include transparency around IP transfer policies.
- d) Universities need to be aware of potential conflicts (such as when dealing with funds who have members of the academic faculty acting as advisors to the fund).

### 33. UKRI

- a) There is a great opportunity for UKRI leadership to set out a vision of what success looks like in commercialisation, including in creating spin-out companies. It should include clarity on its role in the spin-out ecosystem, explicitly identifying its current capabilities which it is trying to leverage. As part of this, UKRI needs to ensure that it is driving success using appropriate and connected metrics, such as in the KEF, to avoid unintended consequences.
- b) UKRI is a relatively new organisational structure which has some proven capabilities which could be better leveraged and aligned particularly with clarity of vision and purpose. Examples would include Innovate UK, UKi2s, KTN, NCUB and Research England's programmes such as the CCF, to name but a few. It could also improve alignment of processes to improve connectivity and minimise bureaucratic burden and cost. UKRI also has a role where critical gaps are observed, with a good example being the London Business School project referred to previously.
- c) As part of its work towards the Government's spending review, UKRI should consider the requirement to address short term funding needs for structural issues at the seed stage. This includes funding for Innovate UK, and for UKi2s in relation to the wider research base. It also needs to consider

whether these capabilities can be leveraged further, or whether another intermediate funding mechanism for early stage spin-outs is required.

- d) The success of Research England's CCF access to finance projects is critical to building for the future. Clarity of expectation of outcomes and how these will be sustained is important, which is a matter for UKRI/ Research England but also for university leadership. Gaps in other geographical regions and/or sector specialism need to be considered.
- e) Success breeds success, and there is a lot of great progress being made that is either unknown or under-leveraged. Stories of success go untold and examples and learnings of best practice are not being shared to the full. UKRI has a role to play in this, working with university organisations, such as PraxisAuril, and organisations that span universities and businesses, such as the National Centre for Universities and Business (NCUB) and the KTN.

### 34. BEIS

- a) There are some clear issues which need to be addressed as critical outcomes of the Patient Capital Review, including an increased diversity in investors. Increased competition such as seen in VCs in the US has distinct benefits. Similar to the comments above, setting out a vision for the future will provide clarity, enabling alignment of initiatives and hence improving outcomes. It would also help improve the alignment of BBB and other parts of BEIS, for example both BBB and Innovate UK have roles to play and bring different attributes. BBB bring access to finance through the implementation of the Patient Capital review, while Innovate UK adds proven entrepreneurial and commercial skills and capabilities.
- b) This includes developing skills of investors to support commercial growth of the companies, and generating a different fund manager skill base. This will have an impact on the performance of the UK industry which will then create a virtuous circle in attracting more investment funds.
- c) Other matters to address:
  - i) The dissuasion of preferential share structures through discouraging co-investment in funds that use such structures.
  - ii) Clarifying the scope and application of State Aid regulations, with a view to addressing a number of issues preventing the opportunity to access overseas money.
  - iii) Encouraging better alignment and collaboration between key areas of expertise, which need to be connected, for example, the British Business Bank or the DIT Venture Capital Unit.

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### 35. HM Treasury

- a) Because of recent noise and publicity around historical schemes such as related to the film industry, there is a need to build investor confidence in the longevity of schemes such as EIS, SEIS and VCTs. Uncertainty may be reduced by reinforcement of messages such those in 'Financing growth in innovative firms: one-year on'<sup>47</sup>, and through giving a sense of the likely future road map. Consistency between HM Treasury and HM Revenues and Customs is also important.
- b) Implementing the EIS funds for KI business, to get more EIS finance supporting spin-outs, is key.
- c) Furthering pension fund initiatives to support access to more capital is vitally important, including to address geographical availability of capital outside the Golden Triangle/greater south east, and to reduce the current very high concentration of institutional investors.

<sup>47</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/769428/Financing\\_growth\\_in\\_innovative\\_firms\\_one-year\\_on.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/769428/Financing_growth_in_innovative_firms_one-year_on.pdf)

## **Letter from David Sweeney, Executive Chair, Research England to Mike Rees (5 September 2018)**

Dear Mike

Advice on universities' access to finance for commercialisation

1. Further to our discussion on 10 July, I would like you to provide advice to me on:
  - whether there are ways to strengthen universities' access to finance to support research commercialisation
  - initially focussed on universities in areas of the country outside of the "golden triangle", as example those supported through our Connecting Capability Fund (CCF), providing evidence on how to strengthen university commercialisation and rebalancing of the UK economy
  - and additionally whether more could be done in the very large research universities/greater south east, such as improving the handoff between spin-off and scale up access to finance
2. You are providing independent advice to me in my role as a UKRI Senior Responsible Officer for commercialisation and as Executive Chair of Research England responsible for funding university commercialisation. This advice is not commissioned by UK HMG.
3. Your advice will inform Research England and UKRI work on delivery of the Government's 2.4% target, including related to the forthcoming Comprehensive Spending Review. Delivery of the 2.4% target is likely to require universities to do more commercialisation, including increasing their access to finance.
4. As well as doing more, universities will need to be more efficient and effective in commercialisation. We discussed on 10 July our current policy positions. Public research funders devolve ownership of intellectual property to universities, which places significant responsibilities on universities to deliver public value from these assets. We need to ensure that universities are discharging these responsibilities effectively. We do not believe that "one size fits all" policies for university commercialisation work. Universities differ significantly in terms of their resources, technologies and spatial contexts. Universities also need to take account of relevant legal and regulatory frameworks in determining their commercialisation approaches. Following your advice, it will be for Research England to consider the appropriate incentives and rewards for universities and any good practice guidance that should be given.
5. Appendix 1 provides more details on areas that you may wish to address in your advice.
6. I look forward to receiving your advice. Alice Frost (Alice.Frost@re.ukri.org, 0119 931 7101) is our lead on UKRI commercialisation and will be your day to day contact.

Yours sincerely

David Sweeney, Executive Chair, Research England

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## Appendix 1: issues in university-investor links and access to finance

### Universities:

- Are there ways to strengthen CCF projects taking collaborative approaches to raising university venture funds?
- How effective are universities more generally in raising venture finance for their commercialisation of their technologies (licensing and spin-off companies ie new companies formed out of university owned intellectual property (IP))? This includes in the Patient Capital movement that was originated by universities themselves, and which has resulted in universities raising over £2bn in finance.
- What are the different opportunities and challenges for different types of universities - of different scales, with different portfolios of commercialisable technologies and in different entrepreneurial contexts? The concentration of university capacity and success in raising venture funding appears to rest in the very large research universities in the greater south east where there is significant local access to finance. Is there anything more that could be done in these institutions and areas? But more importantly, what are the prospects to widen expert capacity and success to the rest of the country?
- What are the different opportunities and challenges in commercialisation of different disciplines and technologies, and the implications for access to finance for these – as example, the different requirement for life sciences (large-scale, long term) and engineering software (small scale, widespread)?
- Are there further opportunities for universities to work together to share capacity, expertise and good practice in venture funding?
- Although a focus of this commission is on finance for university spin-off companies, you might also wish to comment on the roles that universities play in access to finance for start-ups (not based on university IP - including from university staff, alumni and students); and the contributions of universities to provide support to non-university SMEs seeking access to finance (which is the focus of some CCF projects). Are there useful synergies between these different roles and activities?

### Partners/Government support/wider UK economy:

- Universities' status as autonomous, private organisations, may provide particular opportunities for universities to work with the private sector (investors and businesses), but there may also be challenges, such as from the far from market nature of university technologies, and from universities' charitable and publicly funded (eg State Aids implications) status. What are the resulting challenges and opportunities for universities in working with different types of commercial partners? Research England is part of UK Research and Innovation ( [www.ukri.org](http://www.ukri.org))
- Are the objectives of the sources of capital investing in university spin-outs aligned with the objectives of UK public policy on commercialisation? • Do investors (in UK? Overseas?) have the capability and skills to work with universities, and particularly in relation to the novel and disruptive technologies that universities generate. Does the private sector understand the status and nature of universities, and their approaches to commercialisation, sufficiently to make partnerships effective?
- How available is private finance for the different stages of the research commercialisation process? And what is its character? What opportunities and challenges does this present? Are current funding structures appropriate for the needs of university spin-outs – stage, quantum, patience etc?
- Does the UK have the available capital and absorptive capacity to pick up, develop and capitalise on the economic potential of the companies that universities are creating?
- What experiences have universities had of Government/public funder schemes or support that are intended to help universities in accessing finance? How far have universities utilised such support? Are there ways that university uptake of relevant schemes could be improved – or gaps in schemes? Includes:
  - Support within UKRI such as Innovate UK or UKi2s
  - British Business Bank including the recent consultation on knowledge intensive businesses.
  - Access to finance provided by local bodies.
  - Prospects of support from a future UK Shared Prosperity Fund/implications of Brexit.
  - Financial regulation (for example how the Financial Conduct Authority (FCA) supports new funds structured as plcs to list)
- What conclusions can be drawn on the overall availability of finance for university commercialisation at all stages, gaps and priorities, and the effectiveness of hand-offs from state to stage, including the handoff into scale up funds?

# Annex B Interviewees

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The evidence work and preparation of the report was supported by Research England – Alice Frost, Director of Knowledge Exchange, and Hamish McAlpine, Head of KE Data and Evidence, Research England UKRI

## **Universities: senior management, academics/leadership, professional experts**

Dr Celia Caulcott, Vice-Provost (Enterprise), University College London

Professor Dame Jessica Corner, Pro-Vice-Chancellor, University of Nottingham, with research and enterprise team  
Professor David Gann, Vice-President, Imperial College London

Professor Luke Georghiou, Deputy President and Deputy Vice-Chancellor, University of Manchester

Professor Nick Jennings, Vice-Provost for Research and Enterprise, Imperial College London

Professor Andrew Jones, Vice-President Research and Enterprise, City, University of London

Professor Trevor McMillan, Vice-Chancellor, Keele University

Professor Andy Neely, Pro-Vice-Chancellor for Enterprise and Business Relations, University of Cambridge

Professor Jonathan Seckl, Vice-Principal Planning, Resources and Research Policy, University of Edinburgh, and research and enterprise team

Sir Christopher Snowden, Vice-Chancellor, University of Southampton

## **Russell Group pro-vice chancellors/enterprise directors group**

Professor Roy Sandbach, Ageing Science and Innovation, Newcastle University (and formerly NE Local Enterprise Partnership Innovation Board and global R&D positions with the Procter & Gamble Company)

Professor Julian Birkinshaw, Strategy and Entrepreneurship, London Business School

Professor Andy Hopper, Computer Science, University of Cambridge

Professor S Mark Spearing, Engineering, University of Southampton

Simon Bond, Innovation Director, and Sean Fielding, Setsquared

Dr Stephen Conway, Director of Research Service and Richard Liwicki, University of Oxford

Dr Tim Hammond, Business and Innovation Services, Durham University and lead CCF Northern Accelerator

Dr Matt Perkins, Chief Executive Officer, and Dr Adam Stoten, Oxford University Innovation

Dr Tony Raven, Chief Executive, and Dr Anne Dobree, Head of Seed Funds, Cambridge Enterprise

Clive Rowland, Associate Vice-President for Intellectual Property, University of Manchester

Dr Martin Stow, Director of Nexus, University of Leeds

Cengiz Tarhan, formerly Managing Director, UCL Business

Dr James Wilkie, Director of Research and Innovation Services, University of Birmingham and lead CCF MICRA

## **Investors, business, professional services**

Alice Bentinck, co-founder, Entrepreneur First

John Bailye, Partner, The Side by Side Partnership

Dr Nicola Broughton, Mercia Technologies plc

Amhad Butt, Chief Executive Officer and Managing Partner, Jetstone Asset Management

Simon Calver, Partner, British Growth Fund

James Codling, Co-Founder and Managing Director, Venture Founders

Dr Murray Collins, Chief Executive Officer, Space Intelligence (Edinburgh)

Axel Coustere, co-founder, Hubx Capital

Neil Crabb, Chief Executive, Frontier IP

Vito Levi D'Ancona, Director, Anglo Scientific

David Gammon, CEO and founder, Rockspring, and Cambridge Angel

John Godfrey, Corporate Affairs, Director, Legal & General

Douglas Hansen-Luke, Executive Chairman, Future Planet Capital

Jennie Holloway, Co-Founder, The Growth Stage

Alastair Kilgour and Moray Wright, Parkwalk Advisers

Dr Martin Murphy, Chief Executive Officer, Syncona Investment Management Ltd

Alice Newcombe-Ellis, Founding and Managing Partner, Ahren Innovation Capital

Itxaso del Palacio, Investment Director, Notion Capital

Mark Redman, Executive Vice-President, OMERS Private Equity

Kjartan Rist, Founding Partner, Concentric Partners

Dr Mark Payton, Chief Executive, Mercia Technologies plc

Michael Rosen, Co-Founder, Future Positive Capital

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Dag Skattum, Managing Director, Blackrock Long Term Private Capital

Greg Smith, Chief Financial Officer, and Mike Townend, Chief Investment Officer, IP Group plc

Alexandre Terrien, Co-Founder, Future Positive Capital

Simon Thorpe, Cambridge Angel

Alex Van Someren, Managing Partner, Early Stage Funds, Amadeus Capital Partners

Mark White, Investment Director Midven and Investment Committee member UKi2s, with Dr Kate Ronayne, Executive Director, Science and Technology Facilities Council

Jim Wilkinson, Chief Finance Officer, Oxford Science Innovation

Mona Ye Zhang, Roselle Capital

David Eyton, Group Head of Technology, and Bob Sorrell, Vice President for Public Partnerships, BP

Nicola McConville, Partner, Penningtons Manchester

**Public – investment, Government, funders, other national policy**

Gareth Bullock, Chairman, Development Bank of Wales

Russ Cummings, Non-Executive Director, British Patient Capital

Ron Emerson, former Chairman, British Business Bank

Paul Morris, Chief Investment Officer, and Roy Williamson, Venture Capital Unit, UK Government Department for International Trade

Ian Taylor, Chairman, UK Innovation and Science Seed Fund

Alice Hu Wagner, Managing Director, British Business Bank

Paul Drabwell, Deputy Director, Science, Research and Innovation, BEIS

Richard Harrington, then Parliamentary Under Secretary of State, BEIS with Louis Barson, Deputy Director, Future Sectors, BEIS

Dr Rannia Leontaridi, Director, Business Growth and Office for Artificial Intelligence, BEIS

Sam Lister, then Director of Industrial Strategy, BEIS

Josef Pitt-Rashid, Head of Industrial Strategy and Enterprise, HM Treasury

Dr Carolyn Reeves, Head of Policy for University Research and Knowledge Exchange, BEIS

Nick Bassett, Head of Investor Partnerships, Innovate UK UKRI

Professor Steve Caddick, Director of Innovation, Wellcome Trust

Dr Phil Clare, Research England Council member and Deputy Director (Knowledge Exchange and Engagement), University of Oxford

Professor Lynn Gladden, Executive Chair, EPSRC UKRI, with Jane Nicholson, Associate Director, EPSRC

Dr Tony Hickson, Chief Business Officer, Cancer Research UK

Freddie Jones, UKRI strategy

Ian Kenyon, Chief Finance Officer, UKRI

Sir John Kingman, Chair, and Sir Mark Walport, Chief Executive, UKRI

Tim Sawyer, Chief Investment Officer, Innovate UK, UKRI

Chris Warkup, former Chief Executive Officer, The Knowledge Transfer Network

Lord David Willetts, Board member, UKRI

Felicity Birch, Director of Innovation and Digital, CBI

Alison Campbell, Director, Knowledge Transfer Ireland

Maxine Ficarra, Chief Executive Officer, PraxisAuril

Dr Angela Kukula, former Chair PraxisAuril and Director of Enterprise, The Institute of Cancer Research

Sam Laidlaw, Chair, National Centre for Universities and Business (and former CEO, Centrica plc)

Dr Joe Marshall, Chief Executive Officer, National Centre for Universities and Business





