1. We welcome the Committee inquiry into managing IP and technology transfer. This is a crucially important area for Oxford’s mission of research, engagement and education, since it impacts the core of our activity: the generation, exploitation and propagation of ideas. For this reason, The University of Oxford has invested in developing our expertise and activity in managing and utilizing IP for many years in order to underpin our research and innovation mission. This activity is critical in supporting our engagement with industry, attracting investors in start-up companies and optimising the impact of our research. Although we were one of the first universities in the UK to set up technology transfer office alongside our longer-standing research services office, we are now not alone, and spend time sharing learning and good practice with other institutions in the UK and overseas.

Other submissions

2. We have contributed as appropriate to the MacMillan Report to HEFCE – “University Knowledge Exchange Framework: good practice in technology transfer”¹ and commend it as a helpful report, examining the key issues in technology transfer. We will echo many of its findings in our submission. We have also supported the work of PraxisUnico and AURIL on behalf of the professional Knowledge Exchange community; their joint submission reflects the diversity of KE activity by universities across the UK

Oxford’s activity

3. Oxford is the largest Research University in the UK with grants and contracts income in 2014-201 of £520m. Of this, 11% (£57.6m) is received from business and industry, representing a significant endorsement of Oxford’s research by our commercial collaborators.

4. Oxford seeks to maximise the economic and social impact of its research in many ways, most of which do not require the protection of ideas and knowledge through intellectual property rights.

5. One route that does require this, however, is technology transfer. Oxford achieves this through Oxford University Innovation (OUI), a wholly owned subsidiary.² In the last 16 months, OUI created more than 20 spinouts and signed more than 700 licensing and consulting deals. In addition, the University helped OxLEP, through the Growth Deal, invest £750,000 in university start-ups and spinouts to leverage £8.9m of private investment and create 45 jobs to date³ in knowledge intensive firms.

¹ University Knowledge Exchange (KE) Framework: good practice in technology transfer
http://www.hefce.ac.uk/media/HEFCE_2014/Content/Pubs/Independentresearch/2016/University,KE,framework,Good,practice,in,technology,transfer/2016_ketech.pdf
² http://innovation.ox.ac.uk/about/
³ This number is expected to be larger at the end of the monitoring period as the money has been supporting growth firms.
6. Oxford recently partnered with Oxford Sciences Innovation (OSI) to raise a £320m fund to invest in University spinouts. This has helped to support and stimulate more researchers to consider spin-out formation as a pathway to translation and impact. We have seen a sharp rise in the number of invention disclosures, the pipeline of potential spin-outs and in the formation of new spin-outs through Oxford University Innovation.\(^4\)

7. Following the Innovation Review report to the University Council, which looked at our aspirations, activities and future strategy in relation to knowledge exchange and our contribution to the innovation eco-system, the University is pioneering some new approaches. One of these is to link revenue from new spin-outs more directly to the success of the spin out in bringing products to market and to their overall market value. Oxford is committed to creating healthy, well-funded companies that can (a) bring products to market for the benefit of society, (b) create wealth for both investors the economy and (c) help create employment opportunities both within the region and nationally.

**Inquiry Specific Questions**

**How the respective roles of universities and TTOs in commercialising research have developed over the last decade;**

8. The Higher Education Innovation Fund (HEIF) has greatly assisted universities to devote more resources to maximising the impact of their research. Although technology transfer has been a long standing activity, and companies have engaged with university research as sponsors and collaborators for many decades, there has been a new period of purposeful engagement by universities with businesses, government and third sector organisations to maximise the social and economic benefits of our work. The commitment to Knowledge Exchange as a strategic priority alongside research and education has become firmly embedded, at Oxford as in other universities.

9. However this growth of activity has taken place in an environment which is increasingly complex. As the understanding of the potential of technology transfer and collaborative research to achieve impact and make money has increased, so has the number of parties with strong opinions about how IP arising from university research should be managed in contracts and in commercial deals. Research charities wish to share in commercial revenues as well as to ensure that innovations are exploited for the common good. Academics wish to publish, to protect freedom to operate in their future research endeavours, and to benefit financially from any success. Universities wish to generate enough income to ensure the activity is sustainable and to meet their obligations to manage charitable assets well, whilst maximising public benefit and protecting the interests of their staff. Companies wish to secure control of IP rights, and of people who can contribute to their commercial success, and to exclude competitors. All of these approaches are entirely rational, but result in an environment that requires compromise and understanding in order to progress.

10. To support our researchers and manage engagement requires skilled professional services – at Oxford, these include Research Services, whose responsibilities include grants and

\(^4\) [http://innovation.ox.ac.uk/about/]
contracts, IP due diligence, major bid support, knowledge exchange, public engagement with research and University research and innovation policy development; Oxford University Innovation, which helps staff and students to apply their expertise and research for wider social and economic benefit, including through technology transfer and consulting; Business Development Teams focussed on industry partnerships; Research Facilitators; and Knowledge Exchange officers helping build mutually beneficial links between researchers and third parties.

11. It is important to recognise that, although technology transfer is an important activity for universities, for the majority it is a small part of a much broader set of Knowledge Exchange activities and contributes a small fraction of annual knowledge exchange income. For example, annual HEBCI returns show that a small number of outliers are responsible for a significant proportion of the reported external investment received for staff start-ups and sale of shares in spin-offs. There is a concentration of activity among large, research intensive institutions like Oxford which have large, diverse base of world-class research, a suitable IP portfolio (incl. from the life sciences, medical sciences and physical sciences), pipelines, professional support staff and top-level institutional support to drive activity. Even in these institutions, however, technology transfer per se is still a minority sport.

12. In recent years, requirements such as the pathways to innovation sections in Research Council grants and the inclusion of Impact in the Research Excellence Framework have required universities to demonstrate more directly their contribution to economic growth and social good, through dissemination of knowledge, wider engagement and commercialisation activity. Whilst this activity is not new, and Oxford has been collaborating with business for at least as long as it has been commercialising technologies, it is now recognised as a core part of our activity.

13. As well as developing internal capacity for technology transfer and knowledge exchange, universities act as important economic drivers within their local regions, providing skilled graduate employees, technical expertise, facilities and collaborative opportunities. Oxford University has been recognised as a fundamental foundation-stone of Oxfordshire’s economy and has played an active role in recent years in contributing to a purposeful regional strategy for innovation-based growth.

How well universities and TTOs balance objectives of protecting IP and encouraging public-benefit research, and whether TTOs’ and universities’ IP strategies effectively deliver such objectives in practice;

14. The continued steady growth in the volume and value of commercially sponsored research and technology transfer suggest that Oxford has been successful in delivering a well-balanced portfolio of activities. Of particular note are long term collaborations between companies and Oxford, where co-location of staff and frequent collaboration over multiple projects are enabled. For example, Rolls Royce University Technology Centres (UTCs) have been based at the University since 1990. The Oxford Man Institute for Quantitative Finance is entering its

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5 University Knowledge Exchange (KE) Framework: good practice in technology transfer’ HEFCE, 2016. The report found that technology transfer in the UK is fairly concentrated in a small number of universities.


7 OxLEP strategies can be found at http://www.oxfordshirelep.org.uk/content/strategy
eighth year with a new focus on information engineering as applied to the finance sector\textsuperscript{8}, and the recently inaugurated Oxford Emirates Data Science lab\textsuperscript{9} has embarked on five year programme engaging researchers in the commercial challenges of a global airline. All of these relationships require active management through good times and bad, but if they were not delivering commercial benefit, then sponsorship would cease; if they were not delivering excellent, public benefit research then academic interest would wane.

15. The focus is not solely on science and large companies, of course, and the Thames Valley Country Houses Project\textsuperscript{10} e.g. brings the expertise of social and art historians to bear on the commercial challenges of small heritage businesses. Nevertheless, in all of these examples a mechanism has been found which balances public and private aims in a mutually beneficial way.

16. Similarly, it is testament to Oxford University Innovation’s ability to balance the needs of multiple stakeholders that their activity continues to grow, the patient capital available to invest in new businesses continues to increase, and inventive academics continue to seek their professional help.

17. Of course it is inevitable that in such an environment it is impossible to satisfy everybody all the time. Every situation is different; the policies and desires of different organisations can vary widely, and many contracts require careful discussion to meet the needs of both collaborators. Sometimes agreement cannot be reached, although this is quite rare – usually a compromise is found.

18. Oxford is recognised internationally as both a world leading research university and in the top five university innovation ecosystems\textsuperscript{11}. This suggests that we have indeed found a balance and we continue to strive to improve in both arenas.

Any scope for individual universities/TTOs to adopt particular good practices and IP strategies from others

19. There is a great deal of scope for this, and PraxisUnico\textsuperscript{12} and AURIL\textsuperscript{13} as professional communities have spent many years promoting the sharing of good practice throughout the KE and commercialisation community. Their membership is not restricted to universities, but includes research institutes and companies. They promote dialogue and understanding, which improves the ability of all parties. Oxford is a member of PraxisUnico, and has contributed many hours of staff volunteer time to support sharing of good practice. To date, PraxisUnico has trained 3500 UK and overseas professionals in a range of fundamental and advanced technology transfer and KE courses. Oxford staff are also active in the Association of Research Managers and Administrators (ARMA), the Russell Group’s Research Directors,

\textsuperscript{8} http://www.oxford-man.ox.ac.uk/
\textsuperscript{9} http://www.ox.ac.uk/news/2015-10-29-oxford-emirates-data-science-lab-will-streamline-air-travel
\textsuperscript{10} http://www.tvchp.org/about.html
\textsuperscript{11} http://www.rhgraham.org/RHG/Recent_publications_files/MIT%3ASkoltech%20entrepreneurial%20ecosystem%20report%202014%20_1.pdf
\textsuperscript{12} https://www.praxisunico.org.uk/
\textsuperscript{13} http://www.auril.org.uk/
TTOs and PVCs networks, and the League of European Research Universities (LERU), all of which facilitate benchmarking and the adoption of good practice.

20. In an environment where innovative universities across the UK are constantly looking for better ways to address industrial collaboration, the promotion of entrepreneurship, public engagement with research, consultancy and technology transfer, among other manifestations of knowledge exchange, the professional organisations and their courses, conferences and discussion lists provide a valuable resource to the whole sector.

21. Oxford is exploring membership of UIDP 14, a US-based organisation that promote dialogue in a shared environment between leading universities and business in the US and elsewhere. This reflects our view that there is no substitute for developing strong relationships with collaborators in the long term if we are to maximise the benefits of working together.

Whether funding arrangements for research commercialisation by TTOs are adequate and whether they facilitate an appropriate balance of objectives and an appropriate balance between short-term and longer-term aims;

22. The Macmillan report dissects very well the complexities facing TTOs, and we will not rehearse them in detail here. Technologies in different sectors require radically different approaches, individual technologies require very different strategies to reach the marketplace, and the requirements of investors and licensees vary from company to company. As MacMillan observes: “It is unlikely that we can ever resolve the issue of whether universities strike the right balance of impact and income and timescales, given the multitude of different routes to impact and multitude of different agreements being signed at any time.” Nevertheless, Oxford’s is committed to delivering impact in sensible balance with co-investment with partners, and has a track record that suggests we get it right much of the time!

23. The UK’s “highly advanced and sophisticated national IP environment” places it on almost a joint footing with the US as the best in the world15. There is always room for improvement but there are strong indications that current arrangements to exploit IP from UK universities are effective. Many global companies and investors cite the UK as one of the best places in the world to form and scale-up new start-ups. The quality of UK universities is a strong pull-factor for investors and a vital part of creating investor confidence. In this context, UKTI’s Venture Capital Unit was established to increase the funding available for UK entrepreneurs and start-ups, including those spun out of universities, through connecting them with overseas sources of venture capital investment. The Unit has stated that “investors have more confidence in the UK than any other European nation”16.

24. The Higher Education Innovation Fund (HEIF) is the most important funding stream to support KE in the UK. Without it we would not be able to support the activity and generate

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14 https://www.uidp.org/
15 Global IP Center International IP Index
the benefits that we do. One challenge in recent years has been the short-term nature of that funding. Successive single year funding periods, with funding announced to institutions more than half way through the employment contract period, have led to protracted uncertainty for staff and the loss of experienced professionals. We would be very keen to see funding committed to HEIF for multi-year periods to provide stability of employment for the many specialists who support this work.

Whether SMEs and larger businesses are both given an equitable access to commercialisation opportunities;

25. ‘Yes’ is the short answer in terms of our approach at Oxford.

26. Nonetheless, SMEs are very different from larger businesses in e.g. their access to venture capital, knowledge of government schemes to support commercialisation, the resources they can devote to engaging with universities, absorptive capacity, etc. As a recent report to HEFCE by the Enterprise Research Centre (ERC) shows, because universities cannot engage with all SMEs they tend to focus their activity on organisations which have the best ability to take up the research into useful products and services and/or have the internal capacity to dedicate time to working with an external partner. Those companies that do have time will be proactive in seeking out collaborative opportunities. This will tend to favour larger organisations with more resources but considerable efforts are being made to reduce actual or perceived barriers to entry for SMEs17.

27. There is no silver bullet here in terms of seeking to foster more university-SME engagement as a pathway to innovation and growth. Oxford, like many UK universities, is working on many fronts. These include fostering better links through the Local Enterprise Partnership (LEP), showcase events to attract SMEs (including support for Oxford Venturefest, Oxford University Innovation technology days, forums with industry held by our academic departments and centres), student consultancies, easy access to University expertise via our Partnerships and Innovation web portal18, work to enhance external access to University facilities and testing/research services, business education and advice incl. through the Business School, and more. Through Local Growth Fund (LGF) support from government, we are increasing the available spaces for companies both large and small to co-locate with academic research by expanding the Innovation Centre at Begbroke Science Park and the new Bioescalator. Magdalen College is also expanding the Oxford Science Park.

What measures universities, business leaders and Government should take to assist the commercialisation process, and to reach a common understanding of how the different stakeholders involved can engage in the process

17 For a full assessment of HEIs work with SMEs see the ERC’s 2016 report ‘University-SME engagement: the geography of connectivity across England and the effects on innovation’ http://dera.ioe.ac.uk/26434/1/2016_unisme.pdf
18 https://www.ox.ac.uk/research/innovation-and-partnership?wssl=1
28. We would urge the Committee (and Government) to take a positive view and build on the
successes in UK university-industry links. We must reject the lingering (and damaging)
misperception that the UK performs poorly in this domain. 2014-15 HEBCI income reached
£4.2 billion with contributions from corporates, SMEs, private and third sector organisations.
For the first time £1bn of this was from business alone; 6,675 impact case studies were
submitted by universities to the 2014 REF exercise, a large number of which involved business
partners; the UK hosts the world’s number one university business incubator (SETSquared),
ranks fourth in the world for university-industry collaboration in R&D (World Economic Forum
Global) and third in the most recent Global Innovation Index – ahead of the USA\(^1\). Research
by the McMillan Group for HEFCE has underlined this success, whilst emphasising the need
to be aspirational and develop UK’s “distinct innovative approaches”.

29. A successful research and innovation ecosystem must have both a thriving discovery
sector and a vibrant exploitation sector. Therefore the government should

1. Continue to support basic research across all areas (not just STEM) and look to increase
the capacity of UK HEIs and other leading research organisations

2. Invest more in building an innovation environment, including direct joint funding of
industry-HEI research, more capability in national facilities and laboratories to provide
technical services and an increased number of procurement-led or driven engineering
projects to build industrial capability and capacity.

3. Enable HEFCE to offer long-term support for knowledge exchange and innovation though
five-year HEIF allocations

4. An industrial policy that stimulates and incentivises private R&D investment in businesses
across the UK. More research and development capability in industry will improve the
possibilities for knowledge exchange and therefore identification of fruitful ideas.

30. One is also reminded of Professor Richard Jones’ advice that in order to foster the
innovation economy, Government should:

- *Stop making things worse* (R&D capacity – including private-sector R&D – is a national
  asset, and we should try and correct the perverse incentives that lead to its destruction)
- *Recognise and maintain our strengths* (We should build on what we have that is
  positive. The UK’s academic research base is highly competitive and cost-efficient, and
  has become increasingly connected with industry)
- *Build capacity* (in industrial R&D and in the absorptive capacity of the economy for new
technology)\(^2\)

31. Across the UK, HEBCI data has been rising year-on-year for over a decade, faster than
annual GDP growth. Income generated from collaboration with businesses has now reached
£1bn and provides close to £10 return on average for every £1 invested – and the returns for
the top six research intensive universities, including Oxford, are more than twice the average.

\(^{19}\) [SETSquared, Global Competitiveness Report 2014-15](http://speri.dept.shef.ac.uk/2014/11/11/rebuilding-uks-innovation-economy/)
\(^{20}\) Global Innovation Index 2016
We need to have stability of KE policy and funding in order to plan for the long-term and continue to generate such strong returns for the economy. We are in a period of intense instability and so caution against dramatic changes to a sector which is working well in difficult times.