

## 10 WORKING WITH BUSINESSES

The University of Oxford has a direct impact on the economy through the services that it offers for businesses. These services can enable businesses to unlock new potential by allowing the companies to overcome problems that they had or by lowering the cost of doing their own research and development.

The economic impacts may occur in the years after the activities are completed, however the figures presented here are for the year 2014/15 to reflect the impact of the activity in that year.

This section considers the economic impacts associated with:

- consulting;
- contract research;
- facilities hire
- continuing professional development; and
- knowledge transfer partnerships.

The University of Oxford engages with businesses globally and the EU and global impacts of its activities are described in Section 15. The methodology for calculating the impacts described in this chapter are explained in detail in the Methodological Appendix.

### 10.1 Absorptive Capacity

Many studies have shown that an important aspect of business innovation is the propensity and capability of people and organisations to engage, absorb, translate and exploit knowledge. This is “absorptive capacity”, simply defined as the ability to exploit knowledge, whether obtained internally or, especially, externally.<sup>31</sup>

The UK Government recognises that an investment in research must be met with investment in the capacity to exploit it:

**“Through investment in the knowledge base and by building our national absorptive capacity, participation in research enhances the UK’s ability to exploit knowledge generated both internally and internationally; if a country cannot understand new ideas it cannot convert them into economic and social success.”**

*Source: Dept for Business, Innovation and Skills, Our Plan for Growth: Science and Innovation, Evidence Paper, December 2014.*

Firms looking to acquire and use knowledge benefit from ‘spillovers’ from the innovative businesses, universities and public bodies which initially developed new ideas, insights and practices, but which do not keep them these to themselves. There is also a strong role for networks and collaboration as a means to foster greater productivity and innovation, particularly among smaller firms.

An open and engaged University is fundamental to this, for businesses in the region as well nationally and internationally. In fact, the evidence would suggest a clear

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<sup>31</sup> Innovation by Adoption, Measuring and mapping absorptive capacity in UK nations and regions, NESTA (2008), [https://www.nesta.org.uk/sites/default/files/innovation\\_by\\_adoption.pdf](https://www.nesta.org.uk/sites/default/files/innovation_by_adoption.pdf)

regional impact from the University of Oxford. A UK wide study by the National Endowment for Science, Technology and the Arts (NESTA) explored the uneven geographic spread of innovation<sup>32</sup>. It comments that some cities and regions – including Oxford – are cutting-edge innovation leaders. An open and engaged University is key to this and our quantitative analysis of Oxford University's commercialisation impacts provides corroboration. It is harder to evidence the University's national and global influence on absorptive capacity.

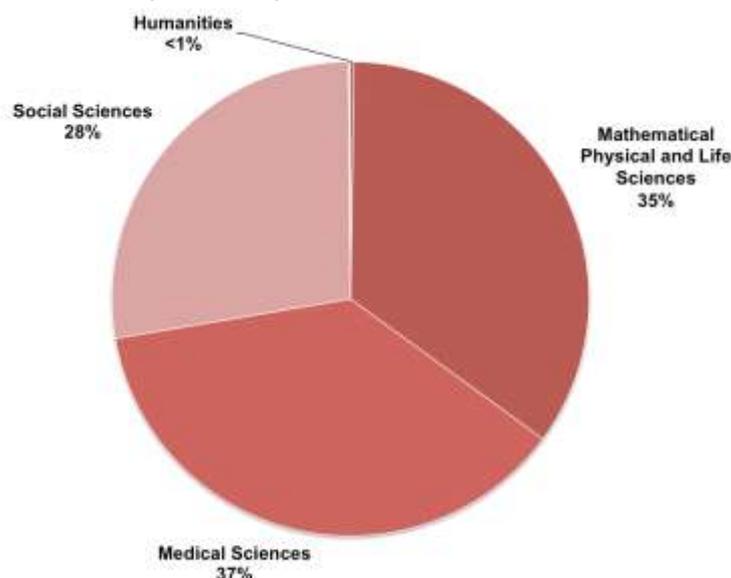
From a business' perspective, **access** is a fundamental attribute of absorptive capacity. This is the ability to connect and link to networks of knowledge and innovation. It requires individuals or teams being able to engage with such networks. The University of Oxford creates many opportunities for such access from businesses. These include:

- founding new companies, with relationships in place from the very beginning leading to a lifelong open channel between the business and its academic progenitor;
- ongoing links with alumni, providing individuals within companies an opening to approach academic contacts and networks;
- commercial/academic research collaborations;
- student placements and internships, creating opportunities for links between teaching staff and company hosts.

## 10.2 Consulting

The University of Oxford received £3.7 million of income from consultancy with industrial clients in 2014/15. The academic department with the greatest amount of consultancy income was Medical Sciences, which accounted for 37% of all consultancy income to the University of Oxford. Mathematical, Physical and Life Sciences accounted for 35% of consultancy income and Social Sciences accounted for 28%.

Figure 10.1 - Consultancy Income by Academic Division



<sup>32</sup> Ibid.

Source: University of Oxford 2014/15 Financial Year Data

Figure 10.2 – REF Case Study: Auction Design<sup>33</sup>

Professor Klemperer, Edgeworth Professor at the University of Oxford, is an expert in auction theory, and in particular developed a new competitive auction design known as the Product Mix Auction, which simulates a simultaneous multiple round auction (SMRA). The auction design involves both the seller and the bidders specifying prices for different quantities of a good, which simulates a supply curve and a demand curve. This overcomes an auction problem, wherein a low number of bids may be placed and a seller is forced to sell a quantity of goods at an undesirable price. Under this system, the seller would sell fewer goods at this lower price, and vice versa.

This research into auction theory played a major role in designing Britain's 3G Telecom auction in 2000, which generated £22.5 billion, the biggest auction ever at the time, and significantly more than the Dutch auction, which raised just \$2.5 billion.<sup>34</sup> It has also been used extensively by the Bank of England in its long-term repo operations, where it allows a greater level of liquidity than previously and reduces systemic risk.

The economic impacts associated with consultancy, and all services for business, are realised through the businesses that commission this work. Therefore the economic impacts are attributed to the geographic study area in which the business operates.

The University of Oxford has an international reputation for academic excellence and therefore companies from all over the world will approach it to undertake consultancy work. In 2014/15, 41% of the income received from consultancy was from companies based outside the UK. The location of clients within the UK was based on previous BiGGAR Economics analysis that was undertaken for the Economic Impact of Oxford University Innovation<sup>35</sup>. The location of clients is given in Table 10.1, which shows that although 59% of income comes from UK clients, less than 10% comes from consultancy clients based within Oxfordshire.

Table 10.1 – Consultancy Income by Geographic Location of Clients

	Oxford City*	Oxfordshire*	UK	EU	Global
Consultancy Income	7%	9%	59%	66%	100%

Source: University of Oxford, \*BiGGAR Economics analysis

The economic impact associated with this consultancy shown in Table 10.2 for within the UK. In total the £3.7 million of consultancy activity would generate £13.0 million GVA in the UK and support 44 jobs. Of these, five jobs and £1.6 million GVA would be within Oxfordshire.

<sup>33</sup> REF (2014), Designing auctions to improve central bank operations

<sup>34</sup> Klemperer, P. and Binmore, K. (2002), The Biggest Auction Ever: The Sale of the British 3G Telecom Licenses

<sup>35</sup> BiGGAR Economics (February 2013) *Economic Impact of Isis Innovation's Commercialisation Activity*

Table 10.2 – Consulting Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	1.2	1.6	13.0
Employment	4	5	44

Source: BiGGAR Economics

The economic contribution of consultancy considered in this section only looks at consultancy undertaken through Oxford University Innovation’s consulting service. Academics may conduct consultancy outside the University and the contribution presented in this section is therefore likely to be a conservative estimate.

As well as the benefits for businesses of undertaking consultancy, there are wider benefits for academics and the University.

As the time and financial commitment required from companies to have consultancy work undertaken is generally quite modest, consultancy can be a low risk way for companies to explore the potential returns of developing a longer-term relationship with academics and the University. Ultimately this may lead to a more extensive commercial relationship that may involve new licensing deals, contract research or long-term industrial funding partnerships. Consultancy activity undertaken by the University is therefore likely to be an important gateway to other types of University business engagement. This is beneficial for researchers as further research can be funded in this manner and can be closely linked with industry needs.

### 10.3 Facilities Hire

The University of Oxford has high tech facilities that it allows other organisations to use for a fee. Companies may be attracted to using these facilities if the research and development equipment they have access to in-house is not able to perform particular testing or analysis. The operators who run the facilities within the University of Oxford may also be able to offer skills that are not available in-house.

In 2014/15 the University of Oxford was paid £5.1 million for commercial use of its facilities. Data is not available regarding the location of the University’s facilities hire clients and therefore it was assumed that the geographic breakdown of clients would be the same as consultancy clients, which is given in Table 10.1.

This expenditure is an investment by companies in research and development activity. The products that are being developed in the hired facilities are often close to market and the main benefits for the University are commercial rather than research. This is the same as consultancy contracts and therefore the commercial and economic returns to this investment in facilities hire research and development is also assumed to be the same as consultancy.

The economic impact associated with the facilities hire at the University of Oxford is given in Table 10.3. This shows that it could generate £18.4 million GVA across the UK and support 62 jobs.

Table 10.3 – Facilities Hire Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	1.6	2.2	18.4
Employment	6	8	62

Source: BiGGAR Economics

## 10.4 Contract Research

The University of Oxford also undertakes contract research for companies and other organisations. Contract research projects on average cover a longer time period than consultancy projects and need to be research orientated. The University of Oxford received £142.1 million in income from organisations to carry out contract research, of which £53.9 million was from commercial companies and £88.2 million was from non-commercial organisations such as the NHS or charities.

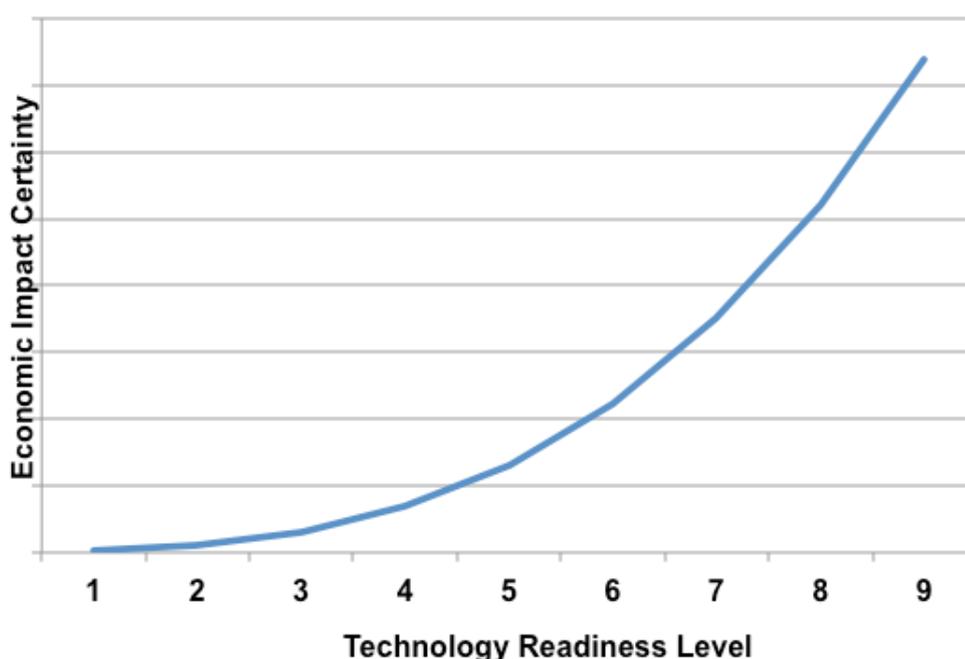
Table 10.4 – Contract Research Income by Client Type

	Value
Value with Commercial SMEs	£2.3 million
Value with Commercial Non-SMEs	£51.6 million
Value from Non-Commercial Organisations	£88.2 million
Total Income from Contract Research	£142.1 million
Total Income from Commercial Contract Research	£53.9 million

Source: University of Oxford HE-BCI Returns 2014/15

The commercial clients would expect to see a return to their investment in contract research with the University. However, as the 'research' component of these contracts is higher than consultancy project the Technology Readiness Level (TRL) or equivalent of many of these contract topics is likely to be lower. A lower TRL level of research results in higher levels of uncertainty on the potential commercial, and therefore economic, impacts. This is because there are greater levels of risk for technologies at the lower TRL levels as each consecutive level of development brings challenges for progress.

Figure 10.3 – Confidence in economic impact estimates at each TRL level



Source: BiGGAR Economics

However, investment in technologies at earlier stages of their development, such as through contract research, is necessary for the technology to progress. The research investing decisions made by companies is dependent on the returns that they would expect to make in the long term. Therefore, if a company would expect to achieve higher returns from investing in research of a more developed product at a higher TRL level than in a less developed product at a lower TRL level, then the company would invest in the higher TRL research, such as through consultancy. Companies will only invest in lower TRL level research if the long term benefits to this research are expected to be at least equal to the returns to alternative investment decisions in more developed products. This analysis considers the economic impacts associated from all commercial research investment to be the same because the returns to the companies are assumed to be similar.

The economic impact associated with this contract research activity is shown in Table 10.5. In total the £53.9 million of commercial contract research income would generate £192.2 million GVA in the UK and support 654 jobs. Of these, 79 jobs and £22.9 million GVA would be within Oxfordshire and £17.0 million and 59 jobs would be within Oxford City.

Table 10.5 – Contract Research Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	17.0	22.9	192.2
Employment	59	79	654

Source: BiGGAR Economics

## 10.5 Executive Education & CPD

The education that the University of Oxford provides is not limited to its students. Professionals who are already in employment can benefit from specially designed

courses to make them more productive. This includes CPD courses run by departments across the University that have a range of client focuses, from health practitioners and teachers in the UK to international government ministers and leaders of industry. This section considers some of the executive education and CPD courses that are particularly unique to the University of Oxford.

### 10.5.1 Saïd Business School

The Executive Education courses run by the Saïd Business School (SBS) are the highest rated in the UK and the ninth in the world<sup>36</sup>. The SBS offers a portfolio of open-enrolment, diploma and custom programmes in order to build long term relationships with its clients. The custom executive education programmes were the most popular, as clients were able to tailor the learning outcomes to meet their needs. In 2015/16 there were 4,667 participants in these custom programmes and 930 participants in the open enrolment programmes.

Figure 10.4 – Improving Megaproject Performance through Better Decision Making<sup>37</sup>

The BT Centre for Major Programme Management (BTC), based at the Saïd Business School, conducts research and advises on megaprojects, such as major infrastructure and IT projects. Research has focused on the causes of budget overspends, time delays and benefit shortfalls, based on one of the most comprehensive project databases in the world. Improving outcomes from these megaprojects is particularly important given that in the UK alone they are worth more than £350 billion. Therefore, there is significant scope to achieve very large savings.

The BTC has advised the UK Government, through the National Audit Office, on the risk factor associated with megaprojects, and held several full-day workshops on new methods and research findings, generating substantial savings. The BTC has also collaborated with McKinsey & Company, a major consultancy, and provided them with invaluable insight into how they can ensure that their clients make the best-informed decisions, with all of the most up-to-date data at hand. BTC research recently formed part of the evidence base that led the city of Rome to withdraw from its bid to host the Summer Olympics.<sup>38</sup>

The BTC now offers an intensive, part-time Masters which consists of eight core modules, including major programme risk, contract management, managing performance and financial management, and is completed over a two-year period.<sup>39</sup> Since 2014, the UK Government has required all Senior Responsible Owners, in charge of major projects, to pass the Major Projects Leadership Academy, which is run in conjunction with the Saïd Business School. In the two years that the Academy has been running the number of projects completed on time and on budget has increased from one third to two thirds, representing large cost savings.<sup>40</sup>

<sup>36</sup> Financial Times (May 2016), *Business School Rankings 2016* (<http://rankings.ft.com/businessschoolrankings/university-of-oxford-said/executive-education-open-2016#executive-education-open-2016>)

<sup>37</sup> REF (2014), Improving Megaproject Performance through Better Decision Making

<sup>38</sup> Saïd Business School (2016), Mayor of Rome uses Oxford Saïd Olympics Study to oppose the city's bid for 2024 Games. <http://www.sbs.ox.ac.uk/programmes/degrees/msc-major-programme-management/news/mayor-rome-uses-oxford-said-olympics-study-oppose-city-s-bid-2024-games>

<sup>39</sup> Saïd Business School (2016), MSc in Major Programme Management. <http://www.sbs.ox.ac.uk/programmes/degrees/mpm>

<sup>40</sup> Saïd Business School (2016), Major Project Leadership Academy. <http://www.sbs.ox.ac.uk/programmes/execed/custom/clients-and-case-studies/major-projects-leadership-academy>

### **10.5.2 Blavatnik School of Government**

The Blavatnik School of Government (BSG) was founded in 2010 and aims to improve governance worldwide. The BSG undertakes teaching, research and engagement in this field and has been growing in influence and size since its creation. The education provided by the BSG is split between two long term courses, the Masters in Public Policy and DPhil in Public Policy, and the short executive education courses.

The short executive education courses include an intensive six-day course on Oil, Gas and Mining Governance, which has run annually since 2013. This course works with high level ministers in governments and public service from around the world. In the first two years of its operation 37 government ministers and senior officials from 17 different countries participated, including those from resource rich countries in Africa, Asia and Latin America.

The BSG also develops specific courses to address specific areas of government, such as the Hong Kong Officer Professional Development Programme. This short course ran over eight weeks in 2015 and was designed to grow the future leaders of government in Hong Kong. There were ten participants in the course who were all mid-level civil service officers from Hong Kong who were challenged to develop a nuanced and deeper understanding of public policy and administration, political economy and international relations.

The BSG also supports the engagement and education of those involved in government through its faculty-led conferences. In total, there were 3,500 attendees to BSG events in 2014 that involved 90 external speakers.

The participants in the Blavatnik School's courses are often senior members of government and public service, who make decisions that will have wide catalytic impacts in the sectors they control. Decisions made regarding how the sector develops in these countries can create thousands of jobs, or alternatively put thousands of jobs at risk. Therefore, the economic implications of making better governance decisions, as a result of attending these courses, can be significantly greater than standard returns to CPD in the private sector.

### **10.5.3 Quantifiable Contribution**

Part of the contribution that the executive education and CPD courses run by the University of Oxford make to the economy can be estimated. The approach taken in this analysis to quantifying these contributions will produce an underestimate because it is not able to differentiate between the particular attributes of these courses. The courses on governance alone are likely to generate significant economic contributions beyond what has been captured in this analysis.

The decision to invest in executive education or in CPD is made by businesses and individuals that expect to receive a return to this investment through increased employment opportunities, salaries or productivity. In this analysis the returns to investment from CPD were assumed to be the same as that of other investments by businesses in university services, such as consultancy or contract research. The key assumptions used to quantify the total economic contribution are summarised in Table 10.6.

Table 10.6 – Key Assumptions for Executive Education & CPD Contribution

	Value	Source
Total Income from Executive Education/ CPD	£25.8m	University of Oxford HE-BCI
...Participants from Oxford City	4%	Department of Continuing Education
... Participants from Oxfordshire	7%	
... Participants from UK	30%	
Private returns to CPD/Executive Education	360%	BiGGAR Economics

It was assumed that the industrial breakdown of the participants of the CPD and Executive Education programmes was similar to that of the consultancy clients.

Using these assumptions, it was possible to estimate some of the economic contribution of the Executive Education and CPD programmes that were run by the University of Oxford. This found that the additional productivity of the participants generated an additional £47.4 million GVA to the UK economy and supported an additional 27 jobs in the UK supply chain of the companies that they worked for. The contribution in Oxford City was £4.1 million GVA and 1 job in the supply chain.

Table 10.7 – Executive Education/CPD Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	4.1	7.9	47.4
Employment	1	2	27

Source: BiGGAR Economics

## 10.6 Knowledge Transfer Partnerships (KTPs)

The KTP scheme is a UK wide initiative designed to enable businesses to access the knowledge and expertise available within UK Universities and Colleges thereby facilitating knowledge exchange. A KTP is a three-way partnership between an academic, a business partner (including private sector companies, charities and public sector organisations) and a recent graduate (known as the Associate) who is employed to work on the specific project relevant to the business partner.

In 2014/15 the University of Oxford was involved with 5 ongoing KTP projects. In the past six years, the University has completed six KTP projects. All of these KTPs were completed with companies that were based outside Oxfordshire.

The economic contribution associated with this activity was calculated based on a strategic review of the KTP programme undertaken by Regeneris Consulting<sup>41</sup>. This found that the average KTP in the UK generated £826,000 net additional GVA for the companies that were involved. This covered the first six years after completion of the KTP and therefore the average annual benefit to the companies was £137,667 GVA. The study also found that each successfully completed KTP programme supported three jobs throughout the economy.

<sup>41</sup> Regeneris Consulting (2011) Knowledge Transfer Partnerships Strategic Review

Table 10.8 – Key Assumptions for KTP Contribution

	Value	Source
Number of ongoing KTPs	5	KTP Online Database
Number of KTPs completed in last 6 years	6	
in Oxford City	-	
in Oxfordshire	-	
in the UK	6	
Jobs created by each KTP	3	Regeneris Consulting (2010), Knowledge Transfer Partnerships Strategic Review
Annual GVA per KTP, UK Average (2009)	£137,667	

Using these assumptions, it was estimated that KTPs with the University of Oxford during the six years to 2014/15 generated £1.0 million GVA for the UK economy and supported 18 jobs.

Table 10.9 – KTP Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	-	-	1.0
Employment	-	-	18

Source: BiGGAR Economics

## 10.7 Working with Business Summary

The University of Oxford's business engagement activity generated £272 million GVA across the UK and supported 805 jobs. The majority of this activity took place outside Oxfordshire, reflecting the client base that used the services offered by the University. This activity supported 68 jobs within Oxford City and generated £23.8 million GVA.

Table 10.10 – Working with Business Impact in 2014/15

	Oxford City	Oxfordshire	UK
<b>GVA (£m)</b>			
Contract Research	17.0	22.9	192.2
Consultancy	1.2	1.6	13.0
Facilities Hire	1.6	2.2	18.4
KTPs	-	-	1.1
Executive Education/CPD	4.1	7.9	47.4
<b>Total GVA</b>	<b>23.8</b>	<b>34.5</b>	<b>272.1</b>
<b>Employment</b>			
Contract Research	59	79	654
Consultancy	4	5	44
Facilities Hire	6	8	62
KTPs	-	-	18
Executive Education/CPD	1	2	27
<b>Total Employment</b>	<b>69</b>	<b>94</b>	<b>805</b>

Source: BiGGAR Economics