8 COMMERCIALISATION

Over and above its fundamental activities of teaching and research, the University of Oxford is a vital source of technological innovation through the commercialisation activities it undertakes. Oxford University Innovation is the wholly-owned subsidiary company of the University of Oxford, which manages the University's commercialisation activities. This includes licensing of the University's intellectual property as well as the creation of new companies spun-out based on research developed at the University.

8.1 Licensing

The University of Oxford is one of the most successful organisations in the UK in terms of commercialising research through licencing technology. There are 159 higher education providers in the UK and the University of Oxford accounts for £1 in every £10 of licencing income received by these institutions.

Licence agreements give companies the legal right to use a particular technology or other type of intellectual property (IP) to generate additional sales, reduce costs or otherwise improve their profitability. In return, companies usually pay royalties to the University. Without the initial research outcomes of the University, the productivity gains would not be possible and therefore the benefits to the economy from this activity can be attributed to the University.

In 2014/15 the University of Oxford received £14.7 million in royalties from licences it owned. The majority of this income was from licence holders outside of the EU, particularly the USA, which accounted for 80% of licensing income received by the University. Only 12% of licensing income came from companies within the UK, reflecting the global nature of the University's research. A study of the University of Oxford's commercialisation activity in 2013[24] found that companies in Oxfordshire held the most valuable licences and accounted for 58% of UK royalties paid to the University of Oxford. The University's licensing income by geographical source is given in Table 8.1.

Table 8.1 – Licensing Income by Geography

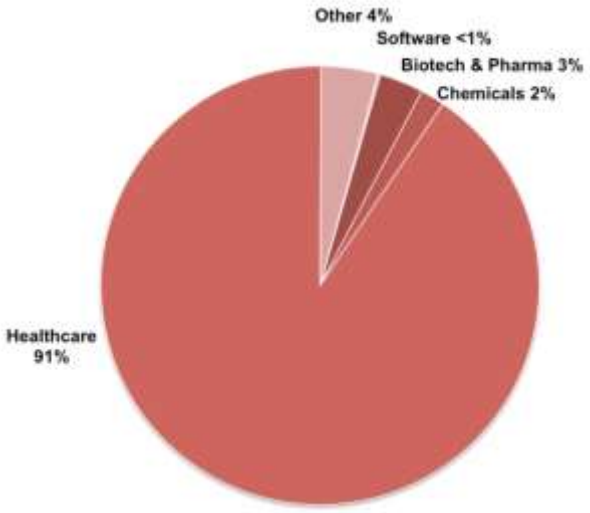
Assumption		Value	Source
Total Licensing Income 2014/15		£14.7 million	University of Oxford
	% of income from Oxford City	5.5%	BiGGAR Economics
	% of income from Oxfordshire	6.9%	
	% of income from UK	11.8%	University of Oxford
	% of income from EU	17.6%	
	% of income from Global	100.0%	

The relationship between the royalties paid and the economic impact is dependent on the sector in which the licences are held. The majority of the licensing income to the University of Oxford is from the healthcare sector, which accounted for 91% of all licensing income in 2014/15. Figure 8.1 shows that the chemicals and biotech

[24] BiGGAR Economics (2013) *Economic Impact of ISIS Commercialisation Activity*

and pharmaceutical sectors are the other main benefactors of University of Oxford licences.

Figure 8.1 – Licensing Income by Royalties Sector



Source: University of Oxford

Using the methodology described in the Supplementary Methodological Appendix, it was estimated that the licences granted by the University of Oxford facilitated £34.2 million GVA in the UK and supported 1,145 jobs. Of this, £14.8 million GVA and 535 jobs were supported in Oxfordshire.

Table 8.2 – Licensing Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	10.9	14.8	34.2
Employment	402	535	1,145

Source: BiGGAR Economics

However, the true impact of the University of Oxford's research activity is much wider than these figures suggest. This is because not all technological advances that have a major impact can be commercialised in the form of licensing or are quantifiable. The case study in Figure 8.2 provides just one example of how the University of Oxford has much wider impacts which are impossible to quantify.

Figure 8.2 – R, A Statistical Computing Software Environment

R is a free, open-source statistical software environment, which is used extensively by businesses, charities, governments and a variety of other organisations. About 50% of the programming that form R has been contributed by Professor Brian Ripley, Professor of Applied Statistics at the University. Professor Ripley incorporated his highly influential research on classification and neural networks[25] which has been cited more than 6,800 times. In particular, he contributed the MASS statistical package, which now forms part of the core statistical and graphical tools that are most widely used, as well as the core time series package.

A 2012 survey showed that over 2 million people use R, of which 1.2 million people are in industry. It is widely used in all sectors, including by very large customers such as pharmaceutical giants Pfizer and Merck, banks such as Bank of America, and Google, and had a prominent role in reducing uncertainty related to the Deepwater Horizon oil spill. Furthermore, it is used by the majority of departments in the UK Government, including the Office for National Statistics, the Ministry of Justice, and Transport for London.

Source: REF (2014), University of Oxford: R, A Free Software Environment for Statistical Computing and Graphics

8.2 Spin-out Companies

The University of Oxford is the most active university in the UK for the creation of spin-out companies with 122 spin-outs emerging from the University since 2000 (Table 8.3).

Table 8.3 – Top 10 Institutions with Most Spin-outs and Start-ups

	Number of Spin-outs
University of Oxford	122
Imperial College London	102
University of Cambridge	97
University of Edinburgh	77
University College London	75
University of Manchester	72
University of Strathclyde	61
University of Bristol	46
Queen's University Belfast	46
Newcastle University	44

Source: SpinOuts UK

In 2014/15, there were 136 active spin-out companies of the University of Oxford, of which 22 were formed before 2000. This includes the oldest spin-out company of the University, Oxford Instruments Ltd which employs 2,100 people across the world and was founded in 1959.

Of these 136 active companies 129 were headquartered in the UK, and 80 were located within Oxfordshire. The UK locations of the registered offices of the

[25] Ripley, B (1996), Pattern Recognition and Neural Networks

University's spin-outs are shown in Figure 8.3. This shows that after Oxfordshire, the second largest grouping of spin-outs is located within London.

Figure 8.3 – Location of University of Oxford Active Spin-out Companies

Source: BiGGAR Economics

An estimated 4,155 people are employed in these spin-out companies globally and over 3,000 are employed directly within the UK. These companies had an estimated total turnover of almost £600 million globally in 2014/15 and £400 million in the UK.

The total economic impact is the sum of the GVA and employment contribution of the spin-out companies themselves and the activity that these companies generate within their supply chain and through the spending of the staff. This has been estimated to be £285.3 million GVA in the UK and 4,578 jobs. Of this, £132.0 million GVA and 1,886 jobs were estimated to be in Oxfordshire.

Table 8.4 – Spin-out Companies Contribution in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)	21.8	132.0	285.3
Employment	51	1,886	4,578

Source: BiGGAR Economics

In order to support the establishment and development of spin-out companies, Oxford Sciences Innovation plc was established in 2015. The company provides capital and scaling expertise to businesses driven by intellectual property (IP) developed in the University's Mathematical, Physical, Life Sciences Division and Medical Sciences Division. In order to fund the next generation of spin-out companies from the University, Oxford Sciences Innovation will raise an initial £300 million, making it one of the largest single university venture capital funds globally[26]. £210 million has already been committed by six cornerstone investors and this expanded to £580 million in December 2016.

Oxford Sciences Innovation has therefore expanded the funding available to the University for the creation of spin-out companies as well as offering commercial expertise to the University's researchers. This unique partnership enhances the opportunities for the University of Oxford's world-leading scientific research to be commercialised into successful companies.

8.3 Commercialisation Summary

In total the commercialisation activity of the University of Oxford generated £320 million GVA across the UK and supported 5,722 jobs. Of this, £147 million GVA and 2,421 jobs were in Oxfordshire and £33.2 million GVA and 453 jobs were in Oxford City.

Table 8.5 – Contribution from Commercialisation in 2014/15

	Oxford City	Oxfordshire	UK
GVA (£m)			
Licensing	10.9	14.8	34.2
Spin-Out Companies	21.8	132.0	285.3
Total GVA	**32.7**	**146.9**	**319.5**
Employment			
Licensing	402	535	1,145
Spin-Out Companies	51	1,886	4,578
Total Employment	**453**	**2,421**	**5,722**

Source: BiGGAR Economics

[26] http://www.globaluniversityventuring.com/article.php/4611/oxford-launches-worlds-largest-university-venturing-fund