



The research commercialisation office of the University of Oxford, previously called **Isis Innovation**, has been renamed **Oxford University Innovation**

All documents and other materials will be updated accordingly. In the meantime the remaining content of this Isis Innovation document is still valid.

URLs beginning [www.isis-innovation.com/](http://www.isis-innovation.com/)... are automatically redirected to our new domain, [www.innovation.ox.ac.uk/](http://www.innovation.ox.ac.uk/)...

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## Economic Impact of Isis Innovation's Commercialisation Activity

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A report to



6<sup>th</sup> February 2013

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# 1 EXECUTIVE SUMMARY

Isis Innovation is a wholly owned subsidiary of the University of Oxford. It is responsible for managing technology transfer and academic consulting for the University and for providing consultancy advice and knowledge transfer expertise to clients around the world. This report presents the results of analysis undertaken by BiGGAR Economics to assess the economic impact of this activity.

## 1.1 Key Findings

The key finding of this report is that commercialisation activity undertaken by Isis Innovation contributed more than £0.4 billion GVA to the global economy in 2012/13 and supported almost 5,000 jobs. This includes:

- £264.0 million GVA and almost 3,400 jobs in the UK (of which £129.3 million GVA and around 1,630 jobs were estimated to be in Oxfordshire);
- £9.9 million GVA and 150 jobs elsewhere in Europe;
- £109.5 million GVA and around 1,200 jobs in the USA; and
- £25.7 million GVA and almost 240 jobs in the rest of the world.

This impact was generated in two main ways:

- by the creation of spinout companies;
- from licence agreements that enable businesses to make use of intellectual property developed at the University of Oxford; and

### 1.1.1 Spinouts

Since 1988 more than 80 companies have spun out of the University of Oxford. Research undertaken to support this study suggests that these businesses employed almost 1,400 people world-wide in 2012/13. Since 2011 15 new start-up companies have also been formed with the assistance of Isis Innovation. It is believed that these businesses employed more than 70 people in 2012/13. After accounting for multiplier effects elsewhere in the economy it was estimated that these spinouts and start-ups contributed a total of £311.0 million GVA to the world economy in 2012/13 and supported 3,464 jobs.

### 1.1.2 Licencing

In 2012/13 Isis Innovation received almost £5.0 million in licence fees for intellectual property. It was estimated that these deals enabled licence holders to generate more than £95.7 million in additional turnover. It was estimated that these deals contributed a total of £98.0 million GVA to the global economy in 2012/13 and supported almost 1,500 jobs.

## 1.2 Supporting Impact Generation

The ability of Isis Innovation to deliver these economic impacts is underpinned by the academic expertise and advice provided through Oxford University Consulting. Consultancy services not only generate substantial direct economic impacts but also play an important role in supporting the creation and survival of start-up and spin-out companies and in building the long-term commercial relationships with businesses that can lead to new licence deals.

## **2 INTRODUCTION**

This study presents the results of an assessment of the economic impact of Isis Innovation Ltd., the University of Oxford's technology transfer company undertaken by BiGGAR Economics at the end of 2013.

### **2.1 BiGGAR Economics**

BiGGAR Economics is an independent consultancy based near Edinburgh. BiGGAR Economics has assessed the commercialisation and knowledge transfer activities of more than a dozen universities and research institutes across the UK and Europe. This experience has enabled BiGGAR Economics to develop a unique methodology for assessing the economic impact of a range of technology transfer activities. In late 2013 BiGGAR Economics was invited to apply this methodology to the technology transfer activity undertaken by Isis Innovation. This report presents the findings of that analysis.

### **2.2 Isis Innovation**

Isis Innovation is a wholly owned subsidiary of the University of Oxford. It is responsible for managing technology transfer and academic consulting for the University and for providing consultancy advice and knowledge transfer expertise to clients around the world. Isis Innovation also operates Isis Enterprise, a technology transfer and innovation management consultancy business that helps technology providers and seekers to source, develop and commercialise new innovations.

### **2.3 Report Structure**

The remainder of this report is structured as follows:

- chapter three describes Isis and the activity it undertakes;
- chapter four describes the scope of this report in terms of the areas of activity it considers and explains the approach used to estimate the economic impact of this activity;
- chapter five quantifies the impact of Oxford University spinout companies around the world;
- chapter six assesses the impact of intellectual property managed by Isis Innovation around the world by considering the scale of licencing activity;
- chapter seven assesses the economic impact of Isis Outcomes, the patient reported outcome measures developed at the University of Oxford; and
- chapter eight considers the impact of academic consultancy services provided through Oxford University Consulting and of the sale of scientific materials sold by Isis Innovation;
- chapter nine presents a summary of the analysis; and
- the appendix provides a break-down of the impacts considered for each of the University of Oxford's four divisions.

## 3 ISIS INNOVATION

Isis Innovation is a wholly owned subsidiary of the University of Oxford that is responsible for managing technology transfer activity for the University. In the year ending 31<sup>st</sup> March 2013 the company generated income of £11.5 million and employed more than 50 staff. This section describes the range of activities undertaken by Isis Innovation and how these activities generate economic impact.

### 3.1 Main Areas of Activity

The main areas of activity undertaken by Isis Innovation are described below.

#### 3.1.1 Technology Transfer

The Technology Transfer group within Isis Innovation commercialises intellectual property developed at the University of Oxford through patenting, licensing and material sales. The group also manages the creation of spinouts from the University of Oxford, helping to put together spinout management teams and source investment. Isis holds a portfolio of more than 2,000 patents and patent applications, with more than 650 active licensing deals and 70 spinouts.

#### 3.1.2 Isis Outcomes

Patient Reported Outcome (PRO) measures are used by the pharmaceutical industry and healthcare providers to assess the quality of care delivered from the patient perspective. Isis Outcomes has a portfolio of PRO measures covering neurological disorders, obstetrics and gynaecology, as well as outcome measures directed at orthopaedic intervention assessments. Isis Outcomes provides licence rights to this portfolio to the pharmaceutical sector, healthcare providers, medical device companies and the academic sector.

#### 3.1.3 Oxford University Consulting

Oxford University Consulting (OUC) became part of Isis Innovation in 2002, with responsibility for assisting academics and researchers to engage in consultancy activities and for supporting University departments to make their facilities and resources available to external organisations.

By 2013 OUC had over 1,000 consultants on its books and was negotiating around 300 client contracts a year and generating a turnover of £2.5 million per year. The range of activity undertaken by OUC reflects the diversity of academic expertise at the University of Oxford and includes:

- environmental consultancy
- diagnostics
- management consulting
- the legal profession
- the energy sector
- the pharmaceutical sector
- the NHS
- education providers
- local and UK Government
- the healthcare sector
- publishing
- retail
- motorsport
- the automotive industry
- the aerospace sector
- NGOs and charities

### **3.1.4 Isis Enterprise**

Isis Enterprise was created in 2004 help research organisations and private companies around the world to commercialise their technology and intellectual property. By 2013 Isis Enterprise was generating around £2 million from clients in 24 different countries and had appointed staff in Spain, China and Australia.

### **3.1.5 Software Commercialisation**

Isis Innovation supports the commercialisation of software by licencing of software packages, providing access to unique software tools and algorithms developed at the University of Oxford and supporting creation of new software spinouts.

The creation of software spinouts is supported by the Isis Software Incubator, which provides a supportive environment for innovative projects from undergraduates, researchers, academic staff and alumni of the University of Oxford. By the end of March 2013 21 ventures had entered the incubator a number of which had become fully fledged businesses providing trade, employment and investment opportunities.

### **3.1.6 Networks and Partnerships**

Isis Innovation supports a range of activity designed to build and foster innovation networks at all stages of the intellectual property commercialisation value chain. This includes running networking groups such as the Oxford Innovation Society and the Isis Angels Network. Isis is also pioneering a networking and collaboration model in Asia called an international technology transfer centre.

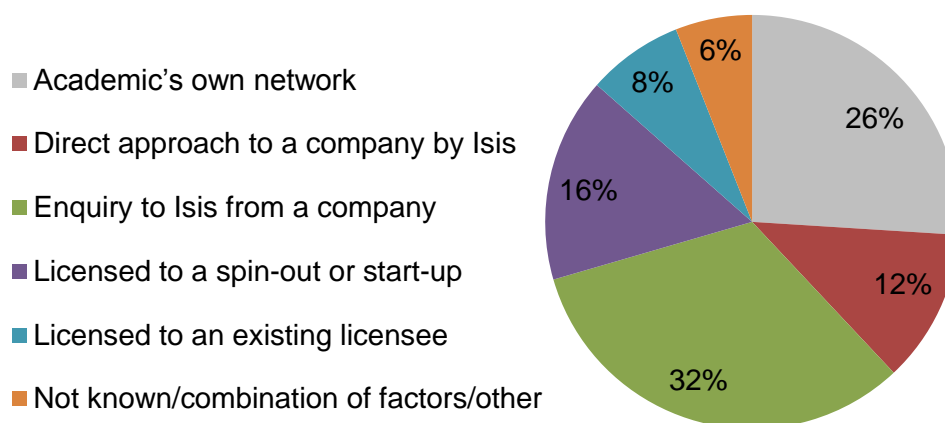
## **3.2 Role of Isis**

Although Isis Innovation is not responsible for developing the technologies and innovations it manages it does play an essential role in enabling these technologies to generate economic impact. A review undertaken at the end of 2013 of the last 200 technology transfer deals made by Isis provides clear evidence of this.

As illustrated in Figure 3-1, 12% of deals with companies were the result of a proactive approach by Isis and a further 32% were as a result of an approach by a company to Isis. It is unlikely that any of these deals would have occurred if Isis did not exist.

Although just over a quarter of deals originated through academic's own networks, it is likely that many of these deals also would not have reached fruition without the support and technology transfer expertise provided by Isis staff. A further 16% of deals were with spinout or start-up companies. As many of these companies would not exist without the support provided by Isis, it is also reasonable to attribute these deals to Isis. All of this implies that the 8% of deals made with existing licences can also be attributed to Isis.

Figure 3-1 - Origin of technology transfer deals



Source: Isis Innovation, 2013

Based on this evidence, all of the economic impact generated by the technology transfer activity considered in this report has been attributed to Isis Innovation. The rationale for this is that while much of the technology considered would have been developed without the support of Isis Innovation, most of the economic impact it generates would not have been realised.

### 3.3 The Role of Consultancy Services

Much of the activity generated by Isis Innovation is underpinned by the consultancy activity facilitated by OUC. This section explores how this relationship works by first of all considering the direct impact of consultancy activity and then looking at how consultancy activity indirectly supports the wider impacts of Isis Innovation.

#### 3.3.1 Direct Impact of Consultancy

One of the ways in which academics at the University of Oxford transfer their skills and expertise into industry is by undertaking consultancy projects for businesses. The relationship between the parties involved in consultancy projects is a commercial one, and although the academic involved may generate some research findings as a result of the work, these are not generally the main objective. Instead, the primary focus of these types of projects is to produce a report (or other output) for the company client.

As with any commercial investment decision, businesses take the decision about whether or not to proceed with a consultancy project or purchase scientific material on the basis of a cost/benefit analysis. Although this analysis may not always be very formal, it is reasonable to assume that companies will only proceed with projects that they expect will at least break-even.

This implies that the total income that Isis Innovation receives in consultancy fees is at least equal to the additional turnover that these projects will generate amongst client companies. In practice however, companies that commission consultancy work will generally be hoping that the impact of the work will help to improve the performance of their business. There are a variety of ways in which this could occur including developing new products or processes, implementing procedures that will help to reduce costs or improving the efficiency of production,



all of which would help to generate additional GVA and potentially support employment within the company.

In some cases this effect could be very significant. For example, there have been occasions when academics from the University of Oxford have appeared as expert witnesses in court cases involving companies, the outcome of which could have serious implications for the future of the business. In these type of examples the consultancy provided can help to safeguard future employment within client companies.

OUC also provides consultancy services to various clients within the public sector, which can help to generate significant savings to the public purse. For example, for the past five years OUC has been providing expert reviewer services for the National Audit Office (NAO) saves the taxpayer an estimated £9 for every £1 spent running the office. The NAO scrutinises public spending on behalf of the UK Parliament. OUC works with an editorial board to identify researchers from the University of Oxford with the expertise to comment on a wide variety of subjects. To date Oxford academics have reviewed over 200 value for money reports, helping the NAO to save millions of pounds of public money.

During the course of their research academics at the University of Oxford also sometimes develop reagents (chemical compounds) that are useful to other scientists working in specialised areas of study such as diagnostic indicators, screening tools or molecular markers. The University also makes these reagents available to commercial clients, such as pharmaceutical companies, through Isis Innovation. The availability of these reagents plays a small role in helping pharmaceutical companies to develop new treatments. This generates an economic benefit for the pharmaceutical companies themselves but also a wider benefit in terms of human health.

The diversity of the range of consultancy services provided through OUC means that it is difficult to quantify the full direct economic impact of this activity; however, the examples highlighted above serve to illustrate the potential significance of this impact. In addition to the direct impact of consultancy services, OUC also plays an important role in supporting the wider commercialisation activity of Isis Innovation. This role is explored below.

### **3.3.2 Indirect Impact of Consultancy**

Some of the consultancy activity undertaken through OUC is undertaken on behalf of new or emerging companies. The type of support provided to these companies varies from contract to contract but will often involve academics providing advice on how to best utilise intellectual property that they were involved in developing.

This type of advice can be invaluable to new companies and can be a material factor in their survival. The knowledge that such advice can be accessed through OUC may also be an important factor in the decision of some entrepreneurs to found a new company. In facilitating this advice, OUC therefore plays an important role in helping to support the creation and survival of spin-out and start-up companies, the economic impact of which is considered in section 5.

Consultancy activity undertaken through OUC also plays an important role in supporting the commercialisation of intellectual property developed at the University of Oxford. This is because commissioning a piece of consultancy enables companies to learn more about a particular area of academic activity and

explore how the intellectual property developed by academics working in this field may be of value to them.

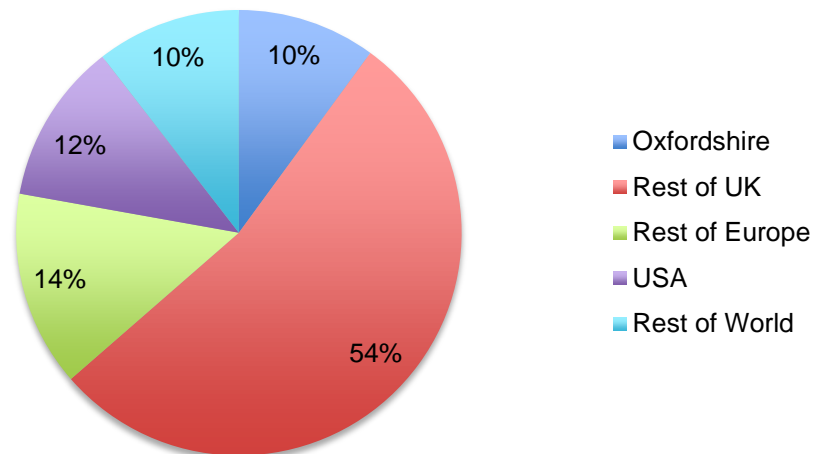
As the time and financial commitment required from companies in order to have a some consultancy work undertaken is generally quite limited, consultancy can be a low risk way for companies to explore the potential returns of developing a longer-term relationship with the University. Ultimately this may lead to a more extensive commercial relationship that may involve new licence deals, contract research or even long-term industrial funding partnerships.

For this reason, consultancy activity undertaken through OUC underpins some of the licencing activity undertaken by Isis Innovation, the impact of which is considered in section 6.

### 3.3.3 International Reach of Consultancy Activity

The majority (54%) of consultancy activity supported by Isis Innovation is undertaken for clients based in the UK. Academics from the University are however active all over the world. A breakdown of consultancy income by source is provided in Figure 3-2. This illustrates the world-wide reach that consultancy activity gives to Isis Innovation.

Figure 3-2 - Consultancy income by source



Source: Isis Innovation

## 3.4 Sources of Impact

The activity undertaken by Isis Innovation gives rise to three main types of economic impact:

- spinout and start-up companies, which generate wealth and support employment in the UK and around the world;
- licence agreements that enable companies around the world to increase turnover, improve profitability or reduce costs; and
- consultancy activity, which helps businesses to improve their performance by taking advantage of the expertise of academics at the University of Oxford.

Each of these sources of impact is considered in turn in the following chapters.

## 4 APPROACH

This section describes the approach used to estimate the impact of Isis Innovation's activity.

### 4.1 Measures of Economic Impact

In this report economic impact is measured in terms of employment and Gross Value Added (GVA). GVA is a measure of the additional value an activity adds to the economy after intermediate consumption (i.e. expenditure on supplies) has been taken account of.

The direct and the indirect impact of each type of activity considered in this report has been estimated separately.

- direct impacts are impacts that are directly supported by the activity being considered, for example the number of people directly employed by a spinout company or the additional GVA generated by a particular licence deal;
- indirect impacts are impacts generated elsewhere in the economy as a result of additional activity elsewhere in the supply chain. For example, the additional turnover and employment supported in businesses that supply spinout companies or provide goods and services to their employees.

The total impact of Isis Innovation is estimated by adding the direct and indirect impacts together.

#### 4.1.1 Estimating Direct Impacts

The direct employment impact of an activity is simply the number of people it directly employs. In this report direct GVA impacts are estimated by multiplying direct employment by an estimate of GVA/employee in the sector in which the employee works. Estimates of GVA/employee in different sectors was obtained from the UK Annual Business Survey.

#### 4.1.2 Estimating Indirect Impacts

The indirect impact of each activity on the UK economy was estimated by multiplying the direct impact of that activity by a GVA or employment multiplier for the relevant sector. These multipliers were developed by BiGGAR Economics using multipliers published by the Scottish Government about the Scottish economy<sup>1</sup>.

The Scottish multipliers were then adapted to reflect the comparative size of the UK economy using information from the UK Annual Business Survey. This approach was taken because the Scottish multipliers are more up to date than equivalent information published about the UK economy as a whole and also provide multipliers for different sectors, which helps to make the analysis more robust.

In order to estimate indirect impacts within Oxfordshire, it was assumed that 40% of the multiplier effect within the UK would occur within Oxfordshire.

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<sup>1</sup> Scottish Government, Input-Output Tables 2009, 2013

### **4.1.3 Estimating Impact Overseas**

The process of calculating the overseas impact of Isis Innovation's activity is identical to that described above. This means that the estimates of GVA/employee used to estimate direct GVA impact and the multipliers used to calculate indirect impacts relate to the UK economy rather than the economy in which the companies are based.

Although this is not strictly accurate, the availability and comparability of multipliers for other parts of the world and lack of detailed information about companies overseas activities means this is the most robust approach available. This means that the direct GVA impact of overseas activity cannot necessarily be directly converted into local currency. As the UK economy is smaller than the three overseas study areas considered, this approach is also likely to somewhat under-estimate the total value of indirect effects.

## 5 SPINOUT AND START-UP COMPANIES

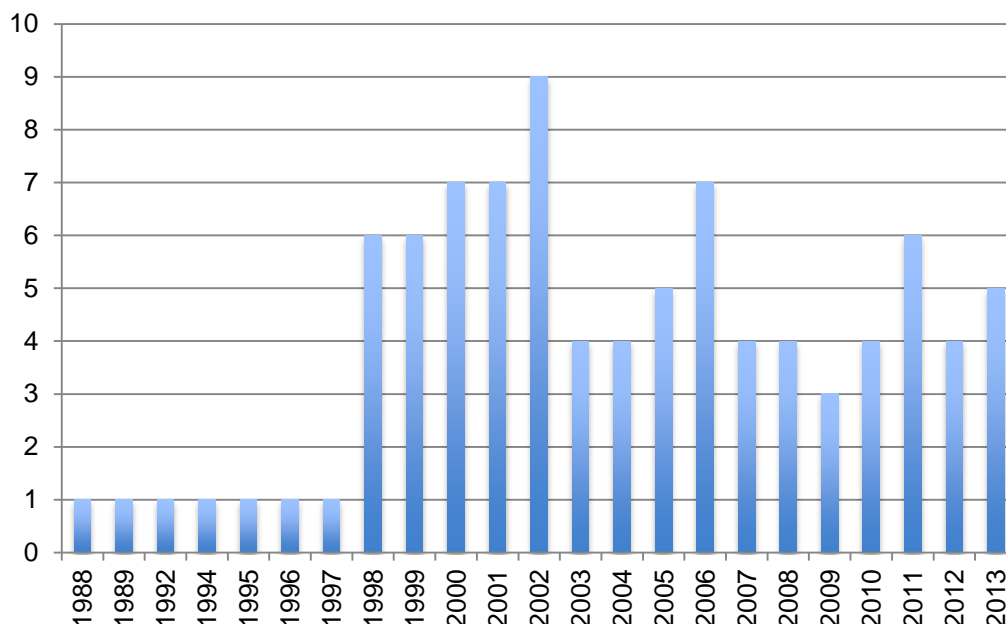
This section describes the economic impact of start-up and spin-out companies associated with the University of Oxford.

### 5.1 Spinout Companies

Since 1988 more than 80 companies have spun out of the University of Oxford (a full list of the spin-outs considered in this report is provided in **Error! Reference source not found.**). As none of these businesses would have been created were it not for the research activity at the University of Oxford, all of the GVA they generate and jobs they support can be attributed to the University.

As illustrated by Figure 5-1, the majority of spinout companies have been created since the turn of the century, with a significant increase in activity starting in 1997. On average Isis Innovation has supported the creation of around four new companies a year for the past ten years – that is approximately one every three months.

Figure 5-1 - Spinouts created by year of formation



Source: BiGGAR Economics analysis of information provided by Isis Innovation

A desk-based review undertaken to inform this study suggested that 75 of these companies remained active at the end of 2013. It is however important to note that some of the companies that are no longer active in their own right still remain an active part of other enterprises, having been taken over by other companies.

Once a company has been taken over it is difficult to assess its contribution to the combined enterprise. In some cases this contribution may diminish over time and gradually become obsolete, in other cases the contribution may be significant. So as to avoid over estimating the impact of spinout companies this report does not attempt to quantify the impact of these companies; however, it should be noted that this means that the total impact may be slightly larger than reported.

## 5.2 Start-up Companies

Since 2011 15 new start-up companies have been formed with the assistance of Isis Innovation. Most of these companies have been supported through the Isis Software Incubator. Desk based research undertaken to support this study suggests that in 2013 these companies employed a total of more than 70 people.

## 5.3 Employment in Spinout Companies

In order to estimate the economic impact generated by these companies in 2012/2013 it was first of all necessary to establish how many people they employed. This was done using a combination of a desk-based review of publicly available information (including company websites and professional networking sites) and a company survey. In total 19 companies responded to the company survey and useful information was obtained about 52 companies from the desk-based review.

The information gathered from these sources was then used to estimate that spinouts from the University of Oxford directly employed around 1,400 people world-wide in 2012/13.

The impact of spin-outs and start-ups is estimated based on the number of people they employ. As the number of people employed by a company often increases with age, this means that the companies that generate the largest impact are likely to be biggest and most established.

Analysis of the information available about spinouts associated with Isis Innovation suggests that there is a relationship between company size and date of formation. On average it was estimated that on average:

- companies that spun out in 2010 or later had 6 employees:
- companies that spun-out between 2000 and 2009 had 20 employees; and
- companies that spun-out between 1988 and 1999 had 36 employees.

## 5.4 Direct Economic Impact of Spinouts and Start-ups

The survey of spinouts found that a significant proportion of spinout companies were pre-revenue. As these companies will not yet be generating any GVA it was necessary to omit them before estimating direct GVA. Based on the survey data it was assumed that 50% of the spin-out companies formed after 2008 were pre-revenue in 2012/13.

The direct GVA impact of the remaining companies was then estimated by multiplying the number of employees in each company by an estimate of the average GVA/employee in the sector in which each company operates. Estimates of GVA/employee were taken from the UK Annual Business Survey.

In this way it was estimated that spinouts from the University of Oxford directly contributed £172.7 million GVA to the world economy in 2012/13.

The direct GVA impact of start-up companies was estimated by multiplying total direct employment in start-up companies by an estimate of GVA/employee in the sector in which the company operates. In this way it was estimated that start-ups from the University of Oxford directly contributed £5.1 million GVA to the world economy in 2012/13.

## 5.5 Indirect Impact of Spinouts and Start-ups

The indirect impact of spinout and start-up companies was captured by multiplying the direct impact of each company by GVA and employment multipliers appropriate to the sector in which it operates. In this way it was estimated that spinouts from the University of Oxford contributed a further £129.1 million GVA to the world economy in 2012/13 and supported a further 1,940 jobs. It was estimated that around two thirds of this impact. Using the same methodology it was estimated that start-ups contributed a further £4.2 million and supported a further 62 jobs.

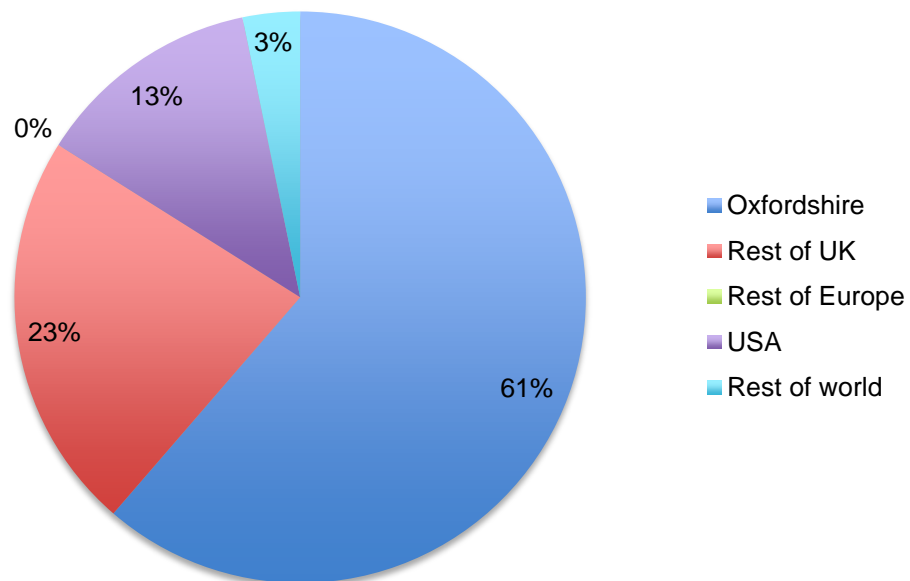
Adding this to the direct impact of spinouts estimated above suggests that spinout and start-up companies contributed a total of £311.0 million GVA to the world economy in 2012/13 and supported around 3,464 jobs.

## 5.6 Impact of Spinouts and Start-ups Around the World

All of the start-up companies from the University of Oxford and the vast majority of spinouts, remain based in Oxfordshire. This includes some companies were founded almost forty years ago. Many of these companies have even incorporated the name of the town into the company name (e.g. Oxford Asymmetry International Plc., Oxford Biomedica Plc. or Oxford Immunotech Ltd.) This is evidence of the reputational value that companies (and their investors) attach to of the University of Oxford connection.

While maintaining their Oxfordshire roots, several spinout companies have also successfully branched out overseas. Analysis of responses to the company survey and information gathered during the desk-based review suggests that around 16% of the jobs supported by University of Oxford spinouts are based overseas and all of the jobs supported in start-up companies are in the UK. A break-down of the jobs supported by region is provided in Figure 5-2.

Figure 5-2 -Direct employment in University of Oxford spinout companies around the world



Source: Isis Innovation



This break-down was used to estimate the impact of spinout and start-up companies in different regions of the world. In this way it was estimated that in 2012/13 spinouts and start-ups from the University of Oxford generated £239.3 million GVA for the UK economy (of which £119.6 million was retained in Oxfordshire), £53.1 million GVA in the USA and £18.6 million GVA in the rest of the world.

It was also estimated that spin-outs and start-up companies supported around 2,960 UK based jobs (of which around 1,450 were estimated to be based in Oxfordshire), approximately 390 jobs in the USA and approximately 120 jobs in the rest of the world. This impact is summarised in Table 5-1.

Table 5-1 – impact of spinout and start-up companies around the world

	Oxfordshire	UK*	Rest of Europe	USA	Rest of World	Total
Spin-outs GVA	£112.8	£230.0	-	£53.1	£18.6	£301.7
Spin-out jobs	1,355	2,821	-	389	119	3,329
Start-up GVA	£6.8	£9.3	-	-	-	£9.3
Start-up jobs	98	135	-	-	-	135
<b>Total GVA (millions)</b>	<b>£119.6</b>	<b>£239.3</b>	<b>-</b>	<b>£53.1</b>	<b>£18.6</b>	<b>£311.0</b>
<b>Total jobs</b>	<b>1,453</b>	<b>2,956</b>	<b>-</b>	<b>389</b>	<b>119</b>	<b>3,464</b>

Source: BiGGAR Economics. \*UK includes Oxfordshire

## 5.7 Future Impact of Spinout Companies

In November 2013 there were 14 spinout opportunities being actively managed by Isis Innovation. These opportunities are at various stages of development and cover a variety of sectors including drug discovery, medical treatments and devices, software and semi-conductors.

All of these companies are in the pre-revenue stage of development and as such their economic impact in 2012/13 was assumed to be negligible. It is however likely that at least some of these companies will go on to become fully-fledged new businesses that will eventually generate wealth and support employment.

## 6 LICENCING ACTIVITY

In 2012/13 Isis Innovation received almost £5.0 million in licence fees for intellectual property. This section assesses the economic impact of this activity.

### 6.1 How Licences Generate Economic Impact

License agreements give companies the legal right to use a particular patented technology or other type of intellectual property right to generate additional sales, reduce costs or otherwise improve their profitability. In return for the right to use intellectual property created at the University of Oxford, companies pay royalties.

The amount received in royalties depends on the details of the agreement reached, which can vary considerably from company to company. In order to agree a licensing deal, negotiators must first form a view of how much the intellectual property is worth to the prospective licensee. There are a wide variety of variables that may inform this judgement including potential risks to the company, the technology's stage of development, any capital investment that might be required and market conditions.

According to a training manual issued by the World Intellectual Property Organisation<sup>2</sup>, a common starting point for many licensing professionals is to start valuation calculations with the "well known and widely quoted" 25% rule. The 25% rule is a general rule of thumb according to which the licensor should receive around one quarter to one third of the profits accruing to the licensee and has been used by IP negotiators for at least 40 years.

The rule is based on an empirical study undertaken in the 1950s, which found that royalty rates were around 25% of the licensee's profits or 5% of sales from products embodying the patented technology. In 2002<sup>3</sup> Goldscheider (et al) undertook further empirical analysis to test the continued validity of the 25% rule. The analysis was based on more than 1,500 licensing agreements from 15 different sectors between the late 1980s and the year 2000.

The study found that although royalty rates ranged between 2.8% in the food sector to 8% in the media and entertainment sector, on the whole they differed very little from those used in the 1950s. This provides support for the continuing use of the 25% rule as a tool for calculating the value of IP. The Goldscheider analysis considered a wide range of sectors, five of which are particularly relevant to Isis Innovation. The royalty rates and number of licences considered for these sectors are summarised in Table 6-1.

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<sup>2</sup> Exchanging Value, Negotiating Technology Licensing Agreements: a training manual, World Intellectual Property Organisation, 2005.

<sup>3</sup> Goldscheider, Use of the 25% rule in valuing IP, les Nouvelles, 2002.

Table 6-1 – Royalty rates by sector

Sector	Number of Licences	Median Royalty Rate
Consumer Goods	90	5.0%
Electronics	132	4.0%
Energy and Environment	86	5.0%
Healthcare Products	280	4.8%
Internet	47	7.5%
Media and Entertainment	19	8.0%
Pharmaceutical and Biotechnology	328	5.1%
Semiconductors	78	3.2%
Software	119	6.8%

Source: Goldscheider et al (2002)

### 6.1.1 Isis Outcomes

As part of its licencing activities, Isis Innovation also provides access to Patient Reported Outcome (PRO) measures developed at the University of Oxford. PROs are specially developed questionnaires that can be used in a clinical setting to gather responses from patients about the outcome of the treatment they have received.

Academics at the University of Oxford have been responsible for developing some of the most respected and widely deployed PROs used by the Pharmaceutical Industry and healthcare providers, including the NHS. Many of these measures have now become standard practice in the assessment of certain types of medical interventions. This means that in order for pharmaceutical or medical device companies to gain acceptance for new products within the medical profession or be approved for use within the NHS, it is expected that relevant PROs will have been used as part of the assessment process.

Access to PROs developed at the University of Oxford is provided under licence to companies engaged in commercial research by Isis Innovation. Isis Outcomes accounted for £0.4 million of the licence fee income generated by Isis Innovation in 2012/13.

## 6.2 Direct Economic Impact of Licencing Activity

The economic impact of licencing activity undertaken by Isis Innovation can be estimated by applying these royalty rates to the total income received in 2012/13.

As stated in above, Isis Innovation received £5.0 million in royalties in 2012/13. Nearly 86% of this income was generated by deals for technology emerging from the Medical Sciences Division and 13% was generated by deals for technology associated with the Mathematical, Physical and Life Sciences Division.

By applying appropriate royalty rates from Table 6-1 to this income it was estimated that these deals enabled licence holders to generate more than £95.7 million in additional turnover in 2012/13. In order to estimate the direct employment supported by this the additional turnover generated was then divided by average turnover/employee in the relevant sector. In this way it was estimated

that licence agreements supported more than 780 jobs around the world in 2012/13.

These additional jobs were then multiplied by GVA/employee in the relevant sectors in order to estimate the direct GVA impact. In this way it was estimated that licence deals secured by Isis directly contributed £50.5 million GVA to the world wide economy in 2012/13.

### 6.3 Indirect Impact of Licencing Activity

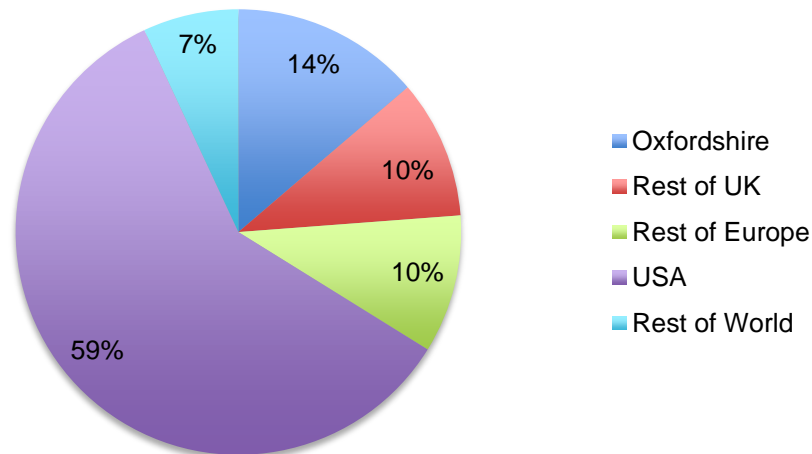
The indirect impacts of licencing activity were estimated by multiplying the direct employment and GVA impacts by GVA and employment multipliers appropriate to the sector in which the impact was generated. In this way it was estimated that licencing activity undertaken by Isis Innovation indirectly generated a further £47.5 million GVA and indirectly supported 710 jobs around the world in 2012/13.

Adding this to the direct impact suggests that Isis Innovation's licencing activity contributed a total of £98.0 million GVA to the global economy in 2012/13 and supported almost 1,500 jobs.

### 6.4 Economic Impact of Licencing Activity Around the World

In order to estimate the economic impact of licencing activity around the world it was first necessary to consider where this income came from. A break-down showing the source of the licence income received in 2012/13 is provided in Figure 6-1. This shows that by far the largest market for licencing technologies from the University of Oxford is the USA, which accounts for 59% of licence income received in 2012/13.

Figure 6-1 - Royalties income received in 2013 by source



Source: Isis Innovation

This break-down was used to estimate the impact of licencing activity in different regions of the world. In this way it was estimated that in 2012/13 licencing activity generated £24.7 million GVA for the UK economy (of which £9.8 million was retained in Oxfordshire), £9.9 million GVA in the rest of Europe, £56.4 million GVA in the USA and £7.1 million GVA in the rest of the world.

It was also estimated that licencing activity supported 410 UK based jobs (of which around 180 were estimated to be based in Oxfordshire), 150 jobs in the rest of Europe, 814 jobs in the USA and 117 jobs in the rest of the world. This impact is summarised in Table 6-2.

Table 6-2 – impact of licencing activity around the world

	Oxfordshire	UK*	Rest of Europe	USA	Rest of World	Total
Total GVA (millions)	£9.8	£24.7	£9.9	£56.4	£7.1	£98.0
Total jobs	180	410	150	814	117	1,492

Source: BiGGAR Economics. \*UK includes Oxfordshire.

## 6.5 Wider Impact of Isis Licencing Activity

The impact presented above quantifies only the private returns to licencing activity but this activity also often generates wider benefits to society that are much more difficult to quantify. For example, the quantifiable impact of Isis Outcomes includes only the additional economic activity generated within the pharmaceutical and medical device sectors but it does not include the benefits to the wider economy of having a healthier population.

These benefits arise when interventions that have been developed using Isis Outcomes result in a reduction in the number of working days lost to ill health across the UK. This includes both working days lost by patients themselves and working days lost by their carers and friends and family who come to visit them.

It is not possible to estimate the number of working days that might have been saved in this way but given the wide use of Isis Outcomes across the UK and further afield it is likely that the effect is significant. It is also important to note that this effect is not restricted to interventions developed by commercial companies but also to those developed by public research organisations, even though the latter are not required to pay a licence fee in order to make use of Isis Outcomes.

## 7 SUMMARY

Taken together it is estimated that the various types of activity considered in this report contributed more than £0.4 billion GVA to the global economy in 2012/13 and supported almost 5,000 jobs. This included:

- £264.0 million GVA and almost 3,400 jobs in the UK (of which £129.3 million GVA and around 1,630 jobs were estimated to be in Oxfordshire);
- £9.9 million GVA and 150 jobs elsewhere in Europe;
- £109.5 million GVA and around 1,200 jobs in the USA; and
- £25.7 million GVA and almost 240 jobs in the rest of the world.

A break-down of this is provided in Table 7-1 Table 7-2.

Table 7-1 – Economic impact of Isis Innovation around the world - GVA

	Oxfordshire	UK*	Rest of Europe	USA	Rest of World	Total
Spinouts & start-ups	£119.6	£239.3	-	£53.1	£18.6	£311.0
Licencing	£9.8	£24.7	£9.9	£56.4	£7.1	£98.0
<b>Total GVA (millions)</b>	<b>£129.3</b>	<b>£264.0</b>	<b>£9.9</b>	<b>£109.5</b>	<b>£25.7</b>	<b>£409.0</b>

Source: BiGGAR Economics. \*UK includes Oxfordshire.

Table 7-2 – Economic impact of Isis Innovation around the world - jobs

	Oxfordshire	UK*	Rest of Europe	USA	Rest of World	Total
Spinouts	1,453	2,956	-	389	119	3,464
Licencing	180	410	150	814	117	1,492
<b>Total jobs</b>	<b>1,633</b>	<b>3,366</b>	<b>150</b>	<b>1,203</b>	<b>236</b>	<b>4,956</b>

Source: BiGGAR Economics. \*UK includes Oxfordshire.