BiGGAR Economics

Economic Impact of the University of Southampton

A report to the

University of Southampton

Final

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1 EXECUTIVE SUMMARY

The University's vision as stated in its Strategic Plan (Vision 2020) is to:

'be a distinctive, global leader in education, research and enterprise.'[1]

In terms of world rankings the University of Southampton is a highly ranked UK university and one of the world's leading universities. It is ranked:

- in the top 1% of universities worldwide by the QS World University Rankings 2014-15;
- 94th in the world (of 800) and 17th in the UK by the QS World University Rankings 2014-15; and
- in the top 20 universities in the UK according to the *Complete University Guide 2015* (16th out of 123), *Guardian University Guide 2015* (19th out of 116) and *The Times/Sunday Times Good University Guide 2015* (18th of 2013).

The impact study aims to demonstrate how the activities of the University of Southampton create benefits and impacts for the economy. Part of this process is to quantify impacts where possible. This quantification is expressed in terms of:

- Gross Value Added (GVA), which measures the monetary contribution of the organisation or individual to the economy; and
- employment, which is measured in full-time equivalent (fte) jobs supported.

1.1 Key Findings

In 2012/13 it was estimated that the University of Southampton supported economic activity in:

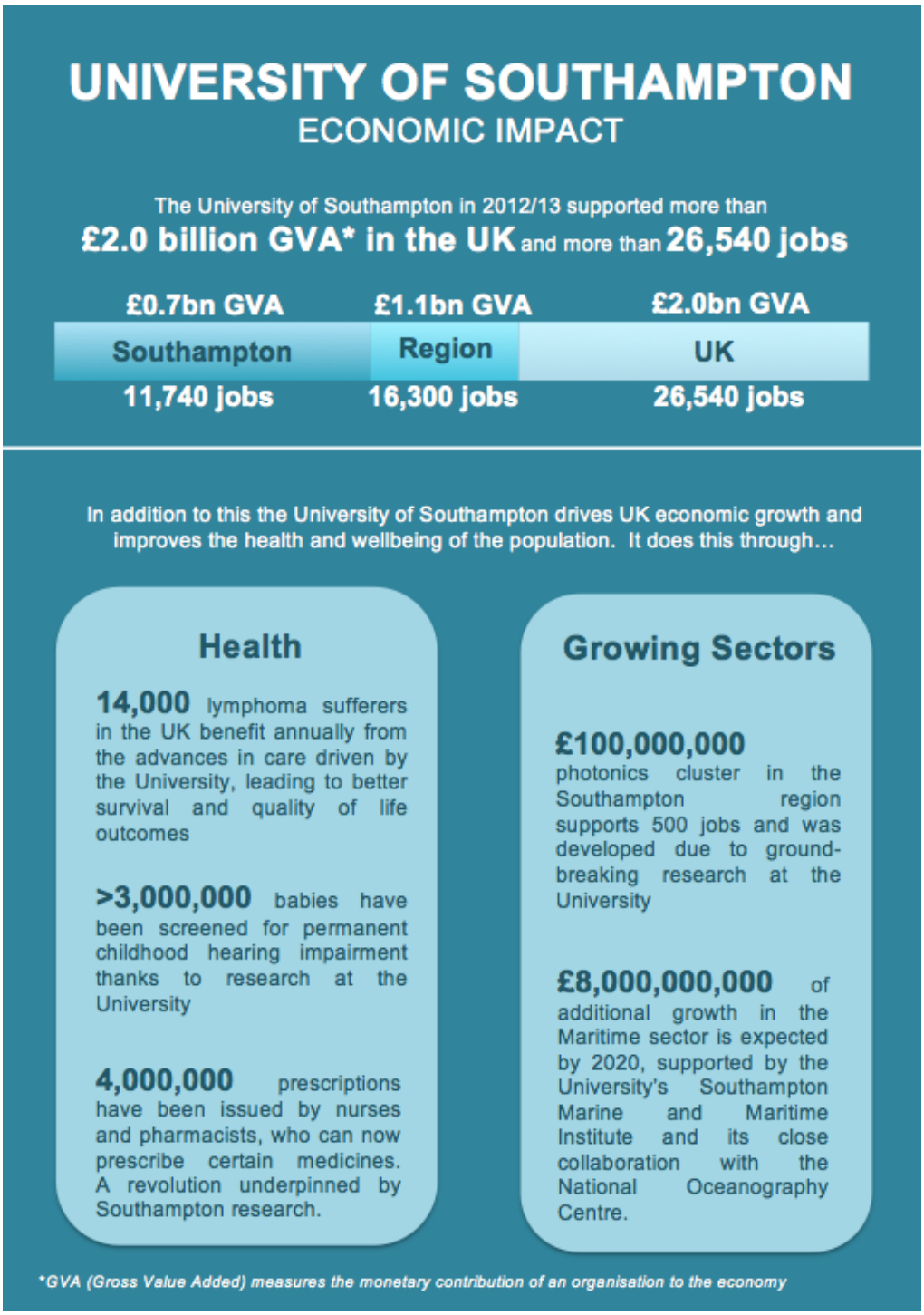
- Southampton of *more than* £729 million GVA and 11,700 jobs;
- the regional area of *more than* £1.0 billion GVA and over 16,300 jobs;
- the UK of *more than* £2.0 billion GVA and over 26,500 jobs.

The impact of the University of Southampton is *more than* the quantitative impact because the excellence of its research has informed policy and strategy and had significant impact on society. This includes:

- supporting sectors key to the competitiveness of the local, regional and UK economy;
- contributing to Southampton's regeneration; and
- helping millions of people through its health research.

A selection of these impacts and the quantitative impacts can be shown in the following figure.

[1] University of Southampton, *A Connected University: Vision 2020 http://www.southampton.ac.uk/strategy/our_vision.html*



1.2 Summary of Findings

More details of the GVA and job impacts are provided in Table 1.1. This shows that students (through their spending, part-time work and volunteering) supported economic activity in 2012/13 with an estimated value of £137 million GVA in Southampton, almost £161 million GVA in the Regional Area and £228.0 million GVA in the UK.

Table 1.1 – The University of Southampton GVA Impact 2012/13 (£m)

	Southampton	Regional Area	UK
Core Impact	452.0	515.9	654.7
Student Impact	137.0	161.6	228.0
Business Engagement Impact	62.1	200.7	449.4
Tourism Impact	4.0	4.6	6.8
Wider Impacts	0.2	2.6	130.4
Graduate Productivity	74.1	178.6	496.1
GVA (£m)	**729.4**	**1,063.4**	**1,953.8**

Note: Totals may not sum due to rounding.

Table 1.2 – The University of Southampton Employment Impact 2012/2013

	Southampton	Regional Area	UK
Core Impact	6,115	7,655	11,448
Student Impact	4,043	4,679	6,400
Business Engagement	1,465	3,839	8,540
Tourism Impact	120	128	159
TOTAL EMPLOYMENT	**11,743**	**16,301**	**26,547**

Note: Totals may not sum due to rounding.

The value of exports associated with the University of Southampton in 2012/13 was estimated at £136.8 million.

The University of Southampton received £97.7 million of its income as higher education funding body grants and generated a total GVA impact of £2.0 billion, £20.13 for each £1 received from higher education funding bodies. The University generated this impact based on income from funding bodies and income leveraged from a range of other public and private sources, a total income of £447.2 million in 2012/13. So, the University of Southampton generated an economic impact of £4.39 GVA for each £1 in income. This represents a good return on investment for the UK economy.

The University of Southampton has a far greater impact than can be reflected in its quantitative impacts above – such as through the excellence of its research, which has informed policy and strategy and had significant impact on society. The following table outlines some of the significant impacts that the University of Southampton supports that are not captured by a quantitative figure.

Table 1.3 – The University of Southampton GVA Wider Impacts To Date Summary examples:

Beneficiaries	Benefit	Role of The University of Southampton
Health and Wellbeing Impacts		
14,000 UK lymphoma sufferers annually.	Improvements in survival and quality of life for lymphoma suffers	The University is a driver of major advances in lymphoma care, leading to the development and standardisation of effective new antibody treatments and optimal drug regimens.
Potential osteoporosis sufferers.	Contribution to £1 billion in annual savings to the NHS in its healthcare provision for osteoporotic fractures in older adults through a change in NICE guidelines regarding vitamin D supplementation and osteoporosis treatment.	University research has shown that universal vitamin D supplementation in the elderly had no discernible effect on fracture incidence. However researchers have found that maternal vitamin D supplementation leads to increased bone mineral accrual in offspring thereby reducing the risk of osteoporosis later in life. This has shaped national and international policy designed to reduce the burden of osteoporosis and is contributing to an estimated 20% decrease in fracture incidence.
Contribution to Clusters		
Southampton's Photonics Cluster	£100 million and 500 jobs	The University provides the ground breaking research that is fundamental to the development and sustained success of companies in the sector.
Maritime Sector	Supports the current maritime sector, which contributes a turnover of £17 billion to the economy Supports the sector to grow by £8 billion, to achieve £25 billion in turnover by 2020.	The Southampton Marine and Maritime Institute based at the University's redeveloped Boldrewood Campus has over 1,000 academic staff and researchers. It is a catalyst for bringing together academia, society, industry and government partners for practical innovation that is vital to the competitiveness and growth of the UK maritime industry. The National Oceanography Centre is co-located and headquartered on the Waterfront Campus, where 400 scientists, engineers, and technical support (with £40 million turnover) are the focus of global UK marine science, and is the logistics hub for UK's two open-ocean research vessels. NOC has a strong engineering and innovation agenda with international leadership in marine sensing and marine autonomy, including the newly created Marine Autonomy and Robotic Systems Innovation Centre created to enhance SME innovation in the Solent region.
Social and Economic Impact of Cultural Impacts		

Promotion of the arts agenda Attractiveness of city as a cultural destination	Contributing to make Southampton a leading cultural destination and a great place to live, work and visit.	The activities of the University through its three cultural venues individually and together creates cultural, social and economic impact. The activities of the University through teaching and research contribute to the cultural sector and strengthen cultural organisations. The University also has a key role in developing the Arts Complex Scheme in the city centre, part of the Cultural Quarter project.

2 INTRODUCTION

This report presents the findings of an economic impact study of the University of Southampton undertaken by BiGGAR Economics in summer 2014.

2.1 Impact Approach

2.1.1 Metrics for Quantitative Impact

The approach in this study aims to demonstrate how the activities of the University of Southampton create benefits and impacts for the economy. Part of this process is to quantify impacts where possible. This quantification is expressed in terms of:

- Gross Value Added (GVA), which measures the monetary contribution of the organisation or individual to the economy; and
- employment, which is measured in full time equivalent (fte) jobs supported.

It takes account of impacts through the economy (multiplier impact) and impact that occurs outside the study area (leakage).

2.1.2 Sources of Quantitative Impacts

Our approach to quantitative impact will cover the impact from the following sources:

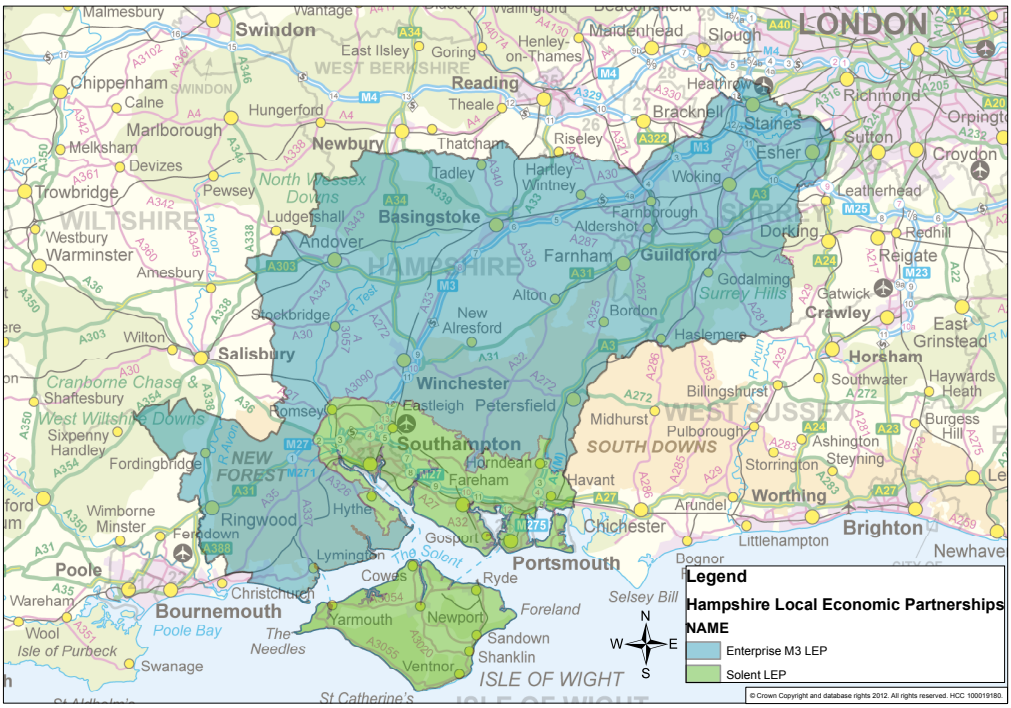
- core operations from employment of staff to expenditure on capital supplies;
- students from student expenditure to student part-time employment and graduate productivity;
- business-university engagement covering a wide range of activities from contract research to consultancy; and
- tourism impacts from friends and family visiting students and staff to open days and events.

2.1.3 Study Areas

The study areas considered are:

- local area – Southampton City Council area;
- regional area – the area covered by M3 Enterprise and Solent Local Enterprise Partnerships (Figure 2.1); and
- national area – the UK as a whole.

Figure 2.1 – Regional Area



2.2 Value to Economy and Society.

Monetary figures highlight only part of the value of an impact. This report recognises that it is not possible to quantify all of the impacts of a higher education institution because:

- the data for monetisation of many of the benefits is at an early stage of research;
- not all economic value can be converted into monetary value;
- monetary value does not capture aspects such as quality and equality; and
- monetary value is static and does not capture the dynamic activities that drive economic and social impact.

2.3 Types of Economic Impact

Some of the activity undertaken by the University of Southampton generates activity elsewhere in the economy immediately. For example, purchases made by the University generate economic impact among the University's suppliers almost straight away.

Much of the activity undertaken by the University of Southampton however does not generate immediate economic impacts. For example, the additional earnings that graduates from the University will earn as a result of the enhanced skills they gain while studying will be generated over their entire working lives – not just in the year after graduation. The impact generated in 2012/13 will therefore be the cumulative impact of activity undertaken over several previous years.

Limitations in data availability mean that it is generally not possible to estimate the actual impact of all historic activity that is realised in any particular year. To overcome this it is assumed that activity undertaken in 2012/13 generates impact

in 2012/13. Although the impact of some activity that occurs in 2012/13 will not occur until a later date, some of the impact realised in 2012/13 will have been generated by historic activity. As no attempt is made to quantify the impact of historic activity this approach provides a reasonable proxy measure of the current impact of historic activity. The impacts considered in this report that have been estimated using this approach include:

- the impacts of support services provided to businesses described in chapter 6;
- the impact of continued professional development (CPD) activity described in chapter 6;
- the graduate impacts described in chapter 8; and
- the impact of social returns to medical research described in chapter 10.

All of the other impacts considered in this report are annual impacts.

2.4 Report Structure

The remainder of this report is structured as follows:

- chapter 3 provides background to the University of Southampton;
- chapter 4 discusses how the University's core activities of turnover, direct employment, purchase of supplies, staff spending their wages and spending on capital projects supports economic impact;
- chapter 5 illustrates how the University's students create impact through their spending, part-time work and volunteering;
- chapter 6 describes how the University drives economic impact through its partnerships with businesses and the public sector;
- chapter 7 shows how the University attracts additional visitors to the economy and how this creates economic impact;
- chapter 8 discusses how the University's teaching activities support greater productivity in the economy through skilled graduates;
- chapter 9 discusses how the monetisation of impact understates the University's impact;
- chapter 10 describes the health impacts created by the University of Southampton;
- chapter 11 shows how the University creates sectors;
- chapter 12 discusses how the University creates cultural impact and how this impact has a social and economic dimension;
- chapter 13 discusses how the University's activities create impact internationally by describing the export earnings of the University; and
- chapter 14 summarises the impacts for which it is possible to obtain a monetary value and draws together the findings of the report; and

- the technical appendix describes in further detail how the economic impact is estimated.

3 THE UNIVERSITY OF SOUTHAMPTON

This section provides background information about the University of Southampton.

3.1 Background

The University of Southampton dates back to 1862 when the Hartley Institution was established in the centre of Southampton. It received its Royal Charter to award degrees in 1952 and became the University of Southampton. The University is situated across seven campuses, five of which are in Southampton, one of which is in Winchester (Winchester School of Art) and one that is in Malaysia.

The University's vision as stated in its Strategic Plan (Vision 2020) is to: *'be a distinctive, global leader in education, research and enterprise.'*[2]

In terms of world rankings the University of Southampton is a highly ranked UK university and one of the world's leading universities. It is ranked:

- one of the top 20 universities in the UK according to the Complete University Guide 2015 (16th); Guardian University Guide 2015 (19th); and The Times/Sunday Times Good University Guide 2015 (18th);
- in top 1% of universities worldwide (QS world university rankings 2014-15); and
- 94th in the world (of 800) and 17th in the UK (QS world university rankings 2014-15).

3.2 Research Quality

The University of Southampton reaffirmed its position as one of the leading research universities, in the latest national assessment of research – the Research Excellence Framework (REF), 18 December 2014.

Southampton is ranked 11th in the UK based on the volume and quality of its research in the 2014 REF. Over 97 per cent of the University's research environment has been assessed as world-leading and internationally excellent. Nearly 90 per cent of its research has been assessed as having world-leading and internationally excellent impact and Southampton remains one of the leading universities across a wide range of subjects:

The University is ranked first on the basis of the volume and quality of its research in:

- Music;
- Electronic & Electrical Engineering; and
- General Engineering.

The University is also ranked in the top five nationally in:

[2] University of Southampton, *A Connected University: Vision 2020*

- Ocean and Earth Science;
- Nursing and Allied Health Professions;
- History;
- Modern Languages; and
- Social Policy (including criminology, demography, gerontology, and sociology).

These results provide an endorsement of the extremely high quality of research produced by the University of Southampton and confirm its reputation as one of the most respected universities in the UK and globally.

4 CORE UNIVERSITY IMPACTS

This section describes the core operational impacts of the University of Southampton.

4.1 Core Activities

The core economic impacts associated with the University of Southampton are those that occur through the day-to-day operations of the University. The core economic impacts that are covered in this chapter include:

- direct impacts – these are the impacts resulting from the University's income and employment;
- supplier impact – the impact of the University's purchasing of goods and services, which increases the turnover of businesses and supports jobs in its supply chain;
- staff spending impact – staff spending their wages increases the turnover of businesses in the economy, which generates wealth and supports employment; and
- impact of capital spending – expenditure on capital projects supports additional economic activity in businesses in the wider economy, particularly in the construction and IT sector.

The key assumptions required to estimate the impact of this activity are given in Table 4.1.

Table 4.1 - Key Assumptions for the Core Impact 2012/13

	Value	Source
Income	£447.2m	Financial Statement 2012/2013
Staff – Headcount	6,136	University of Southampton HR
Staff – Full time equivalents (ftes)	5,470	University of Southampton HR
% living in Southampton (2,568 ftes)	47%	University of Southampton HR
% living elsewhere in Regional Area (1,986 ftes)	36%	
% living elsewhere in UK (916 ftes)	17%	
Expenditure on wages	£203.5m	Financial Statement 2012/2013
Expenditure on goods and services	£135.2m	Financial Statement 2012/2013
% purchased from Southampton	8%	BiGGAR Economics Assumption
% purchased from Regional Area	25%	
% purchased from UK	74%	
Annual capital spending (av. 2008-2017)	£54m	University of Southampton
% capital suppliers from Southampton	25%	University of Southampton
% capital suppliers from Regional Area	80%	
% capital suppliers from UK	100%	

4.2 Economic Impact

The method for deriving estimates for the economic impact of the University of Southampton's core activities discussed above is described in the Technical Appendix. This uses the key assumptions in Table 4.1 to estimate the values in Table 4.2.

Table 4.2 – Core Economic Impact 2012 /2013

	Southampton	Regional Area	UK
GVA (£m)			
Direct	425.1	425.1	425.1
Supplier Spending	5.3	19.2	73.0
Staff Spending	14.6	44.3	108.8
Construction Spending	7.0	27.3	47.8
Total GVA	**452.0**	**515.9**	**654.7**
Employment (FTEs)			
Direct	5,470	5,470	5,470
Supplier Spending	174	630	2,428
Staff Spending	347	1,074	2,711
Construction Spending	124	481	839
Total Employment	**6,115**	**7,655**	**11,448**

The University's core activities in 2012/13 supported economic activity that had a monetary value estimated at £452.0 million GVA and 6,115 jobs in Southampton, £515.9 million GVA and 7,655 jobs in the Regional Area and almost £654.7 million GVA and 11,448 jobs in the UK.

5 STUDENT IMPACTS

In 2012/13, there were over 24,500 students studying in Southampton at the University. Approximately 20% of these students are international students. In addition, there were around 120 distance learners, approximately 600 students on programmes that are co-delivered by the University and 20 students who were the first intake into the University's overseas campus in Malaysia. These students support economic and social impact through their spending, part-time work and volunteering.

5.1 Impacts from Students

The impacts associated with the University of Southampton's students include:

- student spending impacts – students have an impact on the economy through their spending in the same way that staff have an impact by spending their wages;
- students' part-time work – without students some businesses would not have the additional labour they require to increase their economic impact; and
- student volunteering – the University of Southampton estimates that 2,200 students volunteer. The National Union of Students (NUS) estimates that students volunteer 44 hours annually. The value of this is estimated using an approach suggested by Volunteering England.[3]

A key impact of students is their increased productivity from obtaining an undergraduate or postgraduate degree. This is considered in Chapter 8.

The key assumptions required to estimate the impact of the University of Southampton's students are given in Table 5.1.

[3] http://www.volunteering.org.uk/component/gpb/is-there-any-way-of-measuring-the-economic-value-of-the-work-our-volunteers-are-doing (Accessed 1st June 2014)

Table 5.1 – Key Assumptions for Student Impact 2012/13

		Value	Source
Full-time students studying at the University of Southampton's UK campus		24,577	University of Southampton
	Undergraduate	16,490	University of Southampton
	Taught Postgraduate	5,051	
	Research Postgraduate	3,036	
	% living in Southampton	84%	University of Southampton
	% living in Regional Area	88%	
	% living in UK	100%	
Annual spend by English students outside London – adjusted for inflation		£11,723	Department for Business Innovation and Skills - Student Income and Expenditure Survey 2011/12
Proportion of full-time students who work		57%	Endsleigh Insurance and National Union of Students Survey 2013
Proportion of student part-time workers that are additional to the labour force		50%	BiGGAR Economics Assumption
Proportion of employed students who work for the University of Southampton		5%	BiGGAR Economics Assumption
Average number of hours worked per year		44 hours	National Union of Students 'The Student Volunteering Landscape'
Number of students who volunteer		2,207	University of Southampton

The method for deriving estimates for the economic impacts of the University of Southampton's students discussed in this chapter is described in the Technical Appendix. This used the key assumptions in Table 5.1 to estimate the values in Table 5.2.

Students through their spending, part-time work and volunteering supported economic activity in 2012/13 with an estimated value of £137.0 million GVA in Southampton, £161.6 million GVA in the Regional Area as a whole and £228.0 million GVA in the UK as a whole. Students also supported an estimated 4,043 jobs in Southampton, 4,678 jobs in the Regional Area as a whole and 6,400 jobs in the UK as a whole.

Table 5.2 – Impact Supported by Students 2012/13

	Southampton	Regional Area	UK
GVA (£m)			
Student Spending	96.0	116.1	170.4
Student Part-time Work	40.6	45.0	57.1
Student Volunteering	0.4	0.5	0.5
Total GVA	**137.0**	**161.6**	**228.0**
Employment (FTEs)			
Student Spending	2,136	2,591	3,816
Student Part-time Work	1,907	2,088	2,584
Student Volunteering	-	-	-
Total Employment	**4,043**	**4,678**	**6,400**

6 BUSINESS UNIVERSITY PARTNERSHIPS

The University of Southampton drives economic impact through its partnership with businesses and the public sector, leading to invention and innovation in products, services, policy, strategy and healthcare delivery and also the creation and growth of businesses.

Some of this impact can be estimated quantitatively. This chapter will describe the impacts that can be estimated and the activity that supports the impact.

6.1 Partnership activities

The depth of the University's engagement is shown by the fact that:

- at any one time the University is working with over 1,000 external organisations;
- over 40% of research projects involve one or more commercial partners;
- over 150 international businesses have chosen the University as a key partner for their research and development;
- 50% of academic staff have directly provided services to public sector partners/clients, 44% to social, community and cultural partners and 42% to commercial partners/clients;
- four University spin-out companies have floated on London's Alternative Investment Market (AIM) with a combined market value of £180 million;
- the University has contributed to more than 50 Technology Strategy Board (now known as Innovate UK) projects in the last five years; and
- the University has a rolling patent portfolio of more than 300 active patent families.

The breadth and depth of the University's strength in this area is also shown by the Higher Education Business and Community Interaction Survey (HEBCI), the latest of which was carried out in 2012/13. The University of Southampton ranks amongst the top universities in the UK for a wide variety of measures as shown in Table 6.1.

In particular this shows the strength of the University of Southampton's activities with SMEs.

The rest of this chapter will estimate the impact of some of these activities.

Table 6.1 – University of Southampton's rankings in HEBCI 2012/13

Top	In the Top 5	In the Top 10
Total income from consultancy contracts	Number of non-software licences with SMEs granted	Income from consultancy contracts with SMEs
Value of facilities and equipment services with SMEs	Number of non-software licences granted with non-SME commercial businesses	Income from consultancy contracts with non SME commercial businesses
Turnover from staff start-ups	Number of overseas licences	Value of research contracts with SMEs
	Turnover from formal spin-offs	Turnover from graduate start-ups
	Number of research contracts in the current year	Number of overseas patents granted in the current year
	Income from non-software licences with SMEs	Number of new patent applications filed and granted in the current year
		Number of engagements with non-SME commercial businesses for contract research

Source: HEBCI 2012/13

6.2 Projects with Businesses and Organisations

There are three main ways in which businesses and organisations can use the expert knowledge of the University of Southampton for projects:

- collaborative and contract research – businesses and organisations can enter into direct research contracts with the University;
- consultancy – businesses and organisations can access consultancy services across all disciplines at the University and thereby use the expert knowledge of the University of Southampton for projects; and
- facilities services – allowing businesses and organisations to access University facilities and equipment.

Examples of the University of Southampton's collaborative activities include the University hosting two Rolls-Royce University Technology Centres and an Airbus Technology Centre. In addition, the University undertakes a number of contract research projects in infrastructure with companies such as Network Rail and National Grid.

The University of Southampton is also part of the EpiGen Consortium, an international alliance of the world's leading epigenetics researchers, which has a research collaboration with Nestlé. The aim of the research programme is to understand and substantiate optimal nutrition for mothers during pregnancy and for infants in order to promote metabolic health throughout life.

In terms of consultancy, University of Southampton academic staff conduct individual consultancy and the University also has a number of enterprise units. These have professional teams dedicated to working on projects with external

organisations. The enterprise units are wide ranging, offering expertise in electronics and computer science, environmental data management, sound and vibration, information technology, marine technology and industrial aerodynamics and a number of engineering disciplines.

New enterprise units or consultancy initiatives in 2014 include the Orthopaedic Implant Diagnostic service in the Faculty of Engineering and the Environment and the Wessex Institute in the Faculty of Medicine, providing scientific expertise in health research and research management to support decision makers in healthcare.

The University of Southampton possesses world-leading research facilities such as the Mountbatten Clean Rooms, a suite of wind tunnels and the Biomedical Research Unit. These facilities are available for commercial organisations and SMEs to use as well as the public sector.

By helping businesses and organisations innovate and be competitive through contract research, consultancy and facilities hire, the University of Southampton supports economic activity. This is discussed further in the Technical Appendix. The monetary value of this in 2012/13 was an estimated £28.5 million GVA and 449 jobs in Southampton, £150.9 million GVA and 2,441 jobs in the Regional Area and £356.4 million GVA and 5,965 jobs in the UK.

Table 6.2 – Impact supported by Projects with Businesses and Organisations 2012/13

	Southampton	Regional Area	UK
Income from Research with Businesses and Organisations = £23.5 million			
Income from Consultancy with Businesses and Organisations = £23.1 million			
Income from Facility Hire = £6.1 million			
Total Income for Projects with Businesses and Organisations = £52.7 million			
GVA (£m)	28.5	150.9	356.4
Employment	449	2,441	5,965

6.3 Skills for Businesses and Organisations

The University of Southampton offers continuing professional development courses across all eight faculties covering a diverse range of subjects.

In particular, the Statistical Sciences Research Institute of the University offers training for professionals and researchers, including courses tailored to the specific needs of government agencies and companies. Short courses in applied social surveys are also offered to enable social scientists and applied researchers in government, market research and the voluntary sectors to develop skills in survey design, implementation and analysis.

The University of Southampton also offers a range of continuing professional development (CPD) courses within health and social care including courses in cognitive behavioural therapy and courses within the allied health professions, nursing and midwifery and social work.

The Southampton Education School works in partnership with industry and government agencies to fulfil staff training needs. Partners include the Army, local schools and local education authorities as well as overseas partnerships with

Chinese institutions. CPD courses in modern foreign languages are provided by the Centre for Languages, Linguistics and Area Studies who hold an extensive programme of workshops, seminars and conferences. They also offer online resources for teachers to support learning and provide research and information on pedagogical approaches and language education policies.

The University of Southampton's CPD clients include Barclaycard, British Airways, Ford, HMRC, Home Office, Met Office, NATS (air navigation service provider), the NHS and the World Health Organization.

In supporting businesses and organisations to become more productive by increasing the skills of their staff through CPD, the University of Southampton supports economic activity. This is discussed further in the Technical Appendix. The monetary value of this in 2012/13 was an estimated £5.0 million GVA and 114 jobs in Southampton, £10.5 million GVA and 243 jobs in the Regional Area and £15.7 million GVA and 362 jobs in the UK.

Table 6.3 – Impact supported by CPD 2012/13

	Southampton	Regional Area	UK
Income from supporting organisations' CPD needs = £2.1 million			
GVA (£m)	5.0	10.5	15.7
Employment	114	243	362

6.4 Licensing

One of the ways research activity is translated into economic activity is through licensing agreements with industry. 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 pay royalties to the University.

In 2012/13 the University of Southampton received £0.6 million in licensing royalties. The licence holders are mostly located outside Southampton and the regional area and are located elsewhere in the rest of the UK. The Technical Appendix describes the approach to estimating the increased sales, reduction in costs or improvement in profitability of businesses due to the licence. It also describes how the economic activity of these increased sales is estimated.

By licensing its IP the University of Southampton supports an economic impact. In 2012/13 the monetary value of this was estimated at £0.7 million GVA and 11 jobs in Southampton, £1.6 million GVA and 30 jobs in the Regional Area and £6.3 million GVA and 103 jobs in the UK.

Table 6.4 – Impact supported by Licensing 2012/13

	Southampton	Regional Area	UK
Income from Licensing = £0.6 million			
GVA (£m)	0.7	1.6	6.3
Employment	11	27	103

6.5 Knowledge Transfer Partnerships

The University of Southampton participates in the knowledge transfer partnership (KTP) programme, which exists to facilitate knowledge exchange between academia and industry across the UK. The findings of a strategic review of the KTP programme undertaken in 2010[4] have been applied to the 22 KTPs the University of Southampton has been involved in the last six years, seven of which are in the Regional Area.

The value of the economic impact supported by KTPs in 2012/13 was an estimated £0.6 million and 15 jobs in Southampton, £0.9 million GVA and 21 jobs in the Regional Area and £2.7 million GVA and 66 jobs in the UK.

Table 6.5 – Impact Supported by KTPs 2012 – 13

	Southampton	Regional Area	UK
Number of KTPs = 22			
GVA (£m)	0.6	0.9	2.7
Employment	15	21	66

6.6 Spin-Outs and Start-Ups

The research activity of the University also generates economic activity through new spin-out or start-up businesses. By 2012/13 the University was responsible for the creation of 56 new companies of which 15 were graduate start-ups, 25 were staff start-ups and 16 were spin-outs. All of the spin-outs and all but one of the staff start-ups have survived longer than three years. Twelve graduate start-ups have survived at least three years.

Together these companies supported 892 employees and an estimated turnover of £85.4 million in 2012/13. Information from the University of Southampton suggests that most of these companies are based in Southampton or elsewhere in the Regional Area. The economic impact created by this activity is estimated by applying a turnover to GVA ratio and multipliers appropriate to the study areas.

By creating new businesses the University supports economic activity. The monetary value of this in 2012/13 was an estimated £17.5 million GVA and 454 jobs in Southampton, £29.8 million GVA and 801 jobs in the Regional Area and £62.7 million GVA and 1,777 jobs in the UK.

Table 6.6 – Impact Supported by Business Creation 2012/13

	Southampton	Regional Area	UK
Number of Spin-outs and Start-ups = 56			
Turnover of Spin-outs and Start-ups = £85.4 million			
Employment in Spin-outs and Start-ups = 892			
GVA (£m)	17.5	29.8	62.7
Employment	454	801	1,777

[4] Regeneris Consulting (February 2010), Knowledge Transfer Partnerships Strategic Review

6.7 University of Southampton Science Park

The University of Southampton Science Park at Chilworth was established by the University in the early 1980s.

The Park aims to be one of the top university-linked science and innovation campuses in the UK. Its focus is therefore in developing its scientific ethos and facilitating the growth of high quality technology businesses from formation to maturity. The Park is home to a catalyst programme that aims to attract embryonic companies to the Science Park.

The Park provides:

- accommodation – high-quality accommodation with flexible terms, allowing companies to access appropriate facilities as they expand;
- business support – a business support environment providing access to the services required by small businesses (e.g. finance, marketing, HR, business mentoring); and
- community – an entrepreneurial community, enabling individuals to develop their skills, learn from one another and contribute to exchange of business ideas.

6.7.1 SETSquared

SETsquared is a collaboration between the universities of Bath, Bristol, Exeter, Southampton and Surrey and has been named the top university business incubator in Europe and the second best in the world by the University Business Incubator (UBI) Index. It has raised over £1 billion in investments for its 1,000 partner companies and focuses on supporting technology companies.

The SETsquared centre in Southampton moved to its present location at the University's Science Park two years ago. Currently more than 20 SETSquared companies are based on the Science Park, ranging from early start-up companies to globally leading businesses. These businesses have benefited from being on the Science Park because it has provided them with physical accommodation and high-quality amenities.

6.7.2 Science Park Economic Impact

A total of 86 companies are located at the Science Park, of which 29 are start-ups or spin-outs from the University of Southampton. Jobs in the start-up and spin-out companies were excluded before estimating the impact of the Science Park because the impact of spin-outs and start-ups has already been estimated in Section 6.6.

Being located close to the University of Southampton means that the companies based on the Science Park have easy access to the University's research base, facilities, business support services and business networking opportunities. These opportunities all help to support the growth of tenant companies. By providing suitable facilities with flexible leasing arrangements, the University of Southampton also helps to retain these companies in Southampton and the Regional Area.

In order to estimate this impact it was first necessary to make assumptions about the extent to which the activity supported by these companies could be attributed to the University. This is based on previous experience and a survey of the

tenants at the University of Southampton Science Park. This is explained further in the Technical Appendix.

In providing space for businesses to locate in its Science Park, the University of Southampton generates economic impact. The monetary value of this in 2012/13 was an estimated £9.9 million GVA and 422 jobs in Southampton, £6.9 million GVA and 307 jobs in the Regional Area and £5.6 million GVA and 268 jobs in the UK.

Table 6.7 – University of Southampton Science Park Impact 2012/13 (exc. spin-outs and start-ups)

	Southampton	Regional Area	UK
Number of non spin-out and start-up companies at the Science Park = 57			
GVA (£m)	9.9	6.9	5.6
Employment	422	307	268

6.8 Summary Business University Engagement Impacts

The University of Southampton supports economic activity through its engagement with businesses. This chapter has demonstrated the range and scale of these activities. The total monetary value of this activity in 2012/13 was an estimated £62.1 million GVA and 1,465 jobs in Southampton, approximately £200.7 million GVA and 3,839 jobs in the Regional Area and almost £449.4 million GVA and 8,540 jobs in the UK.

Table 6.8 – Total Business University Engagement Impact 2012/13

	Southampton	Regional Area	UK
GVA (£m)			
Projects with Businesses	28.5	150.9	356.4
Skills for Businesses (CPD)	5.0	10.5	15.7
Licensing	0.7	1.6	6.3
Knowledge Transfer Partnerships	0.6	0.9	2.7
Spin-outs and Start-ups	17.5	29.8	62.7
Science Park	9.9	6.9	5.6
Total GVA	**62.1**	**200.7**	**449.4**
Employment (FTEs)			
Projects with Businesses	449	2,441	5,965
Skills for Businesses (CPD)	114	243	362
Licensing	11	27	103
Knowledge Transfer Partnerships	15	21	66
Spin-outs and Start-ups	454	801	1,777
Science Park	422	307	268
Total Employment	**1,465**	**3,839**	**8,540**

7 TOURISM IMPACTS

The University of Southampton supports economic activity by attracting visitors and visitor expenditure to the study areas. Tourism impacts are generated by:

- friends and family visiting students and staff;
- open day visits from applicants, conferences and other events held at the University – the University attracts a large number of additional visitors to Southampton through hosting over 700 events annually and attracts approximately 40,000 people to its open days (including the National Oceanography Centre hosted biennial Ocean Business trade show event that attracts over 80 international companies and 7,000 visitors to Southampton; and
- people attending events at the University of Southampton's three arts venues and the impact of Nuffield theatre's operations. The three arts venues attracted a ticketed audience in Southampton of almost 90,000 in 2012/13.

The University of Southampton's three arts venues are: John Hansard, a contemporary art gallery; Turner Sims, a music venue attracting internationally renowned performers from across the world; and Nuffield theatre, where Southampton's only producing theatre company is based. The impact of Nuffield theatre has been estimated as its finances and employment are reported separated from the University. The University's arts venues and their wider impact are discussed further in Section 12.3.

The method for deriving estimates of tourism impacts generated by the University of Southampton is described in the Technical Appendix. This results in visitor expenditure supporting an estimated £4.4 million GVA and 130 jobs in Southampton, £5.3 million GVA and 145 jobs in the Regional Area and £7.5 million GVA and 181 jobs in the UK.

Table 7.1 – Economic Impact Supported by Additional Visitors 2012/13

	Southampton	Regional Area	UK
GVA (£m)			
Visiting Friends & Relatives	1.2	1.6	2.2
Open Days, Conferences and Events	1.3	1.1	1.4
Art Venues	1.5	1.9	3.2
Total GVA	**4.0**	**4.6**	**6.8**
Employment (FTEs)			
Visiting Friends & Relatives	54	66	88
Open Days, Conferences and Events	24	15	16
Arts Venues	41	47	54
Total Employment	**120**	**128**	**159**

8 GRADUATE PRODUCTIVITY IMPACTS

This section describes the additional value that graduates from the University of Southampton add to the UK economy as a result of the education they receive.

8.1 Graduate Productivity

One of the main ways in which knowledge is transferred from the University of Southampton into industry is when its graduates start working and begin applying what they have learned in the work place. The skills students learn and the experiences they have while at university directly enhance their future productivity. This enables them to contribute more to their employer and generate a greater benefit for the UK economy than they would otherwise be able to.

The GVA of this productivity gain includes the additional profits that graduate employers are able to generate by employing graduates and the additional employment costs they are willing to pay in order to generate these additional profits.

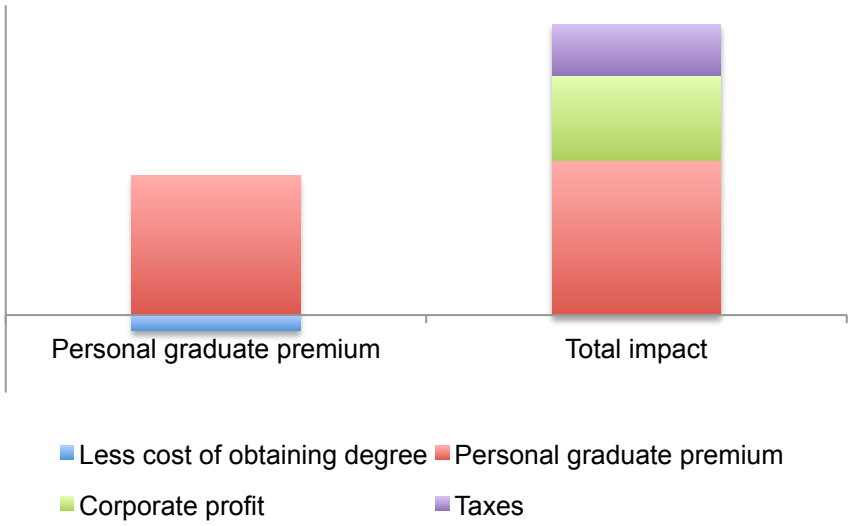
The subject of graduate earnings premiums has been well researched, so information about the earnings premium of graduates is readily available and can be used to provide a measure of the additional contribution graduates make to the economy each year. Unfortunately, information about the additional profits of graduate employers is not readily available so the impact presented in this section is likely to underestimate the true productivity impact of learning.

Information about the graduate premium for different subject areas is provided in a research paper produced by the Department for Business Innovation & Skills[5], which considered data from the Labour Force Survey between 1996 and 2009. The analysis considered the after tax earnings of a graduate compared to the after tax earnings of a non-graduate. The direct and indirect costs were then subtracted from the gross graduate premium for each degree subject to give the net graduate premium. In this way the total graduate premium gives the combined personal economic benefit that graduates will obtain rather than the increase in national productivity associated with the degree, which will be higher.

The UK wide benefits from the increased productivity of graduates will also include the corporate profit associated with each graduate as well as the taxes paid to the Treasury.

[5] Department for Business Innovation & Skills (June 2011), *The Returns to Higher Education Qualifications.*

Figure 8.1 – Personal Graduate Premium Benefit Vs. Economic Benefit



8.1.1 Graduate Premium of University of Southampton Students

The subject that a student graduates in determines the earnings premium that they can expect to achieve over the course of their working life, as shown below. The average for all undergraduate degrees is £101,442.

Table 8.1 – Graduate Premium By Degree Subject Offered by the University of Southampton

	Graduate Premium (£)
Biological sciences	65,788
Business and administrative studies	115,295
Creative arts and design	5,945
Education	115,843
Engineering	128,120
European languages	61,501
Historical and philosophical studies	21,843
Law	161,436
Linguistics, classics and related	49,036
Mass communication	19,460
Mathematical and computing sciences	136,629
Medicine	371,432
Non-European languages	45,165
Physical /environmental sciences	92,063
Social studies	98,793
Subjects allied to medicine	145,633
Technologies	62,512
Postgraduate degree	50,195

Source: Department of Business, Innovation and Skills, The Returns to Higher Education Qualifications, 2011

The impact associated with graduates from the University of Southampton was estimated by applying the graduate premium for each degree subject to the number of graduates in each subject area. In this way it was estimated that the total graduate premium across the UK in 2012/13 amounted to £496.1 million. The impact within each study area was estimated by applying assumptions about the proportion of graduates who remain in each study area after graduation to the total impact.

Table 8.2 – Graduate Premium by Study Area (£m)

	Southampton	Regional Area	UK
Location of graduates	15%	21%	64%
Total Graduate Premium (£m)	**74.1**	**178.6**	**496.1**

9 WIDER IMPACTS

The quantitative impacts described so far are a significant underestimate of the impact of the University of Southampton because:

- the data for monetisation of many benefits is at an early stage of development;
- not all economic value can be converted into monetary value;
- monetary value does not capture aspects such as quality, equality and life itself;
- monetary value is static and does not capture the dynamic activities which drive economic and social impact;
- some impacts are transformative or of such fundamental value that they cannot be captured;
- it is not always possible to estimate the value of the University of Southampton's contribution to impacts that have been generated as a result of collaborative effort between multiple partners; and
- the value of universities is more than economic value.

This is particularly the case for the University of Southampton where the excellence of its research has informed policy and strategy and had significant impact on society. The table below highlights some of these wider impacts that have occurred through research.

Table 9.1 – Wider Impacts

Beneficiaries	Benefit	Role of The University of Southampton
UK productivity, lives saved and environment	Economic benefits of £79 million a year. Reduction in carbon emissions. Development of sustainable transport systems. Safer driving.	The University's Transportation Research Group (TRG) has contributed to the development of sustainable road transport networks by developing and evaluating algorithms for advanced bus priority at traffic signals; and improved methods to forecast traffic flows and journeys. The Group's research has also changed the way government thinks about transport and understanding that it is integral to sustainable development for urban areas worldwide.
Lives saved and users of transport systems	Mitigating impacts from flooding. Improving safety of transport system and saving lives.	The University's Geomechanics group has developed techniques that have been used by the builders, owners and operators of transport infrastructure both in the UK and internationally, to develop an improved understanding of infrastructure geotechnical behaviour leading to significantly improved infrastructure performance and substantial savings in build, maintenance and operational costs.
Government policy	Smarter local policy making that is more effective at assisting the poorest communities and strengthening community cohesion.	The University has very strong and longstanding links with the Office of National Statistics (ONS), including supplying their workforce by being one of the few UK universities that offers an MSc in Demography, an MSc in Social Statistics, an MSc in Official Statistics, and works in partnership with ONS on Administrative Data Research. Specifically the work the University has done to deliver more accurate estimates of socio-economic indicators in relatively small geographic areas, such as local authority districts and wards, has been described by the ONS as a breakthrough.
Education	Importance of foreign language learning at primary level has been incorporated into education policy.	University of Southampton research demonstrated the viability of foreign language teaching in primary schools. Researchers are developing resources to support teachers and practitioners in improving the teaching of foreign languages.
Sport	Widespread British sporting success in all the Olympic games from 2008 onwards. Raising the international profile of British engineering excellence, and inspiring school students to study engineering.	University of Southampton's Performance Sports Engineering Laboratory's research into aerodynamics and fluid dynamic interactions uncovered crucial performance gains. The University's wind tunnel was used for testing these gains. The research was used to improve performance in cycling, skeleton, swimming, rowing, kayaking, sailing and motorsports amongst others.

The economic benefit arising from greater productivity due to a more efficient transport system has been included in the quantitative analysis. This £79 million annual benefit arises from:

- TRG's studies into bus priority systems at traffic signals in London has enabled priority to be given to 8000 buses at 2000 traffic signals in London. Transport for London (TfL) estimates that this generated economic benefits of £29 million between 2009 and 2014 (2007 prices) from reduced bus delays and journey times.

- SERCO, was set up to run the UK's first National Traffic Control Centre. They subcontracted TRG to analyse 18 months of national traffic data obtained from traffic detection systems. The academics used the results to propose optimal methods to forecast traffic flow on Britain's motorway and trunk road network. Simulation modelling by TRG has indicated that the early detection and identification of incidents is likely to have saved around £50m per year during 2008–2013.

The diversity of the University's strengths and activities in engaging with society, the economy and the public means it is difficult to fully capture the wide range of impact the University has. The table above provides a snapshot of this diversity. The following chapters will explore three areas where the University of Southampton has created significant wider impact that it is not possible to monetarise:

- improving healthcare and thereby improving quality of life;

- supporting important growth sectors and thereby making the economy more competitive; and

- contributing to the creative industries and cultural sector and thereby creating cultural impact, which in turn create social and economic benefit.

10 HEALTH

The University of Southampton makes a significant contribution to the healthcare sector through its faculties of Medicine and Health Sciences. This chapter considers the impact the University has through:

- collaboration with NHS hospitals;
- social returns to medical research; and
- medical spin out companies.

10.1 Approach

The Faculty of Medicine focuses on three areas in order to maximise the impact that the University can have on the health sector. These are:

- basic discovery science linked with clinical trials;
- strong collaboration between the Faculty of Medicine, other University departments and the NHS to move developments into clinical practice; and
- a focus on enterprise and innovation.

These three areas ensure that the process between discovery and deployment is as streamlined as possible and that the University of Southampton and its partners are involved throughout each stage of the process.

The Faculty of Health Sciences focuses on finding evidence-based solutions to some of today's most pressing health problems, to improve patient experience and drive NHS policy,

10.2 Collaboration with NHS Partners

The University of Southampton is a strategic partner of the University Hospital Southampton NHS Foundation Trust and the University's Faculty of Medicine is located at Southampton General Hospital, which results in outputs that are in addition to the outputs that are summarised in Table 10.3.

The Faculty of Health Sciences has partnerships with NHS organisations throughout Hampshire.

Researchers from Health Sciences and University Hospital Southampton NHS Foundation Trust, along with the Wessex Academic Health Science Network and other local NHS partners, have formed the NIHR Collaboration for Leadership in Applied Health Research and Care (CLAHRC). The CLAHRC Wessex, which has been awarded £19m, is a five-year research and implementation programme with the aim of improving the health of the people of Wessex and the quality and cost-effectiveness of health care.

10.2.1 Research Income

Collaboration between academic institutions and the organisations that put the knowledge of these institutions into practice is important because it supports positive outcomes for both. One of the positive outcomes of such collaboration is the ability to lever in greater amounts of public and private funding.

The University undertakes a wide range of medical research in collaboration with the University Hospital Southampton NHS Trust.

Joint facilities include the Wellcome Trust/NIHR Clinical Research Facility, the NIHR Southampton Respiratory Biomedical Research Unit and the NIHR Southampton Biomedical Research Centre in Nutrition and Lifestyle. The University also hosts the Medical Research Council (MRC) Lifecourse Epidemiology Unit, the funding for which prior to 2014 was not included in the University's financial accounts.

Close collaboration between the University and the Hospital enables both to benefit from the reputation of the other when making applications for funding. One example of this would be the £9 million Southampton Centre for Biomedical Research. This joint project between the University and the Hospital aims to translate the latest innovations made in laboratories directly into new treatments for patients.

The Hospital and the University both apply for research funding and collaborate with businesses as separate institutions as well as submitting joint bids. The Hospital aims to develop long-term strategic partnerships with organisations to deliver contract-commercial trials. This includes the delivery of commercial research within NIHR Wellcome Trust Clinical Research Facility based at Southampton General Hospital. The facility is core to Southampton's university-hospital partnership. The reputation of the academics of the Faculty of Medicine at the University of Southampton is critical for the Hospital securing research contracts and maintaining relationships with the business community.

10.2.2 Clinical Trials

One area of focus for the Faculty of Medicine is basic scientific discovery and the progression of this through clinical trials. Clinical trials are an essential part of bringing any advances in medical science to the wider world, so that these advances are able to improve public health and wellbeing. Undertaking trials in Southampton enables patients in the local area to be the first to benefit from experimental and cutting-edge treatments. The trials also support employment in the local economy.

A main focus of the clinical trials undertaken by the Clinical Trials Unit (CTU) is cancer trials, which account for 75% of the trials undertaken. The ability of the University to undertake clinical trials is a direct result of the collaboration between the University and the Hospital. This collaboration has enabled the CTU to become one of the Cancer Research UK Clinical Trials Units within the UK that receives core funding from Cancer Research UK.

10.2.3 Students and Graduates

The students of the Faculty of Medicine and the Faculty of Health Sciences are the health workers of the future and local hospitals benefit from being an integral part of their education. The University annually trains around 250 doctors, 523 nurses and midwives, 111 allied health professionals, and 50 health visitors and school nurses.

The stream of doctors and health workers who have been trained at the University of Southampton who go into the NHS has benefits that go beyond their own salaries because the consistent supply of trained medical workers enhances the health care provision available to the people of Southampton and the region, as well as nationally.

10.3 Staff Time

The staff of the University also play a wider role in the delivery of healthcare in the study areas that encourage collaboration between academia and medical practice. These activities include:

- the 100 medical staff who split their time 50/50 between academia and clinical practice;
- allied healthcare staff; and
- board membership on regional health organisations such as Wessex Academic Health Science Network.

10.4 Health Companies

The Faculty of Medicine also supports the University's strong links with industry through the SETsquared Partnership as part of its focus on enterprise and innovation. In addition to this, the Faculty of Medicine has an impact on the economy through start-up companies and spin-outs that have been founded within the Faculty.

The wealth and employment generated by these companies were included in Section 6.6 but these companies also support additional qualitative impacts on the health and wellbeing of the population.

Advances in medical science also have global economic impacts. The University of Southampton has created successful spin-out companies that have focused on international health issues that have a major impact both within and outside the UK. Notable spin-outs include:

- Synairgen, a respiratory drug discovery and development company, focused primarily on asthma and COPD, which works to discover and develop novel therapies for respiratory disease;
- iQur, a biotech company developing a number of exciting new vaccines; and
- Capsant Neurotechnologies, which specialises in 3-dimensional tissue culture models of neurological disease with a specific emphasis on restoring function to damaged nerve tissue.

Companies have also been created out of the Faculty of Medicine's focus on inter-departmental collaboration. These include Karus Therapeutics, which draws from the medical and chemical sciences to develop a range of new drugs to treat cancers, inflammatory disorders and immune diseases. The company was formed as a result of the Faculty of Medicine's work with Cancer Research UK.

Another notable company is Primerdesign, which was formed in 2005 within the School of Medicine, and helped to produce the first swine flu detection kit in 2009.

10.5 Social Returns to Medical Research

The University of Southampton carries out a wide range of research related to health issues including specifically medical research. Research by the Wellcome Trust on the value of medical research in the UK considers two types of return: health gains (net of the health care costs of delivering them) and economic gains.

Some of the economic gains of medical research are considered elsewhere in this report.

This section considers the value of health gains – these are the wider health returns to patients who ultimately benefit from the research. This is discussed further in the Technical Appendix. This finds that the social return on medical research is £1.38 for every £1 spent on medical research.

This is applied to the research income received by the Faculty of Medicine and the Faculty of Health Sciences and income from externally funded resources that support University and NHS medical research, which in 2012/13 was £37.3 million. The key assumptions required to estimate some of the impact of the University of Southampton's medical research is given in the Technical Appendix.

Table 10.1 – Key Assumptions for Medical Research Impact 2012/13

	Value	Source
Research Income to Faculty of Medicine and Faculty of Health Sciences	£28.8 million	The University of Southampton
Externally-funded resources that support University/NHS medical research	£8.45 million	The University of Southampton
Social Return to Medical Research	£1.38 (per £1 spent)	Based on Wellcome Trust research

This results in an estimation of some of the impact of the University of Southampton's medical and healthcare research as being more than £51 million at the UK level in 2012/13.

Table 10.2 – Value of some of the University of Southampton's Research 2012/13

	Southampton	Regional Area	UK
GVA (£m)	0.2	2.6	51.4

As outlined in the previous chapter, this method underestimates the full impact of health research at the University of Southampton in 2012/13, particularly in terms of the unquantifiable nature of improvements to quality of life and the difficulty of measuring how better healthcare policy and delivery leads to better health outcomes. Some of these impacts are discussed in Table 10.3.

Table 10.3 – Health Impacts

Beneficiaries	Benefit	Role of The University of Southampton
14,000 UK lymphoma sufferers annually.	Improvements in survival and quality of life for lymphoma suffers	The University is a driver of major advances in lymphoma care, leading to the development and standardisation of effective new antibody treatments and optimal drug regimens.
More than 3 million babies in the UK screened for Permanent Childhood Hearing Impairment (PCHI) and 5,000+ cases identified for treatment.	Earlier identification of PCHI benefits children's language development and reading ability. The benefits to reading ability have been shown recently to increase significantly between the ages of 8 and 17 years.	Research at the University was central to policymakers recommending universal new-born screening for PCHI.
Individuals receiving improved knee replacements. The manufacturer anticipates around 35% of all knee replacement patients will use this design in the future. They expect the knee to account for 80% of their knee reconstruction sales by 2018.	New design reduces wear, thereby reducing the need for revision procedures and improving patient wellbeing. The techniques applied in the project have allowed the manufacturer to cut down on the level of pre-clinical testing considerably.	The new design is informed by University of Southampton research.
Individuals receiving hip replacements will benefit from development of two hip replacement devices compliant with EU safety, health and environmental requirements. Around10,000 devices implanted within the first 5 years.	Devices are suitable for the younger, more active patient population.	The new design is informed by University of Southampton research.
Four million prescriptions per year issued by nurses and pharmacists. Improvement in quality and efficiency of healthcare.	Patients can access prescribed medicines faster. Healthcare cost savings as changes in prescribing legislation means less use of GP time,	The prescription of medicine has moved away from a "doctor only" model to one that allows a range of healthcare professionals to prescribe a wide range of medicines. The UK is a world leader in this area in terms of both policy and practice. This revolution is underpinned by the

	which is more costly than other healthcare workers. Increased job satisfaction for nurses.	University of Southampton's research. This research is widely cited in international policy development, and the University's survey methods and evaluation measures are used to assess quality and safety internationally.
Potential osteoporosis sufferers	Contribution to £1 billion in annual savings to the NHS in its healthcare provision for osteoporotic fractures in older adults through a change in NICE guidelines regarding vitamin D supplementation and osteoporosis treatment.	University research has shown that universal vitamin D supplementation in the elderly had no discernible effect on fracture incidence. However researchers have found that maternal vitamin D supplementation leads to increased bone mineral accrual in offspring thereby reducing the risk of osteoporosis later in life. This has shaped national and international policy designed to reduce the burden of osteoporosis and is contributing to an estimated 20% decrease in fracture incidence.
Stroke patients in this country and abroad	Aiding recovery of movement and independence in stroke patients.	An allied health research team has made significant advances in developing and evaluating technologies to aid the recovery of movement and independence in stroke patients. In particular in combining electrical stimulation with robot therapy.
Cancer survivors	Significant changes in funding for the care of cancer survivors.	The University's Macmillan Survivorship Research Group has conducted a series of pioneering studies, which have drawn global attention to this patient group and helped inform health policy around the world. Academics have also been instrumental in the formation of the Government backed National Cancer Survivorship Initiative.
Patients requiring end-of-life care	Improved end-of-life care for patients. End-of-life care now has a place on the agenda of NHS commissioners and providers and in the NHS Outcomes Framework.	End-of-life care research at Southampton has been pivotal in making England the first country world-wide to measure end of life care quality from the patient perspective. Our resulting work is integral to the way in which the NHS is held to account and has ultimately led to an improved service.

11 SECTOR DEVELOPMENT

The University of Southampton's activities and impacts outlined in the previous sections from teaching, graduate productivity, research and engagement with businesses together drive economic growth. This is a role that is common to all universities, however the University of Southampton's excellence in these activities means that its impacts are transformative to the local, regional and UK economy as well as globally.

These impacts are highlighted in this chapter by looking at how the University of Southampton has supported the creation of sectors such as photonics, which has changed the world by enabling the development of the internet; maritime industries, which is one of the UK's leading growth sectors and a significant regional employer; and creative industries, which is transforming Southampton as a place to live, work and visit.

11.1 Photonics

The University of Southampton has carried out research since the 1960s on optical fibres. This led to the invention of the first practical optical amplifier in the 1980s which made long-distance optical communications practical by making huge amounts of bandwidth available at low cost over very long distances. This was a major pre-requisite for the formation of the Internet.

This research led to the foundation of the Optoelectronics Research Centre (ORC) in 1989. The Centre now has over 200 staff and there are currently 700 doctoral level ORC alumni who hold senior positions within industry and academia, worldwide. The Centre has also maintained its leading reputation and is today one of the largest university based research groups entirely devoted to optoelectronics in the world. It has also led to the setting up of the EPSRC Centre for Innovative Manufacturing in Photonics with 13 industry partners.

Optical fibres and fibre-related products are increasingly becoming the enabling technology for a vast range of industries either in the manufacturing of products or as components within the products themselves. For example, it has revolutionised areas of industrial material processing and enabled the development of specialist components for high-end industries (such as aviation and defence) as well as an array of new medical devices, procedures and manufacturing technologies.

As well as having a global impact, this has benefited Southampton through the development of a photonics cluster that supports more than 500 jobs and has a turnover of over £100 million. The University's research is fundamental to the existence of this sector and to retaining it both in the region and the UK. For example, Southampton research is directly responsible for the commercial success and sustained growth of a spin-out company, SPI Lasers Ltd, which has an annual turnover of over £40 million and employs more than 250 people in the Southampton area. The UK photonics industry as a whole is worth around £10.5 billion and provides jobs for 70,000 employees. The UK also exports 75 per cent of its output in the photonics sector.[6]

[6] UK Photonics Leadership Group August 2014

11.2 Maritime Sector

World-leading universities such as the University of Southampton attract inward investment by businesses that are keen to co-locate with them. This academic expertise concentrated within the University also supports the growth of domestic businesses. This occurs because universities provide existing businesses with knowledge and skills such as access to world leading researchers and a pool of graduates. This enables them to innovate and develop new products and processes and also helps to create new businesses through the variety of business and industry engagement activities described in Chapter 6.

This inward investment activity also benefits Southampton and the region. An example of this would be the University's partnership with Lloyd's Register and the formation of the Southampton Marine and Maritime Institute (SMMI). Staff from Lloyd's Register's Global Technology Centre have relocated from London to a new building on the University's redeveloped Boldrewood campus. With total staff numbers of over 400 at the Global Technology Centre, this equates to the creation of 400 additional jobs in the local and regional area. Over 1,000 academic staff and researchers will also be located at Boldrewood. Lloyd's Register staff and University researchers will work together at the SMMI, which is located at a new purpose-built facility on the campus.

Another example is the National Oceanography Centre's (NOC) co-location at the Waterfront Campus with 400 staff, collaborating with Ocean and Earth Science in undertaking global scaled marine science. NOC generates some additional £15 million of competitive inward investment per annum from Research Councils, Innovate UK, European Space Agency, EU, Ministry of Defence, and industry, and a further £3 to £5 million of annual capital investment. Much of the research income is either collaborative with the University of Southampton or directly supports the local economy. NOC has specific international and national technology leadership in marine autonomy and environment observing, and with the development of Marine Autonomous and Robotic Systems (MARS) Innovation Centre is innovating with local Solent SME's and attracting international inward investment from companies wishing to embed some of their research teams in the Centre. Collaboration and innovation with the UK Space industry is leading to new sensors and satellite developments for UK-based Earth observation missions.

The existence of the University of Southampton has enabled Southampton to attract this research excellence as NOC was formed by the government research lab, the Institute of Oceanographic Sciences which moved to Southampton to co-locate with the University of Southampton's departments of oceanography and geology. NOC retains a strong collaborative and strategic relationship with the University including sharing the same location. This has benefited NOC and the University and therefore the economy as a whole due the creation of a critical mass of research excellence and activity. Critical mass enables the NOC and the economy as a whole to attract the best research staff. Without this critical mass NOC wouldn't be one of the top six centres in the world for marine science. It also enables specific research activities to be undertaken such as in marine autonomous technology, which NOC is one of the two or three leading research centres in the field. The economic importance of this research is shown by the fact that robotics and autonomous systems are one of the 'eight great technologies' identified by the UK government to propel future growth.

This inward investment activity along with the growth of domestic businesses provides the opportunity to develop and maintain world-leading sectors such as

the maritime sector. The importance of the UK maritime sector to the competitiveness of the UK economy is shown by the fact it is the largest in Europe. The importance of the maritime sector to the region is indicated by the fact that 40% of this sector lies within the South East of England, clustered primarily around the Solent region.

Southampton benefits from the University's contribution to the development of the maritime sector. In the Solent LEP region between 1 in 3 and 1 in 4 of the jobs are in the maritime sector.

The importance of this sector to the UK's future competitiveness is huge, as the marine industry has the potential to grow by £8 billion and be worth £25 billion in turnover by 2020[7]. The importance of the University to securing this growth is shown by the fact that its partnership with Lloyd's Register is the largest university/business partnership of its kind in the UK and was designed specifically to support the maritime cluster. This was recognised by the Government's growth plan for this industry.

The colocation of businesses and the development of a cluster around the University create a positive relationship as it provides the University with the opportunity to make its research more relevant to industrial and societal needs. In addition, making greater use of its research for industrial purposes provides enhanced learning opportunities for students, which leads to improved employability. It may also attract further significant investment to the region in the future as the cluster acts as a magnet for relevant companies.

11.3 Summary

This chapter has shown how the University of Southampton is fundamental to the development and sustained success of key sectors to the local, regional and UK economy. This is summarised in the following table.

7 Department for Business Innovation & Skills "New £8 billion growth plan for marine industries" (19 September 2011)

Table 11.1 – Summary of the University of Southampton and the development of sectors

Beneficiary	Benefit	Role of The University of Southampton
Southampton's Photonics Cluster	£100 million and 500 jobs	The University provides the ground-breaking research that is fundamental to the development and sustained success of companies in the sector.
Maritime Sector	Supports the current sector which has a turnover of £17 billion to the economy Support the sector to grow by £8 billion to £25 billion in turnover by 2020.	The University's working relationship with Lloyd's Register, which goes back 40 years, has led to the UK's largest university-business collaboration. The Southampton Marine and Maritime Institute based at the University's redeveloped Boldrewood Campus has over 1,000 academic staff and researchers. It is a catalyst for bringing together academia, society, industry and government partners for practical innovation that is vital to the competitiveness and growth of the UK maritime industry. The National Oceanography Centre is co-located and headquartered on the Waterfront Campus, where 400 scientists, engineers, and technical support (with £40 m turnover) are the focus of global UK marine science, and is the logistics hub for UK's two open-ocean research vessels. NOC has a strong engineering and innovation agenda with international leadership in marine sensing and marine autonomy, including the newly created Marine Autonomy and Robotic Systems Innovation Centre created to enhance SME innovation in the Solent region

12 CULTURAL IMPACT

The University of Southampton creates cultural impact in a variety of ways, from its teaching and research to the presence and activities of its three arts venues. These cultural activities also lead to social and economic impact. This chapter discusses how these impacts occur and describes their importance to Southampton as a place to live, work and visit.

12.1 Teaching and Skills

Winchester School of Art is located 10 miles away from the city of Southampton and has more than 1,800 undergraduate and postgraduate students. It has four practice based undergraduate programmes - Fine Art, Graphic Arts, Games Design & Art and Fashion & Textile Design. The School has a strong focus on employability and also offers an undergraduate programme in Fashion Marketing & Management. The School's graduates work in a range of settings from large companies, where the skills provided by Winchester School of Art increase the capacity for innovation in their workplace, to self-employment or partnerships with three or four designers. This increases the size and diversity of the creative sector in the economy.

12.2 Research, Wider Impact and Internationalisation

Winchester School of Art's research focuses on tackling social, political, economic and environmental challenges. This means the School has a strong international focus and a wide range of mutually beneficial and interactive partnerships with galleries, museums, arts and communities, publishers and online sources whose activities may benefit social groups. In particular there are five key partnerships including with the Tate, the Victoria & Albert Museum, Third Text journal, the Al Hoash Gallery in Jerusalem and the Transmediale festival in Berlin. This excellence means that the School has a cultural impact through curatorship, exhibitions and publishing.

12.3 Venues

The University's Highfield Campus is home to the University's three arts venues, which are supported and funded by the University and Arts Council England.

The city of Southampton's only producing theatre company is based at the Nuffield Theatre, which was built by the University of Southampton and opened in 1964. Nuffield aims to create world-class productions, directed, designed and written by the best theatre makers in the UK, to make work in different spaces and for different audiences, to find innovative and inclusive means to put community, young and old, at the heart of what they do, to run a bespoke development programme for the nurture of the next generation of theatre practitioners, and to take work to London and on tour nationally and internationally. Nuffield also offers extensive opportunities for schools and colleges to engage with the theatre, including by providing tailor-made schools workshops and resource packs. In 2012/13:

- 10,126 customers brought 60,005 tickets;
- 128 events were hosted;

- 57 separate outreach sessions were organised with 565 individual sessions involving 346 artists and 117 educators.

The Turner Sims concert hall was added to the University's arts provision in 1974. The space was designed by the University's Institute of Sound and Vibration Research. The venue hosts a varied programme of music events including classical, jazz, folk and world music, a well as talks and seminars from world-renowned speakers. In 2012/13:

- the venue carried out learning and participation sessions for all age groups from early years to adults. In total 2,047 people attended these sessions; and
- the venue attracted a ticketed audience of 12,746 with 69% of its ticketed events audience residing outside the city, showing it is an important local resource, which also attracts visitors from outside the city of Southampton to visit the city.

The third of the three arts venues is the John Hansard Gallery, established in 1979. The Gallery presents five contemporary art exhibitions a year, as well as off-site projects in Southampton city centre and other locations. It also develops major touring projects with galleries and institutions across the UK and internationally. In 2016 the Gallery will relocate to Southampton City Centre as a part of the Arts Complex Scheme. In 2012/13 the venue attracted audiences of:

- main gallery – 9,039;
- off-site (elsewhere in Southampton) – 7,081;
- touring exhibitions (elsewhere in UK) – 54,050; and
- touring exhibitions (international) – 3,200.

Alongside each exhibition the Gallery runs a varied programme of educational public events for children, young people and adults, including creative workshops, talks and seminars. The Gallery also runs Arts Award projects, working with socially excluded young people, schools and individuals. The Arts Awards support young people to engage with the arts and achieve a national qualification. In 2012/13 its outreach work attracted:

- school children – 1,311 school children from 11 schools including 6 in the city of Southampton;
- higher education students – 386 visited as part of organised groups (as opposed to individual visits);
- Southampton Youth Offending Service/John Hansard Gallery Arts Award work – 312 attendances;
- free public creative workshops – 41 children; and
- wide programme of artist talks and tours which aren't counted in these figures.

12.4 Cultural Regeneration

The University of Southampton is a key player in the Arts Complex Scheme being developed in the city centre by Southampton City Council as part of its new Cultural Quarter. A key tenant in the new facility will be the University's John Hansard Gallery. The 130,000 square feet scheme will have an auditorium,

studio, creation space, contemporary art gallery, and media facilities. The University of Southampton's support and investment in the arts complex project has helped attract additional investment to the city to fund this scheme and Arts Council England is awarding Southampton City Council £7.3 million towards the scheme as part of its National Lottery-funded capital programme.

12.5 Art at the Heart

The contribution of the University of Southampton to the success of the Cultural Quarter goes beyond the relocation of the John Hansard Gallery and the University's support and investment. The strength of the University of Southampton's cultural offering is also based on how the venues work together and with other organisations and venues in the city of Southampton. This is exemplified by Art at the Heart.

Art at the Heart is a partnership of arts organisations working with Southampton City Council to deliver a series of inspirational creative projects focusing on the Cultural Quarter and benefiting from this unique opportunity to raise the profile of the City's arts. Between June 2009 and March 2013, 30 Art at the Heart projects have been delivered in Southampton, over 2500 participants have engaged with projects and audiences of over 40,000 have experienced the projects live. A survey of participants found that:

- almost 90% of people either agree or strongly agree that more Art at the Heart events would make the City a better place to live; and
- over 50% came to Southampton specifically for the event.

12.6 Local and Regional Impact

The Arts Complex Scheme and overall Cultural Quarter project is likely to lead to the creation of new businesses such as cafes and restaurants. It will also be a cultural and creative hub, which together with the new food and drink offering will create a new social space for the city. This will improve the attractiveness and vibrancy of the city of Southampton, enhancing the quality of life and therefore making it a more attractive place to live, work and visit. This combined with the city's raised profile will create economic impact by attracting inward investment and tourism spend and supporting jobs. This is particularly fitting with Solent LEP's Strategy for Growth, which identifies tourism as a strategic sector.

12.7 Summary

This chapter has shown the variety of ways the University contributes to the creative industries and the cultural sector. The key benefits are summarised below.

Table 12.1 – Impact of Culture

Beneficiary	Benefit	Role of The University of Southampton
Audiences, visitors and participants having access to cultural events	Contributing to make Southampton a leading cultural destination and a great place to live, work and visit.	The activities of the University through teaching and research contribute more people to the cultural sector and strengthens cultural organisations. The activities of the University through its three cultural venues individually and together creates cultural, social and economic impact. The University is a key player in the development of the city's Arts Complex Scheme, part of the Cultural Quarter project.

13 EXPORTS

The value of the University of Southampton's exports has been estimated by considering the inflow of money into the UK from outside the UK economy. This impact is therefore measured in terms of the increase in expenditure or turnover generated from overseas rather than GVA. This value has been estimated by considering:

- tuition fees from non-UK students;
- expenditure by non UK students – this is estimated using the same methodology as in Section 5.1 Impacts from Students. The proportion of full time students who are from outside the UK is 20%. This proportion is applied to total student expenditure rather than the turnover because exports are measured in turnover;
- research income from partners and businesses from overseas charities, governments, businesses and other organisations;
- licence income received by the University of Southampton from overseas companies; and
- consultancy, trading and services with overseas companies.

The value of exports associated with the University of Southampton in 2012/13 was £136.8 million. The breakdown of this figure is given in Table 13.1.

Table 13.1 – Value of Exports

Source	Value (£m)
Tuition fees from EU	6.4
Tuition fees from international non-EU students	52.9
Student spending	52.7
Overseas visitors spending	2.3
Non-UK Research Income	22.6
Licence Income	0.2
Consultancy, trading and services	1.5
Other Income	0.6
Total Export Income	136.8

14 QUANTITATIVE IMPACT

14.1 Quantitative Impact

In 2012/13 The University of Southampton supported economic activity in Southampton worth an estimated £729.4 million GVA and 11,743 jobs, in the Regional Area this was estimated to be £1.1 billion GVA and 16,301 jobs and in the UK it was estimated to be £2.0 billion GVA and over 26,540 jobs.

Table 14.1 – The University of Southampton GVA Impact 2012/13 (£m)

	Southampton	Regional Area	UK
Direct	425.1	425.1	425.1
Supplier Spending	5.3	19.2	73.0
Staff Spending	14.6	44.3	108.8
Construction Spending	7.0	27.3	47.8
Subtotal Core Impact	**452.0**	**515.9**	**654.7**
Student Spending	96.0	116.1	170.4
Student Part Time Work	40.6	45.0	57.1
Student Volunteering	0.4	0.5	0.5
Subtotal Student Impact	**137.0**	**161.6**	**228.0**
Projects with Businesses	28.5	150.9	356.4
Skills for Businesses (CPD)	5.0	10.5	15.7
Licensing	0.7	1.6	6.3
Knowledge Transfer Partnerships	0.6	0.9	2.7
Spin-outs and Start-ups	17.5	29.8	62.7
Science Park	9.9	6.9	5.6
Subtotal Business Engagement	**62.1**	**200.7**	**449.4**
Visiting Friends & Relatives	1.2	1.6	2.2
Open Days, Conferences and Events	1.3	1.1	1.4
Art Venues	1.5	1.9	3.2
Subtotal Tourism Impact	**4.0**	**4.6**	**6.8**
Graduate Productivity	**74.1**	**178.6**	**496.1**
Wider Impacts	**0.2**	**2.6**	**130.4**
GVA (£m)	**729.4**	**1,063.9**	**1,965.4**

Note: Totals may not sum due to rounding.

Table 14.2 – The University of Southampton Employment Impact 2012/13

	Southampton	Regional Area	UK
Direct	5,470	5,470	5,470
Supplier Spending	174	630	2,428
Staff Spending	347	1,074	2,711
Construction Spending	124	481	839
Subtotal Core Impact	**6,115**	**7,655**	**11,448**
Student Spending	2,136	2,591	3,816
Student Part Time Work	1,907	2,088	2,584
Student Volunteering	-	-	-
Subtotal Student Impact	**4,043**	**4,679**	**6,400**
Projects with Businesses	449	2,441	5,965
Skills for Businesses (CPD)	114	243	362
Licensing	11	27	103
Knowledge Transfer Partnerships	15	21	66
Spin-outs and Start-ups	454	801	1,777
Science Park	422	307	268
Subtotal Business Engagement	**1,465**	**3,839**	**8,540**
Visiting Friends & Relatives	54	66	88
Open Days, Conferences and Events	24	15	16
Arts Venues	41	47	54
Subtotal Tourism Impact	**120**	**128**	**159**
TOTAL EMPLOYMENT	**11,743**	**16,301**	**26,547**

Note: Totals may not sum due to rounding.

14.2 Value for Money

In 2012/13 the University of Southampton directly contributed £425.1 million GVA to the UK economy and generated a total quantifiable economic impact of £1,965.4 million GVA. This implies that the GVA multiplier of the University is 4.62 and means that each £1 GVA directly generated by the University generates a total economic impact of £4.62 GVA for the UK economy.

In 2012/13 the University of Southampton supported 26,547 jobs throughout the UK economy. This included 5,470 jobs of people who are directly employed by the University, which means that every job directly created by the University supported more than 4 jobs throughout the UK economy.

In 2012/13 the University of Southampton received total income of £447.2 million and generated a total economic impact of £2.0 billion GVA. This implies that the University generated £4.39 GVA for every £1 income earned.

The University of Southampton received £97.7 million of its income in the form of higher education funding body grants. This suggests that every £1 invested by higher education funding bodies generates £20. 31 GVA for the UK economy.

These multipliers are summarised in Table 14.3.

Table 14.3 – University of Southampton Impact Multipliers

	Total impact multiplier
Direct GVA : Total GVA	4.62
Total Income : Impact	4.39
Funding Body Income : Impact	20.13

15 SUMMARY

This report has estimated the quantifiable economic impact of the University of Southampton in 2012/13. As the total impact of the University includes impact that can't be quantified the impact of the University will be more than the quantifiable figure. Therefore it was estimated that the University of Southampton supported economic activity in:

- Southampton of *more than* £729 million GVA and 11,700 jobs;
- the regional area of *more than* £1.0 billion GVA and over 16,300 jobs;
- the UK of *more than* £2.0 billion GVA and over 26,500 jobs.

The value of exports associated with the University of Southampton in 2012/13 was estimated at £136.8 million.

The University of Southampton received £97.7 million of its income as higher education funding body grants and generated a total GVA impact of £2.0 billion, £20.13 for each £1 received from higher education funding bodies. The University generated this impact based on income from funding bodies and income leveraged from a range of other public and private sources, a total income of £447.2 million in 2012/13. So, the University of Southampton generated an economic impact of £4.39 GVA for each £1 in income. This represents a good return on investment for the UK economy.

The University of Southampton has a far greater impact than can be reflected in its quantitative impacts above – such as through excellence of its research has informed policy and strategy and transformed society. For example the quantitative impacts do not capture:

- the impact of health research at the University of Southampton - particularly in terms of the unquantifiable nature of improvements to quality of life and the difficulty of measuring how better healthcare policy and delivery leads to better health outcomes. One way in which this underestimates the impact of the University is that it does not capture the dynamic way in which its close relationship with the hospital enables both organisations to be more effective at improving health outcomes. This occurs through the ability to lever in greater amounts of public and private funding. It also occurs through the ability to undertake activity, such as clinical trials, which each by itself would not have the capacity to carry out;
- does not describe or capture how the University of Southampton's activities and impacts from teaching, graduate productivity, research and engagement with businesses have a cumulative effect by driving economic growth. This is a role that is common to universities however the excellence of the University's activities means that its impacts translate into impacts that are transformative to the local, regional and UK economy as well as globally and catalyse the development of key sectors such as the maritime sector which is estimated to growth to £25 billion by 2020; and
- does not capture impacts that improve the quality of life such as cultural impacts or capture impacts, such as lives saved.

The above impacts greatly benefit Southampton and the region. For example:

- health – by having clinical trials in Southampton this enables the patients in the local area to benefit from being the first beneficiaries of experimental and cutting-edge treatments;
- photonics cluster – this cluster in Southampton supports 500 jobs;
- maritime sector – between one and three and one in four people in the Solent LEP area are employed in the maritime sector; and
- cultural impact – the significant cultural impact created by the University of Southampton has an additional local social and economic dimension through the University's role in the development of the Arts Complex Scheme in the city centre.

16 TECHNICAL APPENDIX

16.1 Approach

Economic impact is reported in two ways:

- Gross Value Added (GVA) measures the monetary contribution of the organisation and individual to the economy; and
- employment, measured in full time equivalent (ftes) jobs supported.

Each area of impact requires the use of three types of economic assumptions:

- turnover to GVA ratio – this is used to estimate the GVA impact of the spend in an area. This is obtained from the UK Annual Business Survey 2012, published in 2013;
- turnover per employee – this is used to estimate the employment impact of the spend in area. This is obtained from the UK Annual Business Survey 2012, published in 2013; and
- GVA and employment multipliers – this is used to estimate supplier and income impact created by businesses that directly benefit from additional spend in the area.

16.2 Direct Impact

The direct operational Gross Value Added (GVA) of the University was calculated by subtracting all of the non-staff expenditure from the total operational income of the University.

16.3 Supplier Spending Impact

The first step in estimating this impact is to estimate how much of the supplier spending occurs in each study area.

GVA impact of the spend on supplies is estimated by considering the spend on supplies by sector. The spend in each sector supports different GVA depending on the turnover to GVA ratio for that sector (the UK Annual Business Survey[8] gives a breakdown of these figures for industries and smaller sectors). The impact throughout the economy is estimated by applying GVA multipliers appropriate to the sector.

The employment impact of the spend on supplies is estimated by applying the turnover per employee in the industries relevant to the spend. The impact throughout the economy is estimated by applying employment multipliers appropriate to the sector.

16.4 Staff Spending Impact

The first step in estimating this impact is to estimate how much of the staff spending occurs in each study area.

[8] ONS, UK Annual Business Survey 2012, 2013

This requires two steps. The first is that the level of salary paid in each study area was assumed to be proportional to the number of staff that live in each area. The second is an assumption of how much of a person's wage is spent in each study area. This assumption is different for the staff living in each study area.

The economic impact of staff spending as measured by GVA and employment supported, is estimated by applying economic assumptions appropriate to the sector as described in the previous section (i.e. turnover/GVA ratio, turnover/employee ratio, GVA multiplier and employment multipliers).

16.5 Capital Spending Impact

The first step in estimating this impact is to estimate how much of the capital spending occurs in each study area.

The economic impact of capital project spending as measured by GVA and employment supported, is estimated by applying economic assumptions appropriate to the sector as described in the previous section (i.e. turnover/GVA ratio, turnover/employee ratio, GVA multiplier and employment multipliers).

16.6 Student Spending Impact

This impact considers:

- how much students spend;
- where they spend it; and
- what they spend it on.

The amount of money that students spend was based on the cost of living from the Department of Business Innovation & Skills[9], broken down into categories based on information provided on the University's website and adjusted to take account of whether they are undergraduate or post graduate which determines how long they spend studying in the area. In addition the analysis excludes money spent on University accommodation as this will have been accounted for in the University's turnover and is therefore part of the direct impact analysis.

The economic impact of student spending as measured by GVA and employment supported, is estimated by applying economic assumptions appropriate to the sector as described in the previous section (i.e. turnover/GVA ratio, turnover/employee ratio, GVA multiplier and employment multipliers).

16.7 Student Part-time Work Impact

The part-time work that students undertake also contributes to the economy. The economic impact of students' paid employment comes from the additional GVA of the businesses that employ them and the multiplier effect that these additional workers have on those businesses' supply chains.

This impact considers:

- the number of students who work;

[9] Department for Business Innovation & Skills, Student Income and Expenditure Survey 2011/12, June 2013

- additionality of labour – what proportion of jobs undertaken by student would have been unfilled without the availability of student labour;
- proportion of employed students who work for the University – these students are removed from the analysis as their contribution is already included in the core activities; and
- average hours worked per year by a student with a part time job; and
- additional GVA that students generate for their employees - is calculated using the GVA per employee ratios for the industries in which students most frequently find work.

Applying these assumptions to the number of full time students studying with the University of Southampton results in an estimation of how much labour is additional to the economy. The additional GVA that students generate for their employees is calculated using the GVA per employee ratios for the industries in which students most frequently find work.

16.8 Social Returns To Medical Research

Research by the Wellcome Trust on the value of medical research in the UK considers two types of return: health gains (net of the health care costs of delivering them) and economic gains[10]. The economic gains of medical research are considered elsewhere in this chapter. This section considers the value of health gains – these are the wider health returns to patients who ultimately benefit from the research.

The value of health gains was assessed in the Wellcome Trust report using the quality adjusted life years (QALY) method[11]. This is a widely used method developed by health economists to assess how many extra months or years of life of a reasonable quality a person might gain as a result of treatment. Although the QALY method is not perfect, it is widely used and is the accepted method of evaluating potential NHS treatments in the UK. The economic value of the QALY improvement delivered by a particular medical intervention can be assessed by considering the opportunity cost of the investment i.e. by considering what level of improvement could have been achieved by investing the same resources directly in frontline services.

The key finding of the report was that the sum of the total health and economic gains of medical research in the UK gave a total rate of return of around 39%. This included an economic return of 30% and a health gain of just over 9%. This means that a £1.00 investment in public/charitable CVD research produced a stream of health benefits thereafter that is equivalent in value to earning £0.09 per year in perpetuity.

Assuming a discount rate of 5% this implies that over a 20 year period each £1 invested in medical research would deliver a total return of £1.38. The value of the health care gains from medical research was therefore estimated by applying this multiplier to the total value of research undertaken in the Faculties of Health Science and Medicine.

[10] Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK, For the Medical Research Council, the Wellcome Trust and the Academy of Medical Sciences, November 2008
[11] Ibid.

16.9 Projects With Businesses and Skills with Business

Universities also support local businesses by providing consultancy services, supporting collaborative research and allowing businesses to use university facilities and equipment. These services support businesses by enabling them to undertake activity that they may not have the skills or facilities to undertake in-house.

It is reasonable to assume that the businesses that commissioned consultancy projects or paid to access facilities or equipment would only have done so if they expected these projects to generate positive returns. Detailed information about the level of these returns is not available for the University of Southampton's clients; however, an estimate can be made based on the findings of research from similar activity elsewhere.

BiGGAR Economics has evaluated the economic impact of several knowledge transfer initiatives around the UK[12]. These initiatives have covered a range of different types of engagement from small consultancy projects and access to university equipment and facilities through to company sponsored PhDs. The findings of these studies have shown that businesses investing in these types of activities receive an average direct return on investment of 360%. That is that every £1 invested by businesses generated £3.60 GVA in direct economic benefits.

The GVA impact of services provided to businesses by the University of Southampton for both projects with businesses and skills with businesses was therefore estimated by multiplying the amount spent by businesses on these services by £3.60. The employment impact was then estimated by dividing the direct GVA impact by GVA/employee in relevant sectors and the indirect effects were captured by applying appropriate multipliers.

16.10 Licensing

The starting point for calculating the impact generated by licensing activity is to consider the royalties or licence fees that the University of Southampton receives from licence holders; this reflects the value of the licence to the licence holder. However, as licence holders retain a proportion of the income generated by the licence this income only reflects a proportion of the total value of the technology. In order to estimate the full impact of the technology, we need to estimate how much turnover the licences generate within the license holding company.

The relationship between the royalty paid for a technology and the turnover it generates depends on the details of the licensing agreement and can vary considerably from company to company. In order to agree a licence, negotiators must first form a view of how much the IP is worth to the prospective licensee. There are a wide variety of variables that may inform this judgement but a training manual issued by the World Intellectual Property Organisation states that a common starting point is 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

[12] Most recently this has included an economic impact study on behalf of Interface, the organisation responsible for facilitating engagement between industry and Scotland's higher education institutions.

empirical study first undertaken in the 1950s and updated in 2002. The study found that royalty rates were typically around 25% of the licensee's profits, which equates to around 5% of sales from products embodying the patented technology. This implies that royalties paid for a technology typically represent around 5% of the total turnover generated by that technology.

By applying this to the amount of licence income received by the University in 2012/13, an estimate of the additional turnover that these technologies generated for licence holding businesses was estimated.

The employment supported by this turnover was estimated by dividing the additional turnover generated by an estimate of turnover per employee. The GVA of the licensing activity was estimated by multiplying employment by an estimate of GVA/employee.

16.11 Knowledge Transfer Partnerships

A strategic review of the KTP programme undertaken in 2010 found that on average, KTPs undertaken in South East England contributed £726,000 GVA to the UK economy, equivalent to an annual impact of £121,000 in the six years after the KTP is completed. It is assumed that the annual impacts for the duration of the project are only 10% of the impacts after the KTP has been completed, as the outputs of the knowledge exchange will not have been realised. The same study found that on average, each KTP project supports the creation of three jobs.

By multiplying the impacts from this strategic review by the number of KTP projects undertaken by the University it was possible to estimate the economic impact that the KTPs have in each area.

16.12 University of Southampton Science Park

University of Southampton provided data on the number of employees in the companies located there and the industries in which these businesses operated. Information was also provided for spin-outs and start-ups and these were excluded from the analysis.

The information about the remaining non spin-out and start-up tenants was used to estimate the level of employment in each of the sectors. The Direct GVA for the co-located businesses was estimated by using the GVA per employee for the appropriate sectors.

Using the appropriate industry multipliers for GVA and employment, then applying the regional multiplier adjuster for each of the study areas calculated the indirect impacts.

The assumption for how much of the activity on the Science Park is attributable to the University is based on previous experience and a survey of University of Southampton Science Park tenants. This assumption takes into account how much the companies have benefitted from being on the Science Park. In addition the assumption for attribution to the University also needs to account for how much of the activity is additional to the three study areas.

University of Southampton Science Park survey

An online survey was sent out to tenants and eleven tenants replied. While this is not a representative sample, this provides guidance on appropriate assumptions

to use to asses the activity that can be attributed to the University. The responses to the following questions are shown in the following figures.

Figure 16.1 – How important were the following factors in your organisation's decision to locate here?

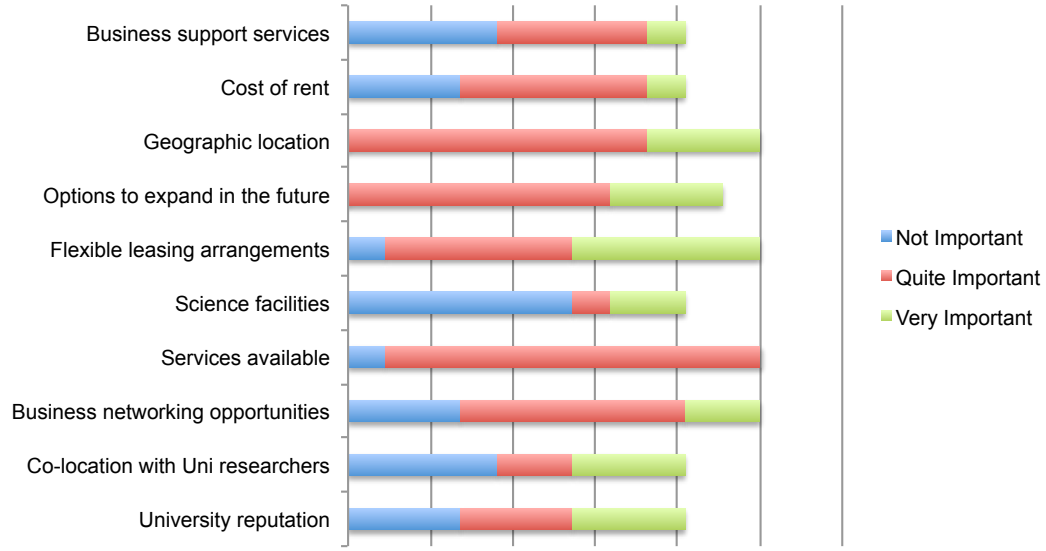


Figure 16.2 – If your business had not located here where would you have located?

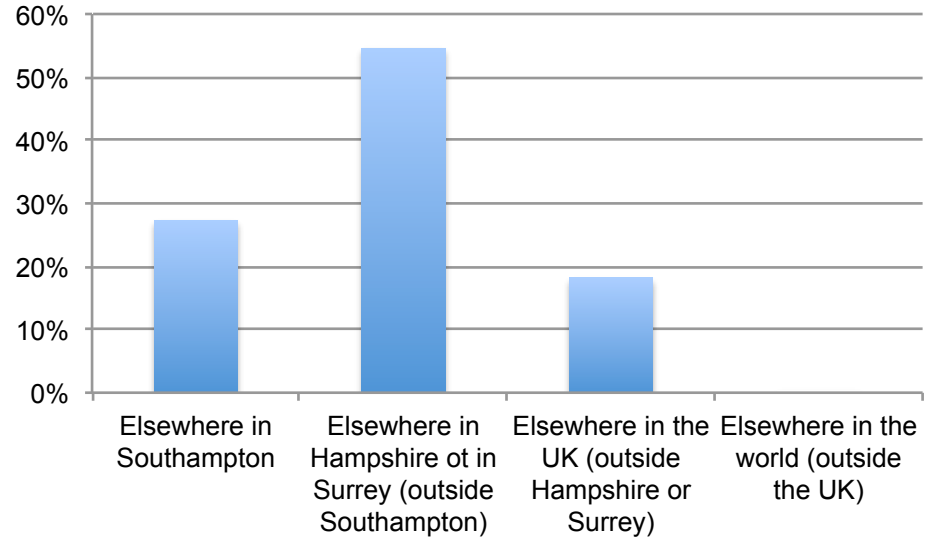
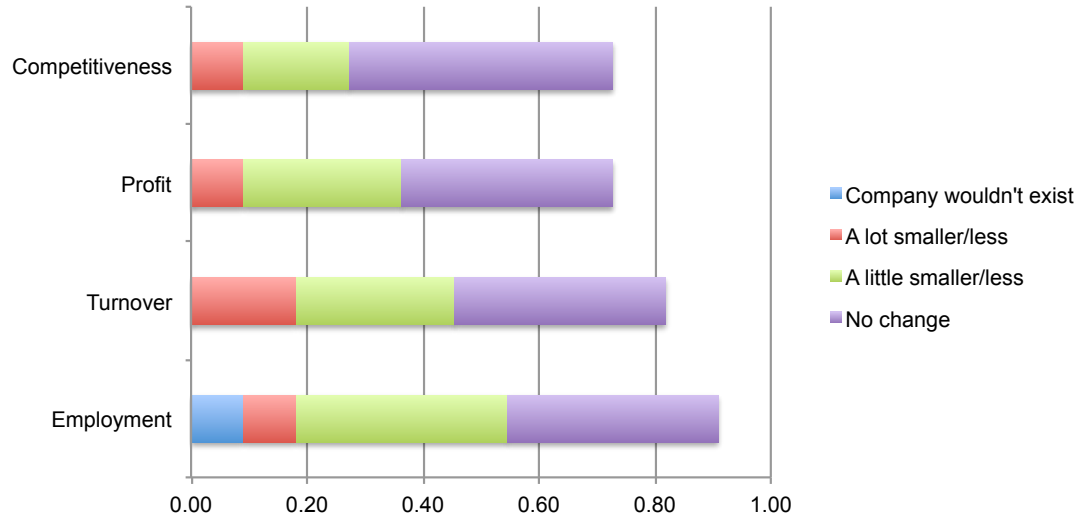


Figure 16.3 – If the Science Park and the University did not exist, would the following be different?



Based on this information it is assumed that 80% of the activity on the Science Park is additional to Southampton and attributable to the University, 50% of activity in the region and attributable to the University and 33% of the activity in the UK is additional to the UK and attributable to the University. Therefore this takes into account that at the UK level, many companies without the presence of the University of Southampton would have been located somewhere in the UK. However, their growth would be a little less without the benefits of being on the Science Park and being close to the research base.

16.13 Visits from Friends and Family

It is expected that friends and family who are not normally resident in the local area will visit staff and students of the university. These trips are referred to as visiting friends and relatives (VFR). The expenditure of these visitors generates GVA and supports jobs in the tourism sector.

The first step towards calculating this impact is to estimate the number of visits from friends and family that students and staff will receive. VisitEngland and ONS compile data on the number of VFR trips from domestic or from overseas visitors[13]. The number of domestic VFR trips per person is multiplied by the number of students and staff at the University to provide an estimate of the visits stimulated by the University.

The economic impacts of the spend from visitors to friends and family was estimated by using economic assumptions.

16.14 Open Day Visits, Conferences and Other Events

In 2012/13 the University of Southampton hosted a number of open days for prospective students, attracting around 39,300 people in total.

Most of the people who attend these events will purchase food and drink on the day but the vast majority of these purchases are made from catering outlets on

[13] VisitEngland North West Fact Sheet for 2010 and Office for National Statistics, *International Passenger Survey*

campus and have therefore already been counted as part of the core operational impacts. In addition to this however, many of the people who attend these events stay overnight somewhere in the local area. The expenditure of these visitors has not been captured elsewhere in this report and would not occur if the University of Southampton did not exist so is therefore included within this section.

Data published by Tourism South East shows that tourists from other parts of the UK who visit the South East spend an average of around £75 per night. Applying this to the number of overnight visitors who attend open days suggests that these events stimulate £1.1 million GVA in the local area each year.

In 2012/13 the University hosted a number of events such as the Distinguished Lectures Programme, attracting 2,350 attendees. The impact of this was estimated in a similar way to the impact of Open Days. It was assumed that a proportion of attendees would be from outwith Southampton. Data published by Tourism South East shows that day visitors from other parts of the UK who visit the South East spend an average of around £32 per day. Applying this to the number of visitors provides an estimated additional expenditure to which turnover to GVA ratios and multipliers were applied.

The University also hosted a number of residential conferences with 8,235 attendees in 2012/13. As these delegates would not otherwise have been in Southampton their expenditure is additional and attributable to the University. 4,235 of these attendees stayed in non-University accommodation. Data published by Tourism South East suggests that the average overnight expenditure of a UK based business tourist was £97.05. This was applied to the number of attendees in non-University accommodation to estimate the total additional spend. The remaining delegates stayed in University accommodation. This expenditure was captured as part of the direct impact and is therefore subtracted from the overnight spend before estimating the impact.

16.15 Arts Venues

The impact of people attending events hosted at the University's arts venues was estimated using data provided by the University on the number of attendees and the proportion of these attendees from each of the study area. It was assumed that visitors from the Regional Area and the rest of the UK were additional, as if the University did not exist these visitors would not have been in the area. The expenditure of these visitors is therefore additional and is estimated by applying data from Tourism South East which indicates that that day visitors from other parts of the UK who visit the South East spend an average of around £32 per day.

The operational impact of Nuffield Theatre is based on its Annual Financial Report 2012/13. This impact includes the impact from the Theatre's direct activities (income generated and jobs supported) as well as the impact from the purchase of supplies and the impact of staff spending their wages.