

BiGGAR Economics

Economic Impact of the Capital Investment Plans of the Russell Group Universities

A final report to
The Russell Group of Universities

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1 EXECUTIVE SUMMARY

This study assesses the economic contribution that capital investment by Russell Group universities between 2012-13 and 2016-17 will make to the UK economy. The key findings of the report are that:

- **over a 25 year period capital investment by Russell Group universities is expected to generate gross value added (GVA) with a current value of £44.3 billion for the UK economy.** This includes £8.2 billion of short-term impacts relating to construction and fit-out, £10.1 billion longer-term operational benefits and £26.0 billion of wider catalytic impacts stimulated by the activities undertaken in the new facilities;
- **these projects are expected to support more than 98,500 UK jobs.** This will include around 37,800 temporary jobs during the five-year construction period, around 45,000 permanent operational jobs and almost 15,700 permanent jobs supported by the wider catalytic impact of the activity undertaken in the new facilities; and
- **overall these projects are expected to generate £4.89 GVA for the UK economy for every £1 invested.**

1.1 Scale of Investment

The Russell Group represents 24 leading UK universities, which together account for almost a quarter of all students studying in UK universities. Taken together these universities support more than 270,000 jobs and account for more than two-thirds of the UK's very best ("world leading") research.

Russell Group universities have a substantial global reach, attracting around a third of the international students studying in the UK and around a third of non-UK nationality staff. The world leading position of Russell Group universities is also recognised in several important global quality rankings. In order to maintain this competitive position, it is essential that Russell Group universities continue to invest in high-quality facilities that will deliver the kind of student experience and research environment expected of world-class universities.

To do this, **Russell Group universities plan to spend in excess of £9 billion on capital investment projects over the five-year period to 2016-17.** This is comparable in value to the rail investment programme announced by the UK Government in 2012 that was described by Deputy Prime Minister Nick Clegg as *"the biggest expansion in railways in over 150 years."* It is also comparable to the £8.9 billion that was reportedly spent hosting the 2012 Olympics in London¹.

1.2 Approach

The capital investment plans of Russell Group Universities cover a wide variety of different types of project from new libraries and student accommodation to major urban regeneration projects and world-leading medical research facilities. The impacts generated by these projects will therefore be extremely diverse and not always readily quantifiable.

¹ The Guardian (23rd October 2012), London 2012 Olympics will cost a total of £8.921 billion, says minister.

This report has quantified impacts wherever possible. This was done by inputting data provided by Russell Group universities about 69 different projects into a specially developed economic model. The model draws on BiGGAR Economics extensive experience of assessing the impact of capital investment by more than a dozen universities across the UK and Europe. Each of the three main types of impact was then scaled up to capture the total impact of the whole capital investment programme. As the report considers a 25 year time-scale, all impacts are presented in current values.

Although this report seeks to quantify impacts where ever possible, it also highlights the equally – if not more - important unquantifiable impacts associated with the capital investment of the Russell Group universities.

1.3 Maintaining a World-Class Asset

Perhaps the most important unquantifiable impact of the Russell Group universities capital expenditure will be the role that it will play in maintaining the future competitiveness of the UK knowledge base.

The recent Heseltine report that explored how to create wealth in the UK economy identified the UK's knowledge base as a “priceless national asset” and a “source of international competitive advantage”. The Russell Group of universities represent a substantial proportion of this knowledge base therefore investment that supports the competitive position of Russell Group universities will directly support the future growth of the UK economy.

Russell Group universities compete globally for students and staff. In order to continue to attract and retain the best students and staff, it is essential that the universities are able to offer world-class research and learning environments. The capital projects considered in this report will enable them to do this. The capital investment considered in this report will also help to ensure that the students and staff at Russell Group universities are able to achieve their full potential during their time at university.

1.4 Quantifiable Impacts

This report considers three main types of quantifiable economic impact:

- **Short-term capital investment impacts** generated by the capital expenditure;
- **Longer-term operational impacts** related to the activities that will take place in the new buildings and facilities; and
- **Long-term catalytic impacts** that occur because the university is able to expand its current activities or to do something new or differently because of the new facilities.

1.4.1 Short-term Capital Investment Impacts

The short-term capital investment impacts considered include:

- **direct construction impacts** - direct impacts on the UK construction sector, associated with capital investment in new or refurbished buildings. The current value of these impacts is estimated at £2.7 million GVA and around 11,680 jobs;

- **indirect construction impacts** - indirect impacts arising from the expenditure of the companies involved in delivering the construction project on supplies and the expenditure of employees whose jobs are supported by the project. The current value of these impacts is estimated at £4.7 billion GVA and around 22,790 jobs;
- **direct equipment impacts** - direct impacts on UK based businesses that supply equipment for the new facilities. The current value of these impacts is estimated at £417 million GVA and around 1,830 jobs; and
- **indirect equipment impacts** - indirect impacts arising from the expenditure of the companies involved in supplying equipment for the new facilities and the expenditure of employees whose jobs are supported by the project. The current value of these impacts is estimated at £396 million GVA and around 1,540 jobs.

1.4.2 Longer-term Operational Impacts

The operational impacts of the specific projects considered in this report include:

- **direct operational impacts** - the direct effect of any additional income generated and/or employment supported by each project. The current value of these impacts is estimated at £2.5 million GVA and around 8,870 jobs;
- **operational supply chain impacts** - benefits to the suppliers of bought-in goods and services required to operate the new facilities. The current value of these impacts is estimated at £212 million GVA and 740 jobs;
- **student impacts** - impacts associated with additional students based in the new facilities. The current value of these impacts is estimated at £2.7 billion GVA and around 15,360 jobs;
- **staff spending impacts** – effect of expenditure by additional staff based in the new facilities. The current value of these impacts is estimated at £497 million GVA and around 1,770 jobs; and
- **operational cost savings** - savings realised as a result of the capital investment projects, for example in reduced heating costs. The current value of these impacts is estimated at £76 million GVA.

The operational impacts of the 69 projects were then scaled up in order to estimate that the current value of the operational impact for the whole capital investment programme will amount to £10.1 billion GVA and around 50,000 jobs.

1.4.3 Longer-term Catalytic Impacts

The catalytic impacts of the specific projects considered in this report include:

- **graduate productivity** – the quality of education provided by Russell Group universities is designed to enhance the employability and productivity of graduates and enhance their future earning potential. This enhances the quality of the UK workforce, which benefits for the UK economy. The current value of these impacts is estimated at £11.5 billion GVA;
- **medical research** – the returns to medical research are particularly high so new medical research facilities will generate significant economic benefits. The current value of these impacts is estimated at £1.2 billion GVA;

- **commercialisation and innovation** – projects designed to increase engagement between industry and academia and facilitate knowledge transfer will enable Russell Group universities to undertake more commercialisation activity. This will lead to new licence agreements, start-ups and spin-outs, which all generate impact for the UK economy. The current value of these impacts is estimated at £2.1 billion GVA and around 5,700 jobs;
- **enhanced research competitiveness** – some of the projects considered in this report are designed to enable the universities concerned to attract and retain the best researchers from around the world. Doing this will help the universities to attract additional research funding and maintain their research competitiveness in relation to other leading universities around the world. The current value of these impacts is estimated at £639 million GVA and around 1,950 jobs;
- **tourism** – the students and staff based in the new facilities will be visited by friends and family during their time at the university. These expenditure of these visitors will generate benefits for the tourism sector. The current value of these impacts is estimated at 23 million GVA and around 90 jobs; and
- **improved learning environment** – many of the projects considered in this report (e.g. new libraries, teaching facilities and student accommodation) are designed to improve the learning environment for students. This will help Russell Group universities to attract new students, enabling them to maintain their competitive position in relation to other top universities around the world. The current value of these impacts is estimated at £283 million GVA and around 1,770 jobs.

The catalytic impacts of the 69 projects were then scaled up in order to estimate that the current value of the catalytic impact for the whole capital investment programme will amount to £26.0 billion GVA and around 15,690 jobs.

1.5 Conclusions

The key conclusion of this study is that the capital investment of Russell Group universities will not only generate a substantial economic impact for the UK economy but will also help to underpin the long-term competitiveness of the UK higher education sector.

This is because the market for higher education is highly competitive so in order to continue to attract and retain the best students and staff it is essential that Russell Group universities are able to provide learning environments and research facilities that are truly world-class. The projects described in this report will help them to do this and enable them to continue to be a priceless national asset and a source of international competitive advantage.

2 INTRODUCTION

This report presents the findings of an economic impact study undertaken by BiGGAR Economics on behalf of the Russell Group to assess the economic impacts of members’ capital investment plans.

2.1 The Russell Group

The Russell Group represents 24 leading UK universities, which together account for almost a quarter of all students studying in UK universities (see Table 2-1). Taken together these universities support more than 270,000 jobs and account for more than two-thirds of the UK’s very best (“world leading”) research. Graduates from Russell Group universities also typically earn more than graduates from modern universities² (16% for male graduates and 9% for female graduates).

Table 2-1 - Russell Group as % of total UK higher education

	Student Numbers		
	Under-graduates	Post-graduates	Total
Russell Group	393,035	182,040	577,525
Total UK	1,928,140	568,505	2,551,065
Russell Group as % of UK	20%	32%	23%

Source: HESA (2011-12)

Russell Group universities have a significant global reach, attracting around a third of the international students studying in the UK and around a third of non-UK nationality staff. The world-leading position of Russell Group universities is recognised in several important global quality rankings. Ten Russell Group universities feature in the Times Higher top 100 world universities, nine feature in the top 100 in the Academic Ranking of World Universities and 17 are included in the QS World University Rankings.

In order to maintain their competitive position, it is essential that Russell Group universities continue to invest in high-quality facilities that will deliver the kind of student experience and research environment expected of world-class universities. To do this, Russell Group universities plan to spend in excess of £9 billion on capital investment projects over the five-year period to 2016-17.

This level of investment is expected to deliver significant economic impacts to the UK economy. This study considers what these impacts will be on the UK economy as a whole and in:

- The devolved nations
- North of England
- Midlands
- South of England; and
- London

² Department for Business Innovation and Skills (August 2013), The impact of university degrees on the lifecycle of earnings: some further analysis.

Table 2-2 shows which institutions have been included in each of these areas.

Table 2-2 – Location of Russell Group Institutions

Location	Institutions		
North of England	Durham University	Devolved Nations	University of Edinburgh
	Newcastle University		University of Glasgow
	University of Liverpool		University of Cardiff
	University of Manchester		Queen’s University Belfast
	University of Leeds	Midlands	University of Nottingham
	University of Sheffield		University of Birmingham
	York University		University of Warwick
South of England	University of Cambridge	London	Imperial College London
	University of Bristol		Queen Mary
	University of Exeter		King’s College London
	University of Oxford		London School of Economics
	University of Southampton		University College London

2.2 Study Objectives

The objective of this study was to assess, and where possible quantify, the economic impact of the capital investment plans of Russell Group universities over a five-year period. The study considers three main types of impact:

- short-term construction impacts arising directly from the capital investment;
- longer-term direct operational impacts associated with the activity that will take place in the new facilities; and
- wider catalytic impacts elsewhere in the economy that are made possible because of the new facilities (e.g. impacts on industry or society).

The study considers impacts at the level of the UK economy as a whole and for the regions and countries in which Russell Group universities operate.

2.3 Report Structure

The remainder of this report is structured as follows:

- Chapter three describes the type of projects included within the Russell Group universities investment plans and summarises the scale of this investment for each country/region of the UK;
- Chapter four describes the various impacts generated by capital investment and explains how capital investment underpins the competitiveness of Russell Group universities;
- Chapter five explains the approach used to calculate each of the impacts considered in this report;
- Chapter six quantifies the direct short-term capital investment impacts associated with Russell Group universities direct expenditure on construction projects and equipment and the indirect effects of this expenditure;
- Chapter seven quantifies the direct operational impacts associated with activities undertaken in each of the new facilities. This includes the benefits to the suppliers of bought-in goods and services required to operate the new facilities, the expenditure of additional staff and students based in the new or refurbished buildings and any cost savings generated by the projects;
- Chapter eight assesses the wider catalytic impacts made possible by the investments. This includes impacts associated with additional students, research and commercialisation activity as well as the enhanced earnings potential of graduates, tourism expenditure by friends and relatives who visit staff and students based in the new facilities and returns to medical research undertaken in the new facilities;
- Chapter nine provides a break-down of the economic impacts by type of project;
- Chapter ten breaks the impact down by location; and
- Chapter eleven summarises the impacts and presents the conclusions of the report.

3 RUSSELL GROUP CAPITAL INVESTMENT PLANS

Between 2012-13 and 2016-17 Russell Group universities plan to spend over £9 billion on capital investment projects. Some of this expenditure will be funded directly by the universities themselves, either by drawing on their own capital reserves or through borrowing and other capital instruments such as bonds. The remainder of the expenditure will be funded from a variety of different public, private and third sector sources within the UK and overseas including businesses, charities and research councils.

This is equivalent in scale to railway investment programme for England and Wales that was announced by the UK Government in 2012, described at the time by Deputy Prime Minister Nick Clegg as *“the biggest expansion in railways in over 150 years.”*³

In order to assess the impact of this investment, each Russell Group university was asked to provide more detailed information about particularly significant projects.

3.1 Types of Investment

Information was received about 67 individual projects, with a combined investment value of £3.8 billion. These projects fall into 11 broad categories, each of which is described below:

- **Major development** – Seven of the projects considered are part of major development projects designed to create new mixed used areas. Each of the projects covers a variety of academic, residential and commercial uses. The total capital value of these investments is £1.3 billion and the average capital value of each project is almost £181 million.
- **STEM Facilities** – 17 of the projects considered will provide new teaching and research facilities for subjects in science, technology, engineering and maths. The total capital value of these investments is £768 million and the average capital value of these projects is more than £45 million.
- **Medical research facilities** – 12 of the projects considered will provide new medical research facilities. These facilities cover the full spectrum of medical research from exploratory lab-based research to applied work undertaken in collaboration with hospitals. The total capital value of these investments is £406 million and the average value of these projects is almost £34 million.
- **Student Accommodation** – Four of the projects considered will provide new or refurbished student accommodation. The total capital value of these investments is £367 million and the average capital value of these projects is almost £92 million.
- **Sports, social and cultural facilities** – Six of the projects considered will provide new facilities such sports centres, student unions and arts centres. These facilities are intended to enhance the student experience and enable the institutions concerned to maintain their competitive position in relation to other leading universities the world. Some of the facilities will also be available to the general public. The total capital value of these investments is

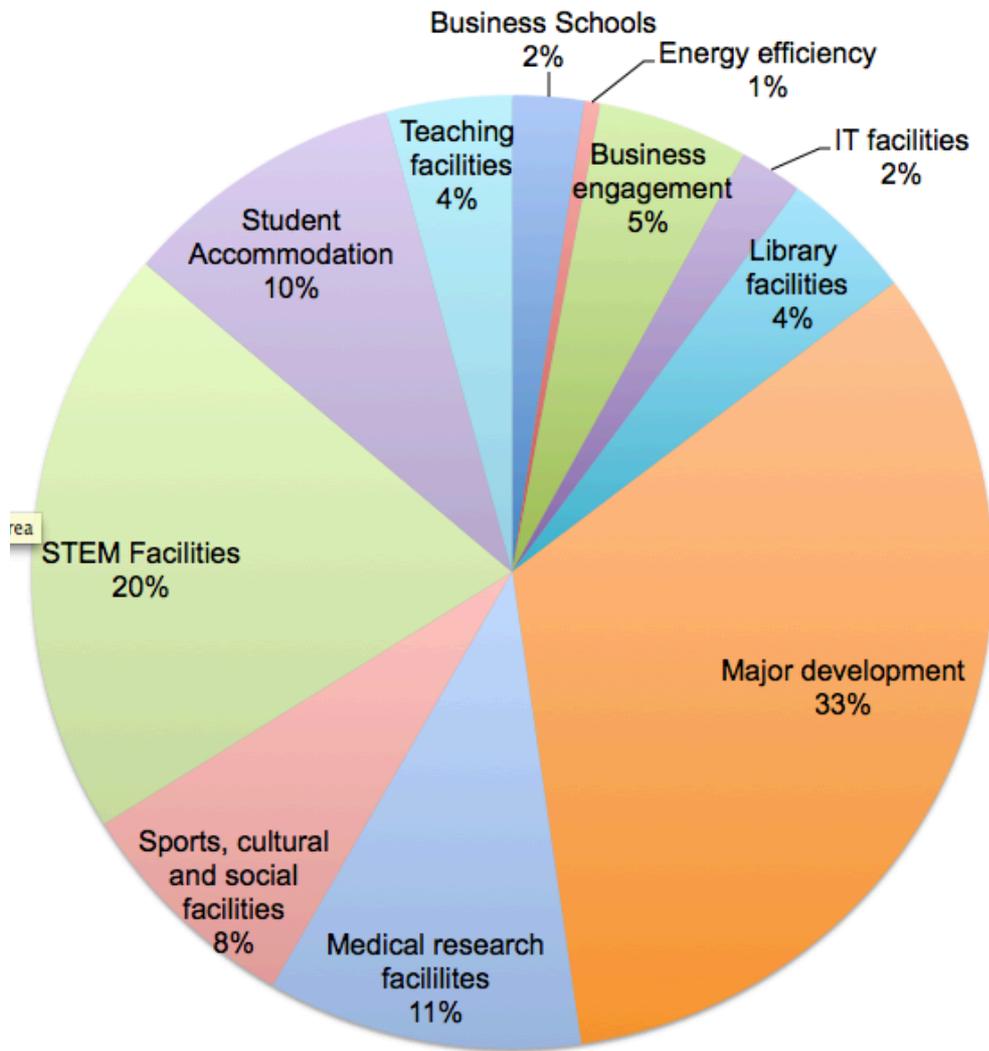
³ Global Rail News (July 2012), coalition announces £9 billion rail investment.

£300 million and the average capital value of these projects is almost £50 million.

- **Business engagement** - Two of the projects considered are designed to facilitate engagement between industry and academia. Both projects are large-scale, campus style projects designed to create a mix of learning, research and industrial space for specific sectors. Close collaboration with industry is at the heart of both projects and this will be achieved through co-location with relevant new and existing businesses. The total capital value of these investments is £194 million and the average capital value of these projects is £97 million.
- **Library facilities** – Three of the projects considered will provide new or refurbished libraries. Each of these projects is designed to provide facilities to support modern learning styles, which will directly improve student experience and help the institutions to maintain their competitive position in relation to other top performing universities. The total capital value of these investments is £172 million and the average value of these projects is around £57 million.
- **Teaching facilities** – Six of the projects considered will provide new or refurbished teaching facilities for other subject areas. The total capital value of these investments is £162 million and the average capital value of these projects is almost £27 million.
- **Business Schools** - Four of the projects considered involved developing new or refurbished facilities for business schools. A key objective for each of the projects is to create a high-quality learning environment that will appeal to students in the competitive international market for executive business education. The total capital value of these investments is £93 million and the average capital value of these projects is £23 million.
- **IT facilities** - Four of the projects considered will provide member institutions with enhanced IT facilities. These projects are intended to help maintain the competitive position of the institutions concerned by providing students and researchers with the kind of computing capabilities expected of leading universities. The total capital value of these investments is £81 million and the average value of these projects is around £20 million.
- **Energy efficiency** - Two of the projects are to upgrade member institution's heating infrastructure. These projects are expected to reduce the cost of energy to the institutions concerned at the same time as reducing carbon emissions. The total capital value of these investments is £20 million and the average capital value of these projects is £10 million.

A breakdown of the projects by value is provided in Figure 3-1.

Figure 3-1 – Value of capital investment by type of project

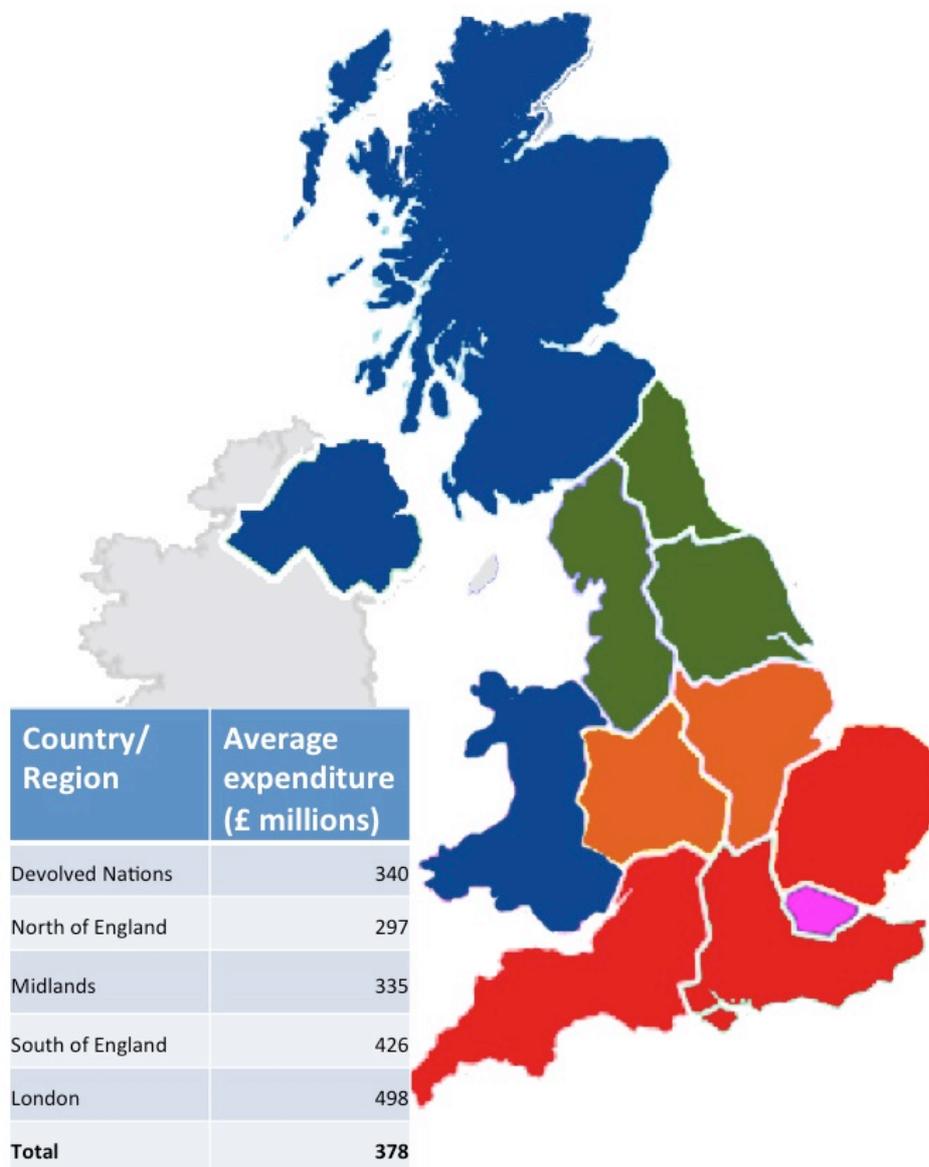


3.2 Location of Investment

A breakdown of the total value of capital spending of Russell Group universities by country or region is provided in Figure 3-2. The table to the left of this figure provides the average capital expenditure per institution in each country or region.

This shows that the average capital expenditure of Russell Group universities is £378 million. This average is highest for institutions in London and lowest for institutions in the North of England.

Figure 3-2 – Value of capital investment by location



4 HOW ECONOMIC IMPACT IS GENERATED

The key economic impact of the Russell Group universities' capital projects is the role they play in maintaining and enhancing the UK's competitiveness and growth. This is a complex role, which means that the economic impact of capital projects can be difficult to fully capture.

This chapter discusses how capital projects generate economic activity but it is important to remember that not all of this impact can be fully quantified. In order to give a sense of the magnitude of the impact of the Russell Group universities' capital projects this report therefore focuses on those impacts that can be quantified. These impacts can be grouped into three types of impact: short-term construction impacts, on-going operational impacts and longer-term catalytic impacts. This section introduces these three types.

4.1 Generating Economic Impact

4.1.1 World Class Asset

Universities are recognised as being key to the future of the UK's growth and competitiveness. In March 2012 Lord Heseltine published a report that looked at how the UK might more effectively create wealth in the UK⁴. This described the UK's universities as a priceless national asset, and a source of international competitive advantage.

In October 2013 Sir Andrew Witty published the conclusions of his review of the role that UK universities play in stimulating economic growth⁵. This review found that UK universities *"have extraordinary potential to enhance economic growth"* and explicitly acknowledged the importance of developing new infrastructure to help maximise university/business interactions and economic outcomes.

Also in 2012, Professor Sir Tim Wilson reviewed the collaboration between business and universities⁶, finding that the economic and social prosperity of the UK depends upon a healthy knowledge-based economy and that the UK university sector has the capability to be the source of strength in the UK's knowledge based economy of the twenty first century. This is because universities form an integral part of the skills and innovation supply chain for business.

For universities to have the capability to provide the necessary skills and innovation and maintain this important national asset, it is essential that the right infrastructure is in place.

4.1.2 Building Capabilities

Capital projects are the starting point for the creating the right infrastructure for the Russell Group universities to carry out their core tasks of teaching and undertaking research at a globally competitive level. The provision of physical facilities helps to create an environment where high quality human capital can be accumulated.

⁴ The Rt Hon the Lord Heseltine of Thenford CH (October 2012), "No Stone Unturned in pursuit of Growth"

⁵ Witty (October 2013), Encouraging a British Invention Revolution: Sir Andrew Witty's Review of Universities and Growth

⁶ Professor Sir Tim Wilson DL (February 2012), "A Review of Business-University Collaboration"

The Russell Group universities compete globally for the best staff and students, therefore they will need to provide world-class facilities for them to live and work in. Russell Group universities are also competing internationally for collaborative research funding. For example, competitiveness in securing funding from Horizon 2020, the European Union's €70 billion programme for research and innovation is based on academic partnership with industry. Global corporations are also carrying out more of their basic research externally. In order to showcase their work to potential partners, the universities require world-leading facilities.

Collaborations with partners also have the potential to be converted into inward investment but this can only be realised by providing partners with high quality facilities to locate in. For example Imperial College's project, the Imperial West Technology Campus will create a university campus that will invite potential partners from business, industry, the NHS and other global universities to co-locate on the campus and collaborate directly with Imperial College.

Investment in physical infrastructure not only enables universities to attract and retain high quality staff and students, it also helps these people to be more productive, for example by providing high quality ICT infrastructure. Productivity will also be enhanced by making the university as a whole more productive by creating cost savings through capital projects relating to energy efficiency.

Productivity will also be enhanced because the capital projects will help to create an environment that will foster innovation. Many of the capital projects are designed to create space for innovation by physically bringing people together. This is essential to enabling dialogue, which leads to an exchange of ideas and a widening of perspective. Capital projects create this environment for collaboration in three main ways, for example:

- unifying departments – Queens University Belfast's Biological Sciences Building will enable it to consolidate its School of Biological Sciences onto a single site;
- co-locating different departments together – an example of this is the building for the University of Cambridge's Department of Chemical Engineering and Biotechnology, required to fully realise the benefits of merging the two departments, enabling them to effectively collaborate with each other; and
- co-locating with external organisations – for example the University of Edinburgh's Brain and Body Institute will be located at the Edinburgh BioQuarter which has already co-located most of the University of Edinburgh's medical teaching and research with a teaching hospital and a science park.

Physical co-location can be an effective way of encouraging dialogue within a research area, across disciplines and between academia and industry. This is reflected in the *Evaluation of Research Capital Funding to Higher Education Institutions*.⁷ This report found that research infrastructure (i.e. buildings in which research is undertaken and the equipment within these buildings) had a major impact through the opening up of new research areas, increasing collaborative and multidisciplinary work, and increasing engagement with external organisations.

Such investments enable Russell Group universities to undertake activities that will maintain their status as a world-class asset. An example of the economic

⁷ PACEC "Evaluation of Research Capital Funding (SRIF2006-08) to Higher Education Institutions 2006-2008"

growth supported by long-term capital investment is the University of Oxford's Medical Sciences Division, which is located on a joint University Hospital campus that has seen £550 million of capital investment in the last ten years. The result of this has been:

- an increase of 30% over four years in the Division's total annual income;
- clinical medical research activity than doubled over five years;
- student numbers have doubled since 2000;
- the University-Hospital partnership has attracted more than £1.4 billion in external research funding since 2006;
- industrial collaborations with over 140 that have attracted £178 million in research funding; and
- £350 million has been invested in hospital buildings.

4.1.3 UK Growth and Competitiveness

The Evaluation of Research Capital Funding referred to in the previous section found that buildings had a catalytic effect by helping universities to attract and retain high calibre staff. This enabled universities to achieve a critical mass of research excellence and enabled them to secure further research grants and contracts. The report also found that high quality infrastructure appeared to be a driver of the wider competitiveness of the UK's research base.

These catalytic impacts are impacts that occur at the institutional level but by maintaining universities as world-class assets this also helps to maintain UK growth and competitiveness. There are also catalytic impacts on the wider economy as the skills and knowledge produced by the universities support world leading sectors and globally competitive businesses.

The previous section discussed how world-leading universities attract inward investment by businesses that are keen to co-locate with them but this academic expertise also supports the growth of domestic businesses. This occurs because universities provides existing businesses with the knowledge and skills to innovate and develop new products and processes and also helps to create new businesses through the commercialisation of intellectual property. This activity helps to maintain and develop world-leading sectors.

The impact of this is hard to measure. For example Southampton is already the home to the UK's largest maritime cluster so it is important to capitalise on this strength and continue to grow marine industries. The importance of this to the UK economy is huge as the marine industry has the potential to grow by £8 billion and be worth £25 billion by 2020⁸. The announcement of the Government's growth plan for this industry cited the University of Southampton's Boldwood project, the largest university and business partnership of its kind in the UK, and designed to support the maritime cluster. While it seems clear that the University of Southampton's capital project is an important contributor to securing this £8 billion growth, it is not possible to attribute how much of this is due to the project.

Another example is Newcastle University's Science Central, which will provide incubator space for science and innovation focused start-ups and office space for

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

businesses to co-locate with the University. Together this will develop Newcastle's existing scientific expertise in biomedicine and ageing and healthcare into world leading sectors. Ultimately Science Central will attract private sector investment of £380 million and 1,900 jobs.

Some of these projects are of such a large scale that they will have a significant impact on the cityscape and be a driver for regeneration and development. For example Newcastle University's Science Central is being built on a 24 acre former Scottish and Newcastle brewery site. This would have a catalytic impact as the expenditure on local services, goods and entertainments would stimulate other businesses to locate and growth and therefore increase the attractiveness and vibrancy of the area. In addition the buildings will provide a mix of uses and opportunities to the local communities.

Smaller projects will also improve the cityscape as universities are often a core part of their host cities and improvements to the universities' physical structure will improve the cities. This will make the cities more attractive places to live. It will also attract visitors and make these places competitive places for inward investment.

4.1.4 Overall Impacts

This report seeks to quantify the additional economic impact that will be generated for the UK economy as a result of the capital investment programmes of Russell Group universities. It is however important to note that not all of the impact that will be generated by these projects can be quantified. As discussed above for example, capital investment by universities can greatly enhance the host city's ability to attract inward investment but the value of this is not something that can be accurately quantified.

It is also important to note that this report measures only the additional impact generated by planned capital investment. It does not attempt to quantify the economic impact that would be lost to the UK if the competitive position of the Russell Group universities were to decline due to a lack of such investment.

For the reasons discussed in this chapter, a high quality physical environment is critical to maintaining the global competitiveness of Russell Group universities. International competition between leading universities is however very fierce so if this investment does not occur, the competitive position of Russell Group universities will decline over time as institutions in competing nations continue to enhance their capabilities.

For example at present 75% of the UK's educational export income comes from international students studying in the UK. This income was worth £17.5 billion to the UK economy in 2011⁹ but competition for international students from leading universities elsewhere in the world is intensifying. This means that unless UK universities continue to invest in the learning experience they can provide then the UK's competitiveness in this area will start to decline.

The total economic impact of the Russell Group universities capital investment plans therefore includes:

- additional quantifiable impacts;
- additional unquantifiable impacts; and

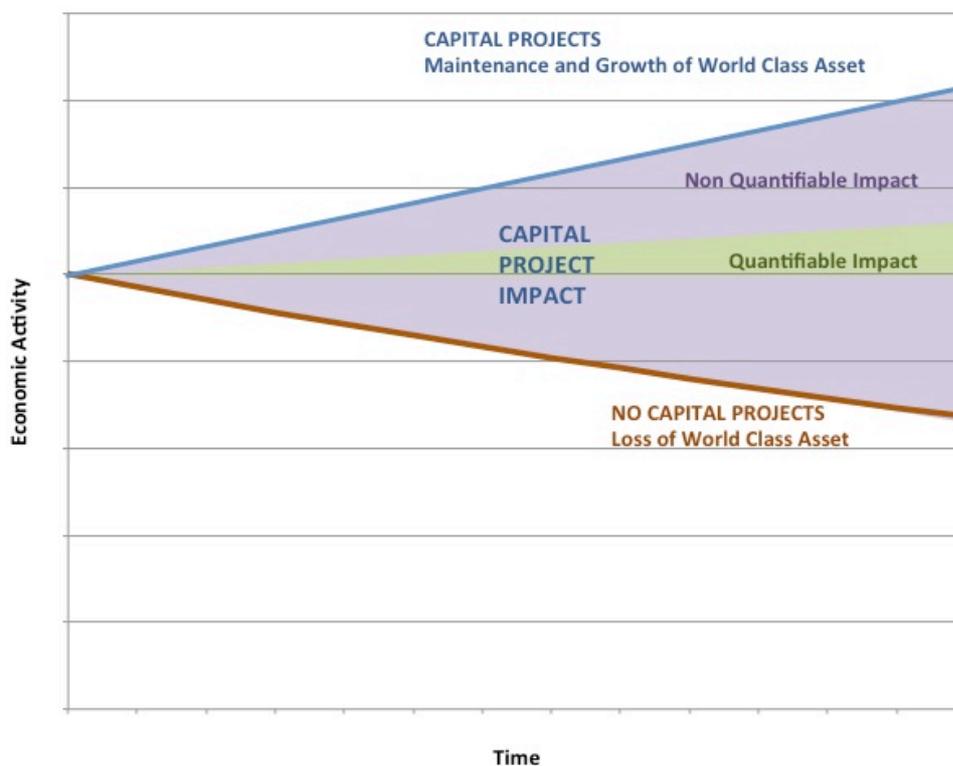
⁹ HM Government "International Education: Global Growth and Prosperity" (July 2013)

- impacts retained as a result of maintaining the universities competitiveness in relation to other universities around the world.

It is only possible to accurately quantify the first of these impacts therefore this report focuses only on these impacts. The difference between these types of impact is illustrated in Figure 4-1.

The green area represents the impacts that are quantified in this report. The area above the green area and the blue line represents the additional impacts that cannot be quantified and the area between the green area and the red line represents the impacts that are protected as a result of maintaining the competitive position of the Russell Group universities.

Figure 4-1 – Impact of capital investment



Source: BiGGAR Economics

4.1.5 Unquantifiable Impacts

There are a number of benefits that are difficult to capture in monetary terms. Examples include:

- it is not just the number of staff and students which drive economic activity but the quality of staff and students. Some of this has been captured through estimating the impacts of staff and student outputs such as increased commercialisation impacts but not all of these impacts have monetary value or have impacts that can be easily quantified;
- education exports bring a number of indirect benefits, including strengthening the quality and reputation of the UK education sector and promoting the English language and British culture;

- the University of Oxford's New Bodleian project will provide protection to the University of Oxford great collection of manuscripts and archives which are an integral part of UK history, such as four of the surviving copies of Magna Carta, two Shakespeare First Folios, the original manuscript of Frankenstein, the papers of six British Prime Ministers and more than 10,000 medieval manuscripts;
- quality of life is difficult to measure even in qualitative terms. Capital projects support jobs, improvement in health, improvement in the environment and improvement in places to live and work which are all key components of well-being.

The shorter and more direct the impact of capital projects the better it can be captured quantitatively:

- the impact of the construction of capital projects can be fully estimated;
- most of the operational impacts of the new or refurbished facilities can be estimated although impacts such as improvements to the universities' reputation and brand are difficult to cover fully; and
- the wider catalytic impacts of the capital projects on the universities and the wider economy is harder to capture quantitatively; however, this report captures a proportion of these impacts, in particular, those relating to the effects of increasing the competitiveness of the universities.

4.2 Types of Impact that Can Be Quantified

4.2.1 Capital Investment Impacts

Each of the projects considered in this report will generate short-term capital investment impacts including:

- **direct construction impacts** - direct impacts on the UK construction sector, associated with capital investment in new or refurbished buildings;
- **indirect construction impacts** - indirect impacts arising from the expenditure of the companies involved in delivering the construction project on supplies and the expenditure of employees whose jobs are supported by the project;
- **direct equipment impacts** - direct impacts on UK based businesses that supply equipment for the new facilities; and
- **indirect equipment impacts** - indirect impacts arising from the expenditure of the companies involved in supplying equipment for the new facilities and the expenditure of employees whose jobs are supported by the project.

4.2.2 Operational Impacts

After the construction phase is completed, each project will then begin generating operational impacts, associated with the day-to-day activities undertaken inside the new building. Operational impacts include:

- **direct operational impacts** - the direct effect of any additional income generated and/or employment supported by each project;
- **operational supply chain impacts** - benefits to the suppliers of bought-in goods and services required to operate the new facilities;

- **student impacts** - impacts associated with additional students based in the new facilities;
- **staff spending impacts** – effect of expenditure by additional staff based in the new facilities; and
- **operational cost savings** - savings realised as a result of the capital investment projects, for example in reduced heating costs.

4.2.3 Catalytic Impacts

The third and potentially most significant category of impacts will be the wider catalytic impacts generated because the university is able to expand its current activities or do something new or differently because of the new facilities created. These impacts vary from project to project. Some of these impacts can be quantified, however most cannot. The impacts that can be quantified include those generated by:

- **graduate productivity** – the quality of education provided by Russell Group universities is designed to enhance the employability and productivity of graduates and enhance their future earning potential. This enhances the quality of the UK workforce, which benefits for the UK economy;
- **medical research** – the returns to medical research are particularly high so new medical research facilities will generate significant economic benefits;
- **commercialisation and innovation** – projects designed to increase engagement between industry and academia and facilitate knowledge transfer will enable Russell Group universities to undertake more commercialisation activity. This will lead to new licence agreements, start-ups and spin-outs, all of which generate impact for the UK economy;
- **enhanced research competitiveness** – some of the projects considered in this report are designed to enable the universities concerned to attract and retain the best researchers from around the world. Doing this will help the universities to attract additional research funding and maintain their research competitiveness in relation to other leading universities around the world;
- **tourism** – the students and staff based in the new facilities will be visited by friends and family during their time at the university. These expenditure of these visitors will generate benefits for the tourism sector;
- **improved learning environment** – many of the projects considered in this report (e.g. new libraries, teaching facilities and student accommodation) are designed to improve the learning environment for students. This will help Russell Group universities to attract new students, enabling them to maintain their competitive position in relation to other top universities around the world.

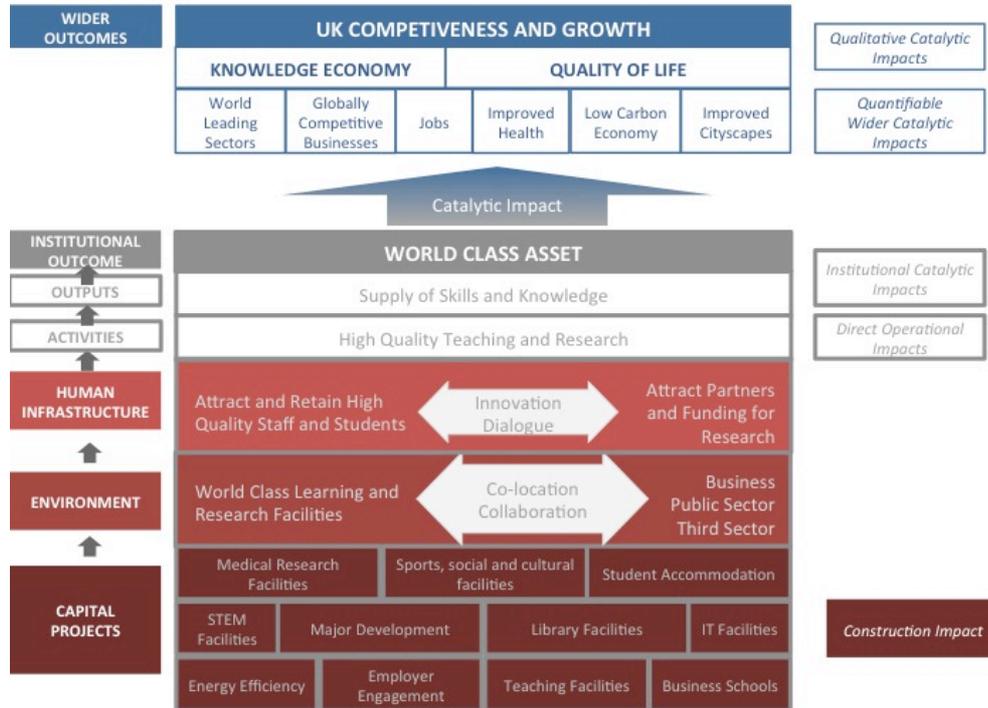
4.3 Sources and Nature of Impacts

Capital investment is critical to maintaining the global competitiveness of Russell Group universities' for two key reasons:

- it enables the universities to attract and retain the best staff and students; and
- it enhances the productivity of students and staff while they are at the university.

This chapter has discussed the various ways in which this is achieved. Figure 4-2 summarises this by showing how capital projects provide the environment necessary for accumulating human capital, which maintains the Russell Group universities' status as a world-class asset for the UK.

Figure 4-2 – How economic impact is generated by capital investment



5 APPROACH AND METHODOLOGY

5.1 Approach

At the start of this study, each of the 24 Russell Group universities was invited to provide information about their capital investment plans. Each institution was asked to provide information about the total amount of capital investment planned between 2012-13 and 2016-17 and more detailed information about key projects.

The starting point for estimating the economic impact of these projects was to review the information provided in order to identify which of the impacts described in chapter 4 might be relevant to each project. The next step was to identify whether the information provided included details about the key drivers of each of the relevant impacts (e.g. additional student numbers or research funding). If information about the impact drivers was provided then it was used to calculate the relevant impact.

If this information was not provided then the information was reviewed to identify whether or not it included details about the number of additional staff who might be recruited or students who might be attracted because of the new facilities. If this information was provided then it was applied to an estimate of the average impact driver across the sector (e.g. average research funding secured per member of staff). This estimate was then used to calculate the impact.

If no information was provided about additional students or staff then it was necessary to estimate this. This was done based on the average amount of capital expenditure required to support one additional student or member of staff across all of the other projects. Once the number of additional students and staff had been estimated, this was then applied to the average impact driver across the sector, which was then used to calculate the impact.

This process was used for all of the impacts considered in this report and is illustrated in Figure 5-1.

5.1.1 Economic Assumptions

The starting point for calculating the direct impacts in this report is the additional turnover generated in UK based companies and the number of people they employ. This turnover is converted into GVA by applying GVA to turnover ratios for relevant sectors. The employment supported by this turnover is estimated by multiplying the number of employees by an estimate of GVA per employee in relevant sectors. Throughout this report estimates of GVA per employee and turnover to GVA ratios have been taken from the UK Annual Business Survey¹⁰.

The indirect impacts considered in this report include the effect of purchases made elsewhere in the supply chain by businesses and their employees. These impacts are calculated by applying an appropriate GVA and employment multiplier to the direct impact. These multipliers have been based on BiGGAR Economics analysis of the UK Input-Output Analytical Tables for 2005¹¹ and the Scottish Government's Input-Output tables¹² for 2009. These two sources have been used because the Scottish IO tables are more up to date than equivalent

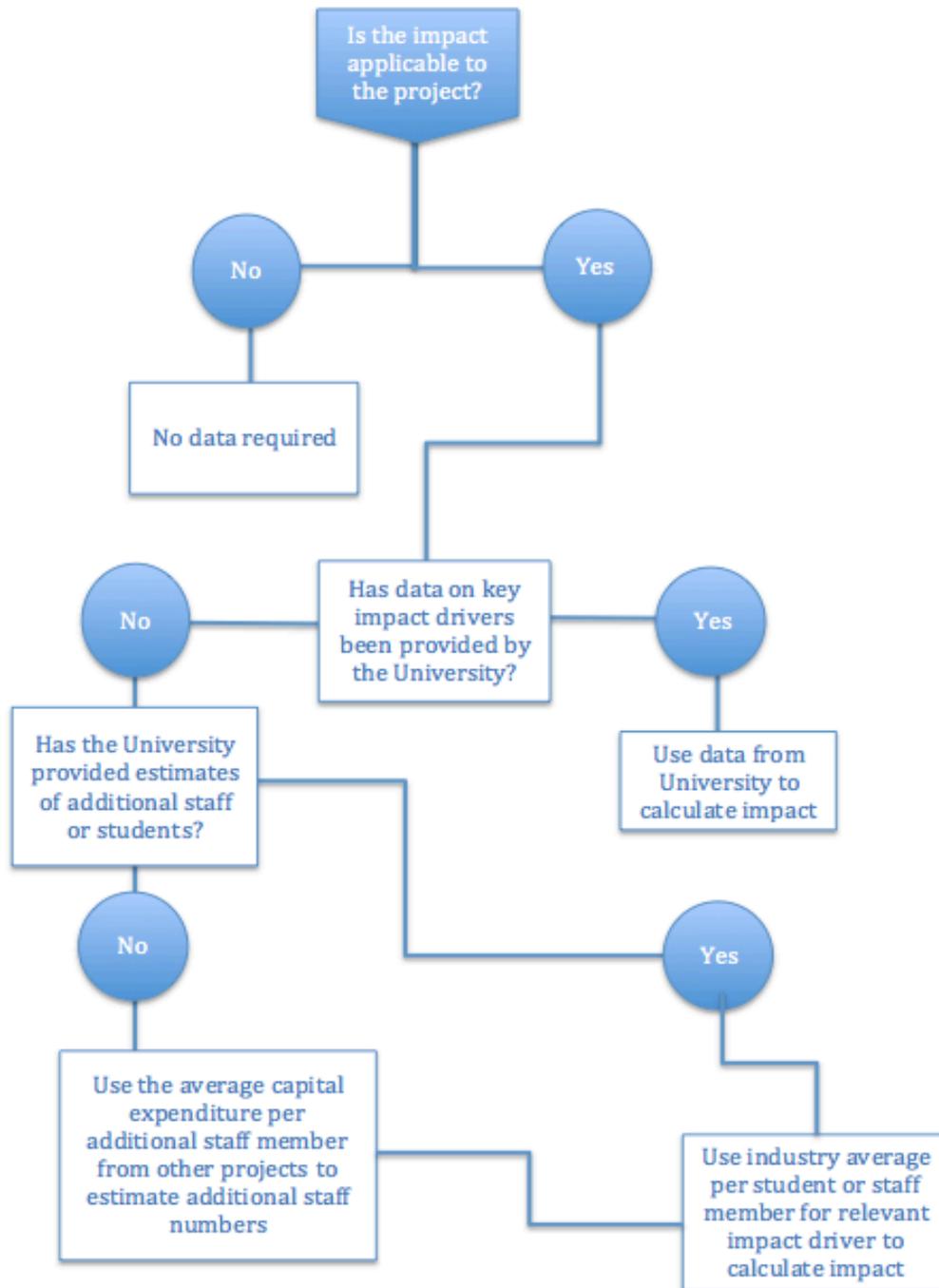
¹⁰ ONS, UK Annual Business Survey 2011, 2013

¹¹ ONS, United Kingdom Input-Output Analytical Tables, 2005, 2009

¹² Scottish Government, Input-Output Tables 2009, 2013

information published about the UK economy which enabled more up to date UK multipliers to be estimated.

Figure 5-1: - Impact calculation process



The remainder of this chapter describes the method used to estimate each of the impacts and the key impact drivers used to do this.

5.2 Capital Investment Impacts

The first category of economic impact considered in this report is short-term capital investment impacts. The capital investments that are considered relate to expenditure within the investment period 2012 – 2017. The impacts include:

- **direct construction impacts** - direct impacts on the UK construction sector, associated with capital investment in new or refurbished buildings;
- **indirect construction impacts** - indirect impacts arising from the expenditure of the companies involved in delivering the construction project on supplies and the expenditure of employees whose jobs are supported by the project;
- **direct equipment impacts** - direct impacts on UK based businesses that supply equipment for the new facilities; and
- **indirect equipment impacts** - indirect impacts arising from the expenditure of the companies involved in supplying equipment for the new facilities and the expenditure of employees whose jobs are supported by the project.

5.2.1 Direct Construction Impacts

Each of the projects considered in this report involves the construction of a new building or buildings, the development of other major infrastructure or a major refurbishment project. The expenditure used to fund this construction generates wealth and supports employment within the UK construction sector. The key drivers of this impact are:

- total capital costs; and
- timing of capital expenditure.

All member institutions provided details of their total capital expenditure over the period and some information about how this would be spent. Some institutions also provided information about when capital expenditure would occur. Where this was not provided, it was assumed that capital expenditure would be spread evenly over the five-year period.

The next step was to estimate the proportion of the construction and equipment contracts that will be secured in the region or nation that the project is in. These assumptions were made based on BiGGAR Economics previous experience of appraising numerous capital investment projects for higher education institutions across the UK. These studies suggest that local expenditure typically accounts for between 50% and 70% of total project costs. It was assumed that all of the construction and equipment contracts were awarded in the UK.

This enabled the increased turnover in the construction and supplier sector in each region/nation to be calculated. The amount of GVA and jobs that would be supported by this increased turnover was then calculated using the turnover/GVA and turnover/employee ratios for the construction sector in Indirect Construction Impacts

The indirect impacts of the construction spend occur in the construction supply chain and through the spending of workers who are employed on the construction projects. These indirect impacts are estimated by applying supply chain and staff spending multipliers for the construction and civil engineering sector to total construction expenditure.

5.2.2 Direct Equipment Impacts

Once complete many of the new facilities considered in this report will be fitted out with specialist equipment. Purchasing this equipment will support employment and generate wealth within the companies responsible for supplying it. The key drivers of this impact are:

- total capital costs
- the proportion of the capital spend spent on equipment; and
- timing of capital expenditure.

As discussed above, all Russell Group universities provided information about total capital costs. Some members also provided details about the timing of this expenditure. Where this was not provided, it was assumed that capital expenditure would be spread evenly over the five-year period. Only two member institutions provided estimates of the proportion of the total capital spend they expect to spend on equipment, ranging from 12% to 30% so it was necessary to make an assumption to estimate the direct equipment impacts for the remaining universities.

This was done based on BiGGAR Economics previous experience of undertaking numerous capital investment appraisals for different universities around the UK. This experience suggests that expenditure on equipment of around 12% of total capital spend is typical for the sector so this assumption was used when no equipment spend breakdown was provided.

The amount of the capital spend that was spent on equipment represents an increase in turnover for the equipment suppliers. The economic impact of this was calculated using ratios for wholesale, retail and the wider economy.

5.2.3 Indirect Equipment Impacts

The indirect impacts of expenditure on equipment arise from the purchase made by the businesses that supply the equipment and the spending of workers involved in supplying it. These indirect impacts are estimated by applying supply chain and staff spending multipliers for the retail, wholesale and the wider economy to the total amount spent on equipment.

5.3 Direct Operational Impacts

The second type of impact considered in this report are the direct operational impacts associated with the activities that will take place in the new buildings and facilities. These include:

- **direct operational impacts** - the direct effect of any additional income generated and/or employment supported by each project;
- **operational supply chain impacts** - benefits to the suppliers of bought-in goods and services required to operate the new facilities;
- **student impacts** - impacts associated with additional students based in the new facilities;
- **staff spending impacts** – effect of expenditure by additional staff based in the new facilities; and

- **operational cost savings** - savings realised as a result of the capital investment projects, for example in reduced heating costs.

5.3.1 Direct Operational Impacts

Many of the capital investment projects considered in this report will provide additional space for teaching and research. Some of this space will be used to relocate existing activity but some will be used to enable the Universities to recruit additional students and/or undertake more research. This will generate additional income (from student tuition fees and/or teaching and research income) and require additional staff, all of which can be attributed to the capital investment projects. The key drivers of this impact are:

- direct income generated by the new facilities; and
- expenditure made on supplies required to operate the new facilities.

Where it was necessary to estimate these drivers, estimates were either based on the number of students based in the new facilities or the number of staff, depending on the information provided. Staff or student numbers were then applied to estimates of the average income or expenditure per student or staff member as appropriate.

Estimates of the average income received per student and per member of staff were based on a study of all 19 higher education institutions in Scotland undertaken by BiGGAR Economics in 2013¹³. Most of the estimates of expenditure on supplies per student or staff member were also based on this study.

The exceptions to this were the assumptions made about research centres and student accommodation projects, which both have different expenditure profiles to typical universities. The assumption made about average expenditure for research centres was taken from an economic impact study of a leading research centre in Scotland¹⁴. The assumption about average expenditure in student accommodation was taken from research undertaken by global real estate experts CBRE¹⁵.

5.3.2 Operational Supply Chain Impacts

The day-to-day operation of each of the new buildings and facilities will require additional goods and services to be purchased from university suppliers. This expenditure will generate wealth and support employment both in the supplier companies and further down the supply chain in the companies that supply the suppliers.

The key driver of this impact is the amount spent on supplies by each facility. Where necessary, this was estimated using the assumptions described in the previous section.

Russell Group universities did not provide information about the location of their suppliers so in order to estimate how much of this impact occurs in each region/nation, it was necessary to make assumptions about where the initial

¹³ BiGGAR Economics (June 2013), Economic impact of Scottish universities. Commissioned by Universities Scotland.

¹⁴ BiGGAR Economics (February 2013), Economic impact of The Roslin Institute.

¹⁵ CBRE (December 2011), Affordable housing viability study – student accommodation, commissioned by Oxford City Council.

expenditure occurs. This was done based on BiGGAR Economics previous experience of undertaking economic impact studies for around a dozen universities across the UK. These studies have found that on average universities purchase approximately 50% of their supplies from companies in the region/nation, and 95% from companies within the UK.

The increased turnover in these companies will generate GVA and employment impacts. The ratios used to convert the increased turnover into GVA and employment impacts relate to the wholesale trade, services to buildings and landscapes and professional, scientific and technical services sectors.

5.3.3 Student impacts

Many of the projects considered in this report will create additional teaching or accommodation capacity, which will enable the university undertaking the project to recruit additional students. These students will have an impact on the local and wider economy through their spending, part time employment and volunteering placements. The key driver of this impact is the number of additional students who will be based in the new facility.

Where member institutions did not provide information about the number of additional students a particular project is expected to attract, an average student to staff ratio of 17.5 students per staff member was used to estimate student numbers. This ratio was initially derived from information provided by one of the Russell Group universities that contributed to this study. It was then cross referenced against the staff/student ratios published in the Complete University Guide 2014, which suggests that this is typical for Russell Group universities.

The number of additional students was then multiplied by an estimate of the average employment supported and GVA generated per student. This estimate was based on an economic impact study of Scottish universities undertaken by BiGGAR Economics in 2013¹⁶, which found that students in Scotland generate an average GVA of £7,150 per year through their spending, volunteering and part time work. The same report also found that each student also supported 0.25 jobs.

5.3.4 Staff spending impacts

Any additional staff who are paid by the university will have an impact on the wider economy by spending their wages. The wages spend is dependent on the number of staff who are employed and the

The key information required to calculate this impact is:

- number of additional staff;
- value of staff salaries; and
- where staff spend their income.

Where information about the number of additional staff was not provided, this was estimated based on the cost of the project and the average capital expenditure required to support one additional job in other projects. If it was not provided by the universities then the value of staff salaries was estimated by multiplying the number of additional staff by an estimate of the average staff costs across the

¹⁶ BiGGAR Economics (June 2013), Economic impact of Scottish universities. Commissioned by Universities Scotland.

industry. This was based on previous research undertaken by BiGGAR Economics, which has found that the average level of spending on staff costs was around £39,000.¹⁷ With on-costs typically amounting to around 20%, this suggests the average staff salaries across the industry are around £32,500.

The indirect impacts of this expenditure was estimated using average ratios and multipliers for the whole economy.

5.3.5 Operational Cost Savings

Some of the capital investment projects considered in this report will enable the institutions concerned to realise cost savings. This means that in future these institutions will be able to either generate either more value using the same resources or the same value using fewer resources. For this reason, the value of cost savings is treated as analogous to GVA in this report.

The key driver of this impact is any cost savings associated with capital project.

Where the institution did not provide this information it was assumed that there were no cost savings.

5.4 Catalytic Impacts

The catalytic impacts quantified in this report include:

- **graduate productivity** – economic productivity improvements arising from the enhanced earnings potential of graduates who would not otherwise have attended a Russell Group university;
- **medical research** - benefits associated with medical research.
- **commercialisation and innovation** - increased commercialisation outputs, e.g. new spin-outs, start-ups and licence agreements;
- **enhanced research competitiveness** - improvements in the competitiveness of the universities made possible by new or improved facilities that enhance the research capabilities of the university;
- **tourism** - expenditure by people who visit staff and students based in the new facilities; and
- **improved learning environment** - improvements in the competitiveness of the universities made possible by new or improved facilities that enhance the student experience of the universities;

5.4.1 Graduate Productivity

The education that the additional students will receive at university will enable them to increase their potential earnings, compared to a similarly gifted individual who does not go to university. This is the graduate premium and is used as a measure of the increased economic productivity that Russell Group university graduates create for the wider economy. The key drivers of this impact are:

- economic productivity increase for under-graduate and post-graduate students;

¹⁷ BiGGAR Economics (June 2013), Economic impact of Scottish universities. Commissioned by Universities Scotland.

- number of additional under-graduate and post-graduate students; and
- proportion of student who will stay in the UK after graduation.

Research undertaken in 2011¹⁸ suggests that the average earnings premium for an undergraduate degree is around £108,100 and the average earnings premium for a postgraduate degree is around £59,000. The additional earnings of graduates is estimated by applying these estimates to the number of additional under-graduate and post-graduate students attending each university. Where information about the number of additional students was not provided by the universities, this was estimated in the same way used to calculate student impacts in section 5.3.3.

Most universities did not provide information about the proportion of additional students would be post-graduates so it was necessary to make an assumption. The information provided by Russell Group universities suggests that many of the investment projects will have a strong research emphasis, which suggests that the proportion of post-graduate students will be relatively high. For this reason it was assume that 50% of all additional students will be postgraduates.

Most of the universities also did not provide information about the proportion of students who might remain in the UK after graduating but project information suggests that there is likely to be a strong emphasis on recruiting international students, particularly amongst business schools. For this reason it was assumed that 40% business school students and 50% of other students will remain in the UK after graduating.

5.4.2 Medical Research

The medical research that will be undertaken in some of the capital project developments will have impacts above and beyond the commercialisation outputs described in section 5.4.1. These will include health benefits experienced by the wider public, which will result in higher economic output because fewer days will be lost to sickness and caring duties.

The key information required to calculate this impact is:

- research funding that is spent on medical research; and
- national returns to medical research.

The economic impacts of medical research were quantified in a study undertaken by Brunel University and the Office of Health Economics¹⁹. This study considered two elements of the economic returns to this research, these were the health gains net of the health care costs of delivering them and the wider GDP gains from the direct and indirect results and operations of medical research. The study focused on research into cardiovascular disease. The study found that although there was a considerable time lag between the research and the economic returns (17 years) the research had a rate of return of 39%. Over 20 years this results in every £1 spent on medical research generating an impact of £7.80

¹⁸ Department of Business, Innovation and Skills, *The Returns to Higher Education Qualifications, 2011*

¹⁹ Health Economics Research Group, Brunel University and Office of Health Economics (November 2008), *What's it worth? Estimating the economic impacts of medical research in the UK.*

5.4.3 Commercialisation and Innovation

Additional research funding secured by universities as a result of the new facilities will help to support the development of new intellectual property. Some of this intellectual property will be commercially valuable and will ultimately be transferred to industry either through the creation of new spin-out or start-up companies or through licensing arrangements with established companies. These companies will then be able to use the intellectual property to generate additional sales and support new jobs. The key driver of this impact is:

- the total amount of additional research income that the university would be able to attract as a result of the new facility; and
- commercialisation outputs (e.g. spin-outs and licence agreements) generated.

Where this information was not provided it was estimated based on either student or staff numbers, depending on which was most appropriate to the project under consideration. This was done by multiplying the number of students or staff in the facility by an estimate of the amount of research funding secured by a university per member of staff or student. This estimate was based on an economic impact study of one of Scotland's leading research institutes²⁰.

The commercialisation outputs generated were estimated based on the amount of research income required to establish one spin-out company or one licence agreement. This estimate was taken from previous work undertaken by BiGGAR Economics on behalf of Universities Scotland²¹. As commercialisation often takes many years before ideas and developments have an economic impact, a time lag of three years between research funding being secured and any economic impact being realised was incorporated into the model.

5.4.4 Enhanced Research Competitiveness

Many of the facilities developed by Russell Group universities will enhance the research capacity of the institution concerned. This will help to maintain the reputation of Russell Group universities and enable them to attract and retain the best researchers. This will enhance the universities' ability to secure research funding, which will generate additional benefits for the UK economy.

The key driver of this impact is the overall increase in research funding that universities are able to secure by maintaining world-class research facilities. It should be noted that this funding is over and above that secured as a result of investment in individual facilities and relates instead to the overall competitive position of the University as a whole. The key information required to calculate this impact is:

- total research funding of the university;
- expected increase in funding due to new facilities; and
- total economic returns to research funding.

The information provided by Russell Group universities did not include any details about how the new facilities are expected to increase the research

²⁰ BiGGAR Economics (February 2013), Economic impact of The Roslin Institute.

²¹ BiGGAR Economics (June 2013), Economic impact of Scottish universities. Commissioned by Universities Scotland.

competitiveness of the university as a whole. It was therefore assumed that the new facilities would increase each universities current research income by 2%.

The economic impacts of the increased income was calculated based on previous work undertaken by BiGGAR Economics on behalf of Universities Scotland. This found that each £1 research income received by Scottish universities enabled them to generate £6.78 GVA as a result of new licencing income, spin-outs and other commercialisation outputs. The study also found that the amount of research income that was required to support a job was £9,747. The economic impact of the enhanced competitiveness of the universities was calculated by applying these estimates to the estimated increase in research funding amongst Russell Group universities. A time lag of 6 years was then applied to this impact to reflect the time it will take for capital spending to increase the profile and competitiveness of the university.

5.4.5 Tourism

The tourism impacts associated with the capital projects are related to the additional number of staff and students that will be at the universities. Tourism impacts arise when friends and relatives of these staff and students travelling to the area where the university is based to visit them. The key drivers of this impact are:

- number of staff;
- number of students;
- frequency of visits; and
- average spend per trip.

The spending and frequency of visits from friends and relatives is taken from tourism research undertaken by VisitEngland²² and the International Passenger Survey²³. Using this data it can be estimated that on average, UK residents receive 0.71 visits from friends and relatives in other parts of the UK and 0.14 visits from friends and relatives who live overseas. The average spend per UK trip was £113, while overseas visitors spent an average of £441 during their trip.

The increased spend in the local tourism sector was estimated by multiplying the spend per trip by the total number of trips that the additional staff and students would expect. This increased turnover in the tourism sector generates GVA and employment impacts. The ratios for converting the increased turnover into GVA and employment impacts come from the UK Annual Business Survey²⁴ and the Scottish Input Output tables²⁵. The industries that most represented in the tourism sector and used in the analysis are the Arts, entertainment, food, drink and transport.

5.4.6 Learning Environment

Many of the projects considered in this report (e.g. new libraries, teaching facilities and student accommodation) are designed to improve the learning environment for students. This will help Russell Group universities to attract new students, who

²² VisitEngland (2013), the GB Tourist

²³ Office for National Statistics (2012), International Passenger Survey Data for 2012

²⁴ Office for National Statistics, UK Annual Business Survey 2011, 2013

²⁵ Scottish Government, Input – Output Tables 2009, 2013

will generate additional impacts in the UK as a result of their spending, part-time work, volunteering and placements.

The key driver for this impact will be the number of students the universities are able to attract because of their capital investment programme. It should be noted that these students are individuals who choose to attend a Russell Group university because of the overall quality of the learning environment rather than students actually based in the new facility. This impact is therefore over and above the student impact calculated in section 5.3.3.

Few of the universities provided information about the indirect effect of capital investment on student recruitment so it was necessary to estimate this using an assumption about overall growth in student numbers. To avoid any risk of overestimating this impact a conservative assumption of 1% was adopted. This implies that the capital investment made by Russell Group universities between 2012-13 and 2016-17 will help the universities to maintain a world-class learning environment, which will enable them to increase student recruitment by 1%.

5.5 Grossing up the impacts

The capital projects that were analysed represent 42% of the total capital investment programmes of the Russell Group universities. In order to estimate the economic impact of the whole capital investment programme it was necessary to include the impacts of the capital projects for which no information was provided.

One way of doing this would be to simply scale up the impact proportionately but doing this would require an assumption that the projects for which information was provided were representative of all capital investment undertaken by the universities and this is not considered likely. The main reason for this is that the information that was provided by Russell Group universities generally relates to particularly high profile projects, which are expected to generate very substantial impacts. Although the other projects undertaken by each university will also generate significant impacts, these are unlikely to be of the scale generated by key headline projects.

For this reason, it was assumed that the impact of the “other projects” would be around 50% that of those projects selected by the universities. The total economic impact of the capital investment plans of the Russell Group was estimated by increasing the operational and catalytic impacts in proportion to the total level of investment. If many of the “other” projects are very high impact then this could be a conservative assumption but given the information available, it provides some confidence that the impacts reported in this study are not over estimated.

6 DIRECT CAPITAL INVESTMENT IMPACTS

Each of the projects considered in this report will generate short-term impacts as a result of the initial capital investment. These include:

- direct impacts on the UK construction sector, associated with capital investment in new or refurbished buildings;
- indirect impacts arising from the expenditure of the companies involved in delivering the construction project on supplies and the expenditure of employees whose jobs are supported by the project;
- direct impacts on UK based businesses that supply equipment for the new facilities; and
- indirect impacts arising from the expenditure of the companies involved in supplying equipment for the new facilities and the expenditure of employees whose jobs are supported by the project.

Each of the impacts will be generated over a five year construction period. This section quantifies the total value of these impacts and presents the net present value of this stream of impact in current prices. Employment impacts are presented in terms of the total years of employment supported each year and the average number of jobs supported over the five year period.

6.1 Direct Impact of Construction Expenditure

The direct impact of construction expenditure is calculated by applying turnover to GVA ratios for the UK construction sector to the total value of construction spending. In this way it can be estimated that the construction related expenditure of Russell Group universities is expected to directly generate £3.0 billion for the UK economy over the next five years. The current value of this stream of impacts is £2.7 billion.

Construction expenditure is also expected to directly support almost 46,900 years of employment for construction sector workers. This equates to an average of around 11,680 construction jobs over the 5 year period. This impact is broken down in Table 6-1.

Table 6-1: Direct construction impact

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Job years	12,243	12,994	12,207	10,942	10,010	58,396
GVA (£millions)	623	661	621	556	509	2,969
Current value of future impacts (GVA £ millions)	2,691		Average jobs supported		11,679	

Source: BiGGAR Economics economic impact model

6.2 Indirect Impact of Construction Expenditure

The indirect impact of construction includes the purchases of construction related supplies required to complete the building works and the purchases made by employees whose jobs are directly supported by the construction projects. This

impact is calculated by applying appropriate GVA and employment multipliers to the total construction spending.

It is estimated that this indirect expenditure will generate a further £5.2 billion GVA for the UK economy. The current value of this stream of impacts is £4.7 billion. It is also estimated that construction expenditure will indirectly support almost 114,000 years of employment. This equates to an average of almost 22,800 jobs over the five year period. This impact is summarised in Table 6-2.

Table 6-2: Indirect construction impact

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Job years	23,888	25,352	23,817	21,348	19,529	113,935
GVA (£millions)	1,085	1,152	1,082	970	887	5,177
Current value of future impacts (GVA £ millions)	4,692		Average jobs supported		22,787	

Source: BiGGAR Economics economic impact model

6.3 Direct Impact of Expenditure on Equipment

Expenditure on equipment will include a very wide range of items from office furniture and canteen fixtures to scientific instruments and laboratory equipment. The impact of this expenditure is calculated by applying a turnover to GVA ratio for relevant sectors to the total amount spent on equipment.

It is estimated that this expenditure will directly generate £460 million for the UK economy over the next five years. The current value of this stream of impacts is £417 million. It is also estimated that this expenditure will directly support around 9,129 years of employment for workers in the sector that produce the equipment. This equates to an average of around almost 1,826 jobs over the 5-year period. This impact is summarised in Table 6-3.

Table 6-3: Direct equipment impact

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Job years	1,901	2,041	1,905	1,718	1,565	9,129
GVA (£ millions)	96	103	96	87	79	460
Current value of future impacts (GVA £ millions)	417		Average jobs supported		1,826	

Source: BiGGAR Economics economic impact model

6.4 Indirect Impact of Expenditure on Equipment

The indirect impact of expenditure on equipment includes purchases made by the businesses involved in manufacturing the equipment and the expenditure of employees whose jobs are directly supported by this. This indirect impact is estimated by applying GVA and employment multipliers for relevant sectors to the total value of expenditure on equipment.

It is estimated that this indirect expenditure will generate a further £437 million GVA for the UK economy. The current value of this stream of impacts is £396

million. It is also estimated that expenditure on equipment will indirectly support around 7,700 years of employment. This equates to an average around 1,540 jobs over the five year period. This impact is summarised in Table 6-4.

Table 6-4: Indirect equipment impact - UK

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Job years	1,604	1,722	1,608	1,450	1,321	7,705
GVA (£ millions)	91	98	91	82	75	437
Current value of future impacts (GVA £ millions)	396		Average jobs supported		1,541	

Source: BiGGAR Economics economic impact model

6.5 Summary of Capital Spending Impacts

Taken together the direct and indirect impact of Russell Group universities capital investment plans over the next five years is expected to amount to £9.0 billion GVA. The current value of this stream of impacts is £8.2 billion. This is summarised in Table 6-5.

Table 6-5: Total capital expenditure impact – GVA (£ millions)

Type of impact	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Direct construction	623	661	621	556	509	2,969
Indirect construction	1,085	1,152	1,082	970	887	5,176
Direct equipment	96	103	96	87	79	460
Indirect equipment	91	98	91	82	75	437
Total GVA	1,895	2,013	1,890	1,695	1,550	9,043
Current value of future impacts (GVA £ millions)						8,197

Source: BiGGAR Economics economic impact model

It is estimated that this expenditure will also support around 189,200 years of employment. This equates to an average of around 37,800 jobs over the five year period. This impact is summarised in Table 6-6.

Table 6-6: Total capital expenditure impact – employment

Type of impact	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Direct construction	12,243	12,994	12,207	10,942	10,010	58,396
Indirect construction	23,888	25,352	23,817	21,348	19,529	113,935
Direct equipment	1,901	2,041	1,905	1,718	1,565	9,129
Indirect equipment	1,604	1,722	1,608	1,450	1,321	7,705
Total Job years	39,636	42,110	39,537	35,458	32,424	189,166
Average jobs supported						37,833

Source: BiGGAR Economics economic impact model

7 DIRECT OPERATIONAL IMPACTS

Once completed, each of the capital investment projects considered in this report will generate further impacts associated with the activities that will take place in the new buildings and facilities. These impacts will include:

- **direct operational impacts** - additional income generated and employment supported by each project;
- **operational supply chain impacts** - benefits to the suppliers of bought-in goods and services required to operate the new facilities;
- **student impacts** – impact associated with additional students based in the new facilities including the impact of student spending, student employment, volunteering and student placements;
- **staff spending impacts** - expenditure of additional staff based in the new or refurbished building;
- **operational cost savings** – arising from cost savings generated by the project.

This report considers the 25 year period from 2012-13 to 2036-37. The operational impacts will start to be generated from the point at which the new facilities are completed until at least the end of the reporting period. Most of the benefits are expected to gradually increase over a short period of time immediately after the new facilities are completed until achieving a steady state. For example many of the new facilities are expected to help members to increase research income but this is expected to occur gradually over a number of years rather than all at once immediately after the facilities are completed. The periods of growth used to calculate the impacts vary from project to project and where ever possible have been based on information provided by member universities.

This section quantifies the value of these impacts. Impacts are reported in terms of the annual GVA they are expected to be contributing to the UK economy by the end of the reporting period and in terms of the current value of the stream of impacts over the entire period. Employment impacts are presented in terms of the number of jobs that will be supported by the last year in the reporting period and the average number of jobs supported over the entire reporting period. The total number of jobs supported is calculated by dividing the total years of employment supported over the reporting period by ten based on the convention that ten years of employment is equivalent to a full time permanent job.

7.1 Direct Operational Impacts

The direct GVA to the UK economy by activities undertaken in the new facilities is calculated by subtracting the total amount of expenditure on supplies in the new facilities from the total income of the new facilities. In this way it can be estimated that by 2036-37 the activity undertaken in the new facilities will be generating £235 million GVA for the UK economy each year.

The current value of this stream of benefits is £2.5 billion. The activity undertaken in the new facilities is also expected to directly support around 4,120 jobs by 2036-37. The total number of full time equivalent jobs expected to be supported between 2012-13 and 2036-37 is around 8,870. This impact is summarised in Table 7-1.

Table 7-1: Direct operational impact - UK

	Jobs	GVA-Current value of GVA (£millions)
Annual impact by 2036-37	4,120	235
Total impact between 2012-13 and 2036-37	8,872	2,532

Source: BiGGAR Economics economic impact model

7.2 Operational Supply Chain Impact

In order to operate the new facilities member universities will require goods and services from suppliers. The nature of these goods and services will vary from project to project but all the purchases will generate wealth and support employment elsewhere in the supply chain. The economic impact of this expenditure is calculated by dividing total expenditure on supplies by a turnover to GVA ratio for relevant sectors. Employment impacts are calculated by dividing the GVA impact by an estimate of GVA/employee in relevant sectors.

In this way it can be estimated that by 2036-37 this expenditure will be contributing £16 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £212 million. By 2036-37 this expenditure is also expected to be supporting around 340 jobs in the UK. The total number of jobs supported between 2012-13 and 2036-37 is expected to be around 740. These impacts are summarised in Table 7-2.

Table 7-2: Operational supply chain impact

	Jobs	GVA/Current value of GVA (£millions)
Annual impact by 2036-37	342	16
Total impact between 2012-13 and 2036-37	740	212

Source: BiGGAR Economics economic impact model

7.3 Student Impact

Many of the new facilities that will be created over the next five years will enable member institutions to recruit additional students. The economic impact of these students is calculated by multiplying the number of additional students based at each new facility by an estimate of the average GVA by a student in UK universities.

In this way it can be estimated that by 2036-37 new students based in the new facilities will be contributing £206 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £2.7 billion. By 2036-37 this expenditure is also expected to be supporting almost 7,200 jobs in the UK. The total number of jobs supported between 2012-13 and 2036-37 is expected to be around 15,400. These impacts are summarised in Table 7-3.

Table 7-3: Student impact

	Jobs	GVA/Current value of GVA (£millions)
Annual impact by 2036-37	7,183	206
Total impact between 2012-13 and 2036-37	15,355	2,702

Source: BiGGAR Economics economic impact model

7.4 Staff Spending Impact

Each of the new facilities will also require additional staff. The type of staff employed will vary from project to project; teaching facilities will require additional teaching staff; research facilities will require additional research staff; and facilities such as new libraries will require additional support staff. All of these staff will generate impact for the UK economy by spending their wages on goods and services.

The impact of this expenditure is calculated by dividing total expenditure in each nation/region by a turnover/GVA ratio for relevant sectors. Employment impacts are estimated by dividing total GVA by an estimate of GVA/employee in relevant sectors.

In this way it can be estimated that by 2035-36 this expenditure will be generating £37 million GVA for the UK economy each year and supporting around 820 jobs. The current value of this stream of benefits amounts to approximately £497 million and the total number of jobs supported between 2012-13 and 2036-37 is expected to be around 1,770. These impacts are summarised in Table 7-4.

Table 7-4: Staff spending Impact

	Jobs	GVA/Current value of GVA (£millions)
Annual impact by 2036-37	821	37
Total impact between 2012-13 and 2036-37	1,768	497

Source: BiGGAR Economics economic impact model

7.5 Operational Cost Savings Impact

The final type of operational impact is expected to arise as a result of cost savings made possible by the new facilities. There are a variety of ways in which these savings could arise including reductions in energy costs or reductions in costs of temporary accommodation. The total value of cost savings is equivalent to GVA.

Such savings are expected to account for around £3 million GVA a year by 2036-37 and the current value of all the savings made between 2012-13 and 2036-37 is estimated at around £76 million GVA. Although cost savings could be used to support additional employment, this will not necessarily be the case and no information to this effect was provided by member institutions so employment impacts have not been calculated. The GVA impacts are summarised in Table 7-5.

Table 7-5: Operational cost savings impact

	Jobs	GVA/Current value of GVA (£millions)
Annual impact by 2036-37	n/a	3
Total impact between 2012-13 and 2036-37	n/a	76

Source: BiGGAR Economics economic impact model

7.6 Summary of Operational Impacts

By 2036-37 the total annual operational impact of new facilities created by Russell Group universities over the next five years is expected to amount to £496 million GVA. The current value of this stream of impacts is around £6.0 billion. A breakdown of this impact is provided in Table 7-6.

Table 7-6: Total operational impact – GVA

Type of impact	Annual impact by 2036-37 (GVA £ millions)	Current value of total impact between 2012-13 and 2036-37 (GVA £ millions)
Direct operational impact	235	2,532
Operational supply chain impact	16	212
Student impact	206	2,702
Staff spending impact	37	497
Operational cost savings impact	3	76
Total operational impact	496	6,020

Source: BiGGAR Economics economic impact model

It is estimated that by 2036-37 the activity undertaken in the new facilities will also support almost 12,500 UK jobs. This equates to around 26,700 permanent jobs between 2012-13 and 2036-37. This impact is broken-down in Table 7-7

Table 7-7: Total operational impact – employment

Type of impact	Annual impact by 2036-37 (jobs)	Total jobs supported between 2012-13 and 2036-37 (jobs)
Direct operational impact	4,120	8,872
Operational supply chain impact	342	740
Student impact	7,183	15,355
Staff spending impact	821	1,768
Operational cost savings impact	n/a	n/a
Total operational impact	12,467	26,736

Source: BiGGAR Economics economic impact model

8 CATALYTIC IMPACTS

Once up and running the new facilities that will be created as a result of the capital investment considered in this report will help to stimulate a range of wider, long-term catalytic impacts. It is not possible to fully quantify all of these benefits but those that can be quantified include impacts associated with:

- **improved learning environment** - additional students that universities are able to attract because of investments that enhance the student experience and learning environment;
- **enhanced research competitiveness** - increased research activity that the universities are able undertake because of investments that enhance their research capabilities and ability to attract research funding and staff;
- **commercialisation and innovation** - increased commercialisation activity such as new spin-outs, start-ups and licence agreements;
- **graduate productivity** - economic productivity improvements arising from the enhanced earnings potential of graduates who would not otherwise have attended a Russell Group university;
- **medical research** - benefits associated with medical research undertaken in the new facilities. and
- **tourism** - tourism expenditure by friends and relatives who visit staff and students based in the new facilities;

There will generally be a time lag between the point at which the new facilities become operational and the realisation of catalytic impacts. The length of this time-lag will depend on the nature of the impact and are explained in chapter 5.

This section quantifies the value of these impacts over the 25 year period from 2012-13 to 2036-37. As with operational impacts, catalytic impacts are reported in terms of the annual GVA they are expected be contributing to the UK economy by the end of the reporting period and in terms of the current value of the stream of impacts over the entire period. Employment impacts are presented in terms of the number of jobs that will be supported by the last year in the reporting period and the average number of jobs supported over the entire reporting period. The total number of jobs supported is calculated by dividing the total years of employment supported over the reporting period by ten based on the convention that ten years of employment is equivalent to a full time permanent job.

8.1 Graduate Productivity

The experience of studying at a Russell Group university is expected to improve the employment prospects and work-place productivity of graduates. This helps to support the long-term competitiveness of the UK economy by ensuring that employers have access to a pool of highly qualified workers.

This effect can be measured using data on the difference between earnings of graduates and non-graduates. The impact is estimated by applying estimates of the earnings premium of under-graduate and post-graduate students to the number of each type of student based in the new facility.

In this way it can be estimated that by 2036-37 this graduate earnings premium will be generating around £1.1 billion GVA to the UK economy each year. The

current value of this stream of benefits is estimated to be around £11.5 billion. This impact is summarised in Table 8-5. This impact is summarised in Table 8-1.

Table 8-1: Graduate productivity

	Jobs	GVA-Current value of GVA (£ millions)
Annual impact by 2036-37	n/a	1,080
Total impact between 2012-13 and 2036-37	n/a	11,525

Source: BiGGAR Economics economic impact model

8.2 Medical Research

Some of the capital investment projects considered in this report will provide additional space and facilities for medical research. Although the impact of medical research is generally associated with long time-lags, the long-term economic impact of this research can be substantial.

This impact is calculated by multiplying the total value of research income associated with medical research facilities by an estimate of the return to investment on medical research.

In this way it can be estimated that by 2036-37 medical research undertaken in the new facilities will be generating £488 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £1.2 billion. This impact is summarised in Table 8-2.

Table 8-2: Medical research

	Jobs	GVA/Current value of GVA (£ millions)
Annual impact by 2036-37	n/a	488
Total impact between 2012-13 and 2036-37	n/a	1,178

Source: BiGGAR Economics economic impact model

8.3 Commercialisation and Innovation

Over the next five years many Russell Group universities plan to invest in projects designed to support interaction with industry. Eventually these types of investment should enable the Universities to commercialise their research by supporting the creation of new start-ups and spin-outs or agreeing new licence arrangements with existing businesses.

This impact is calculated by multiplying the total value of research income associated with the new facilities by an estimate of the average GVA generated and employment supported by commercialisation activity across the sector as a whole.

In this way it can be estimated that by 2036-37 this activity will be generating £187 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £2.1 billion. By 2036-37 this expenditure is also expected to be supporting around 3,000 jobs in the UK. The total number of jobs supported between 2012-13 and 2036-37 is expected to be around 5,700. This impact is summarised in Table 8-3.

Table 8-3: Commercialisation and innovation impact

	Jobs	GVA/Current value of GVA (£ millions)
Annual impact by 2036-37	3,027	187
Total impact between 2012-13 and 2036-37	5,696	2,064

Source: BiGGAR Economics economic impact model

8.4 Enhanced Research Competitiveness

Several of the projects considered in this study are designed to enhance the research capacity of member institutions. These projects will help universities to attract and retain the best researchers from around the world, which will help them to attract additional research funding.

This impact was calculated by assuming that the total value of research income secured by Russell Group universities will increase by 2% as a result of improvements in the research capabilities associated with the new facilities.

In this way it can be estimated that by 2036-37 this additional funding will be generating £141 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £639 million. By 2036-37 this expenditure is also expected to be supporting 2,140 jobs in the UK. The total number of jobs supported between 2012-13 and 2036-37 is expected to be around 1,950. This impact is summarised in Table 8-4.

Table 8-4: Enhanced research competitiveness impact

	Jobs	GVA/Current value of GVA (£ millions)
Annual impact by 2036-37	2,140	141
Total impact between 2012-13 and 2036-37	1,952	639

Source: BiGGAR Economics economic impact model

8.5 Tourism

The operational impacts considered in the previous chapter included impacts associated with the expenditure of additional students and staff. These students and staff will generate further benefits for the UK economy as a result of the expenditure of their friends and family when they come to visit.

This impact is estimated by multiplying the total number of additional staff and students by an estimate of the average number of visits received by UK residents from friends and family each year. The number of visitors was then multiplied by the average expenditure of this type of visitor to provide an estimate of total visitor expenditure. Visitor expenditure was then converted into GVA using turnover/GVA ratios for the UK tourism sector and the employment impacts were estimated by applying estimates of the average GVA/employee in the UK tourism sector.

In this way it can be estimated that by 2036-37 this spending will be generating over £2 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £23 million. By 2036-37 this expenditure is also expected to be supporting 45 jobs in the UK. The total

number of jobs supported between 2012-13 and 2036-37 is expected to be around 93. This impact is summarised in Table 8-5.

Table 8-5: Tourism

	Jobs	GVA/Current value of GVA (£ millions)
Annual impact by 2036-37	45	2
Total impact between 2012-13 and 2036-37	93	23

Source: BiGGAR Economics economic impact model

8.6 Improved Learning Environment

Many of the projects considered in this study are designed to improve the quality of the learning environment. Such projects will help member universities to recruit additional students, many of who may otherwise have attended universities overseas. These students will add to the GVA and employment supported by member institutions and generate wider spending impacts elsewhere in the economy.

This impact is estimated by assuming that the improvements made to the learning environment as a result of the capital investment projects considered by this study will enable Russell Group universities to increase total student recruitment by 1%.

Using this assumption it can be estimated that by 2036-37 these additional students will be contributing £31 million GVA to the UK economy each year. The current value of this stream of benefits is estimated to be around £283 million. By 2036-37 this expenditure is also expected to be supporting almost 1,100 jobs in the UK. The total number of jobs supported between 2012-13 and 2036-37 is expected to be almost 1,800. This impact is summarised in Table 8-6.

Table 8-6: Improved learning environment

	Jobs	GVA/Current value of GVA (£ millions)
Annual impact by 2036-37	1,071	31
Total impact between 2012-13 and 2036-37	1,765	283

Source: BiGGAR Economics economic impact model

8.7 Summary of Catalytic Impacts

By 2036-37 the total annual catalytic impact of new facilities created by Russell Group universities over the next five years is expected to amount to £1.9 billion GVA. The current value of this stream of impacts is around £15.7 billion. This impact is broken down in Table 8-7.

Table 8-7: Total catalytic impact – GVA

Type of impact	Annual impact by 2036-37 (£millions)	Current value of total impact between 2012-13 and 2036-37 (£ millions)
Graduate productivity	1,080	11,525
Medical research	488	1,178
Commercialisation and innovation	187	2,064
Enhanced research competitiveness	141	639
Tourism	2	23
Improved learning environment	31	283
Total catalytic impact	1,929	15,712

Source: BiGGAR Economics economic impact model

It is estimated that by 2036-37 the catalytic impact of the new facilities will support almost 6,300 UK jobs. This equates to around 9,500 permanent jobs between 2012-13 and 2036-37. This impact is broken-down in Table 8-8.

Table 8-8: Total catalytic impact – employment

Type of impact	Jobs supported in 2036-37	Total jobs supported between 2012-13 and 2036-37
Graduate productivity	n/a	n/a
Medical research	n/a	n/a
Commercialisation and innovation	3,027	5,696
Enhanced research competitiveness	2,140	1,952
Tourism	45	93
Improved learning environment	1,071	1,765
Total catalytic impact	6,283	9,507

9 IMPACT BY TYPE OF PROJECT

This section breaks down the impacts estimated in this report by type of project.

9.1 Grossing Up Impacts

The tables in this section illustrate the impacts associated with different types of project undertaken by Russell Group universities. As discussed in section 5.5, the capital projects analysed in this report represent 42% of the total capital investment programmes of the Russell Group universities. This means that in order to estimate the total economic impact of the capital investment programme, it was necessary to gross up the impacts estimated. For the reasons discussed in section 5.5, this was done by assuming that the impact of unspecified expenditure would be around 50% of the projects for which the universities provided information.

The second last line in each of the tables in this section is the total impact of all the projects for which information was provided. The final line in each table represents the total impact of the capital investment programme, grossed up for all expenditure.

9.2 Capital Spending Impact by Type of Project

The capital spending impact of the projects considered in this report is broken down in Table 9-1.

The first column in the table shows the current value of the stream of capital spending impacts over the five-year period in each region/country within the UK. This shows that the current value of the capital spending impact between 2012-13 and 2016-17 will be £3.5 billion GVA. When this impact is scaled up for the entire capital investment programme, the current value of the impact is expected to be £8.2 billion GVA.

The second column shows the total number of permanent jobs the capital expenditure is expected to support over the five year period. It shows that this investment will support around 16,000 jobs in the UK construction sector. When this impact is scaled up for the entire capital investment programme, the total impact is estimated at more than 37,800 jobs.

The third column in the table presents an impact multiplier, which is a measure of the total capital spending impact generated by each £1 of capital expenditure, so each £1 spent on capital investment projects generates short-term benefits worth £0.90 GVA for the UK economy.

It should be noted that although the ratio between impact and expenditure for different types of projects is the same, the impact multiplier varies slightly. This is because each of the projects has slightly different start dates, which effects the current value of expenditure.

Table 9-1: Total capital spending impact by type of project – 2012 - 2037

Country/Region	Current value of future GVA impacts (£ millions)	Average jobs supported	Impact multiplier
Business Schools	85	388	0.91
Carbon reduction and energy efficiency	18	84	0.90
Business engagement	177	811	0.91
IT facilities	75	339	0.92
Library facilities	157	709	0.91
Major development	1,136	5,298	0.90
Medical research facilities	371	1,698	0.91
Sports, cultural and social facilities	273	1,254	0.91
STEM Facilities	702	3,212	0.91
Student Accommodation	335	1,535	0.91
Teaching facilities	147	675	0.91
Total (known expenditure)	3,476	16,002	0.91
Scaled up total	8,197	37,833	0.90

Source: BiGGAR Economics economic impact model

9.3 Operational Impact by Type of Project

The operational impact of the new facilities developed by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 9-2. This shows that the activities undertaken in the new facilities considered in this report will contribute GVA with a current value of £6.0 billion GVA to the UK economy between 2012 and 2037 and support almost 26,700 permanent jobs. When this impact is scaled up for the entire capital investment programme, the current value of the impact is expected to be £10.1 billion GVA and around 50,000 jobs.

The third column of the table provides an impact multiplier. This is a measure of the amount of operational impact that each £1 of capital investment in different types of project will generate. This shows that the projects with the highest operational impact multiplier are business schools, which are expected to generate £2.58 for each £1 invested. Medical research facilities are also expected to have a particularly high operational impact multiplier, generating £2.17 GVA for each £1 invested.

Table 9-2: Total operational impact by type of project – 2012 - 2037

Country/Region	Current value of future GVA impacts (£millions)	Permanent jobs supported (2012-13 – 2036-37)	Impact multiplier
Business Schools	239	995	2.58
Carbon reduction and energy efficiency	38	59	1.91
Business engagement	129	431	0.67
IT facilities	22	78	0.27
Library facilities	20	275	0.12
Major development	2,362	10,583	1.86
Medical research facilities	882	3,395	2.17
Sports, cultural and social facilities	234	1,053	0.78
STEM Facilities	1,295	6,176	1.69
Student Accommodation	599	2,564	1.63
Teaching facilities	193	1,055	1.20
Total (known expenditure)	6,014	26,664	1.57
Scaled up total	10,132	44,999	1.12

Source: BiGGAR Economics economic impact model

9.4 Catalytic Impact by Type of Project

The catalytic impact generated by the new facilities developed by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 9-3. This shows that the long-term catalytic impact of the projects considered in this report will contribute GVA with a current value of £14.9 billion to the UK economy and support around 6,100 permanent jobs. When this impact is scaled up for the entire capital investment programme, the current value of the impact is expected to be £26.0 billion GVA and around 15,700 jobs.

The third column of the table provides an impact multiplier. This is a measure of the amount of catalytic impact that each £1 of capital investment in different types of project will generate. The type of projects with the highest multiplier are medical research facilities, which are expected to generate £8.36 of catalytic impact for each £1 invested.

Table 9-3: Total catalytic impact by type of project – 2012 - 2037

Country/Region	Current value of future GVA impacts (£millions)	Permanent jobs supported (2012-13 – 2036-37)	Impact multiplier
Business Schools	392	15	4.23
Carbon reduction and energy efficiency	<£1	n/a	n/a
Business engagement	306	848	1.58
IT facilities	<1	n/a	n/a
Library facilities	<1	n/a	n/a
Major development	4,731	743	3.73
Medical research facilities	3,394	4,106	8.36
Sports, cultural and social facilities	297	3	0.99
STEM Facilities	3,404	350	4.43
Student Accommodation	1,768	11	4.82
Teaching facilities	576	58	3.56
Total (known expenditure)	14,867	6,134	3.88
Scaled up total	26,009	15,689	2.87

Source: BiGGAR Economics economic impact model

9.5 Total Impact by Type of Project

The total impact generated by the new facilities developed by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 9-4.

This shows that the total impact of projects considered in this report is expected to have a current value of £24.4 billion and these projects are expected to support 48,800 jobs. When scaled up for the entire capital investment programme, the current value of the total impact is estimated at £44.3 billion and around 98,500 jobs.

The types of project expected to have the greatest absolute impact on the UK economy are major development projects, which are expected to generate GVA with a current value of £8.2 billion and support around 16,600 jobs. The second highest impact type of projects are expected to be new STEM facilities, which are expected to generate GVA with a current value of £5.4 billion and support around 9,700 jobs.

Table 9-4: Total impact by type of project – 2012 - 2037

Country/Region	Current value of future GVA impacts (£millions)	Jobs supported (2012-13 – 2036-37)	Impact multiplier
Business Schools	716	1,397	7.72
Carbon reduction and energy efficiency	56	142	2.81
Business engagement	612	2,091	3.16
IT facilities	97	417	1.20
Library facilities	177	984	1.03
Major development	8,229	16,624	6.50
Medical research facilities	4,646	9,198	11.45
Sports, cultural and social facilities	804	2,310	2.68
STEM Facilities	5,401	9,738	7.03
Student Accommodation	2,703	4,111	7.36
Teaching facilities	917	1,788	5.66
Total (known expenditure)	24,357	48,800	6.36
Scaled up total	44,338	98,521	4.89

Source: BiGGAR Economics economic impact model

9.6 Impact In Context

In order to better understand the scale of the economic impact expected to be generated by the capital investment plans of Russell Group universities, it is helpful to consider the impact within the context of other major capital investment projects of a similar scale. Two relevant projects include the high-speed rail network currently being proposed by the UK Government and the investment that was undertaken to enable London to host the 2012 Olympics.

The latest official estimates published by the UK Government suggest that expected cost benefit ratio for the proposed high-speed rail network will be around £2.30; that, is the project is expected to generate £2.30 of economic benefits for every £1 spent. More optimistic figures published by the UK Government suggest that if passenger demand continues to grow at current rates for a decade and a half after the network is completed in 2033, this ratio would rise to 4.9:1. This implies that the benefit to cost ratio of the capital investment programme of the Russell Group universities is as good as the UK Government’s most optimistic assessment of the proposed high-speed rail network.

Figures released by the UK Government in October 2012 suggest that the total cost of hosting the 2012 Olympics in London was expected to be £8.9 million – very similar to the total capital investment of Russell Group universities considered in this report. An independent report²⁶ estimates that the total benefit

²⁶ quoted at on www.olympic.org (the official website of the Olympic movement)

to the UK from hosting London 2012 could reach up to £41 billion by 2020. This implies that the cost benefit ratio of the Games is expected to be around 4.6:1. That is each £1 spent hosting the Olympic games is expected to generate around £4.60 of economic benefits. Again, the Russell Group investments compare favourably; as Table 9-4 shows that the capital investment plans of Russell Group universities are expected to generate £4.89 for each £1 invested.

10 IMPACT BY LOCATION

This section breaks down the impact of capital expenditure by Russell Group universities by location.

The total impact in each region/nation is comprised of two components:

- the impact generated by capital investment projects that occur within the region/nation; and
- a proportion of the impacts generated by projects in other regions/nations.

Estimating the second of these two components presents some difficulties. Whilst it is possible to estimate the proportion of impact generated by each project that will occur outside the region in which the project occurs, without very detailed project information it is difficult to accurately estimate how much of this will occur in each of the other regions/nations. For this reason, it has been assumed that each region/nation will receive an equal proportion of the “outside region” benefits generated by projects in other regions/nations.

10.1 Capital Spending Impact by Location

The impact of the capital spending that will be made by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 10-1. This shows that the region that will benefit the most from the capital investment of Russell Group universities is the South of England which will gain GVA with a current value of £2.0 billion and over 9,000 jobs during the capital investment period.

Table 10-1: Total capital spending impact by UK region/country – 2012 - 2017

Country/Region	Current value of future GVA impacts (£ millions)	Average jobs supported
Devolved Nations	1,826	8,452
North of England	1,939	8,591
Midlands	1,155	5,340
South of England	1,973	9,064
London	1,304	6,026
TOTAL	8,197	37,833

Source: BiGGAR Economics economic impact model

10.2 Operational Impact by Location

The operational impact of the new facilities developed by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 10-2. The largest operational GVA impact is expected to occur in the North of England and is expected to have a current value of £3.6 billion. The largest impact in terms of jobs however is expected to be in London, which is expected to see the creation of more than 19,000 jobs.

Table 10-2: Total operational impact by UK region/country – 2012 - 2037

Country/Region	Current value of future GVA impacts (£millions)	Permanent jobs (2012-13 – 2036-37)
Devolved Nations	1,255	5,468
North of England	3,574	15,803
Midlands	376	979
South of England	1,791	3,470
London	3,135	19,279
TOTAL	10,132	44,999

Source: BiGGAR Economics economic impact model

10.3 Catalytic Impact by Location

The long-term catalytic impact generated by the new facilities developed by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 10-3. This shows that the region that is expected to benefit the most from capital spending by Russell Group universities will be the North of England.

Table 10-3: Total catalytic impact by UK region/country – 2012 - 2037

Country/Region	Current value of future GVA impacts (£millions)	Permanent jobs (2012-13 – 2036-37)
Devolved Nations	4,531	4,621
North of England	9,109	5,314
Midlands	1,727	1,853
South of England	2,896	1,597
London	7,746	2,304
TOTAL	26,009	15,689

Source: BiGGAR Economics economic impact model

10.4 Total Impact by Location

The total impact generated by the new facilities developed by Russell Group universities between 2012-13 and 2016-17 is broken-down in Table 10-4. This shows that although the greatest absolute impact generated by Russell Group universities capital investment will be felt in the North of England.

Table 10-4: Total impact by UK region/country – 2012 - 2037

Country/Region	Current value of future GVA impacts (£millions)	Permanent jobs (2012-13 – 2036-37)
Devolved Nations	7,611	18,541
North of England	14,622	30,067
Midlands	3,258	8,173
South of England	6,660	14,131
London	12,186	27,609
TOTAL	44,338	98,521

Source: BiGGAR Economics economic impact model

11 SUMMARY AND CONCLUSIONS

11.1 Summary

Over five years the Russell Group universities plan to invest £9.1 billion on a wide variety of capital projects ranging from new student accommodation and libraries to new teaching and research facilities.

The current value of the GVA that this investment is expected to generate for the UK economy amounts to more than £44.3 billion.

This includes £8.2 billion of short-term construction and equipment related impacts between 2012-13 and 2016-17, £10.1 billion longer term operational benefits and £26.0 billion of wider catalytic impacts.

These projects are also expected to support more than 98,500 jobs throughout the UK.

This will include around 37,800 temporary jobs during the short-term construction period between 2012-13 and 2016-17, around 45,000 permanent jobs supported by the activities undertaken in the new facilities and almost 15,700 permanent jobs supported by the wider catalytic impact of the facilities.

The short-term impacts generated by these capital investments will include:

- direct construction impact of £2.7 million GVA and 11,679 jobs;
- indirect construction impact of £4.7 billion GVA 22,787 jobs;
- direct equipment impact of £417 million GVA and 1,826 jobs; and
- indirect equipment impact of £396 million GVA and 1,541 jobs.

The operational impacts of the specific projects considered include:

- direct operational impacts of £2.5 billion GVA and 8,872 jobs;
- operational supply chain impacts of £212 million GVA and 740 jobs;
- student impacts of £2.7 billion GVA and 15,355 jobs;
- staff spending impacts of £497 million GVA and 1,768 jobs; and
- operational cost savings of £76 million GVA.

These impacts were then scaled up to give a total operational impact of £10.1 billion GVA and around 50,000 jobs.

The longer term catalytic impact of the new facilities include:

- graduate productivity impact of £11.5 billion GVA;
- medical research impact of £1.2 billion GVA;
- commercialisation and innovation impacts of £2.1 billion GVA and 5,696 jobs;
- enhanced research competitiveness impact of £639 million GVA 1,952 jobs;
- tourism impacts of 23 million GVA and 93 jobs; and

- improved learning environment impact of £283 million GVA and 1,765 jobs.

These impacts were then scaled up to give a total operational impact of £26 billion GVA and around 15,700 jobs.

11.2 Conclusions

The new facilities created by the capital investment of Russell Group universities over five years will improve the physical environment at member institutions. This is important because the physical environment underpins the learning environment and research capabilities of each university. The physical environment at a university also helps to create the conditions for effective collaboration and engagement with industry, which is key to facilitating the transfer of knowledge from academia to industry.

Investing in a high quality learning and research environment also enables members to attract and retain the best students and researchers. This human capital is what enables members to provide high quality education and continue to supply employers in the UK and beyond with a highly qualified workforce. Human capital is also what enables members to undertake cutting edge research, which when transferred into industry, helps to support the competitiveness of UK businesses. In the highly competitive global market for higher education this is essential for maintaining the competitive position of UK institutions.