LE London Economics

The economic and social impact of the University of Sheffield

Final Report for the University of Sheffield

March 2025

About London Economics

London Economics is one of Europe's leading specialist economics and policy consultancies headquartered in London. We advise clients in both the public and private sectors on economic and financial analysis, policy development and evaluation, business strategy, and regulatory and competition policy.

Our consultants are highly-qualified economists with experience in applying a wide variety of analytical techniques to assist our work, including cost-benefit analysis, multi-criteria analysis, policy simulation, scenario building, statistical analysis and mathematical modelling. We are also experienced in using a wide range of data collection techniques including literature reviews, survey questionnaires, interviews and focus groups.

Head Office: Somerset House, New Wing, Strand, London, WC2R 1LA, United Kingdom.

w: londoneconomics.co.uk e: info@londoneconomics.co.uk 𝕏: @LE_Education
t: +44 (0)20 3701 7700 @LondonEconomics

Acknowledgements

We would like to acknowledge the useful data, guidance and feedback provided by the University of Sheffield throughout this research, with particular thanks to Jonathan Wright, Katy Whitfield, Yasmin Knight, Matt Waterman, Lizzie Hughes, Tom Bartlett, Tom Hemington, Mary Young, Kate Fletcher, Claire Rundstrom, Laura Hounslea, Rachel Latham, Pip Strafford, Cliona Boyle, and Anna Blagg. Responsibility for the contents of this report remains with London Economics.

Authors

Philip Hagelberg, Economic Consultant, phagelberg@londecon.co.uk
Marina Symington, Economic Analyst, msymington@londecon.co.uk
Maike Halterbeck, Partner, mhalterbeck@londecon.co.uk
Dr Gavan Conlon, Partner, gconlon@londecon.co.uk

Picture credits: The University of Sheffield. Source of icons: Palsur / Shutterstock.com; Microsoft PowerPoint

Wherever possible London Economics uses paper sourced from sustainably managed forests using production processes that meet the EU eco-label requirements.

Table of Contents

Economic & Social Impact
of the University of Sheffield

University of Sheffield

£4.82 bn economic impact
The economic impact associated with the University of Sheffield's activities in 2022-23

1st in the UK
The University of Sheffield was voted University of the Year at the Whatuni Student Choice Awards 2024

8,500
The University worked with more than 8,500 local children and young people in 2022-23 to raise aspirations through its outreach schemes

12th in the UK
The University is ranked 12th in the UK and 98th in the world*

* THE World University Rankings 2025

6.4
For every £1 of operating expenditure, the University generates £6.40 of economic impact

2nd in the UK
The University of Sheffield ranks 2nd among all UK HEIs in terms of its 2022-23 IP income

36,000 volunteer hours
The University has 2,200 student volunteers, who contribute more than 36,000 hours of their time to local community groups and charities

138 spinouts and start-ups
The number of University of Sheffield spinouts and start-ups operating in the UK in 2022-23, with 60% located in South Yorkshire

23,000 FTE jobs
The University supports 23,000 FTE jobs in the UK, including 13,000 in South Yorkshire and 15,000 across the whole Yorkshire and the Humber region

£265m research income
The total research income received by the University of Sheffield in 2022-23

Greater impact than the size of Sheffield's manufacturing, health, and information & communications sectors combined
We contribute £4.8 billion every year to the UK economy. That's more than Sheffield's manufacturing, health, and information and communications sectors combined (£4.1 billion).

750 students
Number of students working in clinical NHS placements in 2022-23, for a total of more than 365,000 hours

Alumni Survey

selected responses

University of Sheffield

Best 6 years of my life! Miss Sheffield dearly every day.

The university and its academic environment helped me positively shape part of my critical and creative thinking, and let me view the world in a bigger perspective.

Forever grateful for the wonderful opportunities I was offered at Sheffield. I gained confidence and enjoyed every minute of my time there. I appreciate the high-quality teaching and learning experiences I had, the friends I made and the fun we had, in a safe and secure environment of a small (at the time) student population. Thank you, Sheffield!

In my experience (and many of my peers) the role that the city of Sheffield and its residents played in my development was key. The city is so welcoming and supportive of students and in turn the university appears to positively contribute to the city of Sheffield

My five years at medical school in Sheffield were the most formative of my life.

Lifelong friendships made. Degree opened the way to diverse career opportunities.

I loved it - it changed my life.

Best thing I did.

The University of Sheffield was a crucial part of my life without which I would not have had a successful career in higher education.

My time at the University of Sheffield was completely life altering and made me who I am today. My ability to construct an argument and think critically developed as a result of my degree. However, it is hard to put into words the true impact of my time at Sheffield because it truly shifted my mindset and gave me the confidence I needed to thrive in the working world.

Entering as a comprehensive school educated, working class girl, my time at Sheffield opened my eyes to endless possibilities. My extra-curricular activities developed self-confidence and a sense of personal agency.

Overall, the University of Sheffield has taught me resilience, discipline, more purpose towards my goals and hardworking values.

How lucky I was. I spent a wonderful three years at Sheffield and it has had a huge impact on my personal and professional life. Thank you!

Best time of my life was the time spent at the University of Sheffield and the friends I met beside studying that helped secure my professional life.

Amazing experiences in the most important phase of my life.

As the first person from my family to go to university the impact on my life and outlook was profound. Sheffield as a city and the university as an institution were good places to achieve that.

My time at the University of Sheffield was completely life altering and made me who I am today. It is hard to put into words the true impact of my time at Sheffield because it truly shifted my mindset and gave me the confidence I needed to thrive in the working world.

I cherish my studies at the University.

Foreword

When the University of Sheffield was established in 1905, it was to be a university not just in our city, but for our city and region. Through penny donations, the citizens of Sheffield gave the equivalent of £15 million to create an institution that would bring real benefits to the economy, and to people in our communities. Since then, the University has grown its influence and impact, nationally and internationally – but we have never lost sight of our responsibility to repay the generosity of our founders by making a significant and tangible difference to their lives.

This report demonstrates how we do that. The economic and social impact of our university extends far beyond our campus, reaching communities across our city, region and the UK. Our research and innovation attracts inward investment, creates highly-skilled jobs and contributes to national prosperity. The education we provide not only benefits our graduates, apprentices and their employers through equipping them with the skills they need for the future – it attracts thousands of students to Sheffield from around the world every year, who support local businesses, shops and restaurants. We partner with SMEs and industry to help them solve their challenges, develop new and innovative spin-outs, raise the aspirations of young people through outreach schemes, and our student volunteers support countless charities and causes in our region.

In total, the University's total economic impact in 2022-23 was £4.82 billion which means, for every £1 of operating expenditure, we generated £6.40 of economic impact. We are especially proud that 46 per cent of our identifiable impact – £1.24 billion – was felt in South Yorkshire.

This report also highlights how universities like Sheffield are so critical to the prosperity of the UK, locally and globally. We are engines for growth, and the Education Secretary has been clear that she wants universities to make an even stronger contribution to economic growth and their civic role. We are committed to working with national and local government and our partners – to whom we owe a tremendous amount of thanks for the impact we make – to achieve this. While it is undoubtedly a challenging time for higher education in the UK, we remain focused on our founding mission – to make a positive impact on people and communities in our region and beyond.

Professor Koen Lamberts

President and Vice-Chancellor

Executive Summary

London Economics were commissioned by the University of Sheffield to analyse the economic and social impact of the University's activities, focusing on the 2022-23 academic year. The analysis considers the impact associated with the University's research and knowledge exchange activities, teaching and learning activities, international students, and operating and capital expenditures.

The aggregate economic impact of the University of Sheffield

The total economic impact on the UK economy associated with the University of Sheffield's activities in 2022-23 was estimated to be approximately **£4.82 billion** (see Table 1)[1]. Within this total, the value of the University's **research and knowledge exchange activities** stood at **£1.76 billion** (**37%** of the total). The impact associated with the University's **teaching and learning activities** accounted for **£1.20 billion** (**25%**). The impact generated by the University's **operating and capital expenditures** was estimated to be **£539 million** (**11%**), and the impact of the University's **international students** accounted for **£1.3 billion** (**27%**).

The economic impact associated with the University of Sheffield's activities in 2022-23 stood at £4.82 billion.

Table 1 Total economic impact of the University of Sheffield's activities on the UK in 2022-23 (£m and % of total)

Type of impact		£m	%
	Impact of research and knowledge exchange	**£1,764m**	**37%**
	Research activities	£1,283m	27%
	Knowledge exchange activities	£481m	10%
	Impact of teaching and learning	**£1,198m**	**25%**
	Students	£570m	12%
	Exchequer	£629m	13%
	Impact of international students	**£1,322m**	**27%**
	Tuition fee income	£703m	15%
	Non-tuition fee income	£618m	13%
	Impact of the University's spending	**£539m**	**11%**
	Direct impact	£220m	5%
	Indirect and induced impact	£320m	7%
Total economic impact		**£4,823m**	**100%**

Note: All estimates are presented in 2022-23 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

[1] All estimates here are presented in terms of economic output (equivalent to income/turnover). The impact of the University's research and knowledge exchange activities, international students, and institutional expenditures can also be converted into gross value added (GVA) and full-time (FTE) employment, and these additional findings are provided within the relevant sections throughout this report.

For every £1 of expenditure, the University of Sheffield generated £6.40 of impact.

Compared to the University of Sheffield's relevant operating costs of approximately **£751 million** in 2022-23[2], the total impact of the University's activities on the UK economy was estimated at **£4.82 billion**, which corresponds to a **benefit-to-cost ratio of approximately 6.4:1**.

Regional impacts

In addition to assessing the University's impact on the UK economy as a whole, it is also possible to estimate the economic impact of a number of strands of the University's activities on **South Yorkshire**, and on the **Yorkshire and the Humber region as a whole**. Specifically, we estimated the direct, indirect and induced economic impacts of the University's research and knowledge exchange activities, of the spending of the University's international students, and of the University's institutional expenditures on the South Yorkshire and wider Yorkshire and the Humber economies[3]. Approximately **56%** of the University of Sheffield's total impact can be linked to a specific UK region.

The analysis indicates that almost **£1.24 billion** (**46%**) of the identifiable impact accrued in **South Yorkshire**, with a further **£270 million** (**10%**) accrued throughout the rest of **Yorkshire and the Humber;** and **£1.17 billion** (**44%**) throughout the rest of the UK.

More than half of the University of Sheffield's identifiable regional impact occurs in Yorkshire and the Humber, of which more than 80% occurs in South Yorkshire.

Employment impacts

In terms of the number of full-time equivalent (FTE) jobs supported, the University itself directly employed **7,380** FTE staff in 2022-23[4]. The analysis indicates that the University's activities supported a total of **22,990** FTE jobs across the UK economy in 2022-23, of which **12,890** were located in **South Yorkshire**, and **15,020** were supported throughout **Yorkshire and the Humber as a whole**.

Social impacts

There are also a wide range of **social impacts** associated with the University's activities, both for its students and society at large. These wider societal benefits (e.g. in terms of the impact of studying at the University on social and community engagement, personal development, and well-being) were identified via a survey of University of Sheffield alumni[5].

[2] This relates to the University's total operating expenditure, excluding capital expenditure, depreciation and amortisation, and movements in pension provisions.
[3] It is not possible to attribute the impact of the other strands of economic impact to any specific UK region (i.e. there is no regional breakdown available for the estimated productivity spillovers associated with the University's research, or for the impact of the University's teaching and learning activities).
[4] Based on data published by HESA (2024d). Note that this excludes staff on atypical contracts.
[5] See Section 7 for more detail.

The impact of the University of Sheffield's research and knowledge exchange activities

The estimated impact of the University of Sheffield's research and knowledge exchange activities in 2022-23 stood at £1.8 billion.

To estimate the economic impact associated with the University's **research activity**, we used information on the total research-related income received by the University from Research England and other sources (e.g. UK Research Councils, central and local government, charities etc.) in 2022-23, which stood at **£265 million**.

We assessed the direct, indirect, and induced economic impacts associated with the University's research activity, using economic multipliers derived from a (multi-regional) Input-Output model. After accounting for **£195 million** of Exchequer costs, the **net direct, indirect, and induced impact of the University's research** was estimated at **£338 million**.

The University of Sheffield was placed amongst the top-5 UK higher education institutions in terms of successful equity deals secured by their spinouts in 2023.

In addition, existing academic literature[6] finds strong evidence of **productivity spillovers** from public investment in university research. Applying estimates from the academic literature, our analysis estimates an average spillover multiplier of **4.34**, suggesting that **every £1 invested in the University of Sheffield's research activities generates an additional annual economic output of £4.34 across the UK economy through positive productivity spillovers to the UK private sector**, resulting in total estimated spillovers of **£945 million**. This results in a total economic impact associated with the University's research activities of **£1.28 billion** in 2022-23.

The University generated £55 million of IP licensing income in 2022-23.

In addition to the University of Sheffield's research, the analysis estimated the direct, indirect, and induced impact associated with the University's **knowledge exchange activities**. This includes the activities of the University's **spinout** and **start-up companies**; **contract research** and **consultancy services** provided by the University; **business and community courses**; **facilities and equipment hire**; and **licensing of the University's IP** to other organisations, and is illustrated by signature assets such as the University of Sheffield Advanced Manufacturing Research Centre which has acted as a magnet for capital investment and a source of high value jobs throughout South Yorkshire over the last 20 years[7].

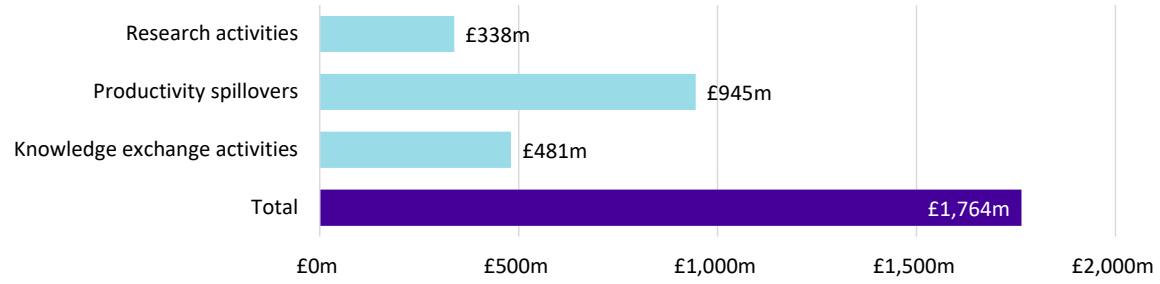
[6] See Haskel and Wallis (2010), and Haskel et al. (2014a).
[7] See Advanced Manufacturing Research Centre (2022).

The analysis estimates that these knowledge exchange and commercialisation activities generated a total of **£481 million** of impact across the UK economy in 2022-23.

The combined economic impact associated with the University of Sheffield's research and knowledge exchange activities in 2022-23 was therefore estimated to be **£1.76 billion** (see Figure 1). In terms of full-time equivalent (FTE) employment, the analysis estimates that the University's research and knowledge exchange activities supported approximately **7,980** FTE jobs, of which **4,045** are located in **South Yorkshire**, with a total of **4,675** jobs supported throughout the **Yorkshire and the Humber region as a whole**.

The latest Knowledge Exchange Framework recognised the University of Sheffield as one of the top universities in the country for working with businesses, developing IP, commercialising research, and engaging with the public and communities.

Figure 1 Total economic impact of the University of Sheffield's research and knowledge exchange activities in 2022-23, £m



Note: All values are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. ***Source: London Economics' analysis***

The impact of the University of Sheffield's teaching and learning activities

Ranking 12th in the UK and 98th in the world in the Times Higher Education World University Rankings 2025[8], and having recently been voted UK University of the Year at the Whatuni Student Choice Awards 2024, the University of Sheffield's teaching and learning activities provide substantial benefits to the UK economy. The analysis of the impact of these activities estimates the **enhanced employment and earnings benefits to graduates** and the **additional taxation receipts to the public**

The proportion of University of Sheffield students remaining in Yorkshire and the Humber post-graduation is larger than for any other HEI located in the region.

[8] See Times Higher Education (2024).

purse associated with higher education qualification attainment at the University[9]. The analysis is tailored to the characteristics of the **7,055** UK domiciled students who started a higher education qualification at the University in the 2022-23 academic year.

The net graduate premium associated with a typical full time first degree from the University of Sheffield was estimated to be £112,000

Incorporating both the expected costs associated with qualification attainment and the labour market benefits expected to be accrued by students/graduates over their working lives, the analysis estimates that the **net graduate premium** achieved by representative UK domiciled students in the 2022-23 cohort completing a **full-time first degree** (with a Level 3[10] qualification as their highest level of prior attainment) stands at approximately **£112,000** (in 2022-23 money terms). Separately, taking account of the benefits and costs to the public purse, the corresponding **net Exchequer benefit** associated with these students was estimated at **£117,000**.[11]

The net graduate premiums and net Exchequer benefits per student were combined with information on the number of UK domiciled students starting qualifications at the University of Sheffield in the 2022-23 academic year, as well as expected completion rates. The resulting aggregate economic impact generated by the University's teaching and learning activities associated with the 2022-23 cohort stood at approximately **£1.20 billion** (see Table 2). This total is split roughly evenly between the Exchequer and students/graduates: **£629 million** (**52%**) of the total economic benefit is accrued by the Exchequer, while the remaining **£570 million** (**48%**) is accrued by students/graduates undertaking qualifications at the University of Sheffield.

The total economic impact of teaching and learning generated by the 2022-23 cohort of University of Sheffield students stood at £1.2 billion.

The University of Sheffield's Access Service and Student Recruitment Team engaged with a total of 8,555 children and young people in 2022-23 through their outreach schemes.

[9] The estimation of the net graduate premiums and net Exchequer benefits is based on a detailed econometric analysis of the Labour Force Survey. The analysis considers the impact of higher education qualification attainment on earnings and employment outcomes; however, as no information is specifically available on the particular higher education institution attended, the analysis is *not* specific to University of Sheffield alumni. Rather, the findings from the analysis are adjusted to reflect the characteristics of the 2022-23 cohort of University of Sheffield students to the greatest extent possible (e.g. in terms of mode of study, level of study, subject mix, domicile, gender, average age at enrolment, or duration of qualification).

[10] Based on the Regulated Qualifications Framework (RQF) used in England, Wales, and Northern Ireland.

[11] The full set of estimated net graduate premiums and net Exchequer benefits per student is presented in Annex A2.3.8.

Table 2 Impact of the University of Sheffield's teaching and learning activities associated with the 2022-23 cohort (£m), by type of impact, domicile, and level of study

Beneficiary and study level	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Students	**£556m**	**£10m**	**£2m**	**£2m**	**£570m**
Undergraduate	£492m	£9m	£1m	£1m	**£504m**
Postgraduate	£64m	£1m	£1m	£0m	**£66m**
Exchequer	**£614m**	**£11m**	**£2m**	**£2m**	**£629m**
Undergraduate	£517m	£9m	£1m	£2m	**£529m**
Postgraduate	£96m	£1m	£1m	£0m	**£99m**
Total	**£1,170m**	**£20m**	**£4m**	**£3m**	**£1,198m**
Undergraduate	£1,010m	£18m	£2m	£3m	**£1,033m**
Postgraduate	£160m	£3m	£2m	£1m	**£165m**

Note: All estimates are presented in 2022-23 prices, discounted to reflect net present values, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

The proportion of University of Sheffield graduates in sustained employment, further study, or both is consistently higher than the corresponding proportion from the wider GB based Russell Group of universities.

The impact of the University of Sheffield's international students

With the University of Sheffield attracting a large number of international students each year, the University's higher education offer represents a tradeable activity with imports and exports like any other tradeable sector. The economic impact of the University's contribution to educational exports is based on the **direct** injection of **tuition fee** and **non-tuition fee income** from its international students. As with the University's research and knowledge exchange activities, this income generates additional **indirect and induced impacts** throughout the UK economy, through supply chain and wage income effects. The analysis focuses on the cohort of **6,570** non-UK domiciled students who started qualifications at the University of Sheffield in the 2022-23 academic year. Of these students, **195** (**3%**) were EU domiciled, and **6,375** (**97%**) were from non-EU jurisdictions.

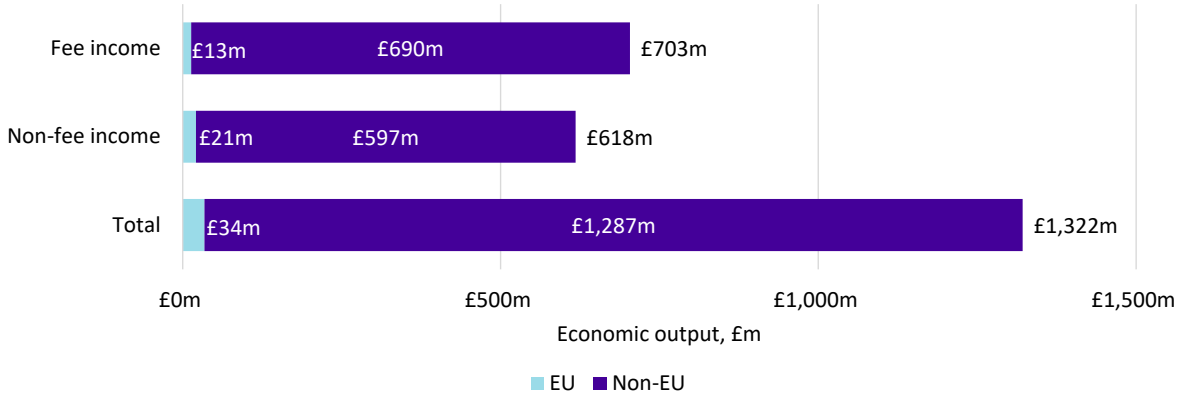
Combining the estimated tuition fee income (net of the University of Sheffield's cost of fee waivers and bursaries for international students) and non-tuition fee income associated with international students in the 2022-23 cohort, the **total export income** (**i.e. direct impact**) generated by this cohort stood at **£536 million**. Around **54%** of this income (**£287 million**) was generated from international students' (net) tuition fee expenditure accrued by the University of Sheffield, while the remaining **46%** (**£249 million**) was generated from these students' non-tuition fee expenditure (e.g. including costs related to accommodation, subsistence, course-related purchases, and travel).

The total (direct, indirect, and induced) economic impact associated with this income was again estimated using relevant economic multipliers, identifying the extent to which the expenditures of international students generate additional activity throughout the UK economy. We thus estimate that the **total economic impact** on the UK generated by the (net) fee income and non-fee income associated with international students in the 2022-23 University of Sheffield cohort amounts to **£1.32 billion**. Of this total, **£709 million** was associated with international students' (net) **tuition fees**, and **£618 million** was associated with their non-fee expenditures over the duration of their studies at the University of Sheffield (see Figure 2).

The impact of the 2022-23 University of Sheffield cohort of international students stood at £1.3 billion.

In employment terms, these educational exports supported an estimated **11,320 full-time equivalent jobs** across the UK as a whole, including **6,575** supported in **South Yorkshire** and a total of **7,730** jobs supported throughout **Yorkshire and the Humber as a whole**.

Figure 2 Impact of the University of Sheffield's educational exports associated with international students in the 2022-23 cohort (£m), by domicile and type of income



Note: All estimates are presented in 2022-23 prices, discounted to reflect net present values, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

The impact of the University of Sheffield's expenditure

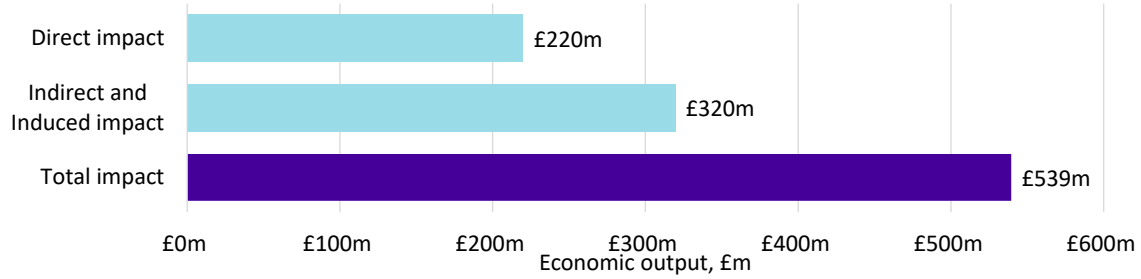
The University of Sheffield's significant physical footprint supports jobs and promotes economic growth throughout South Yorkshire and the wider UK economy. This is captured by the **direct, indirect, and induced impact** associated with the University's expenditures. The **direct impact** of the University's physical footprint was based on its operating and capital expenditures. In the 2022-23 academic year, the

The impact of the University's expenditure on the UK economy in 2022-23 stood at £539 million.

University of Sheffield incurred a total of **£839 million**[12] of expenditure (including **£751 million** of operating expenditure[13] and **£87 million** of capital expenditure). From this total, we deducted **£619 million** to avoid double-counting across other areas of economic impact, which resulted in a net direct impact of **£220 million**.

Again, the direct increase in economic activity resulting from the University's expenditures generates additional rounds of spending throughout the economy (through the University's supply chains and the spending of its staff). Applying relevant economic multipliers, the **total direct, indirect, and induced impact** associated with the University's expenditures in 2022-23 was estimated at **£539 million** (see Figure 3). Half of this impact (**£269 million, 50%**) occurred in **South Yorkshire**, and a total of **£328 million** (**61%**) was accrued throughout **Yorkshire and the Humber as a whole**. In terms of the number of FTE jobs supported, the University's expenditures[14] supported a total of **3,685** FTE jobs across the UK economy in the 2022-23 academic year, of which **2,270** were based in **South Yorkshire**, while **2,615** jobs were supported across **Yorkshire and the Humber as a whole**.

Figure 3 Impact associated with the University of Sheffield's expenditure in the 2022-23 academic year (£m)



Note: All estimates are presented in 2022-23 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

The University's activities supported a total of 22,990 full time equivalent jobs across the UK economy in 2022-23.

12,890 were located in South Yorkshire, with a further 2,130 supported throughout the wider Yorkshire and the Humber region.

[12] This figure excludes depreciation and amortisation, and movements in pension provisions (thus, approximating a cash-based figure). As such, this figure will not coincide exactly with the estimated expenditure in financial statements from the University of Sheffield.
[13] The total operational expenditure (excluding capital expenditure) of the University stood at **£795 million**. From this, for the purpose of the analysis, we excluded a total of **£44 million** in depreciation and amortisation costs and pension provision movement, as it is assumed that these are not relevant from a procurement perspective (i.e. these costs are not accounted for as income by other organisations).
[14] Again, after adjusting for double-counting with the other strands of economic impact considered here.

1 Introduction

London Economics were commissioned to assess the **economic and social impact of the University of Sheffield on the United Kingdom**, focusing on the 2022-23 academic year. The University contributes to the UK's national prosperity through a range of activities and channels, and the economic impact analysis is split into:

- The impact of the University of Sheffield's **research and knowledge exchange activities**;
- The economic contribution of the University's provision of **teaching and learning**;
- The impact of the University's **international students**; and
- The impact of the University's **operating and capital expenditures**.

In addition, results from a survey of University of Sheffield alumni provide information on the University's wider social impacts, in terms of the effect on graduates' lives (e.g. in relation to their wider skills, social and community engagement, personal development, or well-being).

Reflecting these channels of impact, the remainder of this report is structured as follows.

Section 2 focuses on the impact of the University of Sheffield's **research and knowledge exchange activities**. To estimate the impact of the research undertaken at the University, we combine information on the research-related income accrued by the University in 2022-23 with estimates from the wider economic literature on the extent to which public investment in research activity results in additional private sector productivity (i.e. positive 'productivity spillovers'). In addition, the analysis estimates the direct, indirect, and induced impact associated with the University's research and knowledge exchange activities, including the commercialisation activities of spinout companies and start-up companies associated with the University; contract research provided by the University; consultancy services provided by the University; business and community courses; facility and equipment hire; and licensing of the University's intellectual property (IP) to other organisations.

In **Section 3**, we assess the improved labour market earnings and employment outcomes associated with higher education attainment at the University of Sheffield. Through an assessment of the expected lifetime benefits and costs associated with educational attainment, we estimate the **net economic benefits of the University's teaching and learning activity to its graduates and the public purse** (through enhanced taxation receipts), focusing on the cohort of **7,055** UK domiciled students who started higher education qualifications at the University in the 2022-23 academic year.

In addition to these UK domiciled students, there were a further **6,570** international students commencing their studies at the University in 2022-23. These students contribute to the value of UK educational exports through their tuition fees as well as their non-fee (i.e. living cost) expenditures during their studies. **Section 4** assesses the **direct, indirect, and induced economic impacts generated by this international fee and non-fee income** associated with the University's 2022-23 cohort of non-UK domiciled students.

Given that the University is a large employer and supports its wide-ranging activities through significant expenditures, the University's substantial physical footprint supports jobs and promotes economic growth throughout South Yorkshire and the wider UK economy. **Section 5** presents our estimates of the **direct, indirect, and induced economic impacts associated with the operating and capital expenditures incurred by the University** in the 2022-23 academic year.

In addition to the economic impacts associated with the University, there are a wide range of **non-economic or societal benefits** associated with higher education qualification attainment. In **Section 6**, we present the wider economic and social benefits of learning at the University of Sheffield for students and graduates, based on a survey of the University's alumni.

Finally, **Section 7 summarises** our main findings.

2 The impact of the University of Sheffield's research and knowledge exchange activities

This section outlines our estimates of the economic impact of the University of Sheffield's **research and knowledge exchange activities**. To achieve this, we first consider the impact of the University's expenditure on research and wider knowledge exchange activities, in terms of the direct, indirect and induced effects of that spending. Secondly, we assess the wider productivity spillovers that are generated through the University's research activities. Thirdly, we estimate the economic impact generated by the spinout and start-up companies that are linked to the University (i.e. spinout companies that are based on the University's IP, and student/graduate and staff start-up companies).

2.1 Economic impact of the University of Sheffield's research

In this section, we outline our analysis of the **economic impact of the University of Sheffield's research activities**. Specifically, we estimate both the **direct, indirect, and induced effects** of the University's research (captured by the research income accrued by the University of Sheffield and the subsequent rounds of spending this income generates across the economy), as well as the private sector **productivity spillover effects** from the University's research activities.

2.1.1 The University of Sheffield's research income in 2022-23

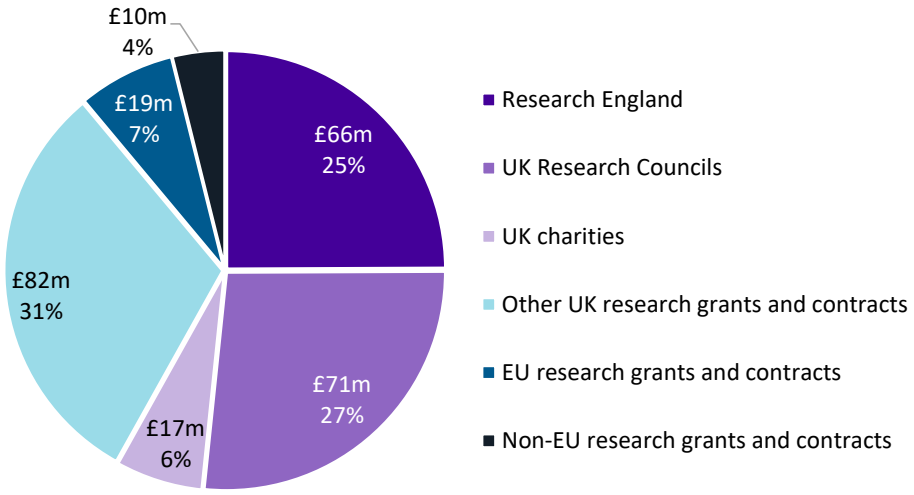
To estimate the **direct impact** generated by the University of Sheffield's research activities, we used information from the Higher Education Statistics Agency (HESA) on the total research-related income accrued by the University in the 2022-23 academic year. This includes:

- Income from **research grants and contracts** provided by:
  - **UK sources**, including the UK Research Councils; UK-based charities; central government bodies, local authorities, and health and hospital authorities; industry and commerce; and other UK sources;
  - **EU sources**, including government bodies, charities, industry and commerce, and other sources; and
  - **Non-EU sources**, including charities, industry and commerce, and other sources; and
- **Recurrent research funding** allocated to the University by Research England.

Aggregating across these sources, the total research-related income accrued by the University of Sheffield in the 2022-23 academic year stood at **£265 million** (see Figure 4).[15] Approximately **£66 million** (**25%**) of this income was received through recurrent research grant funding from **Research England**, with an additional **£71 million** (**27%**) received from the **UK Research Councils**, **£17 million** (**6%**) from **UK charities**, and **£82 million** (**31%**) from **other UK sources**[16]. In addition, in terms of funding from international sources, **£19 million** (**7%**) of the University's research-related income was derived from **EU research grants and contracts**, and the remaining **£10 million** (**4%**) was from **non-EU sources**.

[15] Note that, for the purpose of the analysis, we then adjust this income (i.e. the estimated direct impact of research) to avoid double-counting with knowledge exchange activities, and to deduct the public costs of these research activities (see Sections 2.1.2 and 2.1.3).
[16] This income from 'other UK sources' includes **£59 million** from UK central government bodies, local authorities, and health and hospital authorities; **£21 million** from UK industry, commerce and public corporations; and **£2 million** from other sources.

Figure 4 Research income received by the University of Sheffield in 2022-23, £m by source



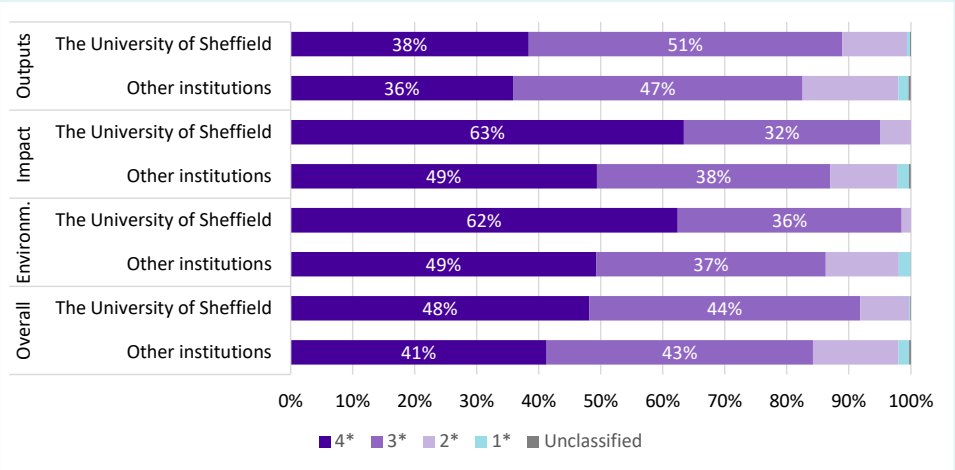
Note: All values are presented in 2022-23 prices and rounded to the nearest £1 million.
Source: London Economics' analysis based on data provided by the Higher Education Statistics Agency (HESA, 2024a)

Box 1 The University's performance in the 2021 Research Excellence Framework

The results from the 2021 Research Excellence Framework (REF)[17] highlight the University's world-leading research contributions.

Overall, nearly half (**48%**) of the University's submissions were rated as **4* (world-leading)** and **44%** were rated as **3* (internationally excellent)**, compared to **41%** and **43%** respectively across all other UK higher education institutions (HEIs; see Figure 5). The University performs particularly strongly in terms of the **quality of its research environment** (where **99%** of the University's submissions were rated as 4* or 3*, compared to **86%** at all other institutions), as well as in terms of the **impact of its research** (**95%** rated as 4* or 3*, compared to **87%** for all other institutions).

Figure 5 REF2021 ratings for the University of Sheffield vs. all other UK higher education institutions



Source: London Economics' analysis of REF2021 results (see Research Excellence Framework (2022))

[17] See Research Excellence Framework (2022).

The University of Sheffield's specific strengths in certain areas were highlighted by the University **ranking in the top 10 in the UK in terms of overall research quality**[18] in Biological Sciences, Physics, Engineering, and Architecture, Built Environment, and Planning. In addition, the University ranked **top in the UK for research impact**[19] in Education, and also **ranked within the top 10 institutions in terms of its research impact** in 10 subjects (including Clinical Medicine; Public Health, Health Services and Primary Care; Biological Sciences; Physics; Mathematical Sciences; Engineering; Architecture, Built Environment and Planning; Geography and Environmental Studies; Area Studies; and Communication, Cultural and Media Studies, and Library and Information Management).

2.1.2 Adjustment for double-counting with knowledge exchange activities

The **£265 million** of research income received by the University of Sheffield in 2022-23 includes the income generated by the University from its **collaborative research** and **contract research**.[20] However, the income from these two activities is *also* recorded separately within HESA's Higher Education Business and Community Interaction Survey (HE-BCI)[21] data, which we use to separately estimate the economic impact associated with the University's wider knowledge exchange activities (described in further detail in Section 2.2).

Since the income from these sources is included in *both* the data on the University's research-related income as well as the HE-BCI data on its wider knowledge exchange activities, to avoid any double-counting between the estimated impact of the University's research activity (described in this section) and wider knowledge exchange activities (described in Section 2.2), we made the following adjustments:

- In terms of the University's income from **collaborative research**, we implicitly account for publicly funded and cash income from collaborative research within the **impact of the University's research**. We therefore do *not* take collaborative research income into account in the analysis of wider knowledge exchange activities. This income represents **£58 million** out of the **£265 million** of total research income received by the University in 2022-23.[22]
- In terms of **contract research**, we account for this activity within the impact of the University of Sheffield's wider knowledge exchange activities (see Section 2.2). Therefore, to avoid double-counting, we deduct **£47 million** of contract research income from the above total research-related income. We thus estimated that the *gross* **direct impact** (before deducting public costs) associated with the University's research activity in 2022-23 stands at **£217 million**.

A schematic overview of the methodological approach adopted, including these adjustments for double-counting, is provided in Annex A2.2.1.

[18] Based on the proportion of submissions that were rated 4* in terms of overall research quality.
[19] Based on the proportion of submissions that were rated 4* in terms of research impact.
[20] Collaborative research involving public funding includes cash or in-kind contributions to research projects with material contributions from at least one external non-academic collaborator. Contract research meets specific research needs of external partners, excluding basic research council grants. The two activities are mutually exclusive.
[21] See Higher Education Statistics Agency (2024b).
[22] The **£58 million** in collaborative research funding is made up of **£54 million** of public funding and **£4 million** of collaborative cash contributions. Note that any income in terms of in-kind contributions to collaborative research (**£44 million**) is excluded here, since these contributions do not represent a cash transaction for which we can robustly apply economic multipliers.

2.1.3 Total direct, indirect, and induced impact of the University of Sheffield's research activity

The analysis then assesses the total **direct, indirect, and induced economic impacts** on the UK economy associated with the University of Sheffield's research activity in 2022-23. While the direct impact reflects the research income that the University received in the 2022-23 academic year[23], the indirect and induced effects reflect the chain reaction of subsequent rounds of spending throughout the economy, often referred to as a 'ripple effect'. These are defined as follows:

- **Indirect effect ('supply chain impacts')**: The University of Sheffield spends its research income on purchases of goods and services from suppliers, who in turn spend this revenue purchasing inputs to meet the University's demand. This results in a chain reaction of subsequent rounds of spending across industries, often referred to as a 'ripple effect'.
- **Induced effect ('wage spending impacts')**: The University's employees (supported by the University's research income) use their wages to purchase consumer goods and services within the economy. This in turn generates wage income for employees within the industries producing these goods and services, again leading to subsequent rounds of spending, i.e. a further 'ripple effect' throughout the economy as a whole.

The total of the direct, indirect, and induced effects constitutes the *gross* economic impact of the University of Sheffield's research activities. An analysis of the *net* economic impact ideally needs to account for two additional factors that potentially reduce the size of any of the above effects:

- **Leakage** into other geographical areas, by taking account of how much of the additional economic activity actually occurs in the area of consideration (i.e. within the UK); and
- **Displacement** of economic activity within the region of analysis, i.e. taking account of the possibility that the economic activity generated might result in the reduction of activity elsewhere within the region[24].

The direct, indirect, and induced impacts are measured in terms of monetary economic output[25], gross value added (GVA)[26], and full-time equivalent (FTE) employment supported[27]. In addition to measuring these impacts on the UK economy as a whole, the analysis is broken down by geographic region[28] and sector.

These impacts of the University of Sheffield's research activities were estimated using **economic multipliers** derived from Input-Output tables,[29] which measure the total production output of each

[23] Net of contract research income, as discussed above.
[24] It is important to note that, while the analysis (wherever possible) takes account of *leakage* (e.g. adjusting for the extent to which any additional income for supplying industries might be spent on imports of goods and services from outside the UK), the estimated impacts here are *not* adjusted for *displacement* or additionality (e.g. the extent to which the research income received by the University might otherwise have been used for other purposes by the organisations from which the income is received). Hence, our analysis effectively estimates the direct, indirect, and induced impacts associated with the University of Sheffield's research activities in *gross* terms.
[25] In this analysis, economic output is equivalent to income or expenditure (e.g. the direct research income that the University of Sheffield accrued in 2022-23).
[26] Gross value added is used in national accounting to measure the economic contribution of different industries or sectors and is defined as economic output minus intermediate consumption (i.e. minus the cost of goods and services used in the production process).
[27] Full-time equivalent jobs represent the total number of full-time jobs supported, accounting for part-time positions on an equivalent full-time basis.
[28] Specifically, the underlying analysis is broken down into the UK's 41 International Territorial Level 2 (ITL2) regions (for more information, see Office for National Statistics (2024)). Within the overall Yorkshire and the Humber region, the analysis thus distinguishes between North Yorkshire, South Yorkshire (where the University of Sheffield is located), West Yorkshire, and East Yorkshire and Northern Lincolnshire.
[29] Input-Output tables quantify the interdependencies between different sectors and regions of an economy by detailing the origin and destination of resource flows between each sector and region.

industry in the UK economy, and the inter-industry (and intra-industry) flows of goods and services consumed and produced by each sector. In other words, these tables capture the degree to which different sectors within the UK economy are connected, i.e. the extent to which changes in the demand for the output of any one sector impact all other sectors of the economy. To be able to achieve a breakdown of the analysis by region, we developed a **multi-regional Input-Output model**, combining UK-level Input-Output tables (published by the Office for National Statistics[30]) with a range of regional-level data to achieve a granular breakdown by sector *and* region.[31]

To estimate the total direct, indirect, and induced impact, we apply the relevant average economic multipliers[32] derived from the Input-Output analysis associated with organisations in the **government, health, and education sector in South Yorkshire**.[33] These multipliers (for the impact on South Yorkshire, all of Yorkshire and the Humber, and the UK economy as a whole) are presented in Table 3.

Based on these estimates, in terms of economic output, we assume that every **£1 million** of research income accrued by the University of Sheffield generates a *total* of **£2.45 million** of impact throughout the UK economy on average, of which **£1.22 million** is accrued in South Yorkshire (and **£1.49 million** is generated throughout the whole of the Yorkshire and the Humber region). In terms of employment, we assume that, for every **1,000** FTE staff employed directly by the University of Sheffield, a total of **1,910** staff are supported throughout the UK, of which **1,170** are supported in South Yorkshire (and a total of **1,350** are supported throughout Yorkshire and the Humber as a whole).

Table 3 Economic multipliers associated with the University of Sheffield's research activities

Location of impact	Output	GVA	FTE employment
South Yorkshire	1.22	1.19	1.17
Yorkshire and the Humber	1.49	1.42	1.35
Total UK	2.45	2.23	1.91

Note: All multipliers constitute Type II multipliers, defined as [Direct + indirect + induced impact]/[Direct impact].
Source: London Economics' analysis

In addition to the direct, indirect, and induced economic impacts associated with the University of Sheffield's research activity, a similar methodology is applied to estimate the direct, indirect, and induced economic effects associated with the University's knowledge exchange activities (see Section 2.2), international students (see Section 4), and operational and capital expenditures (see Section 5).

Adjusting for public costs

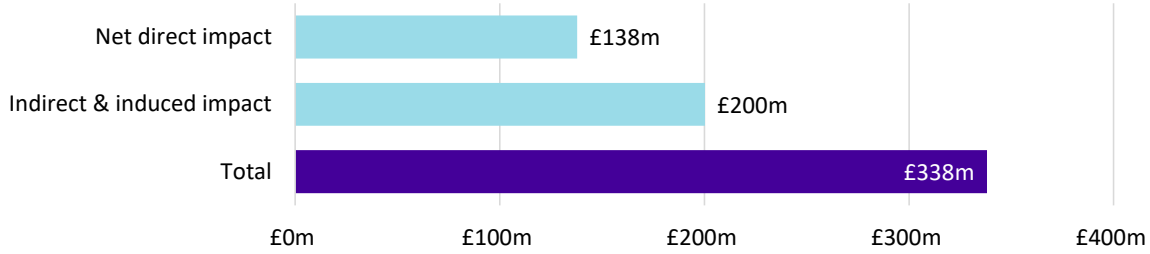
To arrive at the ***net* total impact** of the University's research activities on the UK economy (**net of public costs**), we deducted the **costs to the public purse** of funding these activities. These public costs include the funding provided to the University by the UK Research Councils (**£71 million**), recurrent research grants provided by Research England (**£66 million**), and other research income from UK central government bodies, local authorities, and health and hospital authorities (**£59**

[30] See Office for National Statistics (2023d).
[31] See Annex 2.1 for more details on the Input-Output analysis.
[32] Specifically, the analysis makes use of *Type II* multipliers, defined as [Direct + indirect + induced impact]/[Direct impact].
[33] i.e. we assume that the expenditure patterns of the University of Sheffield are the same as for other institutions operating in South Yorkshire's government, health, and education sector.

million)[34]. These total public purse costs (**£195 million**) are deducted from the total direct, indirect, and induced impacts of research activity (estimated using the multipliers outlined above). As a result, the **direct, indirect, and induced impact** (net of public costs) associated with the University of Sheffield's research activity in 2022-23 was estimated at **£338 million**, with a (net) direct impact of **£138 million** (see Figure 6).

In terms of GVA and FTE employment, the total direct, indirect, and induced impact associated with the University's research was estimated at **£198 million** and **3,250** FTE jobs, respectively.[35]

Figure 6 Net direct, indirect, and induced impacts associated with the University of Sheffield's research income in 2022-23, £m



Note: Estimates are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated.

Source: London Economics' analysis

[34] This is included within the **£82 million** of income from 'other UK research grants and contracts' in Figure 4 (which also includes **£21 million** of income from UK industry and **£2 million** from other UK sources).

[35] To estimate the *direct* GVA and employment supported by the University's research income, we multiplied this income by the average ratio of GVA to output and FTE employees to output within South Yorkshire's government, health, and education sector (based on the above-described multi-regional Input-Output model). Again, this approach assumes that the expenditure patterns of the University of Sheffield are the same as for other institutions operating in South Yorkshire's government, health, and education sector. To estimate the *total direct, indirect, and induced* impacts in GVA and employment terms, we then applied the above-described economic multipliers (see Table 3).

A catalyst for innovation and jobs

The University of Sheffield's sector-leading translational research centres are not only vibrant hubs of collaboration and interdisciplinary expertise, but also drivers of economic growth, innovation, and knowledge exchange.

Through fostering a culture of innovation and entrepreneurship across the institution, the University of Sheffield's research is also helping to attract inward investment and create highly skilled jobs in the South Yorkshire region.

Advanced Manufacturing Research Centre (AMRC)

Bridging the gap between academia and industry is the University of Sheffield's Advanced Manufacturing Research Centre (AMRC). With 100 industrial partners, including Boeing, McLaren, and Rolls-Royce, the AMRC's cutting-edge collaborations are shaping the advanced manufacturing sector not just in the UK, but across the globe.

Data released in a 2022 Impact Analysis report by Lichfields illustrated the economic benefits attributable to the AMRC, including attracting over £260 million of inward investment into the South Yorkshire manufacturing cluster, training over 1,700 apprentices, and creating 520 high value jobs during its first 20 years of operation. The same report found that AMRC workers also earn 46% higher than the South Yorkshire average reflecting the high value and productivity of the workforce.

This success of the AMRC in stimulating regeneration and growth has also been 'exported' to other areas of the UK, with AMRC North West established to catalyse investment and development on the Samlesbury Enterprise Zone in Lancashire; and AMRC Cymru supporting the delivery of Airbus UK's 'Wing of Tomorrow' programme in Broughton, which was seen as critical to safeguarding 6,500 jobs at Airbus and thousands more in the supply chain.

The University of Sheffield's partnership with Boeing

The 24-year partnership between the AMRC and Boeing paved the way for translational research which underpinned Boeing's decision to build its only manufacturing site in Europe in Sheffield. In 2024, the team were presented with the Bhattacharya Award, a prestigious honour backed by the UK government that recognises sustained industrial collaboration, and its benefits to academia, business, and the UK economy.

In 2023, the AMRC announced a groundbreaking £80m research programme, Composites at Speed and Scale (COMPASS), with a new open-access innovation facility in Sheffield. Boeing's largest research and development project, Isothermic High-Rate Sustainable Structures (IHSS), will be the first project to be undertaken within the facility. IHSS aims to de-risk and develop high-rate sustainable structures with the potential to reduce large component process times from 40 hours to approximately four hours, and help the aviation industry reach net zero. The Boeing-led project will initially create around 50 jobs in South Yorkshire and, based on existing and forecasted aircraft demand, has the potential to create 3,000 UK jobs long-term, and around £2 billion annually in export opportunities.

2.1.4 Productivity spillovers to the private sector

In addition to the direct, indirect, and induced impact of research, the wider academic literature indicates that **investments in research & development (R&D) and other intangible assets may induce positive externalities**. Economists refer to the term 'externality' to describe situations in which the activities of one 'agent' in the market induce (positive or negative) external effects on other agents in that market (which are not reflected in the price mechanism). In the context of research activities, existing academic literature assesses the existence and size of **positive productivity and knowledge spillovers**, where knowledge generated through the R&D activities of one agent enhances the productivity of other organisations.

There are many ways in which research generated at universities can induce such positive spillover effects to the private sector[36]. For example, spillovers are enabled through direct R&D collaborations between universities and firms (such as Knowledge Transfer Partnerships), the publication and dissemination of research findings, or through university graduates entering the labour market and passing on their knowledge to their employers. A prime example of the role of knowledge exchange and the existence of positive productivity spillovers is illustrated by signature assets such as the University of Sheffield Advanced Manufacturing Research Centre which has acted as a magnet for capital investment and a source of high value jobs throughout South Yorkshire over the last 20 years.[37]

In order to estimate the productivity spillovers associated with the University of Sheffield's research activities, we apply productivity spillover multipliers from the existing literature to the different types of research-related income received by the University in 2022-23 (again see Figure 4). Specifically, we assign a multiplier of **12.7**[38] to the University's research funding from **UK Research Councils and UK charities**[39] (amounting to **£88 million**), and a multiplier of **0.2**[40] to **all other research funding** received by the University in 2022-23 (amounting to **£177 million**)[41]. A more detailed summary of the key relevant literature on this topic is presented in Box 2.

Using this approach, we infer a weighted average spillover multiplier associated with the University of Sheffield's research activities in 2022-23 of approximately **4.34** – i.e. **every £1 invested in the University's research activities generates additional annual economic output of £4.34 across the UK economy**. This captures the impact of the research undertaken by the University in 2022-23 within that same academic year (but excludes any additional (and likely substantial) impacts in subsequent years).[42] Applying this weighted average multiplier to the direct impact of research (i.e.

[36] Note that there are also clearly significant economic and social spillovers to the *public* sector associated with university research. However, despite their obvious importance, these have been much more difficult to estimate robustly, and are not included in this analysis.
[37] See Advanced Manufacturing Research Centre (2022).
[38] This is based on a key study by Haskel and Wallis (2010). For more detail, see Box 2.
[39] Where the vast majority of funding provided by UK charities relates to projects commissioned through an open competitive process.
[40] This is based on a study by Haskel et al. (2014a). Again, see Box 2 for more detail.
[41] In terms of the large difference in magnitude between these multipliers, explaining the size of the 12.7 multiplier in particular, Haskel and Wallis (2010) argue that they would expect the productivity spillovers from Research Council funding to be large, 'given that the support provided by Research Councils is freely available and likely to be basic science'. To the best knowledge of the authors, there exists no further and recent empirical evidence to support this. As a result, we apply the separate multipliers to the different income strands.
[42] Specifically, the 12.7 multiplier (based on the analysis by Haskel and Wallis (2010)), as well as the 0.2 multiplier (from Haskel et al. (2014a)), constitute the impact of research investment on *annual* UK economic output within a given year (and, in our analysis here, we use these multipliers to estimate the level of private sector spillovers occurring in 2022-23 associated with research undertaken by the University of Sheffield in 2022-23). However, we do *not* account for any subsequent productivity spillovers from this research that might occur in subsequent years (i.e. 2023-24 and beyond). For example, as outlined by Haskel et al. (2014a), based on their analysis, 'a one-off increase in public spending [on R&D] generates an infinitely-lived rise in the level of knowledge capital and so an infinitely-lived higher output' (see Haskel et al. (2014a), p. 48) – i.e. their findings suggest that every £1 spent on public R&D results in an additional *annual* output of £0.20 within the UK private sector *in perpetuity* (under their assumption that the public R&D knowledge stock does not

£217 million, excluding contract research)[43], we estimate that the research conducted by the University of Sheffield in 2022-23 resulted in **total market sector productivity spillovers** of **£945 million**.

Box 2 Literature relating to the productivity spillovers to the private sector associated with university research activities

Of particular interest in the context of research conducted by universities, a study by Haskel and Wallis (2010)[44] investigates evidence of **spillovers from publicly funded R&D activities**. The authors analyse productivity spillovers to the private sector from public spending on R&D by the UK Research Councils and public spending on civil and defence-related R&D[45, 46], and the relative effectiveness of these channels of public spending in terms of their impact on the 'market sector' (i.e. the private sector). They find strong evidence of the existence of market sector productivity spillovers from public R&D expenditure originating from the UK Research Councils[47]. Their findings imply that, while there is no spillover effect associated with publicly funded civil and defence R&D, the marginal spillover effect of public spending on research through the Research Councils stands at **12.7 (i.e. every £1 spent on research through the Research Councils results in an additional annual output of £12.70 within the UK private sector)**.

Another study by Haskel et al. (2014a) provides additional insight into the size of potential productivity spillovers from university research. Rather than estimating effects on the UK economy as a whole, the authors analyse the size of spillover effects from public research across different UK industries[48]. The authors investigate the correlation between the combined research conducted by the UK Research Councils, the higher education sector, and central government itself (e.g. through public research laboratories)[49], interacted with measures of industry research activity, and total factor productivity within the different market sectors[50]. Their findings imply a

depreciate, i.e. a 0% depreciation rate of public R&D; for more information, also see Haskel et al. (2014b)). Here, conservatively, we do *not* estimate any spillover effects in subsequent years, so that our analysis likely underestimates the total spillovers to the private sector associated with the research undertaken by the University in 2022-23.

[43] Note that by applying this weighted average multiplier, we implicitly assume that the source of the University of Sheffield's contract research income is representative of all other research income received by the University (in the absence of information on the source of its contract research income).

[44] Also, see Imperial College London (2010) for a summary of Haskel and Wallis's findings.

[45] The authors use data on government expenditure published by the (former) Department for Business, Innovation and Skills for the financial years between 1986-87 and 2005-06.

[46] This is undertaken by regressing total factor productivity growth in the UK on various measures of public sector R&D spending.

[47] Note that the authors' regressions only test for correlation, so their results could be subject to the problem of reverse causation (i.e. it might be the case that increased market sector productivity induced the government to raise public sector spending on R&D). To address this issue, the authors not only test for 1-year lags, but for lags of 2 and 3 years respectively, and produce similar estimates. These time lags imply that if there was a reverse causation issue, it would have to be the government's *anticipation* of increased total factor productivity growth in 2 or 3 years which would induce the government to raise its spending on research; as this seems an unlikely relationship, Haskel and Wallis argue that their results appear robust in relation to reverse causation.

[48] Haskel et al. (2014a) use data on 7 industries in the United Kingdom for the years 1995 to 2007.

[49] A key difference to the multiplier for Research Council spending provided by Haskel and Wallis (2010) lies in the distinction between *performed* and *funded* research, as outlined by Haskel et al. (2014a). In particular, whereas Haskel and Wallis (2010) estimated the impact of research *funding* by the Research Councils on private sector productivity, Haskel et al. (2014a) instead focus on the *performance* of R&D. Hence, they use measures of the research undertaken by the Research Councils and the government, rather than the research funding which they provide for external research, (e.g. by higher education institutions). The distinction is less relevant in the higher education sector. To measure the research performed in higher education, the authors use Higher Education Funding Council funding where research is both funded by and performed in higher education.

[50] In particular, the authors regress the three-year natural log difference of total factor productivity on the three-year and six-year lagged ratio of total research performed by the Research Councils, government, and the Higher Education Funding Councils over real gross output per industry. To arrive at the relevant multiplier, this ratio is then interacted with a measure of co-operation of private sector firms with universities and public research institutes, capturing the fraction of firms in each industry co-operating with government or universities. The lagged independent variables are adjusted to ensure that the resulting coefficients can be interpreted as annual elasticities and rates of return.

total rate of return on public sector research of **0.2 (i.e. every £1 spent on public R&D results in an additional annual output of £0.20 within the UK private sector)**[51].

How do these estimates compare to the wider literature?

It is important to note that, to date, the studies by Haskel and Wallis (2010) and Haskel et al. (2014a) still constitute the two core pieces of UK-based evidence on the size of private sector productivity spillovers associated with public research (particularly in relation to higher education research). This is due to a number of significant data limitations and discontinuities within the key dataset on R&D expenditures in the UK, so that it is currently not possible to replicate and update the analysis using more recent data[52]. Therefore, aside from these two key analyses, there is only relatively limited economic literature available on the productivity spillovers associated with publicly funded research. For example[53]:

- A report for the (former) Department for Business, Innovation and Skills (2014a) replicates the Haskel and Wallis (2010) approach, using a different (publicly-available) dataset and a slightly different methodology to explore variation in types of Research Council R&D investments in terms of their impact on private sector productivity. Despite the difference in data and approach, they find qualitatively similar findings: Research Council R&D investments yield large returns through their impact on private sector productivity[54], with the comparable productivity spillover multiplier estimated at **10.71**. Moreover, the report finds much higher returns depending on the precise approach and sample used.
- Comparable research by Elnasri and Fox (2017) applies the Haskel and Wallis (2010) approach to assess the productivity spillovers associated with publicly funded research in Australia. The authors find a similar research spillover to Haskel and Wallis (2010), albeit with a slightly lower research multiplier of **9.76**[55] (which may be expected given the different country studied).
- A US-based study by Jones and Summers (2020) undertakes an economy-wide calculation of the average social benefits of investments in innovation, including spillovers. They find a baseline benefit-to-cost ratio of **13.3:1**, although their estimates range from 5 to more than 20 depending on the assumptions made in relation to inflation bias, health benefits, and the discount rate (among other factors).
- In contrast, a study of 22 OECD countries by van Elk et al. (2019) using production function models finds that public R&D investments do not automatically result in positive

[51] For a summary of Haskel et al.'s (2014a) findings, also see Haskel et al. (2014b).

[52] Specifically, the Office for National Statistics (ONS) recently introduced a number of major methodological improvements to its data on Gross Expenditure on R&D (GERD), which constitutes one of the core datasets measuring the scale of total R&D activities across the UK. In particular, the ONS recently improved the measurement of R&D performed by the HE sector, by introducing Transparent Approach to Costing (TRAC) data into its underlying methodology. These changes were implemented from 2018 onwards (but with no changes to previous GERD estimates), resulting in a significant structural break/discontinuity in the data series. In turn, this results in two major issues. First, there are severe limitations associated with the GERD data prior to 2018, since this earlier data omits R&D that was both performed and funded by the HE sector itself (e.g. research funded by surpluses from other activities) – thus under-recording the sector's R&D activity; in addition, the data only accounts for the *direct* costs of R&D work while omitting some *indirect* costs (such as laboratory security and cleaning costs). Second, since the methodological improvements were only made to the data for 2018 onwards, there is currently only a very limited time series (and, therefore, number of observations) available to undertake an updated assessment of the productivity spillovers associated with publicly funded research. For more information on these data issues, see Office for National Statistics (2022e).

[53] It should be noted that much of the existing literature does *not* assume a rate of depreciation on publicly-funded R&D investments. A standard assumption of the depreciation rate from the literature is around 20%-25% per year, which still implies a significant estimate of the productivity spillover.

[54] The coefficient on research council spending is 10.71 in the sample up to 2008, although this is not statistically significant given the limited number of observations employed in their sample.

[55] See London Economics (2018). The authors find an elasticity of 0.175, which we converted to a research spillover of 9.76.

returns in terms of GDP and total factor productivity growth, and that positive and statistically significant returns depend on the national context in which these investments take place.

- While there is even more limited research associated with general R&D multipliers (for other research income), a report published by the (former) Department for Business, Innovation and Skills (2014b) that focuses on internationally benchmarking the UK science and innovation system notes a rate of return in the range of 20% to 50%[56].

Hence, overall, although the number of relevant studies is very limited (given the inherent difficulty in identifying spillovers and the above-mentioned data issues), most of these studies suggest that there are significant productivity spillovers associated with R&D activities.

Sensitivity analysis of the estimated productivity spillovers associated with the University of Sheffield's research

As outlined above, the (limited) existing literature has found different estimates of research spillovers, despite generally being qualitatively similar. In the following, we utilise these alternative estimates to provide a sensitivity analysis of our findings on the productivity spillovers associated with the University of Sheffield's research activities.

These alternative estimates, including the resulting weighted average productivity spillover multipliers, are presented in Table 4. In the first alternative model, we adjust the public sector R&D multiplier to be **0.5** (the upper bound of the range estimated in Department for Business, Innovation and Skills (2014b)), whilst retaining the baseline estimate for the Research Council R&D multiplier. This results in a weighted average research multiplier of **4.55**. In the second alternative model, we adjust the Research Council R&D multiplier to be **10.7** (in line with the findings from the Department for Business, Innovation and Skills (2014a)), whilst retaining the baseline estimate for the public sector R&D multiplier. This results in a weighted average research multiplier of **3.68**. Finally, as a third alternative, we adjust both the public sector and the Research Council R&D multiplier (to **0.5** and **10.7**, respectively), which would result in a weighted average research multiplier of **3.88**.

Table 4 Sensitivity analysis of estimated productivity spillovers

Model	Research Council R&D multiplier	Other public sector R&D multiplier	Weighted average multiplier	Total spillovers from the University's research
Baseline	**12.7**	**0.2**	**4.34**	**£945m**
Alternative 1	12.7	0.5	4.55	£988m
Alternative 2	10.7	0.2	3.68	£801m
Alternative 3	10.7	0.5	3.88	£844m

Note: The 'Baseline' here refers to the core estimates presented in Section 2.1.4 above.
Source: London Economics' analysis

Using these alternative weighted average research multipliers, we are able to evaluate the impact of alternative multiplier assumptions on the estimated total productivity spillovers associated with the University of Sheffield's research in 2022-23. As shown in the last column of Table 4, these alternative estimates range from a lower bound of **£801 million** to **£988 million**.

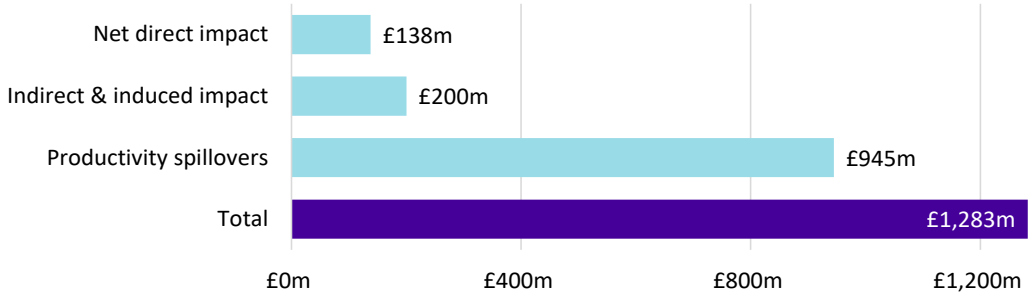
[56] See also Salter and Martin (2001).

2.1.5 Aggregate impact of the University of Sheffield's research

Combining the **direct, indirect, and induced economic impact** of the University of Sheffield's research (**£338 million**) with the **productivity spillovers** associated with this research (**£945 million**), we estimate that the total economic impact associated with the University's research activities in 2022-23 stood at approximately **£1.28 billion** (see Figure 7).

Comparing this impact to the **£195 million** of publicly funded research income received by the University in 2022-23, this suggests that **for every £1 million of publicly funded research income, the University of Sheffield's research activities generate an estimated total of £6.57 million in economic impact across the UK.**

Figure 7 Total impact of the University of Sheffield's research activities in 2022-23, £m



Note: All values are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the total indicated
Source: London Economics' analysis

2.2 Economic impact of the University of Sheffield's knowledge exchange activities

In addition to its research activities, the University generates significant economic impacts through a range of knowledge exchange activities. In practical terms, this is demonstrated at the Advanced Manufacturing Research Centre (AMRC), which has fostered significant innovation, leading to enhanced competitiveness and improved productivity. Additionally, AMRC sites located in the North West and Wales, in addition to the main centre in Sheffield, increases the geographic reach of the benefits associated with the University of Sheffield's knowledge exchange activities. A report by Lichfield conducted in 2022 estimated that AMRC attracted over £260m of inward investment into the South Yorkshire manufacturing cluster.

Specifically for our analysis, we assess the impact of **spinout and (graduate or staff) start-up companies** associated with the University, and of the **wider knowledge exchange activities** undertaken at the University, including:

- **Contract research** undertaken by the University;
- **Consultancy services** provided by the University;
- **Licensing of the University's IP** to other organisations;
- **Business and community courses** offered by the University; and
- **Facilities and equipment hire**, and related activities.

Specifically, the analysis captures the direct, indirect, and induced economic impacts associated with these knowledge exchange activities, again using **economic multipliers** derived from the above-described Input-Output analysis (see Section 2.1.3 above for more detail).

Spinouts: Driving growth

University spinouts and tech-focused start-up companies have the potential to significantly boost the region's economy by creating skilled, high-paying jobs and bringing innovative products to market. The University of Sheffield's Commercialisation Journey provides a pathway for innovators to turn their research into tangible products or services. Since 2017, 23 new businesses have been spun out from the University, ranging from advanced medical companies such as Rinri Therapeutics to 4th generation Artificial Intelligence developers such as Opteran.

The University of Sheffield was in the top five academic institutions for the number of equity deals secured by their spinout portfolios in 2023. The University has also been recognised as one of the top universities in England for developing IP and commercialising research through the latest Knowledge Exchange Framework (KEF).

Over the last five years, the University has targeted resources towards establishing high-value spinout companies and was one of three universities that founded Northern Gritstone - a venture investment company established to boost the commercialisation of university spinouts and start-ups in the north of England. As of September 2024, Northern Gritstone had raised £312 million in capital. Investment rounds including Northern Gritstone in South Yorkshire companies have achieved a combined £44m venture capital investment.

Future developments

The South Yorkshire region has historically struggled to offer the right facilities and infrastructure to maximise the economic opportunities that spinouts and start-up companies bring. The Sheffield Innovation Spine is a long-term spatial and economic strategy to create and link the infrastructure required to grow knowledge-led businesses in the city centre alongside housing, public realm, and economic development activity. The Innovation Spine has the backing of the city's two universities, Sheffield City Council, Sheffield Technology Parks and the South Yorkshire Mayoral Combined Authority (SYMCA).

Heralding the beginnings of the Innovation Spine is the University's spinout Phlux Technology, which has secured its new headquarters in the heart of the Spine close to the University's campus. The spinout benefited from Northern Gritstone investment to develop revolutionary infrared sensors - a game changer for robotics and self-driving machines - to the mass market, and is a perfect example of what the Spine vision is trying to achieve.

2.2.1 Economic impact of the University of Sheffield's spinout and start-up companies

To assess the **direct impact** associated with the University of Sheffield's spinout and start-up companies, we made use of information on **turnover** (as a measure of economic output) and **FTE employment** associated with a total of **38** spinout companies (**3** of which were founded by international University of Sheffield students) and **100** student and staff start-ups that were active and based in the UK in 2022-23[57], where available. The information on each company's turnover and employment was sourced from Bureau van Dijk's FAME database (based on Companies House information)[58]. The direct **GVA** generated was then estimated by multiplying the turnover of each firm by the average ratio of GVA to output among organisations within the given company's industry and region[59].

It is important to note that the analysis presented in this section is likely to underestimate the total impact of the University of Sheffield's spinout and start-up companies, since:

- Given that there were a large number of companies for which no turnover and/or employment information was available, the data likely provide only an incomplete estimate of the total turnover, GVA, or employment of the University of Sheffield's spinout and start-up companies. This particularly applies to relatively small companies falling below the reporting thresholds required by Companies House (implying that their financials would not be included in the FAME data); and
- Many spinout companies will be pre-revenue, meaning that they have no turnover, but may still have an economic impact through their expenditure. This expenditure would not be accounted for within the estimates (in economic output terms) presented here. However, the activities of these companies would be *partially* captured through the employment data collected from FAME.

Using this approach, the **direct impact** of the University of Sheffield's spinout companies in 2022-23 was estimated at **£69 million** in economic output (i.e. turnover) terms, **440 FTE staff**, and **£34 million** of GVA. Similarly, the direct impact associated with the activities of the University's **start-up companies** in 2022-23 was estimated at **£20 million** in economic output terms, **455 FTE staff**, and **£12 million** of GVA.

In terms of the location of these companies, of the University's total of **138** UK-based active spinout and start-up companies in 2022-23, **83** (**60%**) were headquartered in South Yorkshire, employing a total of **330** FTE staff. However, note that for *all* of these **83** firms, there is no (or zero) turnover

[57] The analysis in relation to spinouts includes firms with some University of Shefield ownership, as well as formal spinouts that are not owned by the University. We received data from the University (based on its HE-BCI submission) on a total of 40 spinouts for 2022-23; from this total, we exclude 2 companies that were active in 2022-23 but that were non-UK based. In terms of start-ups, we received data from the University on a total of 102 start-ups (including 4 staff start-ups and 98 student/graduate start-ups), from which we exclude 2 companies that were inactive in 2022-23.

[58] Given that there were a large number of companies for which no turnover and/or employment information was available from FAME, the data likely provide only an incomplete estimate of the total turnover, GVA, or employment of the University of Sheffield's spinout and start-up companies. This particularly applies to relatively small companies falling below the reporting thresholds required by Companies House (implying that their financials would not be included in the FAME data). The FAME data contained non-zero turnover for 4 of the 38 active spinouts, and employment data for 26. For start-ups, the data contained non-zero turnover data for 8 of the 100 active start-up companies, and employment data for 56. The analysis made use of *any* resulting turnover or employment information available for a given company, irrespective of whether complete data (i.e. in terms of both turnover *and* employment) was available for that firm. Note also that the information is based on each company's 2022-23 financial year, which does not necessarily coincide with the 2022-23 academic year and varies across companies.

[59] Again, these ratios were derived based on the above-described multi-regional Input-Output model. Each firm's main industry classification and regional location (again, based on ITL2 regions) was based on information from FAME on the firm's SIC code and the region of its main registered address.

information recorded within the FAME data. Instead, *all* of the above turnover of the University's spinouts and start-ups (amounting to a total of **£89 million**) is associated with companies that are based elsewhere in the UK[60]. As a result of these data limitations, the analysis likely **underestimates** the true impact of the University of Sheffield's spinouts and start-ups on its local region.

To estimate the **total direct, indirect, and induced** economic impacts associated with the University's spinout and start-up companies, we again applied relevant **economic multipliers** (derived from our above-described Input-Output analysis). Specifically, we assigned relevant economic multipliers to each active company in 2022-23 based on each firm's industry classification and the region of its main registered office address[61]. Applying the resulting multipliers to the above direct impacts:

- The total economic impact associated with the activities of the University's spinout and start-up companies in 2022-23 was estimated at **£203 million** across the UK economy (including **£156 million** associated with spinouts, and **£47 million** from start-ups), of which approximately **£0.4 million** occurred in South Yorkshire, and **£1.8 million** was generated in Yorkshire and the Humber as a whole (see Table 5). Again, these likely constitute *underestimates* of the true impact of these spinout and start-up activities on the region, due to the fact that there is no (or zero) turnover information recorded within the FAME data for any of the companies based in South Yorkshire (as well as Yorkshire and the Humber as a whole)[62].
- The estimated total number of FTE jobs supported stood at **2,065** (including **1,085** associated with the University's spinouts, and **975** associated with its start-ups), of which **400** were located in South Yorkshire, and **480** were located in the wider Yorkshire and the Humber region as a whole.
- The corresponding estimate in terms of GVA stood at **£106 million** (**£80 million** from spinouts and **£26 million** from start-ups), of which **£0.2 million** and **£0.9 million** occurred in South Yorkshire and Yorkshire and the Humber as a whole, respectively[63].

[60] Predominantly in London (total of **£66 million** of turnover).
[61] Again, this was based on ITL2 regions.
[62] As a result, the (small) estimated impacts of the University's spinouts and start-ups generated within South Yorkshire (and Yorkshire and the Humber as a whole) include only 'indirect' and 'induced' impacts, i.e. they are driven entirely by the supply chain impacts and wage spending impacts of spinouts or start-ups that are located in other parts of the UK (e.g. due to companies that are based in *other* regions sourcing their inputs from suppliers located in South Yorkshire).
[63] The relatively low estimates for South Yorkshire and the Humber here are again driven by the fact that the GVA generated by the University's spinouts and start-ups is derived based on these companies' turnover, which is entirely missing (or zero) within the FAME data for all firms located in these regions.

Table 5 Economic impact associated with the University of Sheffield's spinout and start-up companies in 2022-23

Location of impact	Output, £m	GVA, £m	# of FTE employees
Spin-out companies			
South Yorkshire	£0.3m	£0.2m	175
Yorkshire and the Humber	£1.5m	£0.8m	210
Total UK	£155.6m	£79.9m	1,085
Start-up companies			
South Yorkshire	£0.1m	£0.0m	225
Yorkshire and the Humber	£0.3m	£0.2m	270
Total UK	£47.1m	£26.3m	975
Total			
South Yorkshire	£0.4m	£0.2m	400
Yorkshire and the Humber	£1.8m	£0.9m	480
Total UK	£202.7m	£106.2m	2,065

Note: All monetary values are presented in 2022-23 prices and rounded to the nearest £0.1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Again, note that all of these impacts are likely to be underestimated, given the limitations to the data that were available on these companies' turnover and employment.

2.2.2 Economic impact of the University of Sheffield's wider knowledge exchange activities

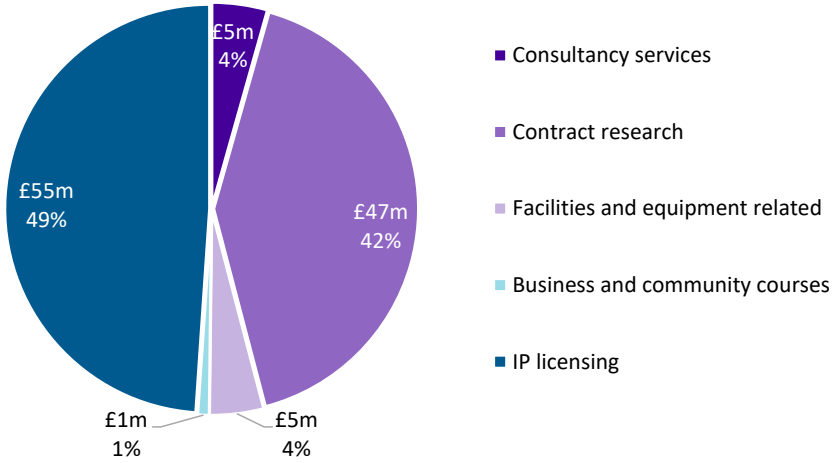
In addition to spinouts and start-ups, we estimate the **economic impact of the University of Sheffield's wider knowledge exchange activities** (which are captured in the HE-BCI data (i.e. separately from the spinout and startup companies)). These wider knowledge exchange activities include[64]:

- **Contract research** provided by the University;
- **Consultancy services** provided by the University;
- **Licensing of the University's IP** to other organisations;
- **Business and community courses** provided by the University; and
- **Facilities and equipment hire**, and related activities.

Again, in addition to the direct impact in **economic output terms** associated with each of these activities, we estimate the impact in **GVA** and **FTE employment terms**, by multiplying the direct output by the average ratios of GVA to output and of FTE employees to output among organisations within the government, health, and education sector located in South Yorkshire.[65]

[64] Note again that the income from collaborative research is not included in this section, but implicitly accounted for in the impact of the University's research (see Section 2.1). Although the income from collaborative research is likely to contain funding related to wider knowledge exchange activities, it is difficult to attribute it with certainty to a specific knowledge exchange activity. As such, we retain collaborative research within the research impact category (see Section 2.1.2 for more details on the adjustment for double-counting).
[65] This follows a similar approach as for the estimated impact of the University's research (see Section 2.1), and again assumes that the expenditure patterns of the University of Sheffield are the same as for other institutions operating in South Yorkshire's government, health, and education sector.

Figure 8 Income from knowledge exchange activities received by the University of Sheffield in 2022-23, £m by activity



Note: All values are presented in 2022-23 prices and rounded to the nearest £1 million.
Source: London Economics' analysis based on data provided by the Higher Education Statistics Agency (HESA, 2024b)

The **direct impact** of the University of Sheffield's wider knowledge exchange activities is made up of **£5 million** of income from consultancy services, **£47 million** associated with contract research activities, **£1 million** generated from business and community courses, **£5 million** associated with the hire of the University of Sheffield's teaching/research facilities, and **£55 million** of IP licensing income. The total direct impact of these activities in 2022-23 therefore stood at **£113 million** (see Figure 8), with an associated impact in GVA terms of **£73 million**, supporting **1,405** FTE jobs.

To estimate the **total direct, indirect, and induced impacts** associated with these activities, we multiplied these direct impacts by the estimated average economic multipliers associated with organisations in the government, health, and education sector in South Yorkshire. These multipliers are, therefore, the same as those used to estimate the direct, indirect, and induced impacts of the University's research, discussed in Section 2.1.3 above.

Table 6 presents the resulting **aggregate impact** associated with the University of Sheffield's **wider knowledge exchange activities**. The analysis estimates that, in 2022-23, the University's wider knowledge exchange activities generated a total of **£278 million** of economic output across the UK economy (including **£139 million** generated in South Yorkshire, and **£169 million** occurring in the wider Yorkshire and the Humber region as a whole). The total GVA impact was estimated at **£163 million**, with an estimated **2,670 FTE jobs** supported across the UK economy.

Table 6 Economic impact associated with the University of Sheffield's wider knowledge exchange activities in 2022-23

Type of impact	Output, £m	GVA, £m	# of FTE employees
South Yorkshire	£139m	£87m	1,645
Yorkshire and the Humber	£169m	£104m	1,895
Total UK	£278m	£163m	2,670

Note: All monetary values are presented in 2022-23 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Box 3 Further information on the scale of the University of Sheffield's knowledge exchange activities

In addition to allowing us to estimate the economic impacts associated with the University of Sheffield's knowledge exchange activities, the information from the **Higher Education Business and Community Interaction Survey** also provides additional valuable insights into the University's knowledge dissemination and commercialisation activities.

For example, the HE-BCI data provides information on the University's substantial **business and community services** to external organisations. This includes giving businesses access to its world-class research facilities (e.g. to carry out routine testing, analysis, and advanced research), with the University providing a total of **486 contracts for facilities and equipment related services** in 2022-23 (ranking **14th** among UK HEIs[66], see Figure 9), predominantly for small and medium-sized enterprises (SMEs). In addition, the University delivered a large number of **contract research services**, executing **756** research contracts for external organisations in 2022-23 (ranking **15th** among UK HEIs). The University also delivered **314 consultancy services contracts** in that year.

The University of Sheffield is also a leader in **generating innovations and other research outputs**. For example, the University ranks **2nd** among all UK HEIs in terms of its 2022-23 IP income (**£55 million**, ranking 2nd, behind the University of Oxford). The University also filed **61 disclosures** and **28 new patent applications** in 2022-23, filed **14 new patents as a co-applicant**[67], and held a **cumulative portfolio of 286 patents** - **ranking within the top 25 UK HEIs** on each of these measures.

Finally, the University's commercialisation activities are further evidenced by the success of its **spinout companies**. The University ranks **15th** in terms of the number of active spinouts operating in 2022-23, with a total of **40** University of Sheffield spinouts operating in that academic year[68]. To support their activities, these companies received a total of more than **£16 million** of external investment in 2022-23, which is equivalent to **24%** of their total turnover in that year[69]. According to an analysis of equity investment into UK universities' spinouts in 2023 by Beauhurst and Parkwalk[70], while the University of Oxford, Cambridge, and Imperial College London continued as the top UK HEIs in terms of the number of successful equity deals secured by their spinouts in 2023, the University of Sheffield 'emerged as a notable contender' in 2022-23, securing a place in the top 5 institutions for the first time.

[66] Out of a total of 222 UK higher education institutions included in the published 2022-23 HE-BCI data.
[67] Where the University was named a co-applicant in a filing by an external party.
[68] Again, to assess the economic impact of these spinouts on the UK (described in further detail in Section 2.2.1), we excluded 2 companies that were active in 2022-23 but that were non-UK based (so that our above-described analysis is based on a total of 38 firms).
[69] Based on a total of **£69 million** of total turnover generated by the University's spinout companies in 2022-23. Again, see Section 2.2.1 for more information.
[70] See Beauhurst and Parkwalk (2024).

Figure 9 The University of Sheffield's rankings in the UK in terms of business and community services and IP generation

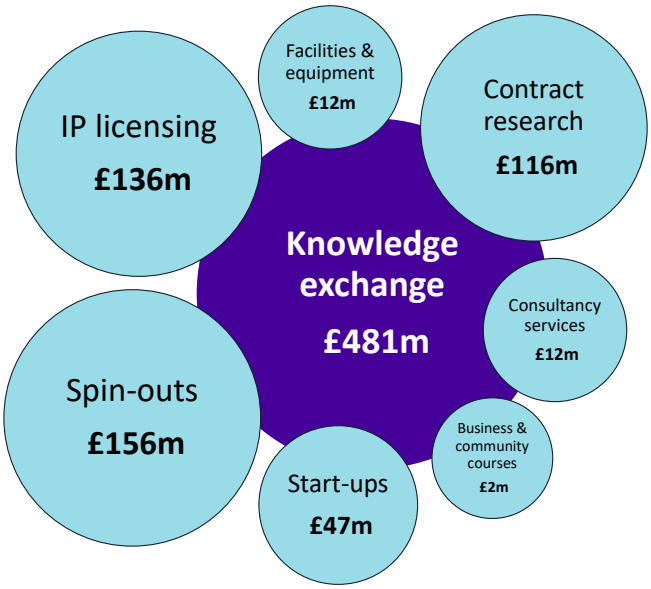
Rank	Facilities & equipment contracts	Research services contracts	IP licensing income	Disclosures	New patent applications	New patent co-applications	Cumulative patent portfolio
1	1	1	1	1	1	1	1
2	2	2	**2**	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13
14	**14**	14	14	14	14	14	14
15	15	**15**	15	15	15	15	15
16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18
19	19	19	19	19	**19**	19	19
20	20	20	20	20	20	20	20
21	21	21	21	**21**	21	21	21
22	22	22	22	22	22	**22**	22
23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	**24**
25	25	25	25	25	25	25	25

Note: Rankings are based on a total of 222 UK HEIs included in the published 2022-23 HE-BCI data.
Source: London Economics' analysis of HESA (2024b)

2.2.3 Total economic impact of the University's knowledge exchange activities

Combining the above spinout, start-up, and wider knowledge exchange activities, the combined knowledge exchange and commercialisation activities of the University of Sheffield in 2022-23 *directly* generated an estimated **£203 million** of economic output across the UK economy. When accounting for the *indirect and induced impacts*, the total impact of these knowledge exchange activities on the UK economy stood at **£481 million** (see Figure 10). The corresponding estimates in GVA and employment terms stood at **£269 million** and **4,735 FTE jobs**.

Figure 10 Total economic impact associated with the University of Sheffield's knowledge exchange activities in 2022-23, £m by activity



Note: Estimates are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Circles are not to scale.
Source: London Economics' analysis

2.3 Total impact of the University of Sheffield's research and knowledge exchange activities

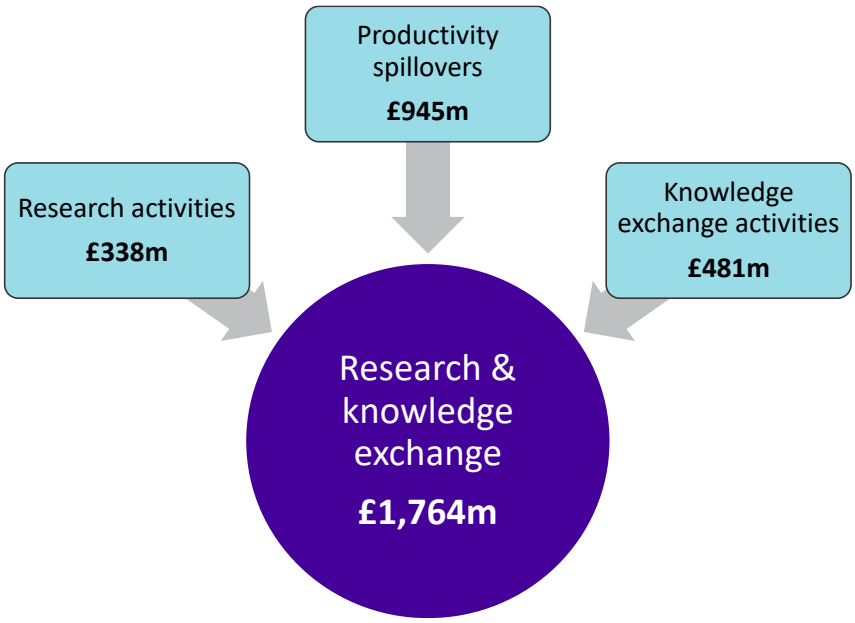
Combining all of the above estimates, the total impact on the UK economy associated with the University of Sheffield's research and knowledge exchange activities in 2022-23 was estimated to be approximately **£1.76 billion** (see Figure 11). In terms of the components of this impact:

- The University's **research activities** accounted for **£338 million**;
- The associated **productivity spillovers** to the wider UK economy stood at **£945 million**; and,
- The impact associated with the University's **knowledge exchange activities** was estimated at **£481 million**, including **£203 million** from the spinout and start-up companies associated with the University, and **£278 million** associated with the University's wider knowledge exchange activities.

The total impact of the University of Sheffield's research and knowledge exchange activities in 2022-23 stood at £1.76 billion.

A breakdown of these impacts by region and sector (and in GVA and employment terms - where available) is presented in Annex A2.2.2.

Figure 11 Total impact of the University of Sheffield's research and knowledge exchange activities in 2022-23, £m



Note: All values are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

Sheffield's research powers a sustainable future

Sheffield, a city known for its industrial roots, is now at the heart of the UK's green sustainable revolution. The University of Sheffield's pioneering research is helping to find practical solutions to local, national, and global environmental challenges.

As the world races to meet net-zero emissions by 2050, the University is driving the development of technologies that will create a sustainable, greener future for generations to come.

Reducing global carbon emissions

The aviation industry is one of the fastest growing sources of greenhouse gas emissions, but one of the most difficult to decarbonise. Sustainable aviation is vital to reducing global carbon emissions – and, without it, we cannot achieve net zero.

In 2023, the first transatlantic flight using 100 percent Sustainable Aviation Fuel (SAF) took off with the help of University of Sheffield researchers from the Sustainable Aviation Fuels Innovation Centre (SAF-IC) - the UK's first research and testing centre of its kind. Located in the University of Sheffield Innovation District, SAF-IC provides a space for fuels to be developed, tested, and certified, helping new fuels come to market quicker. SAF-IC worked with the Virgin Atlantic-led consortium to confirm that the fuel, made from waste products, delivers carbon dioxide lifecycle emissions savings by up to 70 per cent compared to the traditional jet fuel it replaces. In April 2024, the University was selected as the delivery partner for the UK's SAF Clearing House, helping to position the UK at the forefront of decarbonising the global aviation industry.

A sustainable university

The University of Sheffield aims to be one of the most sustainable research-intensive universities in the country by 2038. According to THE Impact Rankings 2024, Sheffield is 58th in the world, from over 1,900 institutions, and 15th in the UK for its progress towards the United Nations' Sustainable Development Goals (SDG). The University is also ranked 10th in the UK and 27th in the world in the QS World Rankings: Sustainability.

The Wave, the University's newest building, has been recognised for its sustainability credentials by achieving an Outstanding BREEAM (Building Research Establishment Environmental Assessment Method) accreditation. This globally recognised sustainability assessment method for buildings looks at a range of factors such as energy, transport, materials, waste and ecology.

Supporting clean energy and manufacturing

Rolls-Royce SMR has selected the University of Sheffield's Advanced Manufacturing Research Centre (AMRC) to house its new multi-million pound facility for manufacturing and testing prototypes for small modular reactors (SMRs). This first phase of £2.7m is part of a £15m+ project underpinning the Rolls-Royce SMR programme, which aims to deploy 'factory-built' nuclear power plants, each providing enough low-carbon electricity to power a million homes for more than 60 years. The AMRC has been a research partner to Rolls-Royce SMR on modular builds since 2017, and this latest opportunity will allow the scale-up of this fundamental research to full-scale products and processes bringing job creation and economic growth to the region.

From urban gardens to plant-based proteins: Sheffield's sustainable food research

The University of Sheffield's research is producing practical solutions that will not only benefit the health of our planet, but also improve the nutritional quality of our food and the wellbeing of people across the globe.

Improving food security in the UK

Food Ladders is an innovative evidence-based framework developed in Sheffield that is helping organisations provide new ways to tackle hunger vulnerability, poor nutrition, and social isolation. By following the Food Ladders approach, local communities can plan for future actions and pool resources to create a strengthened community and build long-term resilience.

Sheffield is just one of many local authorities across the country using the food ladders to structure locally focused interventions aiming to increase community resilience, improve public health, and address issues of isolation and loneliness. Recently, researchers developed a Food Ladders tool kit for local authorities, and representation from Sheffield and Doncaster councils were involved in its co-production. Alongside this, national charities (FareShare, The Bread and Butter Thing, Feeding Britain, Comic Relief) as well as trusts (Greggs Foundation) are using the Food Ladders to structure how they allocate resources and ensure all rungs of the ladder are supported.

Using green spaces to feed the population

At the Institute for Sustainable Food, the University aims to ensure everyone has equitable access to nutritious foods, while also protecting natural resources.

Urban horticulture, i.e. growing fruits and vegetables in cities, could make an important contribution to UK food security. The University of Sheffield's researchers found that expanding urban horticulture into just one tenth of land potentially available for food growing in Sheffield could provide nearly 90,000 people with their 5-a-day. Fruit and vegetable consumption is crucial to a healthy food-secure population, and the University's researchers found that people who grow-their-own eat 6.3 portions of fruit and vegetables a day, more than their recommended 5-a-day (70% more than the UK national average), alongside other benefits including improved physical and mental health, nature connectedness, social capital, and community cohesion.

Developing planet-friendly foods

As global demand for protein increases, plant-based substitutes are needed to mitigate the carbon footprint of traditional agriculture. University spinout ReNewFood is harnessing nature's fermentation process to bring a whole new palette of flavour proteins to enhance access to alternative foods. Sheffield is also the co-lead of a new £38 million centre that seeks to develop planet-friendly alternatives to animal protein. The University will lead on the National Alternative Protein Innovation Centres (NAPIC) research to deliver health-enhancing protein alternatives that are both affordable and appealing to the public. The NAPIC will generate a broad range of new industry-funded research projects which aim to drive industrial adoption of alternative protein-based products and innovative processes, fostering a diverse workforce with many new skilled jobs in the sector and excellent return on investment. The researchers will also identify new business opportunities for farmers and producers, and work to future-proof the UK's protein supply against reliance on imports.

3 The impact of the University's teaching and learning activities

Ranking 12th in the UK and 98th in the world in the Times Higher Education World University Rankings 2025[71], and having recently been voted UK University of the Year at the Whatuni Student Choice Awards 2024 (see Box 4), the University of Sheffield's teaching and learning activities provide major benefits to the UK economy, by improving the labour market productivity of graduates. In this section of the report, we detail our estimates of the economic impact of the teaching and learning activities undertaken at the University of Sheffield, by considering the labour market benefits associated with enhanced qualification attainment and skills acquisition – to **both the individual and the public purse**.

Box 4 Valued by students: The Whatuni Student Choice Awards 2024

The University of Sheffield was voted University of the Year at the Whatuni Student Choice Awards (WUSCAs) 2024.

The WUSCAs are the largest annual university awards in the UK voted for exclusively by students, and the 2024 awards were based on more than 39,000 student reviews from the UK. In addition to being voted University of the Year, the University of Sheffield also won the award for **Best Students' Union** for the seventh year in a row, as well as the award for **Best Student Life**. The University also ranked within the top 10 UK higher education providers in the **Facilities**, **Student Support**, and **International** Categories.

"Sheffield has a solid performance across all categories. It's one of the most well-balanced universities for quality of education, student experience, value, and opportunity. Key highlights include the quality of its academic programs and research, as well as an inclusive and supportive Students' Union. Student reviewers also note the friendliness of Sheffield locals, plentiful green areas within the city, and access to the Peak District national park."[72]

3.1 The 2022-23 cohort of domestic University of Sheffield students

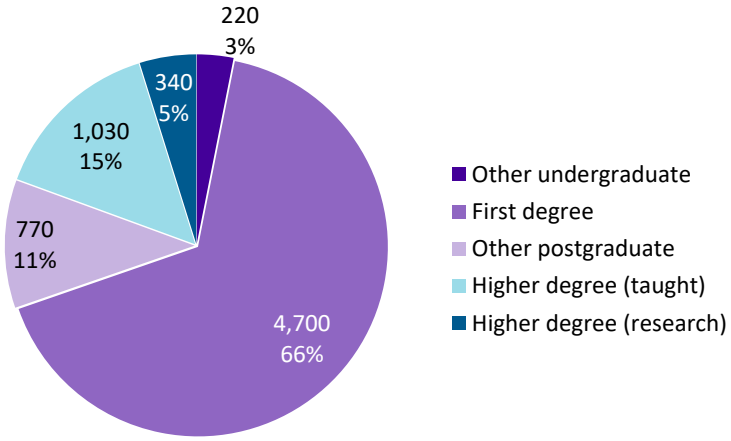
The analysis of the economic impact of the University's teaching and learning activities is based on the **2022-23 cohort of UK domiciled students**. In other words, instead of the University's entire student body of **31,475** students in the 2022-23 academic year (including both UK and non-UK domiciled students, *irrespective* of when these individuals may have started their studies), the analysis in this section focuses on the **7,055** UK domiciled[73] students **starting higher education qualifications (or standalone modules/credits) in the 2022-23 academic year.**[74]

[71] See Times Higher Education (2024).
[72] For more information, see Whatuni? (2024).
[73] A proportion of EU and non-EU domiciled students undertaking their studies at the University of Sheffield will remain in the UK to work following completion of their studies; similarly, a proportion of UK domiciled students will leave the UK to pursue their careers in other countries. Given the uncertainty in predicting the extent to which this is the case, and the difficulty in assessing the net labour market returns for students not resident in the UK post-graduation, the analysis of teaching and learning focuses on UK domiciled students only. In other words, for the purposes of this analysis, we assume that all UK domiciled students will enter the UK labour market upon graduation, and that non-UK students will leave the UK upon completing their qualifications at the University.
[74] We received HESA data on a total of 13,650 first-year students from the University of Sheffield. From this total, we excluded 20 students who did not have a stated gender, and 6,570 non-UK domiciled students (who are instead considered as part of the analysis of international students (see Section 4)). Figures may not add up precisely due to rounding.

In terms of **level of study** (see Figure 12), **66%** (**4,700**) of students in this cohort of UK domiciled students were undertaking **first degrees**, with a further **1,030** students (**15%**) undertaking **postgraduate taught degrees**, and **340** students (**5%**) enrolled in **postgraduate research degrees**. An additional **770** (**11%**) students were undertaking **other postgraduate qualifications**[75], while the remaining **220** (**3%**) students were enrolled in **other undergraduate qualifications**[76].

In relation to **mode of study** (see Figure 13), **6,295** (**89%**) students in the cohort were undertaking their studies with the University of Sheffield on a full-time basis, while the remaining **760** (**11%**) were enrolled on a part-time basis. As shown in Table 7, most full-time students in the cohort were undertaking first degrees (**75%** of full-time students). Instead, part-time students were predominantly enrolled in other postgraduate qualifications (**61%** of part-time students) or higher degree (taught) qualifications (**25%** of part-time students).

Figure 12 UK domiciled students in the 2022-23 cohort of University of Sheffield students, by level of study

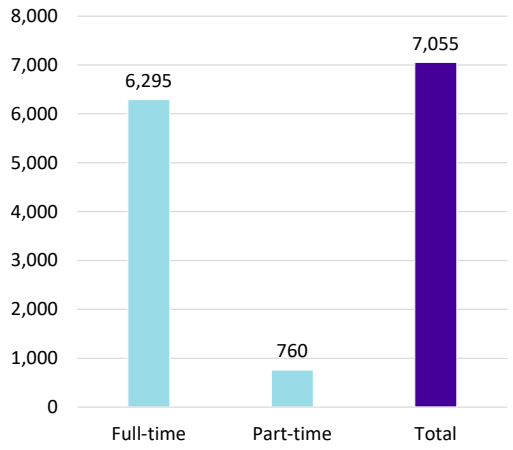


Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding. 'Other undergraduate' learning includes Certificates of Higher Education, Higher National Certificates, other certificates or diplomas at undergraduate level, and undergraduate-level credits. 'Other postgraduate' learning includes Postgraduate Certificates in Education, Postgraduate Diplomas in Education, and other postgraduate-level certificates, diplomas, qualifications, and credits.
Source: London Economics' analysis based on University of Sheffield HESA data

In terms of **domicile** (see Figure 14), the vast majority of students in the cohort (**6,880**, **98%**) were domiciled in England. A further **115** (**2%**) students were from Wales, and the remainder were domiciled in Scotland (**35**) and Northern Ireland (**25**).

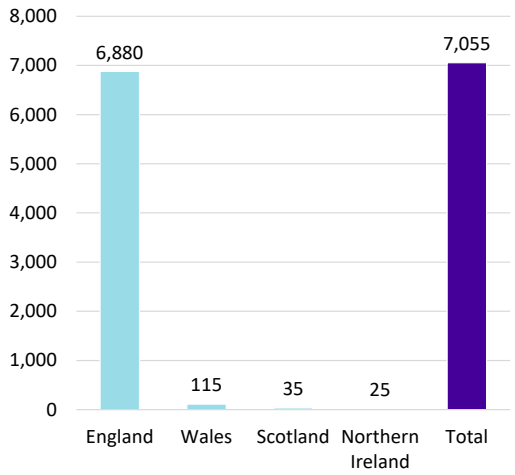
[75] 'Other postgraduate' learning includes Postgraduate Certificates in Education, Postgraduate Diplomas in Education, and other postgraduate-level certificates, diplomas, qualifications, and credits.
[76] 'Other undergraduate' learning includes Certificates of Higher Education, Higher National Certificates, other certificates or diplomas at undergraduate level, and undergraduate-level credits.

Figure 13 UK domiciled students in the 2022-23 cohort of University of Sheffield students, by mode of study



Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding.
Source: London Economics' analysis based on University of Sheffield HESA data

Figure 14 UK domiciled students in the 2022-23 cohort of University of Sheffield students, by domicile



Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding.
Source: London Economics' analysis based on University of Sheffield HESA data

Table 7 UK domiciled students in the 2022-23 cohort of University of Sheffield students, by level of study, mode, and domicile

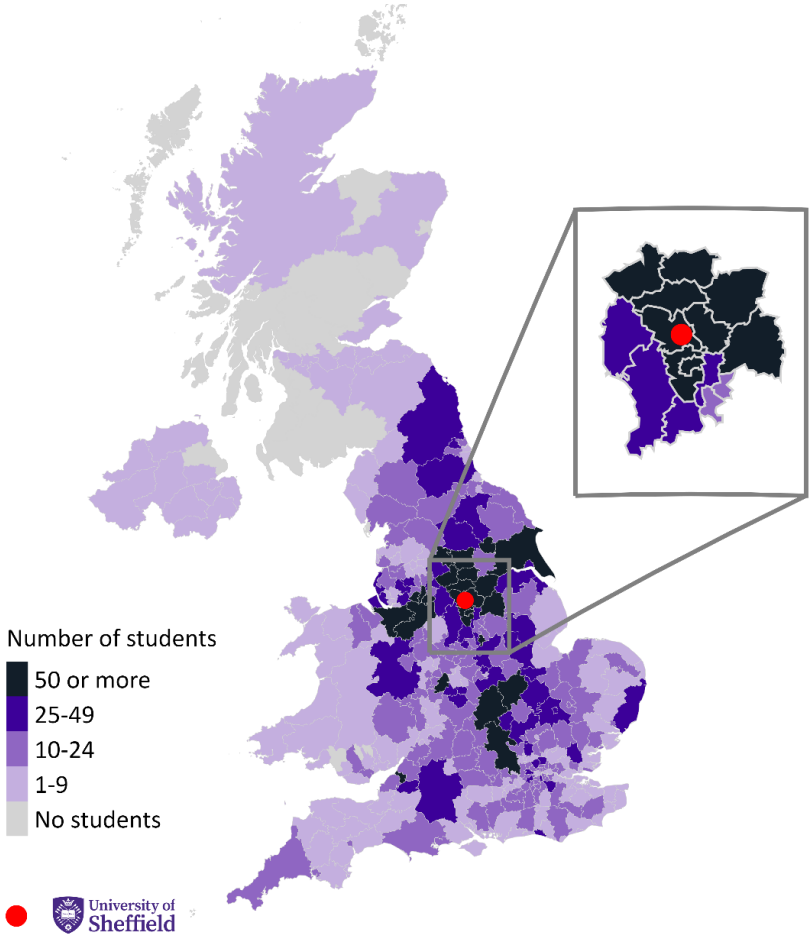
Level and mode of study	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Full-time					
Other undergraduate	155	0	0	0	**155**
First degree	4,590	85	10	15	**4,700**
Other postgraduate	295	5	0	0	**300**
Higher degree (taught)	815	10	5	5	**840**
Higher degree (research)	290	5	5	0	**305**
Total	**6,150**	**105**	**25**	**20**	**6,295**
Part-time					
Other undergraduate	65	0	5	0	**65**
First degree	0	0	0	0	**0**
Other postgraduate	455	5	5	5	**465**
Higher degree (taught)	180	5	5	5	**190**
Higher degree (research)	35	0	0	0	**35**
Total	**735**	**10**	**10**	**5**	**760**
Total					
Other undergraduate	220	0	5	0	**220**
First degree	4,590	85	10	15	**4,700**
Other postgraduate	750	5	5	5	**770**
Higher degree (taught)	995	15	10	5	**1,030**
Higher degree (research)	325	5	5	0	**340**
Total	**6,880**	**115**	**35**	**25**	**7,055**

Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding. 'Other undergraduate' learning includes Certificates of Higher Education, Higher National Certificates, other certificates or diplomas at undergraduate level, and undergraduate-level credits. 'Other postgraduate' learning includes Postgraduate Certificates in Education, Postgraduate Diplomas in Education, and other postgraduate-level certificates, diplomas, qualifications, and credits. There were less than 5 part-time first degree students in the 2022-23 cohort (rounded to 0 in the table).
Source: London Economics' analysis based on University of Sheffield HESA data

Figure 15 presents the distribution of the University of Sheffield's 2022-23 cohort of UK domiciled students by domicile at the Local Authority level[77]. The map illustrates the University's importance as an anchor institution to its local regions, with approximately **18%** (**1,270**) of the University's first-year UK domiciled students in 2022-23 coming from **South Yorkshire**, including **11%** (**800**) from Sheffield, **3%** (**210**) from Rotherham, **2%** (**150**) from Doncaster, and another **2%** (**115**) from Barnsley. More broadly, a total of **29%** (**2,060**) of students were domiciled in the **Yorkshire and the Humber** region as a whole before starting their studies at the University of Sheffield.

Alongside this 'draw' of the University from its local surroundings, the map also shows its geographical draw of students from other parts of the UK. **14%** of the University's UK domiciled student starters came to the University from the **East Midlands**, **13%** came from the **North West**, **10%** came from the **South East**, **9%** were domiciled in the **East of England**, and **8%** came from **London**.

Figure 15 UK domiciled students in the 2022-23 cohort of University of Sheffield students, by Local Authority of domicile



Note: LE received HESA data on a total of 7,091 first-year students from the University of Sheffield. We excluded 18 students with an invalid or missing domicile postcode, so that the map is based on 7,073 students. Domicile refers to a student's permanent home address before starting their qualification at the University of Sheffield. Totals may not sum due to rounding.

Source: London Economics' analysis based on data from the University of Sheffield and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data © Crown copyright and database right 2024.

[77] See Annex A2.5.1 for an alternative breakdown by parliamentary constituency.

Highlighting the University's efforts to widen participation in higher education**, a large proportion of students in the 2022-23 University of Sheffield's cohort met one or more widening participation or access criteria**. Specifically, **27%** (**1,315**[78]) of first-year undergraduate UK domiciled students who registered at the University in 2022-23 met one of the University's Access+ criteria (e.g. were estranged students or those with caring responsibilities), were from areas with low levels of HE participation (i.e. were living in a postcode designated as POLAR Quintile 1[79]), and/or had previously engaged in one of the University's widening participation schemes (such as the Discover Programme or the Realising Opportunities programme).

Related to the latter criterion, the University operates a wide range of **outreach schemes with local schools, colleges, and other partners to broaden interest in and access to higher education**. In 2022-23 alone, through these outreach schemes, the University's Access Service and Student Recruitment Team engaged with a total of **8,555** children and young people. This includes **2,215** children involved in its pre-16 access programmes[80], and **6,340** pupils who participated in its post-16 access programmes[81] (including **230** engaged in the University's STEM-subject-specific outreach initiatives)[82].

3.2 Methodology

The analysis of the impact of the University's teaching and learning captures the enhanced labour market benefits and taxation receipts (minus the costs of attendance/provision) associated with students in the above 2022-23 cohort completing qualifications at the University of Sheffield. Specifically, the fundamental objective of the analysis is to estimate the **gross and net graduate premium** to the individual and the **gross and net public purse benefit** to the Exchequer associated with higher education qualification attainment, defined as follows (and presented in Figure 44 in Annex A2.3):[83]

- The ***gross* graduate premium** associated with qualification attainment is defined as the **present value of enhanced after-tax earnings** (i.e. after income tax, National Insurance and VAT are removed, and following the deduction of any foregone earnings during study) relative to an individual in possession of the counterfactual qualification;
- The ***gross* benefit to the public purse** is defined as the **present value of enhanced taxation** (i.e. income tax, National Insurance and VAT, following the deduction of the costs of foregone tax revenues during study) relative to an individual in possession of the counterfactual qualification;
- The ***net* graduate premium** is defined as the gross graduate premium *minus* the direct costs associated with qualification attainment; and

[78] Numbers are again rounded to the nearest 5.
[79] POLAR is a local area classification used by the Office for Students that groups areas across the UK based on the proportion of young people who participate in higher education. POLAR classifies local areas into five groups - or quintiles - based on the percentage of young people who enter higher education aged 18 or 19 years old. Quintile 1 has the lowest rate of participation, while Quintile 5 has the highest participation rate. For more information, see Office for Students (2022).
[80] This includes initiatives such as Children's University, the Brilliant Club, Access to Sheffield (for Years 7-11), Building Learning Power, or CoacHE.
[81] This includes programmes such as Access to Sheffield (for Years 12-13), Realising Opportunities, the Brilliant Club (which is targeted at both pre-16 and post-16), the Access to Sheffield Summer School, the Sutton Trust Summer School, and the University's work as part of HeppSY (a partnership between Sheffield Hallam University, the University of Sheffield, and South Yorkshire colleges and target schools).
[82] Note that this information only relates to participants who had direct interactions with the University's staff, but excludes additional children and young people who were supported through the University's outreach partnership activities but didn't directly interact with University of Sheffield staff. As a result, the numbers here likely underestimate the University's overall outreach engagement.
[83] See Annex A2.3 for a detailed description of the methodology used to estimate the impact of the University's teaching and learning activities.

- The ***net* benefit to the public purse** is defined as the gross public purse benefit minus the direct Exchequer costs of provision during the period of attainment.

The analysis examines the benefits of the above-described single cohort of students (i.e. the cohort of 2022-23 UK domiciled starters) across their lifetimes in present value terms (i.e. in 2022-23 money). A detailed methodology is presented in Annex A2.3[84].

3.3 Impact of the University's teaching and learning activities

3.3.1 Estimated net graduate premium and net Exchequer benefit per student

The net graduate premium for a representative full-time first degree student stands at £112,000.

Table 8 presents the net graduate premiums and net Exchequer benefits achieved by UK domiciled students[85] starting qualifications at the University of Sheffield in 2022-23 (on average across men and women[86] and across students from all domiciles). The analysis estimates that the average **net graduate premium** achieved by a representative[87] student in the 2022-23 cohort completing a **full-time** first degree at the University of Sheffield (with an RQF Level 3 qualification as their highest level of prior attainment[88]) is approximately **£112,000** in today's money terms[89]. At postgraduate level, the net (post)graduate premiums for representative[90] students completing a full-time postgraduate taught or postgraduate research degree at the University of Sheffield (relative to a first degree) stand at **£28,000** and **£89,000**, respectively.

There are also substantial **net graduate premiums** for **part-time** students. For instance, the estimated net graduate premium for a representative part-time student in the cohort completing a postgraduate taught degree stands at **£62,000** (vs. **£28,000** for full-time students). The fact that part-time students tend to complete their studies later in life[91] (resulting in fewer years spent in the labour market post-graduation) results in a relative reduction in the net graduate premiums for part-time students compared to full-time students. However, it is assumed that part-time students are able to combine work with their academic studies and thus do not incur any opportunity costs in the form of foregone earnings, which results in increased net graduate premiums relative to full-time students. Depending on which of these effects dominates, the net graduate premiums for part-

[84] The estimation of the net graduate premiums and net Exchequer benefits is based on a detailed econometric analysis of the Labour Force Survey. The analysis considers the impact of higher education qualification attainment on earnings and employment outcomes; however, as no information is specifically available on the particular higher education institution attended, the analysis is *not* specific to University of Sheffield alumni. Rather, the findings from the analysis are adjusted to reflect the characteristics of the 2022-23 cohort of University of Sheffield students to the greatest extent possible (e.g. in terms of mode of study, level of study, subject mix, domicile, gender, average age at enrolment, or duration of qualification). Again, for further information on our methodological approach, see Annex A2.3.

[85] The full set of net graduate premiums and net Exchequer benefits (for all study levels, study modes, and prior attainment levels) is presented in Annex A2.3.8.

[86] For a breakdown of the results by gender, again see Annex A2.3.8.

[87] The analysis is based on an average age at graduation of 22 for students undertaking full-time first degrees at the University in the 2022-23 cohort (also see Annex A2.3.5 for further information).

[88] As further outlined in Annex A2.3.3, this predominantly includes 2 or more GCE 'A' levels (or equivalent qualifications). RQF refers to the Regulated Qualifications Framework used in England, Wales, and Northern Ireland.

[89] In comparison, our recent analysis for Universities UK of the economic impact of teaching and learning associated with the entire UK higher education sector estimated an average net graduate premium for full-time first degree students studying anywhere in the UK (i.e. at any UK HE provider) of **£77,000**, with a corresponding net Exchequer benefit of **£75,000**. For more information, see London Economics (2024c).

[90] This is based on an average age at graduation in the 2022-23 cohort of 26 for full-time higher degree (taught) students and 31 for full-time higher degree (research) students.

[91] Again, see Annex A2.3.5 for more information.

time students can be either lower or higher than the corresponding net graduate premiums achieved by full-time students.

Table 8 Net graduate premium and net Exchequer benefit per UK domiciled student in the 2022-23 University of Sheffield cohort, by study level and mode

Level of study	Net graduate premium		Net public purse benefit	
	Full-time students	Part-time students	Full-time students	Part-time students
Other undergraduate[1]	£49,000	£89,000	£50,000	£72,000
First degree[1]	£112,000	-	£117,000	-
Other postgraduate[2]	£20,000	£38,000	£30,000	£32,000
Higher degree (taught)[2]	£28,000	£62,000	£53,000	£57,000
Higher degree (research)[2]	£89,000	£95,000	£126,000	£86,000

Note: All estimates constitute weighted averages across men and women (weighted by the estimated number of student completers in the 2022-23 cohort) and are presented in 2022-23 prices, discounted to net present values, and rounded to the nearest £1,000.
We assume that the gross graduate premium / Exchequer benefit associated with any HE qualification attainment can never be negative – i.e. students will never incur a wage/employment penalty from achieving additional qualifications. In instances where this would be the case, we instead assume a £0 gross graduate premium / Exchequer benefit (while the costs of qualification attainment would still be incurred). Gaps may arise where there are no students in the 2022-23 University of Sheffield cohort expected to complete the given qualification (with the given characteristics).
[1] Net graduate premiums and net public purse benefits associated with qualifications at 'other undergraduate' and first degree level are estimated relative to possession of Level 3 qualifications (see Annex A2.3.3 for further detail). [2] Net graduate premiums and net public purse benefits associated with qualifications at 'other postgraduate', higher degree (taught) and higher degree (research) level are estimated relative to the possession of first degrees.
Source: London Economics' analysis

The public purse also benefits significantly from higher education qualification attainment at the University of Sheffield. The **net Exchequer benefit** for a representative **full-time first** degree student (again with a Level 3 qualification as their highest level of prior attainment) stands at approximately **£117,000** in 2022-23 money terms. The corresponding net Exchequer benefits for representative students completing a full-time postgraduate taught or postgraduate research degree (relative to a first degree) were estimated at approximately **£53,000** and **£126,000**, respectively.

The net public purse benefit for a representative full-time first degree student stands at £117,000.

Again, there are also large net Exchequer benefits associated with **part-time students**. For instance, the net Exchequer benefit for a representative part-time student undertaking a postgraduate taught degree (relative to a first degree) stands at approximately **£57,000**.

3.3.2 Total impact of teaching and learning activities at the University of Sheffield

The total economic impact of teaching and learning generated by the 2022-23 cohort of University of Sheffield students stood at £1.20 billion.

Combining the information on the number of UK domiciled students in the 2022-23 University of Sheffield cohort, expected completion rates, and the net graduate and public purse benefits associated with the different qualification levels (relative to students' specific prior attainment), the **aggregate economic benefit of the University's teaching and learning activities** associated with the 2022-23 cohort was estimated to approximately **£1.20 billion** (see Table 9).

This total impact is split roughly evenly between the Exchequer and students, with **£629 million** (**52%**) of the economic benefit accrued by the Exchequer, and the remaining **£570 million** (**48%**) accrued by students. In terms of study level, **86%** (**£1.03 billion**) of the total impact is generated by the University of Sheffield's undergraduate students, with the remaining **14%** (**£165 million**) generated by the University's postgraduate students. In terms of domicile, mirroring the distribution of students in the cohort, **98%** (**£1.17 billion**) of the estimated total impact is associated with students from England, while the remaining **2%** (**£28 million**) is generated by students coming to Sheffield from elsewhere in the UK.

Table 9 Aggregate impact of the University of Sheffield's teaching and learning activities associated with the 2022-23 cohort (£m), by type of impact, domicile, and level of study

Beneficiary and study level	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Students	**£556m**	**£10m**	**£2m**	**£2m**	**£570m**
Undergraduate	£492m	£9m	£1m	£1m	**£504m**
Postgraduate	£64m	£1m	£1m	£0m	**£66m**
Exchequer	**£614m**	**£11m**	**£2m**	**£2m**	**£629m**
Undergraduate	£517m	£9m	£1m	£2m	**£529m**
Postgraduate	£96m	£1m	£1m	£0m	**£99m**
Total	**£1,170m**	**£20m**	**£4m**	**£3m**	**£1,198m**
Undergraduate	£1,010m	£18m	£2m	£3m	**£1,033m**
Postgraduate	£160m	£3m	£2m	£1m	**£165m**

Note: All estimates are presented in 2022-23 prices, discounted to reflect net present values, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

3.4 Additional information on the employment outcomes of the University of Sheffield's graduates

In addition to the above analysis of the economic impact of the University's teaching and learning activities, we analysed the Longitudinal Education Outcomes (LEO) dataset to examine the labour market outcomes of the University of Sheffield's graduates.

The LEO dataset is a matched individual-level dataset produced by the Department for Education, combining information from multiple educational data sources with information on earnings and employment outcomes[92]. The data provides disaggregated information on graduates' post-graduation outcomes by tax year, qualification level, subject area of study, gender, and higher education provider, separately for graduates 1, 3, and 5 years after graduating[93].

[92] These sources combine data on school (National Pupil Database, NPD), further education (Individualised Learner Record, ILR), and higher education (HESA) participation and attainment with information on earnings, employment, and benefits records from administrative data sources (HM Revenue and Customs P14, P45 and self-assessment data (covering both employees and self-employed individuals), and the National Benefits Database from the Department for Work and Pensions).
[93] Note that institutions from Northern Ireland are not covered by the LEO data and are therefore excluded from this analysis. Additionally, to avoid distortion by very small providers, those with fewer than 100 graduates have been excluded from averages across higher education institutions.

For this analysis, we used data from the Department for Education (2024a), covering the outcomes of three different graduating cohorts in the tax year 2021-22[94]. These graduating cohorts include the 2019-20 graduating cohort (at 1 year after graduation), the 2017-18 cohort (at 3 years after graduation), and the 2015-16 cohort (at 5 years after graduation). For all of these cohorts, we examine the **movement of graduates across regions** (i.e. the extent to which the University's students remain in Yorkshire and the Humber post-graduation), as well as the **proportion of graduates who are in sustained employment[95], further study, or both** (again, during the 2021-22 tax year).

In terms of **graduate mobility**, Figure 16, Figure 17 and Figure 18 demonstrate the extent to which UK domiciled University of Sheffield graduates remain in Yorkshire and the Humber after study[96]. In total, **34%** of the University of Sheffield's graduates remained in Yorkshire and the Humber 1 year after graduation. Within this total, almost all (**98%**) of the University's students who were originally from Yorkshire and Humber[97] remained in the region 1 year after study, with an additional **19%** of students who originally came from other regions staying in the region post-graduation. This resulted in net migration to Yorkshire and the Humber of **15%** of the relevant graduating cohort 1 year post-study[98], decreasing to **13%** and **10%** at 3 and 5 years post-study (but still remaining substantial). These net migration figures are **larger than for any other HEI located in Yorkshire and the Humber** and demonstrate the University of Sheffield's role as a **local anchor institution and key contributor of skilled graduates to its local economy**.

Figure 16 Location of UK domiciled University of Sheffield graduates before and 1 year after study

Note: Based on the University of Sheffield's 2019-20 graduating cohort, including UK domiciled first degree graduates only. All numbers are based on the 2021-22 tax year. Totals may not sum due to rounding. Pre-study location refers to a graduate's 'home' domicile region before study (based on HESA postcode data).

Source: London Economics' analysis using provider-level Longitudinal Education Outcomes data (Department for Education, 2024)

[94] This is the latest year for which the LEO data is currently available.

[95] To be classified as being in sustained employment in a given tax year, a graduate must be in paid employment for at least one day in five out of six months between October and March of a given tax year.

[96] Unfortunately, due to a lack of granularity within the published LEO data, it is not possible to disaggregate the data further to examine the retention of the University's graduates within South Yorkshire (or other sub-regional geographical levels).

[97] i.e. who were domiciled in Yorkshire and the Humber prior to starting their studies at the University of Sheffield

[98] From Figure 16, this is based on **19%** of graduates being domiciled in Yorkshire and the Humber prior to their studies, increasing to **34%** remaining in the region 1 year post-graduation (i.e. a difference of **15%**).

Figure 17 Location of UK domiciled University of Sheffield graduates before and 3 years after study

Note: Based on the University of Sheffield's 2017-18 graduating cohort, including UK domiciled first degree graduates only. All numbers are based on the 2021-22 tax year. Totals may not sum due to rounding. Pre-study location refers to a graduate's 'home' domicile region before study (based on HESA postcode data).
Source: London Economics' analysis using provider-level Longitudinal Education Outcomes data (Department for Education, 2024)

Figure 18 Location of UK domiciled University of Sheffield graduates before and 5 years after study

Note: Based on the University of Sheffield's 2015-16 graduating cohort, including UK domiciled first degree graduates only. All numbers are based on the 2021-22 tax year. Totals may not sum due to rounding. Pre-study location refers to a graduate's 'home' domicile region before study (based on HESA postcode data).
Source: London Economics' analysis using provider-level Longitudinal Education Outcomes data (Department for Education, 2024)

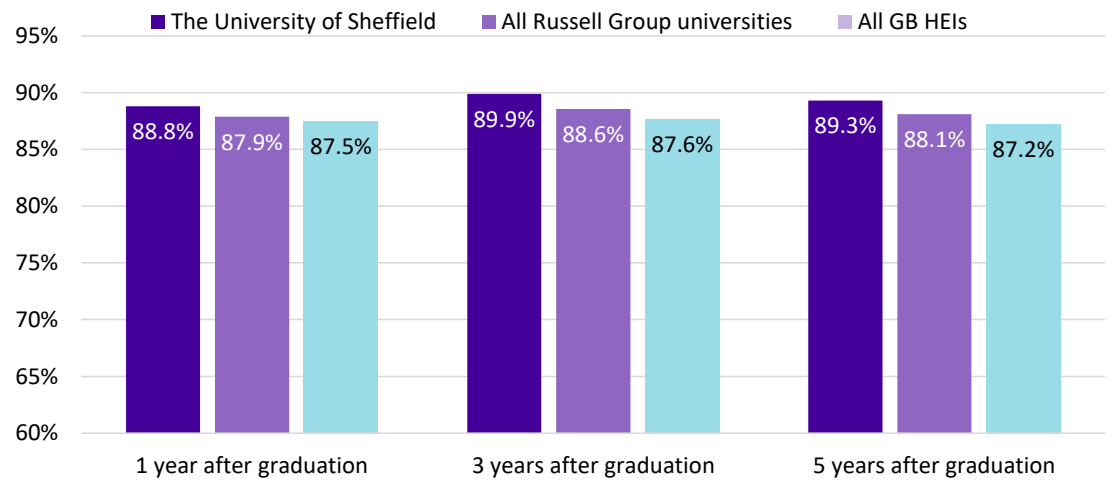
In addition to the LEO data, HESA's Graduate Outcomes Survey constitutes another core source of information on graduates' activities, providing insights on the post-graduation outcomes of students who obtained HE qualifications in the UK in the 2021-22 academic year, approximately 15 months after they completed their studies[99]. Specifically, in relation to graduate mobility, the Graduate Outcomes Survey data provides more detailed information on graduates' locations at sub-regional (rather than regional) level. Based on data for the University of Sheffield, out of a total of **3,215**

[99] For more information, see HESA (2024e).

surveyed graduates who completed qualifications at the University in 2021-22 and who were in employment 15 months after, **800** (**25%**) were working in **South Yorkshire**[100]. Among these **800** graduates who stayed in the region, **250** (**31%**) were working in human health and social work activities (including **205** (**26%**) working in the NHS, specifically), **195** (**25%**) were working in education, and **105** (**13%**) were working in the professional, scientific, and technical activities sector. Importantly, note that this information is based on survey data, and therefore does *not* cover the entire 2021-22 University of Sheffield graduate cohort. Hence, the absolute numbers here underestimate the true number of University of Sheffield graduates working in the region – but the percentages still provide a useful indication of the likelihood of the University's graduates entering key industries and professions within the local labour force.

In addition to graduates' mobility, the above-described LEO data also provides information on the **proportion of University of Sheffield graduates who are in sustained employment, further study, or both** – again 1 year, 3 years, and 5 years post-graduation (based on the same three graduate cohorts as outlined above). Figure 19 compares these employment outcomes for the University of Sheffield to the average outcomes among graduates from all Russell Group universities and from all HEIs in Great Britain[101]. Across the three graduating cohorts, the proportion of University of Sheffield graduates in sustained employment, further study, or both is consistently higher than the corresponding proportion from either all Russell Group universities or all GB HEIs. For example, the proportion of University of Sheffield graduates who achieve these positive outcomes at 5 years post-completion stands at **89.3%**. This compares to an average of **88.1%** of graduates across all Russell Group institutions, and **87.2%** across all GB HEIs combined.

Figure 19 % of graduates in sustained employment, further study, or both for the University of Sheffield, all Russell Group institutions, and all GB HEIs



Note: Based on the 2015-16, 2017-18, and 2019-20 graduating cohorts, including UK domiciled first degree graduates only. All numbers are based on the 2021-22 tax year. The proportions for all Russell Group universities and all GB HEIs constitute averages across all relevant institutions included in the LEO provider-level data.

Source: London Economics' analysis using provider-level Longitudinal Education Outcomes data (Department for Education, 2024)

[100] Again, all numbers here have been rounded to the nearest 5.

[101] Again, note that Northern Irish HEIs are excluded from the LEO data.

Box 5 The workforce contributions of University of Sheffield students during their studies

In addition to their economic contributions post-study, a large number of the University's students also contribute to the workforce during their studies.

For example, many of the University's students gain valuable employment experience of key relevance to their studies by undertaking a **placement year** in their third year of study (for first degree students), before returning to the University to complete their degree in their fourth and final year. Placement years provide students with the opportunity to apply what they have learnt in their course and gain valuable work experience before completing their studies, while also earning a salary during their placement. The University's students have had placements with major organisations like IBM, AstraZeneca, the Home Office, the Volkswagen Group, and Unilever, as well as a wide variety of smaller organisations. In 2022-23, a total of **525** University of Sheffield students[102] were on a placement year, including **300** Engineering students, **105** students studying Science subjects, and **120** Social Sciences students.

In addition, and separately, many of the University's students support the health sector workforce in South Yorkshire and the wider UK by completing **clinical placements with the NHS** during their studies (e.g. as part of their nursing, midwifery, speech and language therapy, or orthoptics courses). In 2022-23, there were **755** University of Sheffield students working in NHS placements, for a combined total of more than **365,000** hours – which equates to **1,000 hours of NHS placement work completed per day**.

Furthermore, included in its overall student body, the University offers a number of **degree apprenticeship** courses (at Level 6 and 7 – equivalent to an undergraduate or master's degree, respectively). These apprenticeships offer students the chance to combine paid work and study, by mixing higher education level classroom learning with real-world experience. The University provides a range of apprenticeship courses with industry and business across the region, designed in partnership with employers so that learners develop the skills and expertise they need to succeed in their industry. In 2022-23, there were **1,335** apprentice learners studying at the University of Sheffield, predominantly in **Advanced Manufacturing** (delivered via the University's Advanced Manufacturing Research Centre (AMRC)), but also including **Nursing**, **Psychology**, **Social Work**, and **Management and Leadership** apprentices. In terms of student starters of degree apprenticeships at the AMRC, **76%** were residents in **South Yorkshire**, predominantly in **Sheffield** (**42%**) and **Rotherham** (**22%**), as well as in **Barnsley** (**6%**), and **Doncaster** (**6%**).

More widely, a large proportion of the University's students undertake part-time work in Sheffield and the wider region during their studies. Based on the University of Sheffield's Career Confidence Survey for the 2023-24 academic year, out of **28,350** respondents to the survey, **11,290** - i.e. **40%** - reported having worked part-time in the last 12 months.

[102] Again, all numbers here are rounded to the nearest 5.

Building careers, shaping futures

The University of Sheffield cultivates resilient, adaptable, and confident graduates, who are ready for the challenges and opportunities of an ever-changing global job market.

The Sunday Times Good University Guide 2024 found that more than 85% of University of Sheffield graduates went into graduate-level employment or further study.

Many of the University's undergraduate courses offer the opportunity for students to undertake a placement year in a related industry or field enabling them to leave university with the ability to think logically and critically through real-world learning. Elizabeth, a BA Sociology with Criminology student, undertook a year's placement with the Department of Education where she worked on projects focused on the wellbeing and mental health of children and young people. Here, she developed skills and connections through networking that would be useful for her future career. While studying for a degree in Geography, Anna undertook a placement as an Environmental Advisor on a large construction project in the summer of her second year. This role developed her ability to think critically, which was essential for her job with the company after she graduated.

Helping students pursue their passions and interests

The University of Sheffield's degrees also offer the flexibility for students to pursue their passions and work towards their career goals.

Launched by students in 2023, Octagon records, is the first-of-its-kind record label to help young musicians, and was launched by students at the University of Sheffield in September 2023. The new label is helping student artists publish their own music whilst developing skills in promotion, distribution, and event management to help launch their careers.

Another notable extra-curricular achievement is the development of a supersonic rocket by a team of engineering students, which has surpassed a series of UK and European altitude records. The team built and designed the rocket alongside their studies as part of the University of Sheffield's Engineering Student-Led Projects - a programme to help STEM students develop skills and experience for careers in the field of engineering.

Training the next generation of clinical genetics experts

In 2021, the University of Sheffield and Sheffield Children's NHS Foundation Trust launched the Julia Garnham Centre, a new NHS-badged genomics facility in Firth Court. The centre provides placements to students for them to develop key diagnostic skills from a team of 20 NHS experts and academic staff. These experiences are instrumental in progressing their understanding of genomics and healthcare and boosts their employability. The output of placement work helps the NHS reduce rare disease and cancer backlogs requiring specialist analysis, and simultaneously supports the development of the future workforce.

Sheffield alumna Maisy Wilkes dedicated her time to working with clinicians at the Julia Garnham Centre during her studies. In 2024, she received the University of Sheffield's prestigious Chancellor's Medal for her work in accelerating diagnosis and treatment access for patients with rare cancers and is now a geneticist at Synovis at Guy's and St Thomas' NHS Foundation Trust.

4 The impact of the University of Sheffield's international students

In this part of the analysis, we focus on the impact of educational exports through the injection of **overseas funding into the UK generated by the University.** Specifically, we analyse overseas income in the form of **tuition fee spending** (net of any fee waivers and other bursaries provided by the University) and **non-tuition fee (off-campus) expenditures** by international students in the 2022-23 cohort of University of Sheffield students, over the entire course of their studies.[103]

In addition to the **direct impact**, captured by the level of (net) fee income (accrued by the University of Sheffield itself) and non-fee income (accrued by other organisations providing goods and services to international students) associated with non-UK students in the 2022-23 cohort, the analysis also estimates the **indirect and induced economic impacts** associated with this export income on the UK economy. These again reflect the chain reaction of subsequent rounds of spending throughout the economy that are generated by this export income, i.e. a 'ripple effect'.[104] The analysis of these impacts follows a similar methodology to the one used to estimate the direct, indirect, and induced economic effects associated with the University's research and knowledge exchange activities (see Section 2) and operational and capital expenditures (see Section 5).

4.1 The 2022-23 cohort of international University of Sheffield students

Figure 20, Figure 21, and Figure 22 present information on the number of non-UK domiciled students in the 2022-23 cohort of University of Sheffield students (by domicile, mode of study, and level of study, respectively).

In terms of domicile (Figure 20), of the total of **6,570** international students starting higher education qualifications at the University of Sheffield in 2022-23, **195** (**3%**) were domiciled within the European Union, while **6,375** (**97%**) were from non-EU countries. In terms of study mode (Figure 21), most international students in the cohort (**6,395**, **97%**) were undertaking their qualifications on a full-time basis, with only **175** (**3%**) studying on a part-time basis.

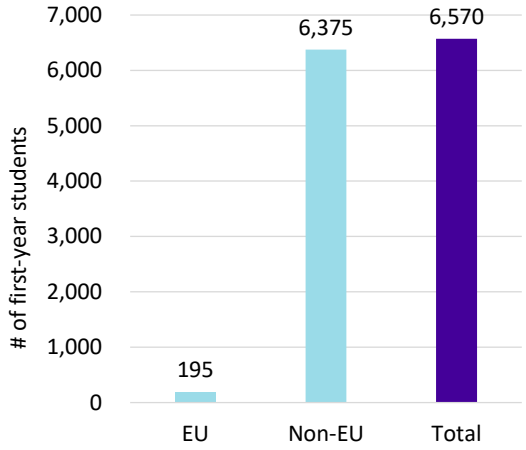
In terms of study level (Figure 22), in contrast to UK domiciled students (see Section 3.1), the majority of non-UK domiciled students in the cohort were undertaking postgraduate qualifications (**5,215, 79%**), including **4,745** students (**72%**) enrolled in postgraduate taught degrees, **330** (**5%**) undertaking postgraduate research degrees, and **140** (**2%**) undertaking other postgraduate qualifications. At undergraduate level, there were **1,350** (**21%**) students undertaking first degrees, while the remaining **5** (**<1%**) students were enrolled in other undergraduate learning.[105]

[103] Note that other types of export income accrued directly by the University of Sheffield (such as research income from international sources, or any other income received from non-UK sources) are accounted for in our analysis of the impact of the University's research activity (Section 2.1) and the impact of the expenditures of the University (Section 5), and are thus excluded from the analysis of international students to avoid double-counting.

[104] Our analysis excludes any similar direct, indirect, and induced effects associated with the non-fee expenditures of *UK domiciled* students. In this respect, we (conservatively) assume that these expenditures are *not* additional to the UK economy (i.e. that they would likely have occurred even if these students had not enrolled in programmes at the University of Sheffield). The economic impact associated with UK students' tuition fee expenditures is instead (implicitly) included in the estimated direct, indirect, and induced impacts associated with the University of Sheffield's own expenditures (see Section 5).

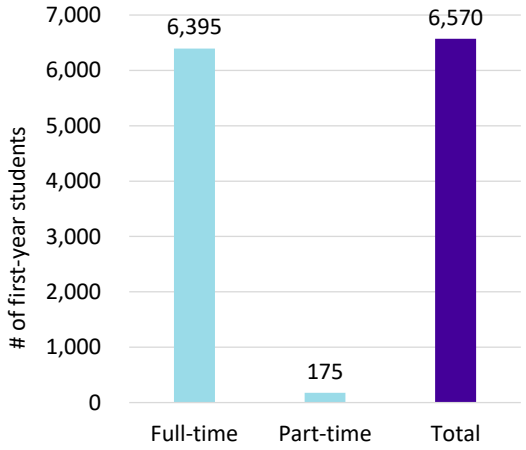
[105] For more detailed information on the University of Sheffield's 2022-23 cohort of non-UK domiciled students, please refer to Annex A2.4.2.

Figure 20 Non-UK domiciled students in the 2022-23 cohort of University of Sheffield students, by domicile



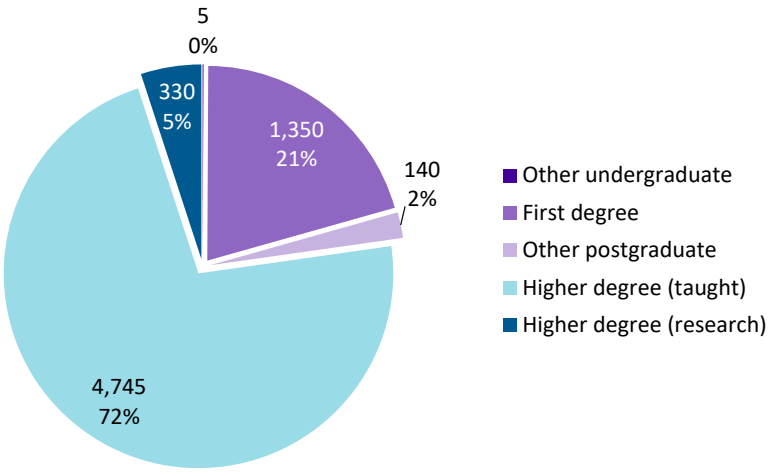
Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
Source: London Economics' analysis based on University of Sheffield HESA data.

Figure 21 Non-UK domiciled students in the 2022-23 cohort of University of Sheffield students, by study mode



Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
Source: London Economics' analysis based on University of Sheffield HESA data.

Figure 22 Non-UK domiciled students in the 2022-23 cohort of University of Sheffield students, by level of study



Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
'Other undergraduate' learning includes Certificates of Higher Education, Higher National Certificates, other certificates or diplomas at undergraduate level, and undergraduate-level credits. 'Other postgraduate' learning includes Postgraduate Certificates in Education, Postgraduate Diplomas in Education, and other postgraduate-level certificates, diplomas, qualifications, and credits.
Source: London Economics' analysis based on University of Sheffield HESA data.

Global students, local impact

In 2024, data produced by London Economics and published by the Higher Education Policy Institute (HEPI) and Kaplan International Pathway, found that international students from both of Sheffield's universities contribute £770 million to Sheffield and £2.9 billion to the Yorkshire and Humber region. This figure underscores the huge economic impact that international students have on the cities and towns they choose to study in. As well as contributing to their local economies, the University of Sheffield's international students and alumni are also driving entrepreneurial ventures that are fostering innovation and making a positive impact on local communities.

Fostering innovation: Future Greens

In January 2024, four University of Sheffield graduates from across the globe secured substantial backing for a sustainable vertical farming startup, Future Greens. After pioneering a circular system for growing food sustainably, the team is now focused on unlocking the benefits of circularity for food manufacturers that generate inevitable organic waste.

Gabrielė, an Artificial Intelligence and Computer Science student from Lithuania and one of the co-founders of Future Greens, undertook a nine-month internship with the University Sheffield's Emerge: Be Enterprising team. Here, she said the skills she acquired during her internship and studies were crucial in getting the company up and running.

Future Greens is based in a former Sheffield steel mill, after moving from its initial base at Sheffield Technology Park's Cooper Project - an initiative designed to help tech entrepreneurs with tailored startup support.

Global citizens: Supporting the local community

Aynour Abouelkhair, an MSc Molecular Biology and Biotechnology student from Egypt, is passionate about giving back to her community. In addition to her studies, she actively supported several charities, including the Anthony Nolan centre, a UK charity focused on leukaemia and hematopoietic stem cell transplantation. She also volunteered as a primary school assistant, supporting children from underprivileged backgrounds. Furthermore, Aynour is a founding committee member of the North African Society, which provides a welcoming space for North African students to connect, share their cultures, and create a sense of community away from home.

Student doctor Aarushi Johri, from India, spent a month working with local charity Cavendish Cancer Care as part of a Social Accountability Placement. The placements, introduced in 2015, provide students with a practical learning experience away from clinical settings while also giving them a chance to serve the local community. Through the placement, Aarushi was able to meet and support cancer patients, take part in outreach groups and help the charity to reach more people who need support with the illness. Aarushi is one of over 2,600 students who have worked with local charities and community organisations since the programme began.

4.2 Direct impact

4.2.1 Methodology

Net tuition fee income

To assess the level of ***gross* tuition fee income** associated with international students in the 2022-23 cohort, we used data on the average tuition fees per student charged by the University of Sheffield in the 2022-23 academic year (by study level, mode, and domicile[106]). Assuming the same average study durations as in the analysis of the impact of the University of Sheffield's teaching and learning activities provided to UK domiciled students (see Annex A2.3.5), we calculated the resulting tuition fee income per international student in the cohort from the start of a student's learning aim until completion. Expressing the total fee income until completion in 2022-23 prices and again using the HM Treasury Green Book real discount rate of **3.5%/3.0%** (see HM Treasury, 2022), we arrived at an estimate of the gross tuition fee income per student (in present value terms over the total study duration).

To calculate the ***net tuition* fee income** per student, we then deducted any fee waivers and bursaries paid to international students by the University of Sheffield.[107] These costs were again calculated over students' total study duration and estimated in present value terms.[108] These estimates per student were then combined with information on the number of non-UK students in the 2022-23 cohort, and the same assumptions on completion rates as for UK domiciled students (as part of the analysis of the impact of teaching and learning (see Annex A2.3.1))[109].

Non-fee income

In addition to tuition fees, the UK economy benefits from export income from overseas students' **non-fee (i.e. living cost) expenditures** incurred during their studies at the University of Sheffield. These costs include:

- **Accommodation costs** (e.g., rent costs, council tax, household bills etc.);
- **Subsistence costs** (e.g., food, entertainment, personal items, non-course travel etc.);
- **Direct course costs** (e.g., course-related books, subscriptions, computers etc.);
- **Facilitation costs** (e.g., course-related travel costs); and
- **Spending on children** (including childcare that is not related to students' course participation).

[106] As in the analysis of the University of Sheffield's teaching and learning activities (see Annex A2.3.7), we made use of information published by HESA (2024a) on the total fee income received by the University of Sheffield in 2022-23, separately by domicile, study level and study mode. Data was provided for all undergraduate students combined, postgraduate (taught) students, and postgraduate (research) students (and we assume that students undertaking learning at 'other postgraduate' level are included in the postgraduate (taught) category). To arrive at the average fees per *full-time* student, we then divided the total fee income for full-time students in 2022-23 by the corresponding number of (first-year and continuing) students studying at the University of Sheffield in 2022-23, again based on HESA student data provided to us by the University. To arrive at the average fees per *part-time student* (ensuring that the fees for part-time students accurately reflect the average study intensity amongst part-time students in the 2022-23 cohort), we adjusted the respective full-time rates for the average study intensity amongst part-time students in the cohort. Also see Annex A2.3.7 for further information.

[107] See Annex A2.3.7 for more information on our assumptions in relation to fee waivers and bursaries.

[108] For information on the resulting estimated levels of net fee income per student, please refer to Annex A2.4.3.

[109] In terms of other funding costs, EU domiciled students starting HE qualifications in the UK *prior to 2021-22* were typically eligible for public tuition fee support paid by the UK Exchequer as well as public teaching grants provided to HEIs by the relevant higher education funding body. However, following the end of the Brexit transition period, EU students entering UK higher education from 2021-22 onwards were generally no longer eligible for these types of public funding (and, as a result, these public costs have been excluded here). For more information on the impact of Brexit on fees and funding for EU students, please refer to Annex A2.4.1.

To analyse the level of non-tuition fee expenditure associated with the 2022-23 cohort of international University of Sheffield students , we used estimates from the **2021-22 Student Income and Expenditure Survey** (SIES).[110] The survey provides estimates of the average expenditures of English domiciled undergraduate students (studying in England or Wales) on living costs, housing costs, participation costs (including tuition fees) and spending on children, separately for full-time and part-time students. For this analysis, we made the following adjustments to the SIES estimates:

- We excluded estimates of **tuition fee expenditure** (to avoid double-counting with the above-described analysis of international tuition fee income).
- We deducted any **on-campus expenditure** that students might incur (to avoid double-counting with the analysis of the impacts of the expenditure of the University of Sheffield itself (see Section 5)).[111]
- Since the SIES results do not provide expenditure estimates for non-UK domiciled students, our analysis implicitly assumes that non-tuition fee expenditure levels do not vary significantly between UK and international students. We do, however, adjust the SIES estimates for the expected longer **average stay durations** in the UK of non-EU students compared to EU students.[112]

Similar to tuition fees, we then calculated the non-tuition fee expenditure over the entire duration of students' higher education courses (and discounted to reflect present values). The resulting estimates provide the total average (off-campus) non-fee expenditure per student in 2022-23 prices, by level of study, mode, and domicile.[113] Again, the estimated non-tuition fee spending per student was combined with the number of international students in the 2022-23 cohort expected to complete qualifications (or credits/modules) at the University of Sheffield.

4.2.2 Total direct impact

The total direct economic impact of the expenditures of international students in the 2022-23 University of Sheffield cohort (in economic output terms) was estimated at **£536 million** (see Figure 23). More than half of this total (**£287 million, 54%**) was generated from international students' tuition fees accrued by the University of Sheffield (net of any fee waivers or bursaries provided by the University), while the remaining **£249 million** (**46%**) was generated from these students' non-tuition fee spending. In terms of student domicile, reflecting the composition of the cohort, most of this impact (**£522 million**, **97%**) was generated by non-EU domiciled students, while **£14 million** (**3%**) was associated with EU students (not presented graphically here).

In addition to economic output (i.e. export income), it was possible to convert the above estimates into GVA and the number of FTE jobs supported.[114] We thus estimate that the export income

[110] See National Centre for Social Research & Institute for Employment Studies (2023).
[111] Specifically, following the approach undertaken by Oxford Economics (2017) in analysing the collective economic impact of all UK higher education institutions in 2014-15, we assume that **10%** of students' non-tuition fee expenditures are spent on campus (i.e. are accrued as income by the University of Sheffield itself).
[112] These adjustments are based on the approach outlined by the Department for Business, Innovation and Skills (2011b) in estimating the value of educational exports to the UK economy. For more information, please refer to Annex A2.4.4.
[113] For information on the estimated levels of non-tuition fee income per student, please refer to Annex A2.4.5.
[114] To estimate the direct GVA and employment associated with the (net) tuition fee income generated by the University of Sheffield's international students, we multiplied this income by the average ratio of GVA to output and FTE employees to output within South Yorkshire's government, health, and education sector as a whole (again based on the above-described multi-regional Input-Output model, using a similar approach as for the impact of the University's research and wider knowledge exchange activities). To estimate the direct GVA and employment associated with the non-tuition fee income generated by the University's international students, we instead multiplied this income by the average ratio of GVA to output and FTE employees to output associated with the expenditure of households located in South Yorkshire (also based on the multi-regional Input-Output model). In other words, we assume that the non-tuition fee

generated by international students in the 2022-23 University of Sheffield cohort directly generates **£334 million** in GVA (**£185 million** from international (net) fee income and **£149 million** from non-fee income) and supports **5,405** FTE jobs (**3,545** from (net) tuition fee income and **1,860** from non-tuition fee income).

Figure 23 Total direct impact associated with non-UK students in the 2022-23 University of Sheffield entrant cohort, by type of impact

Note: All monetary estimates are presented in 2022-23 prices, discounted to reflect net present values, and rounded to the nearest £1m. The employment figures are rounded to the nearest 5. Values may not add up precisely to the totals due to rounding.
Source: London Economics' analysis

4.3 Total economic impact associated with the University of Sheffield's international students

To estimate the total (direct, indirect, and induced) economic impact associated with the income generated by international University of Sheffield students, we again used economic multipliers derived from the above-described multi-regional Input-Output model (see Section 2.1), estimating

expenditures of the University of Sheffield's international students support the same levels of GVA and employment (in relative/proportionate terms) as the expenditure of households located in South Yorkshire more generally.

the extent to which the direct income from international students generates additional activity throughout the UK economy. Specifically, we applied two types of multipliers to the above-described fee and non-fee income associated with international students in the 2022-23 cohort, including:

- **Multipliers relating to international tuition fee income (accrued by the University of Sheffield itself)**: The multipliers used to estimate the impact of the University of Sheffield's international tuition fee income were calculated based on the inter- and intra-industry flows of goods and services for South Yorkshire's government, health, and education sector as a whole.[115]
- **Multipliers relating to income from international students' (off-campus) non-tuition fee expenditures:** These were calculated based on the final consumption expenditure patterns of households located in South Yorkshire[116], and applied to the estimated off-campus non-tuition fee expenditures of overseas students in the 2022-23 cohort of the University of Sheffield students.

Again, these multipliers are expressed in terms of **economic output, GVA**, and **FTE employment**, and are calculated as **total multipliers**, capturing the aggregate impact on all industries in the UK economy arising from an initial injection relative to that initial injection. Table 10 presents the economic multipliers applied to the income generated by international students at the University of Sheffield (in terms of the impact on South Yorkshire, Yorkshire and the Humber, and the UK economy as a whole).[117]

Table 10 Economic multipliers associated with the income from international students in the 2022-23 University of Sheffield cohort

Location of impact and type of income	Output	GVA	FTE employment
Tuition fee income			
South Yorkshire	1.22	1.19	1.17
Yorkshire and the Humber	1.49	1.42	1.35
Total UK	2.45	2.23	1.91
Non-fee income			
South Yorkshire	1.25	1.24	1.30
Yorkshire and the Humber	1.52	1.49	1.58
Total UK	2.48	2.39	2.45

Note: All multipliers constitute Type II multipliers, defined as [Direct + indirect + induced impact]/[Direct impact].
Source: London Economics' analysis

[115] This approach is based on the fact that the tuition fee income from international students is accrued by the University of Sheffield itself. In other words, similar to the impact of the University's research and wider knowledge exchange activities, we assume that the expenditure patterns of the University are the same as for other institutions operating in South Yorkshire's government, health, and education sector. Specifically, we apply these multipliers to the *gross* tuition fee income generated by international students in the 2022-23 University of Sheffield cohort, and then deduct the University's cost of provision (i.e. the University of Sheffield's fee waivers and bursaries) to arrive at the *net* direct, indirect and induced impact associated with this income.

[116] In other words, for the purpose of applying relevant economic multipliers, we assume that international students studying at the University of Sheffield have similar expenditure patterns as households in South Yorkshire more generally. To estimate these multipliers, we inserted a separate vector into the multi-regional Input-Output model, capturing the estimated final demand (again by industry and region) of households located in each region (where, again, the analysis was broken down into ITL2 regions).

[117] While the table presents the multipliers for the impacts on South Yorkshire, Yorkshire and the Humber, and the UK as a whole, a full breakdown of the total economic impacts of the University's activities across all regions (as well as by sector) is provided in Section 7.3.

Applying these multipliers to the above direct impacts,[118] we estimate that the total economic impact on the UK generated by the (net) tuition fee income and non-tuition fee income associated with international students in the 2022-23 University of Sheffield cohort amounts to **£1.32 billion** in **economic output** terms (see Figure 24):

- In terms of the breakdown by type of income, **£703 million** of this impact was associated with international students' (net) **tuition fees**, and **£618 million** was generated by their **non-tuition fee expenditures** over the duration of their studies at the University of Sheffield.
- In terms of the breakdown by region, most of this impact (**£662 million**, **50%**) was generated in **South Yorkshire**, with **£144 million**, **11%** generated in the **rest of Yorkshire and the Humber**, and the remaining **£515 million** (**39%**) occurring in other regions across the UK.

The impact of the export income from international students generated by the 2022-23 University of Sheffield student cohort stood at £1.32 billion.

- In terms of sector, the tuition fee and non-tuition fee income generated from the University of Sheffield's international students generated particularly large impacts within the **government, health, and education sector** (**£352 million**, **27%**), given that the cohort's tuition fee income is accrued by the University of Sheffield itself. In addition, there are relatively large impacts felt within the **distribution, transport, hotel, and restaurant sector** (**£254 million**, **19%**), and the **real estate industry** (**£183 million, 14%**).[119]

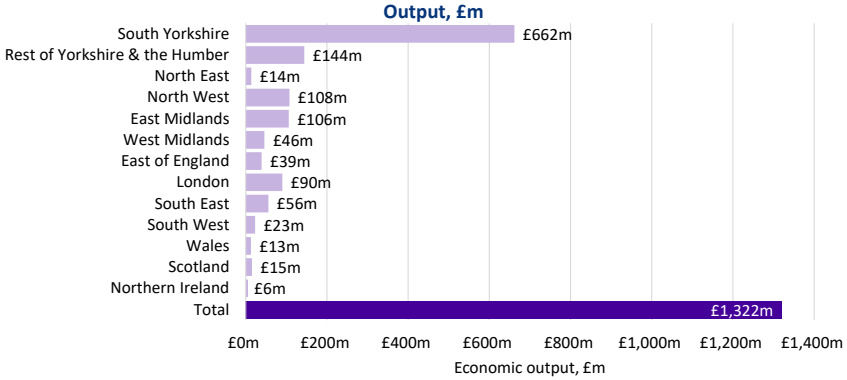
The impact in terms of **GVA** was estimated at **£769 million** across the UK economy as a whole (with **£406 million** generated within South Yorkshire, and **£79 million** generated in the rest of Yorkshire and the Humber), while the corresponding estimates in terms of employment stood at **11,320 FTE jobs** across the UK as a whole (with **6,575** jobs supported across South Yorkshire, and **1,155** across the rest of Yorkshire and the Humber).

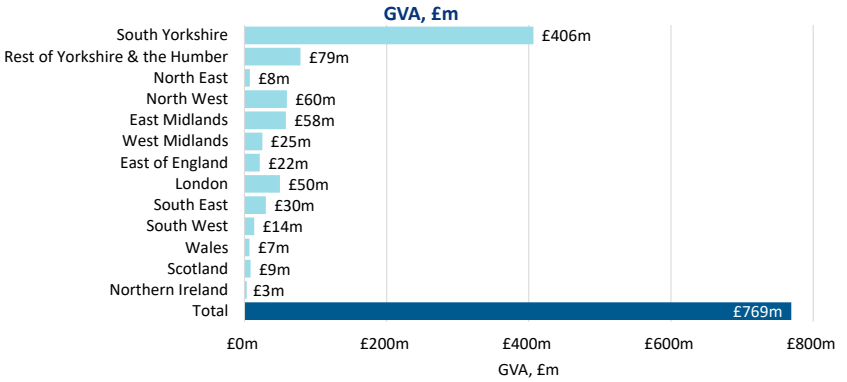
Box 6 The impact of international students in Sheffield Central

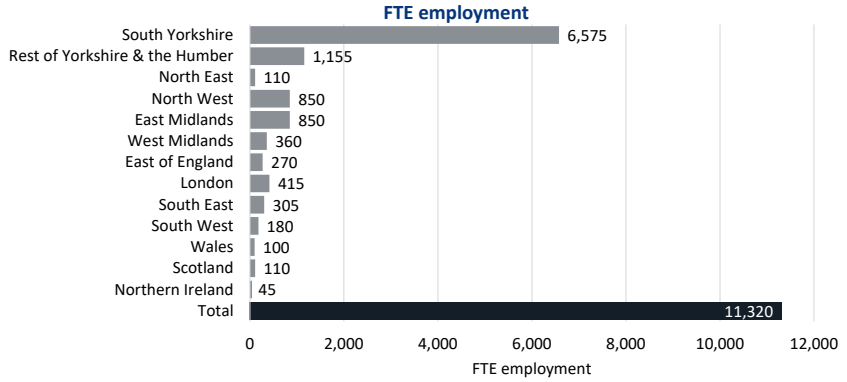
As part of a separate recent analysis by London Economics[120] for the Higher Education Institute and Kaplan International Pathways, we estimated the economic value to the UK of international students by parliamentary constituency (based on the new constituency boundaries introduced ahead of the 2024 General Election). The analysis indicates that first-year international students living in Sheffield Central alone generate a net economic impact of **£521 million** per cohort for the UK economy, equating to a net UK-level economic impact of **£5,800** per resident in the constituency[121]. Sheffield Central ranked **2nd** out of the 650 UK parliamentary constituencies.

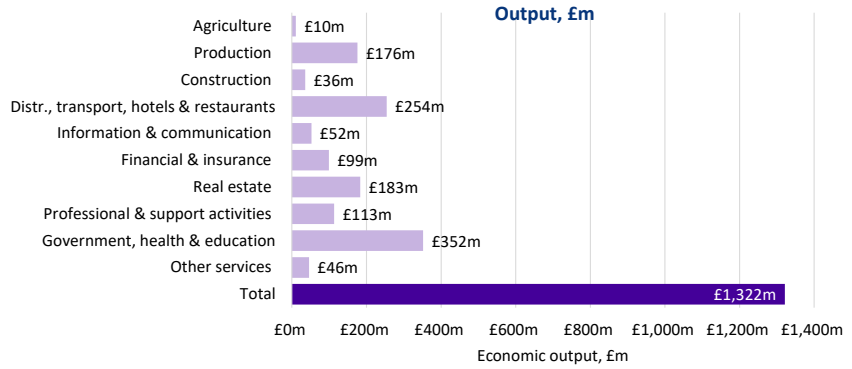
[118] Again, in terms of tuition fee income, note that we apply the relevant multipliers to the *gross* tuition fee income generated by international students in the 2022-23 University of Sheffield cohort, and then deduct the University's cost of fee waivers and bursaries to arrive at the *net* direct, indirect and induced impact associated with this income.
[119] Again, for more detail on which industries are included in this high-level sector classification, please refer to Table 14 in Annex A2.1.2.
[120] See London Economics (2024a).
[121] Note that the analysis estimates the impact of *all* international students residing within each constituency, without specifying which Higher Education Institution they are studying at (but it is expected that the University of Sheffield accounts for the majority of international students living in Sheffield Central). In addition, note that the analysis focused on first-year international students starting their studies in the 2021-22 (rather than 2022-23) academic year.

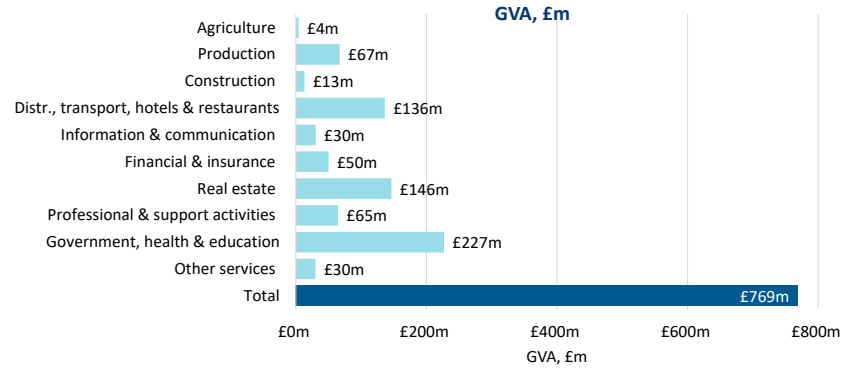
Figure 24 Total economic impact associated with the University of Sheffield's international students in the 2022-23 academic year, by region and sector

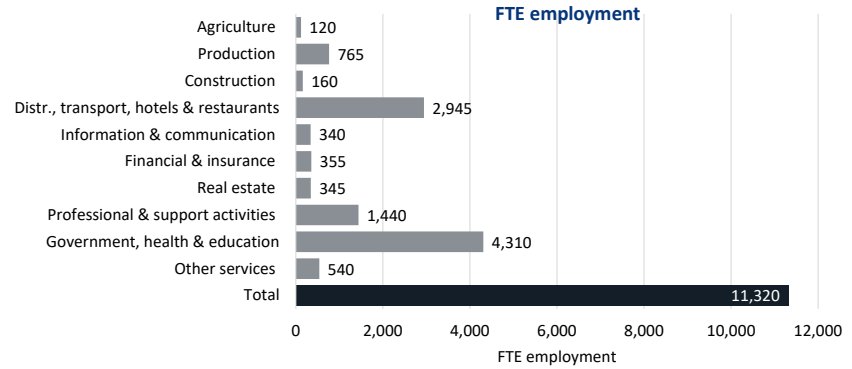












Note: Monetary estimates are presented in 2022-23 prices, discounted to reflect net present values, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. ***Source: London Economics' analysis***

5 The impact of the University of Sheffield's expenditures

In this section, we outline our estimates of the **direct, indirect, and induced impacts associated with the operational and capital expenditures of the University of Sheffield**. The **direct impact** considers the economic output generated by the University itself, by purchasing goods and services (including labour) from the economy in which it operates. Similar to the impact associated with the University's research and knowledge exchange activities (see Section 2) and international students (see Section 4), the **indirect and induced economic impacts** of the University's expenditures reflect the chain reaction of subsequent rounds of spending throughout the economy, i.e. a 'ripple effect'. Again, these impacts can be measured in terms of economic output, GVA, and FTE employment, and are derived using the relevant multipliers derived from the above-described multi-regional Input-Output model.

5.1 Direct impact of the University's expenditures

5.1.1 Gross direct impact of the University's expenditures

To measure the direct economic impact of the purchases of goods, services, and labour by the University of Sheffield, we used information on the University's operational expenditures (including staff and non-staff spending), capital expenditures, as well as the number of staff employed (in terms of full-time equivalent employees), for the 2022-23 academic year.[122] Based on this, in terms of monetary economic **output** (measured in terms of expenditure), **the gross direct economic impact** associated with the University of Sheffield's expenditures stood at approximately **£839 million** in the 2022-23 academic year (see Figure 25). This includes **£454 million** of operating expenditure on staff-related costs, **£298 million** of expenditure on other (non-staff) operating expenses,[123] as well as **£87 million** of capital expenditure incurred in that year.

In terms of staff, the University employed a total of **7,380** FTE staff in 2022-23[124] (**8,150** in headcount terms), which equates to **3%** of total employment in Sheffield[125]. In GVA terms, the University's gross direct impact stood at **£611 million**.

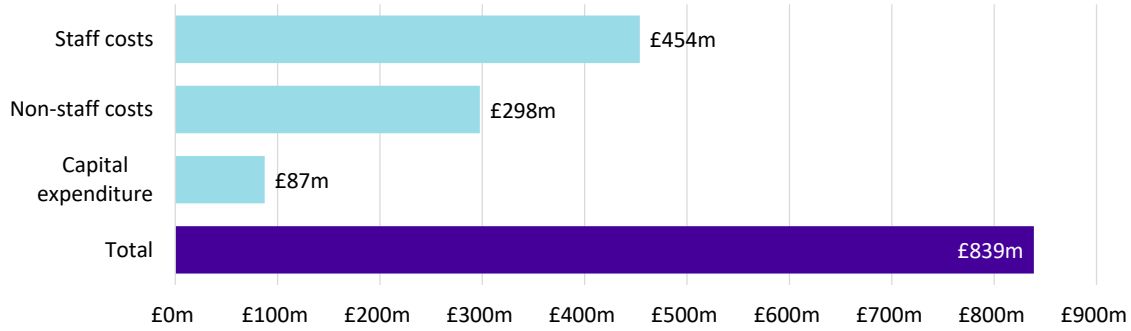
[122] Based on staff and financial data published by HESA (2024a and 2024d) and the University of Sheffield's annual accounts (see University of Sheffield, 2023).

[123] The total operational expenditure (excluding capital expenditure) of the University of Sheffield in 2022-23 stood at **£795 million**. From this, for the purpose of the analysis, we excluded **£44 million** in depreciation and amortisation costs and pension provision movement, as it is assumed that these costs are not relevant from a procurement perspective (i.e. these costs are not accounted for as income by other organisations). This results in total operational expenditure of **£751 million** in 2022-23 included here.

[124] Based on data published by HESA (2024d). Note that this excludes staff on atypical contracts.

[125] Based on the University's **8,150** staff (in headcount terms) in 2022-23, compared to total employment in the Sheffield Local Authority of **272,000** in 2022. Total employment in Sheffield is based on data from the 2022 Business Register and Employment Survey (see Nomis, 2023), where employment numbers include both employees (i.e. anyone aged 16 years or over that an organisation directly pays from its payroll(s), in return for carrying out a full-time or part-time job or being on a training scheme) plus self-employed workers and working owners who are registered for VAT or Pay-As-You-Earn (PAYE) schemes.

Figure 25 Operating and capital expenditures of the University of Sheffield in 2022-23, by type of expenditure



Note: All estimates are presented in 2022-23 prices and rounded to the nearest £1m.
Source: London Economics' analysis based on HESA (2024a) and the University of Sheffield's annual accounts (University of Sheffield, 2023).

5.1.2 Net direct impact of the University's expenditures

Before arriving at the net direct impact associated with the University of Sheffield's expenditure, it is necessary to deduct a number of income and expenditure items to avoid double-counting, and to take account of the 'netting out' of the costs and benefits associated with the University between different agents in the UK economy. Specifically, we deducted a total of **£619 million**, including:

- The total research income (excluding contract research income) received by the University in the 2022-23 academic year (**£217 million**), to avoid double-counting with the estimated impact of the University's research activities (Section 2.1);
- The University's income from its knowledge exchange activities (excluding spinouts and start-ups, but including contract research income) of **£113 million**, to avoid double-counting with the impact of the University's wider knowledge exchange activities (Section 2.2);
- **£1 million** in University of Sheffield bursary spending for UK domiciled students,[126] as this was included (as a benefit) in the analysis of the University's teaching and learning activities (Section 3); and
- The University's (gross) international fee income associated with the 2022-23 cohort of non-UK students (**£287 million**)[127], to avoid double-counting with the impact of the University's international students (Section 4).

After accounting for these deductions, the net direct impact of the University's expenditure in 2022-23 stood at **£220 million**.

[126] The University's bursary support to UK domiciled students is considered as a benefit to the student in the analysis of the impact of teaching and learning activities (see Section 3). It was therefore necessary to deduct these bursaries from the direct impact of the University's spending to correctly take account of the fact that these bursaries are a transfer from the University to its students, and not an additional benefit to the UK economy.
[127] This is slightly larger (in unrounded terms) than the above *net* tuition fee income associated with international students in the 2022-23 cohort (see Section 4.2), as the value deducted here relates to the University's *gross* international fee income *before* the deduction of the University's fee waiver/bursary costs associated with these students (since these costs are already deducted when estimating the impact of the University's international students).

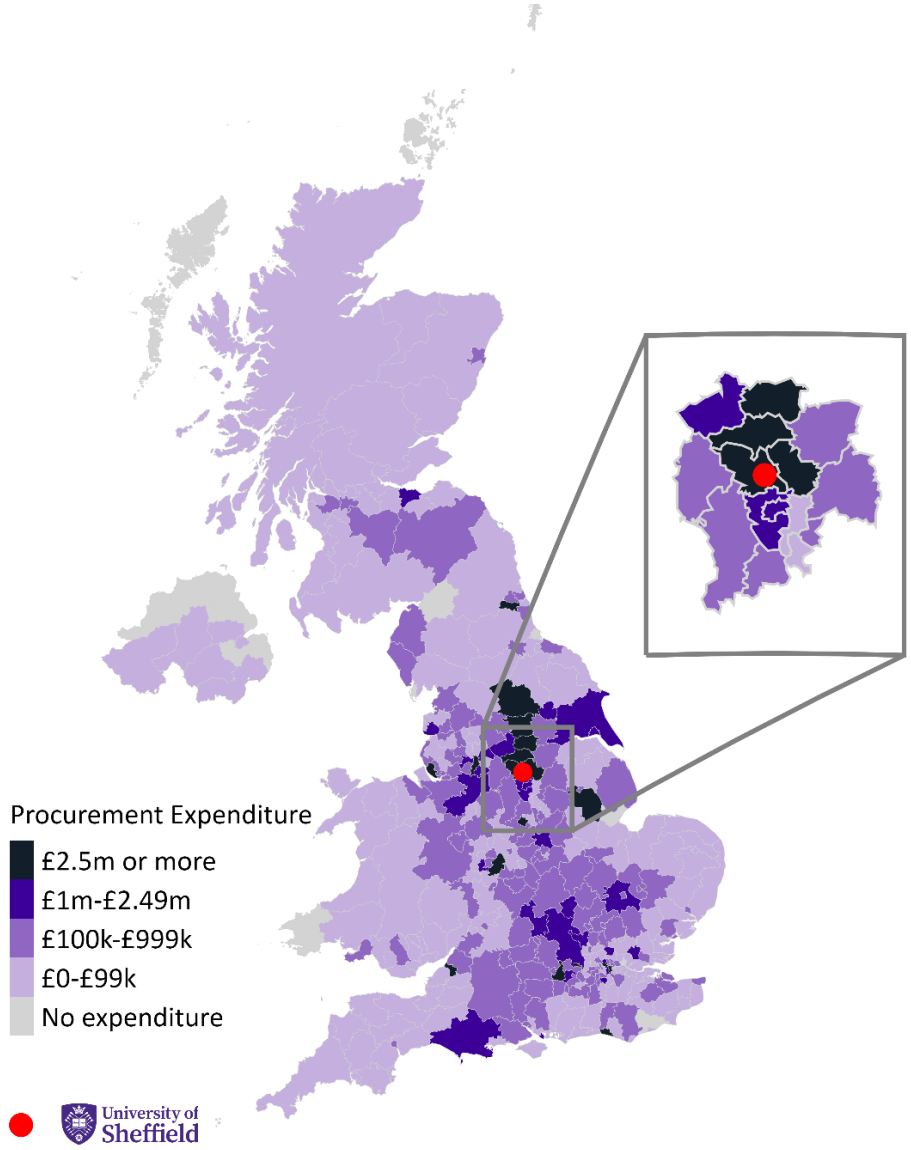
5.1.3 The University's geographical footprint

In addition to these total expenditures, we investigated the **geographical breakdown** of the University of Sheffield's procurement expenditures, staff salary expenditures, and the number of staff, to demonstrate the University's impact across South Yorkshire and the rest of the UK[128].

Figure 26 presents the distribution of the University of Sheffield's UK procurement expenditure (based on invoice data for 2022-23)[129] by Local Authority. The map illustrates a concentration of procurement expenditure in **South Yorkshire** (**£43 million**, i.e. approximately **15%** of total expenditure), with **36%** of all UK procurement expenditure taking place in **Yorkshire and the Humber** as a whole. Within South Yorkshire, the University spent approximately **£36 million** in Sheffield, **£3 million** in Barnsley, **£3 million** in Rotherham, and **£0.4 million** in Doncaster. The University also spent significant amounts on goods and services from suppliers in other regions, including the **North West** (**14%** of UK procurement expenditure), **London** (**13%**)[130], the **South East** (**9%**), the **East Midlands** (**7%**), and the **West Midlands** (**6%**).

[128] See Annex A2.5.2 for an alternative breakdown by parliamentary constituency.
[129] The figures are based on the value of orders raised in 2022-23, rather than invoiced spend. This leads to a variance of roughly 4% when compared to financial statements. This does not make a material change to the analysis.
[130] It is possible that the data overestimate the level of procurement expenditure occurring in London as compared to other regions, since the invoice data will often reflect suppliers' head office locations, rather than the location where these purchases actually took place.

Figure 26 Distribution of the University of Sheffield's procurement expenditure in 2022-23 by Local Authority (of invoice address)

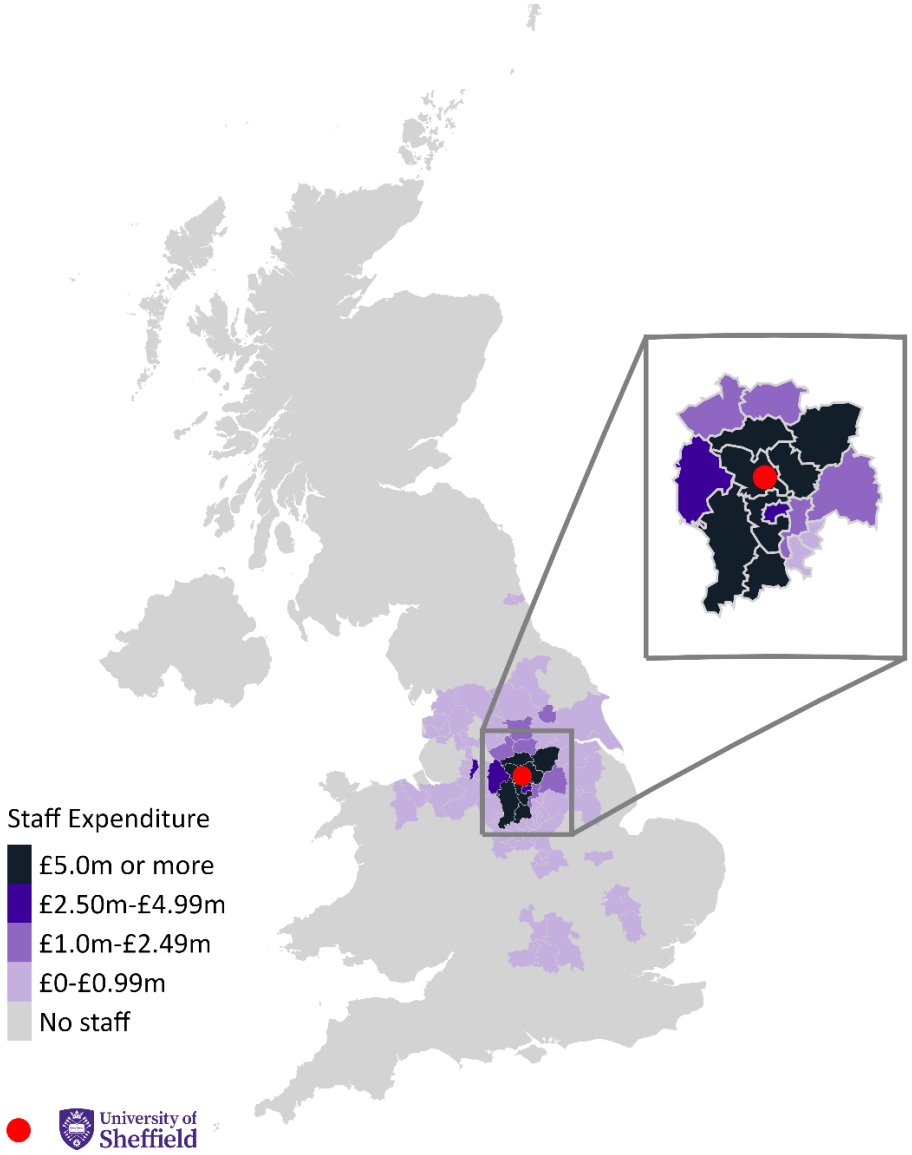


Note: We received postcode data on £326m of procurement expenditure from the University of Sheffield. Expenditure with a missing or invalid postcode (£4m in total) and any overseas expenditure (£32m in total) was excluded. This figure is thus based on £290m non-staff (procurement) expenditure. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from the University of Sheffield and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data © Crown copyright and database right 2024.

In addition, Figure 27 and Figure 28 illustrate the distribution of the University's staff expenditure and staff headcount by Local Authority (based on the postcode of employees' home addresses) in 2022-23. As expected, compared to the University's procurement spending, the maps show a particularly strong concentration of staff in the University's local area, and the University constitutes a key employer in its city and region. Approximately **73%** (**6,335**) of the University's staff live in **South Yorkshire**, with **75%** (**6,535**) living in **Yorkshire and the Humber** as a whole. Within South Yorkshire, there was a particularly strong concentration of staff living in Sheffield itself (**58%**, **4,990**), with a further **10%** (**870**) living in Rotherham, **3%** (**285**) in Barnsley, and **2%** (**195**) in Doncaster. In terms of expenditure, in total, the University spent **71%** of its total salary expenditure on staff living in South Yorkshire in 2022-23, equating to **£276 million**.

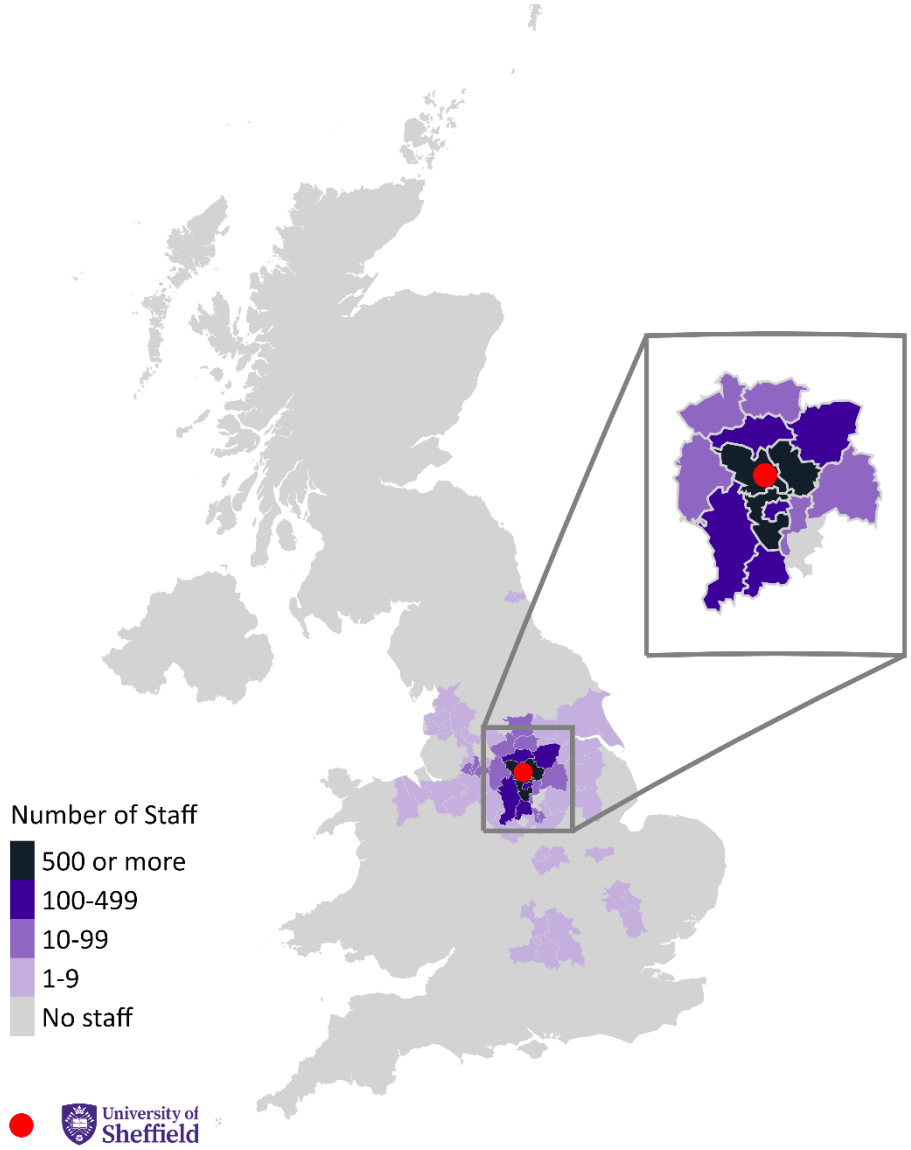
Figure 27 Distribution of the University of Sheffield's staff expenditure in 2022-23 by Local Authority (of home address)



Note: We received data on a total of £432m staff expenditure from the University of Sheffield, broken down by postcode district. Expenditures in postcode districts that are outside of the UK or are unknown (£4m) were excluded. In addition, expenditures in postcode districts with fewer than 5 staff (£40m) were not included in the data. The figure is thus based on £388m of staff expenditure for which the postcode districts can be mapped. Expenditures associated with postcode districts that are spread across multiple Local Authorities have been apportioned equally across them. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from the University of Sheffield and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data © Crown copyright and database right 2024.

Figure 28 Distribution of the University of Sheffield's staff (in headcount) in 2022-23 by Local Authority (of home address)



Note: We received data on a total of 9,765 staff from the University of Sheffield, broken down by postcode district. Staff in postcode districts that are outside of the UK or are unknown (129) were excluded. In addition, staff in postcode districts with fewer than 5 staff (970) were not included in the data. The figure is thus based on 8,666 for which the postcode districts can be mapped. Staff associated with postcode districts that are spread across multiple Local Authorities have been apportioned equally across them. The number of staff is based on the count of staff who were paid at any point during the 2022-23 year, which means that the numbers are not reflective of an average headcount. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from the University of Sheffield and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data © Crown copyright and database right 2024.

5.2 Indirect and induced impacts of the University's expenditures

As with the economic impact of the University of Sheffield's research and knowledge exchange activities (see Section 2) and international students (see Section 4), the assessment of the indirect and induced economic impacts associated with the expenditures of the University is based on

economic multipliers derived from the above-discussed multi-regional Input-Output model.[131] We applied the estimated average multipliers associated with organisations in South Yorkshire's government, health, and education sector (thus mirroring the approach used to assess the impact of the University's international fee income and the income derived from its research and wider knowledge exchange activities, since this income was accrued (and subsequently spent) by the University itself). Again, this approach asserts that the spending patterns of the University reflect the average spending patterns across organisations operating in South Yorkshire's government, health, and education sector. These multipliers (for the impact on South Yorkshire, Yorkshire and the Humber, and the UK as a whole) are presented in Table 11[132], and are applied to the **net direct impact** of the University of Sheffield's expenditures of **£220 million**.

Table 11 Economic multipliers associated with the University of Sheffield's spending

Location of impact and type of income	Output	GVA	FTE employment
South Yorkshire	1.22	1.19	1.17
Yorkshire and the Humber	1.49	1.42	1.35
Total UK	2.45	2.23	1.91

Note: All multipliers constitute Type II multipliers, defined as [Direct + indirect + induced impact]/[Direct impact].
Source: London Economics' analysis

5.3 Aggregate impact of the University of Sheffield's spending

Figure 29 presents the estimated total direct, indirect, and induced impacts associated with the expenditures incurred by the University of Sheffield in 2022-23 (after the above-described adjustments have been made). The aggregate impact of these expenditures was estimated at approximately **£539 million** in economic output terms (see top panel of Figure 29):

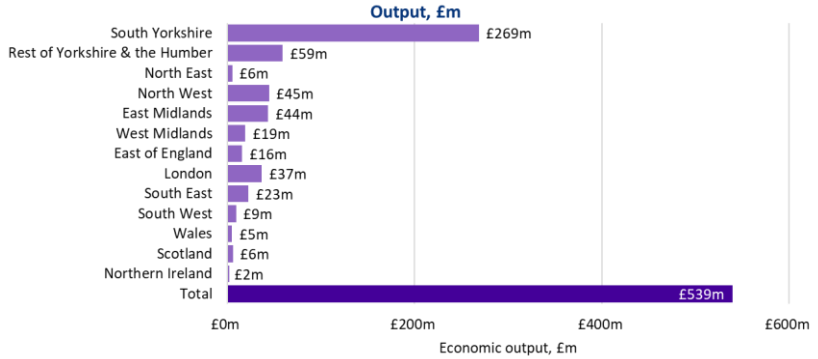
The impact of the University's expenditure on the UK economy in 2022-23 stood at £539 million.

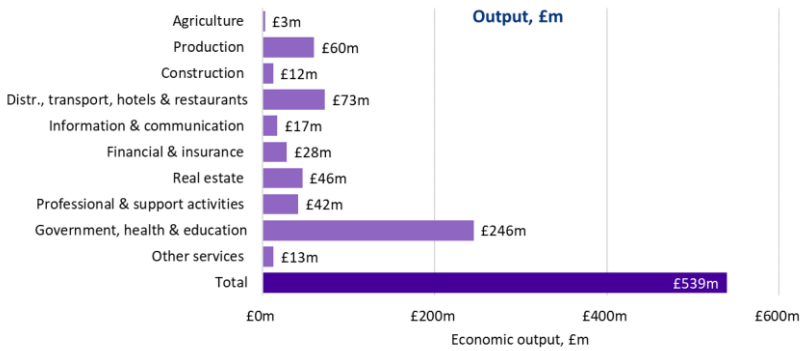
- In terms of region, **50%** of this impact (**£269 million**) was generated in **South Yorkshire**, with an additional **£59 million** (**11%**) generated throughout the rest of Yorkshire and the Humber, and the remaining **£212 million** (**39%**) occurring in **other regions** across the UK.
- In terms of sector, in addition to the impacts occurring in the **government, health, and education sector** itself (**£246 million, 46%**), there are also large impacts felt within other sectors, including the **distribution, transport, hotel, and restaurant sector** (**£73 million, 13%**), the **production sector** (**£60 million, 11%**), and the **real estate sector** (**£46 million, 9%**).

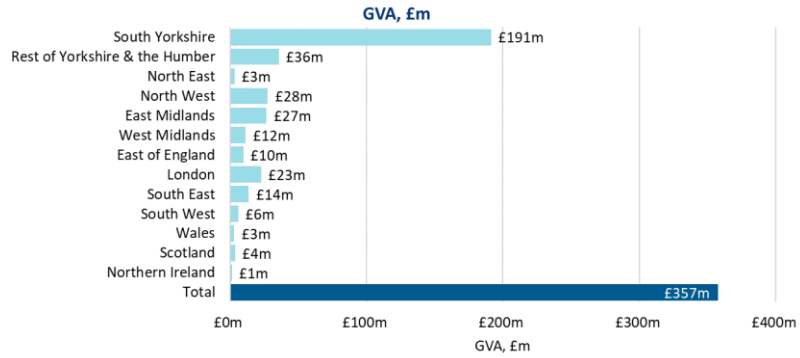
In terms of the number of FTE jobs supported, the results indicate that the University's spending supported a total of **3,685** FTE jobs across the UK economy in 2022-23 (of which **2,270** were located in South Yorkshire). In addition, the impact in terms of GVA was estimated at **£357 million** across the UK economy as a whole (with **£191 million** accrued within South Yorkshire).

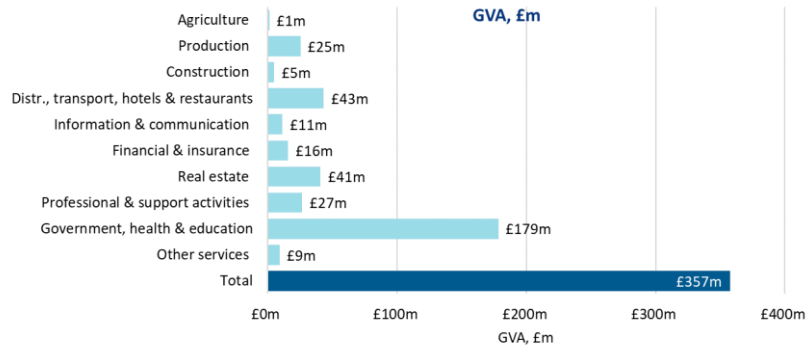
[131] See Annex A2.1 for more information.
[132] These multipliers mirror those presented in Section 4.3 (in relation to international fee income received by the University) as well as in Sections 2.1.3 and 2.2.2 (in relation to the University's research and wider knowledge exchange activities, respectively).

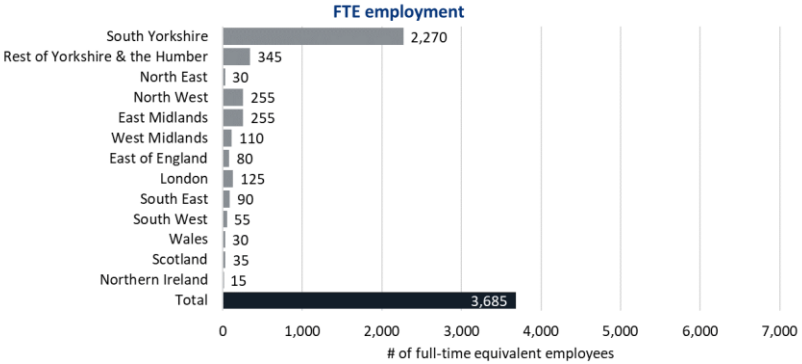
Figure 29 Total economic impact associated with the University of Sheffield's expenditures in the 2022-23 academic year, by region and sector

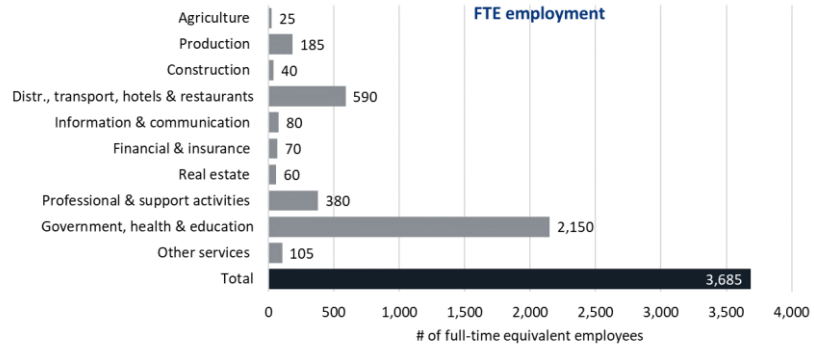












Note: Monetary estimates are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. ***Source: London Economics' analysis***

6 The social and civic impact of the University of Sheffield

In addition to its economic impacts, there are a wide range of further social impacts associated with the University of Sheffield's activities. For example, these wider benefits include **improvements in health and well-being outcomes; social capital and cohesion and community engagement; improved social mobility; the subsequent acquisition of further learning and qualifications; improved communication and autonomy**, and improved **self-esteem** and **self-confidence**. While equally important as the above economic effects, these impacts are generally more difficult to monetise in any robust way. As such, we do not attempt to monetise these wider impacts, but instead, demonstrate the impact of learning at the University of Sheffield on graduates' jobs, lives, and prospects.

Specifically, to assess these wider impacts of the University on its students and society at large, we conducted an **online survey among University of Sheffield alumni** (over three weeks in September 2024). The survey achieved a total of **4,076 complete responses**. In the following, we summarise the main survey results in terms of **alumni's motivations for undertaking their studies**, as well as the **impacts** of University of Sheffield qualifications on graduates' **job-related outcomes, general and job-related skills, personal development, social and community engagement, and well-being**.

6.1 Wider economic and societal benefits of the University of Sheffield for students and graduates

6.1.1 Motivation for study

Student motivation provides an important insight into how higher education qualifications at the University of Sheffield may have supported graduates' personal and career development. Figure 30 presents the reasons provided by University of Sheffield alumni for **choosing their programme of study**. The main reasons indicated by respondents for choosing their degree programme were **to pursue further or higher learning** (**65%** of respondents). Further, **58%** of respondents reported **improving their job prospects / getting a new job** as one of the main reasons for choosing their degree programme; and **56%** had a **personal interest in the course**. In terms of personal development, **39%** reported having chosen their programme to **learn something new / gain new skills**; and **33%** reported having chosen the programme to **increase their earnings prospects**.

Partnering with people across Sheffield

From connecting the University of Sheffield's academics with the city's cultural, creative, and digital industries to deliver the Festival of the Mind and curating Off the Shelf (one of the largest literary festivals in the north) to driving multi-million pound regeneration initiatives and sharing the University's expertise with local communities, the University of Sheffield plays a pivotal role in Sheffield and the wider region's economic, social and cultural growth. But the University does not do this alone. The University of Sheffield collaborates with many partners to make the region healthier, greener, more vibrant and innovative for all.

Transforming Sheffield's high streets

If you stroll down Sheffield's High Street or Fargate, you will witness the continued transformation of the city centre taking shape. The University of Sheffield played a central role in this regeneration through the its support for Sheffield City Council's successful Future High Streets Fund bid, securing £15.8m to bring to life a shared vision of a future-proofed city centre catering to visitors of all ages. The University's support, which included developing a VR experience of a future Fargate, producing architectural designs and conducting planning workshops with over 120 stakeholders, helped showcase the area's potential as a creative and cultural hub. These workshops informed plans on various aspects, from flood defences to the use of urban space.

Connecting local communities with the University's research

And it does not stop there. Over the past decade, the University has worked with Sheffield City Council, civic organisations, local businesses, and community groups to co-produce a vision for the regeneration of Sheffield's historic Castlegate area.

Live Works, a city-centre based initiative led by the University of Sheffield's School of Architecture and Landscape, was instrumental in this grassroots redevelopment through connecting local communities with the University's design and research experts. University of Sheffield archaeologists also played a key role in analysing past archaeological studies of the area to uncover the rich history and importance within the Sheffield city landscape.

This work helped to attract £17.5M in Levelling Up funding which includes (among other regeneration projects), the development of a new city park on the site of Sheffield Castle and the restoration of a landmark Grade II* listed heritage building to create Harmony Works, a new cultural/education centre for young musicians from across the region.

Grey to green

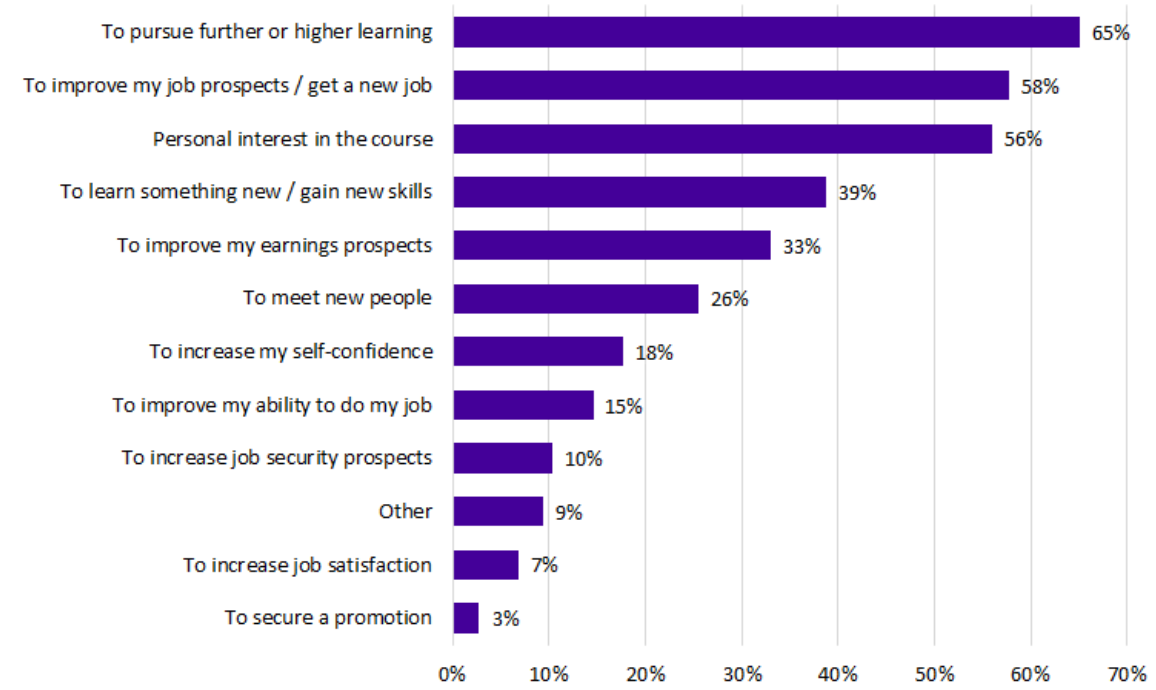
The University of Sheffield's landscape research and expertise inspired the UK's largest inner city 'green corridor', which saw the Sheffield City Council-led transformation of 1.3km of redundant highways into lush vegetated public spaces that also work to prevent flooding. The Grey to Green project created jobs and demonstrated a 561% increase in biodiversity while rejuvenating a dilapidated area of the city for all to enjoy.

Supporting organisations helping our most vulnerable communities

Since 2015, over 2,600 of the University's Medical Students have spent a month working with local charities and community-based organisations through the University's Social Accountability

Placement programme. This has had a direct impact on the communities the University serves, with University of Sheffield students working with organisations that support the most vulnerable members of society, including children living in poverty, homeless people, and those living with physical and mental health challenges.

Figure 30 'Thinking about your qualification from the University of Sheffield, what was / were your main reason(s) for choosing this degree programme?'

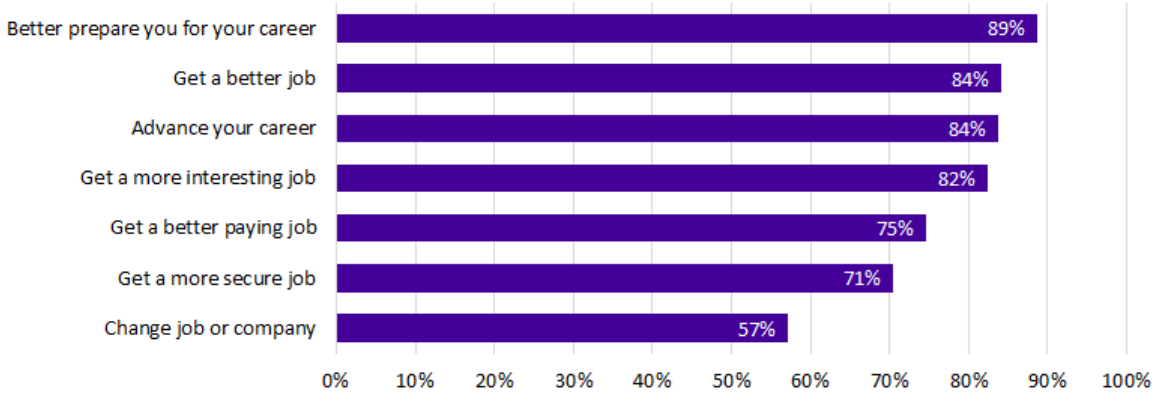


Note: Based on responses from 4,062 of 4,076 respondents, excluding 14 respondents that answered 'don't know'.
Source: London Economics' analysis of University of Sheffield alumni survey data

6.1.2 Impact on job-related outcomes

To assess the impact of University of Sheffield qualifications on graduates' economic outcomes, the survey asked respondents whether certain aspects of their **career prospects and working lives** had changed following their learning at the University of Sheffield.

Figure 31 'Overall, would you say that your experiences at the University of Sheffield helped you...?'



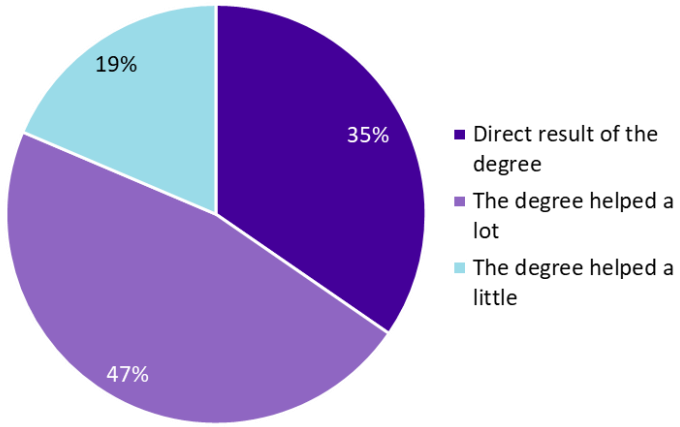
Note: Based on responses from between 2,311 and 3,811 respondents. 'Don't know / not applicable' responses have been excluded (between 203 and 1,703 respondents).
Source: London Economics' analysis of University of Sheffield alumni survey data

As presented in Figure 31, approximately **89%** of respondents believed that their degree had **better prepared them for their career**, and **84%** of respondents stated that their degree had helped them **advance their career**. Further, **84%** reported that their degree helped them **get a better job**, with

82% indicating that their degree helped them obtain a **more interesting job**, **75%** reporting a **better-paying job**, and **71%** indicating a **more secure job**. In addition, **57%** of respondents indicated that their University of Sheffield degree allowed them **to change jobs or employers**.

It is important to analyse the counterfactual, i.e. what might have happened in the absence of the learning experience with the University of Sheffield, to assess the causal impact of learning at the University. As presented in Figure 32, of those alumni who reported that their degree had helped them improve their working lives in any of the above-described ways (Figure 31), **35%** indicated that these improvements were a **direct result** of their qualification from the University of Sheffield, with a further **47%** stating that the learning had **helped a lot**. These results demonstrate the very high degree of **additionality** associated with attaining qualifications at the University of Sheffield.

Figure 32 'To what extent do you think this impact was / these impacts were related to your degree programme at the University of Sheffield?'



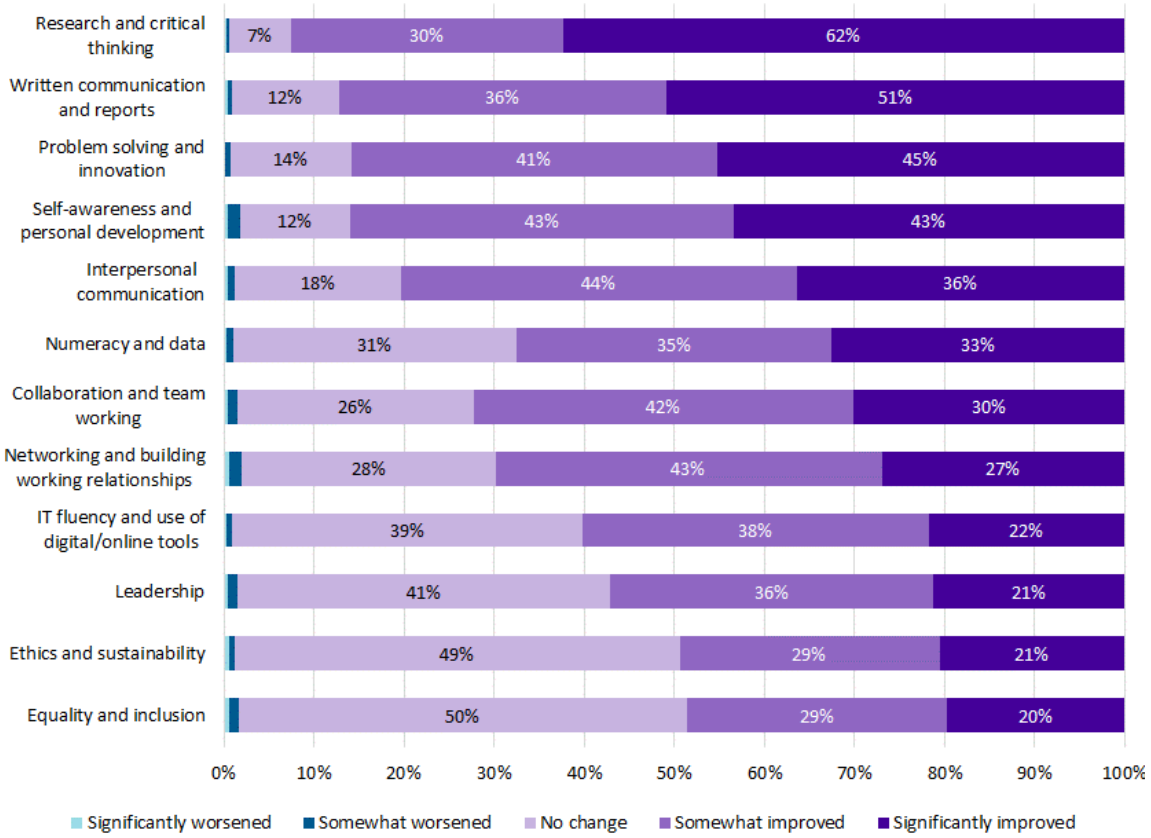
Note: Based on responses from 3,684 of 3,767 respondents who answered 'Yes' to at least one of the items in Figure 31, excluding 83 respondents that answered 'don't know'. Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Sheffield alumni survey data

6.1.3 Impact on skills

Figure 33 presents the impact of graduates' experiences at the University of Sheffield on their **general skills and proficiencies**, asking respondents to indicate the extent to which their skills improved following their learning experience at the University. Respondents reported improvements (either by 'somewhat' or 'significantly') in a wide array of skills, including their **research and critical thinking** skills (**93%**); **written communication** skills (**87%**); **problem-solving and innovation** skills (**86%**); **self-awareness and personal development** (**86%**); **interpersonal communication** skills (**80%**); **numeracy and data** skills (**67%**); **collaboration and team working** skills (**72%**); **networking** skills (**70%**); **IT fluency and use of digital/online tools** (**60%**); **leadership** skills (**57%**); **ethics and sustainability** (**49%**); and **equality and inclusion** skills (**49%**).

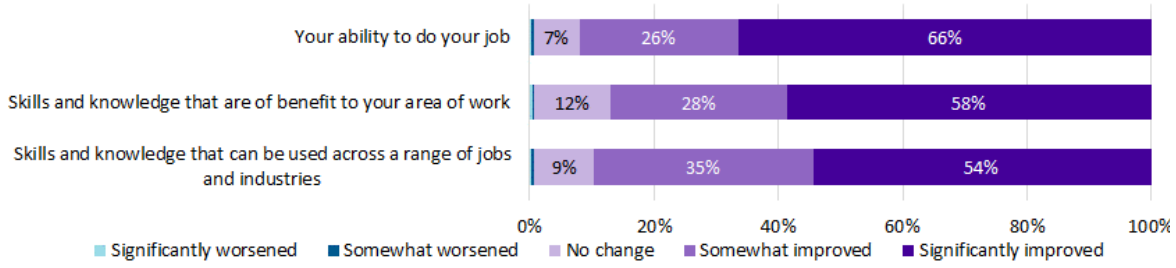
Figure 34 presents alumni's responses in relation to whether they felt that their **job-related skills** had improved as a result of their University of Sheffield degree. The vast majority of respondents (**92%**) reported that their **ability to do their job** had improved (either 'significantly' or 'somewhat') as a result of their degree; **90%** reported that their **general transferable skills** had improved; and **87%** reported an improvement in the **skills and knowledge** they use in their area of work.

Figure 33 'To what extent do you think your degree and other experiences at the University of Sheffield had an impact on your skills in the following areas?'



Note: Based on responses from between 3,320 and 4,035 respondents. 'Don't know / not applicable' responses have been excluded (between 41 and 756 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Sheffield alumni survey data

Figure 34 'What impact did your degree from the University of Sheffield have on your job-related set of skills?'



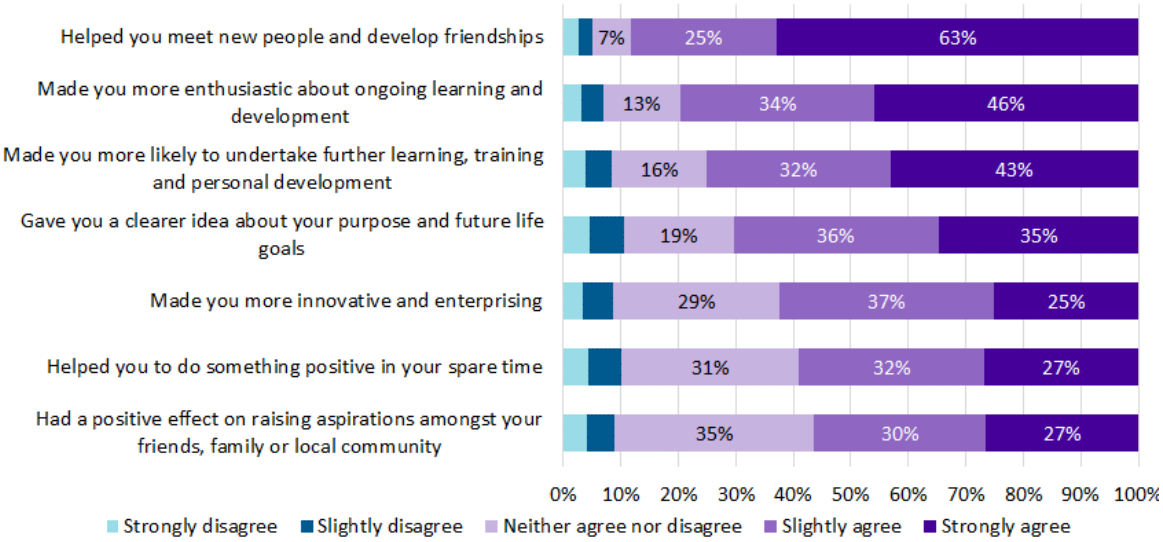
Note: Based on responses from between 3,616 and 3,864 who indicated that they had been employed or self-employed at some point since the completion of their studies at the University of Sheffield. 'Don't know / not applicable' responses have been excluded (between 150 and 398 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Sheffield alumni survey data

6.1.4 Impact on personal development, social and community engagement, and wellbeing

In addition to the effect on respondents' working lives and skills, the survey also measured the extent to which learning experiences at the University of Sheffield impacted respondents' **personal development, community engagement, and well-being**.

Figure 35 explores the extent to which alumni agreed with a number of statements relating to their **personal development**. **88%** of respondents believed that their experience at the University of Sheffield helped them **meet new people and develop friendships**; **80%** felt that they had become **more enthusiastic about learning**; **75%** were more likely to **undertake further learning, training, and personal development**; **70%** indicated that their experience **gave them a clearer idea of their purpose and future life goals**; **62%** stated that their time at the University made them **more innovative and enterprising**; **59%** indicated that their experience **helped them to do something positive with their spare time**; and **56%** reported a positive effect on **raising aspirations amongst friends, family, or their local community**.

Figure 35 'In terms of your personal development, to what extent do you agree or disagree that your experiences at the University of Sheffield...?'



Note: Based on responses from between 3,858 and 4,037 respondents. Don't know / not applicable' responses have been excluded (between 39 and 218 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Sheffield alumni survey data

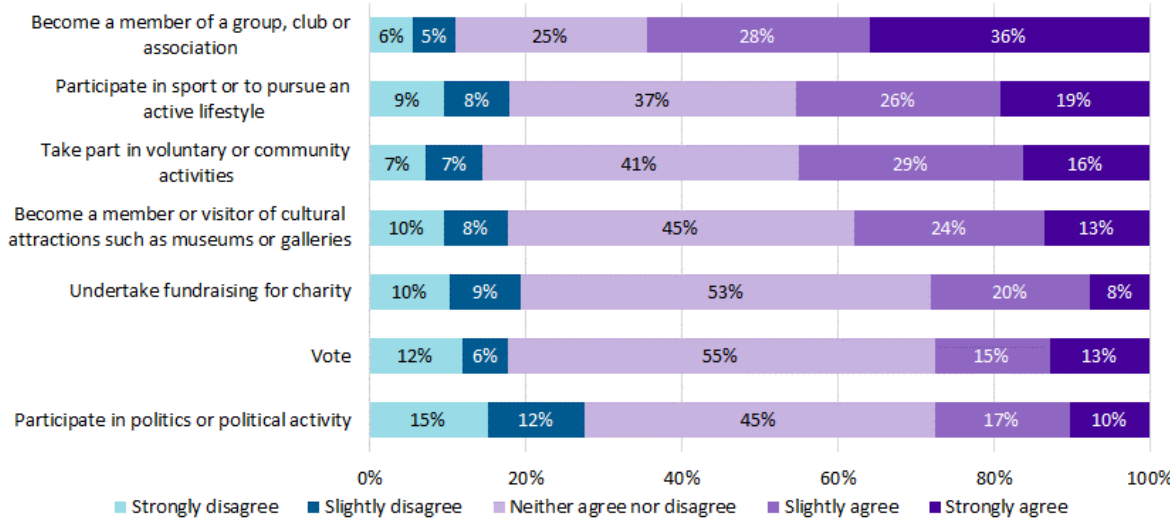
In relation to wider **social and community engagement** (see Figure 36), **64%** of respondents believed that their experience at the University of Sheffield encouraged them **to become a member of a group, club, or association**; **45%** reported that their time at the University of Sheffield made them more likely **to participate in sport or to pursue an active lifestyle**; **45%** were more likely **to take part in voluntary or community activities**; **38%** were more likely to become **members or visitors of cultural attractions**; **28%** had become **encouraged to undertake fundraising for charity**; and **28%** felt that their experience at the University of Sheffield had **encouraged them to vote** (with **27%** reporting that they had become encouraged **to participate in politics or political activity**).

Box 7 Encouraging students to vote

Related to individuals' engagement in the political process, **the University also encourages its eligible students to vote while they are attending the University**, e.g. by collaborating with Sheffield City Council on communications campaigns (particularly in the lead-up to general and local elections); working with the Sheffield Students' Union to coordinate communications and inform students of the importance of using their vote; the inclusion of voter registration as part of its own online registration process (prompting all eligible students to register to vote at their Sheffield address); and sending communications to students who have moved address to remind them to re-register at their new address. In 2022-23, out of a total of approximately **16,355** UK

domiciled University of Sheffield students who were eligible to vote, **8,711** (**53%**) had registered to vote via the University's own online registration process[133].

Figure 36 'In terms of your social or community engagement, to what extent do you agree or disagree that your experiences at the University of Sheffield ...?'



Note: Based on responses from between 3,705 and 3,867 respondents. 'Don't know / not applicable' responses have been excluded (between 209 and 371 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Sheffield alumni survey data

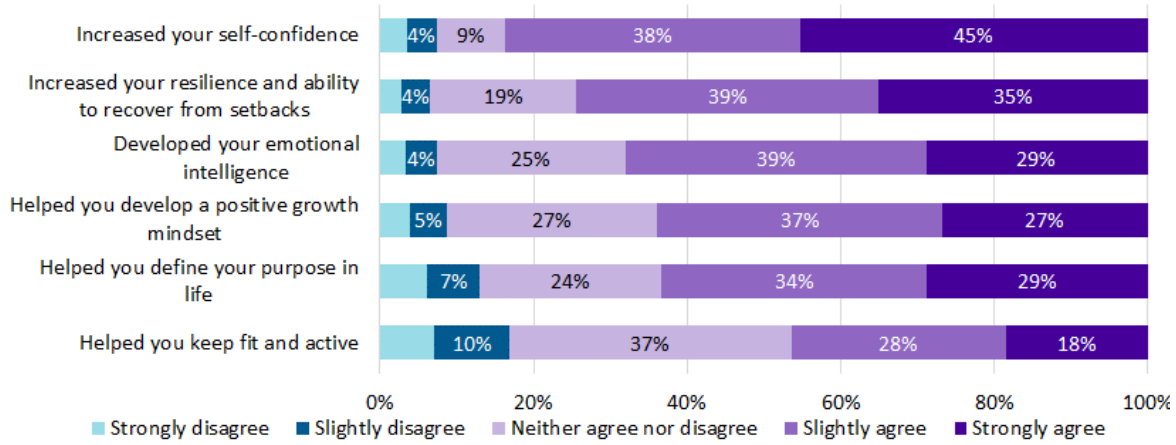
Box 8 Sheffield Volunteering Programme

Through the Sheffield Volunteering programme run by the Sheffield Students' Union, **the University's student volunteers give back to the local community and make a positive difference for Sheffield and the region**. The University's student volunteers work on a wide range of projects, from assisting mental health charities to preparing and serving meals to the homeless, dedicating their time to causes and organisations throughout the city. In 2022-23 alone, these student volunteers contributed a total of more than **36,600** hours of their time to volunteering in the local community[134], equating to **more than 100 hours of volunteering hours per day**. These hours were contributed by approximately **2,200** University of Sheffield students, including more than **550** international student volunteers.

Finally, in terms of measures of **well-being**, Figure 37 shows that **84%** of respondents agreed (either 'strongly' or 'slightly') that they had become **more confident** as a result of their degree; **74%** felt that their degree **helped increase their resilience and ability to recover from setbacks**; **68%** agreed that their **emotional intelligence had increased**; **64%** believed that their degree had **helped them develop a positive growth mindset**; **63%** indicated that their experiences had helped them **define their purpose in life**; and **46%** felt that their degree had helped them **keep active**.

[133] Based on data provided by the University of Sheffield.
[134] The beneficiaries of these activities all relate to community groups in the city. This information does *not* include any peer-to-peer volunteering, or volunteering that was done for University of Sheffield departments.

Figure 37 'In terms of your well-being, to what extent do you agree or disagree that your University of Sheffield experiences...?'



Note: Based on responses from between 3,915 and 4,053 respondents. 'Don't know / not applicable' responses have been excluded (between 23 and 153 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Sheffield alumni survey data

7 The total economic impact of the University of Sheffield on the UK economy in 2022-23

7.1 Aggregate impact

Combining all of the above strands of impact, the total economic impact on the UK economy associated with the University of Sheffield's activities in the 2022-23 academic year was estimated at approximately **£4.82 billion** (see Table 12). In terms of the components of this impact:

- The University's **research and knowledge exchange activities** accounted for **£1.76 billion** (**37%**) of this impact;
- The economic impact of the University's **teaching and learning activities** stood at **£1.20 billion** (**25%**);
- The impact associated with the University's **international students** was estimated at **£1.32 billion** (**27%**); and
- The impact generated by the **operating and capital expenditures** of the University stood at **£539 million** (**11%**).

The total economic impact associated with the University of Sheffield's activities in 2022-23 stood at £4.8 billion.

Table 12 Total economic impact of the University of Sheffield's activities on the UK in 2022-23 (£m and % of total)

Type of impact		£m	%
	**Impact of research and knowledge exchange**	**£1,764m**	**37%**
	Research activities	£1,283m	27%
	Knowledge exchange activities	£481m	10%
	**Impact of teaching and learning**	**£1,198m**	**25%**
	Students	£570m	12%
	Exchequer	£629m	13%
	**Impact of international students**	**£1,322m**	**27%**
	Tuition fee income	£703m	15%
	Non-tuition fee income	£618m	13%
	**Impact of the University's spending**	**£539m**	**11%**
	Direct impact	£220m	5%
	Indirect and induced impact	£320m	7%
	Total economic impact	**£4,823m**	**100%**

Note: All estimates are presented in 2022-23 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

Compared to the University's total relevant operational costs of approximately **£751 million** in 2022-23[135], the total impact of the University of Sheffield's activities on the UK economy was estimated at **£4.82 billion**, which corresponds to a **benefit-to-cost ratio of approximately 6.4:1**.

7.2 Putting the University's impacts into context

To place these findings into context, we provide several comparisons.

In its framework for economic evaluation guidance, TASO (which is funded by the Office for Students)[136] indicates that **a benefit-to-cost ratio greater than or equal to 4 would be considered to be delivering 'very high' value for money**[137]. As such, according to this wider benchmark used by the UK Central Government, the University of Sheffield's activities generate very high levels of value for money. Additionally, to further contextualise the findings, given the University of Sheffield's reliance on public funding to deliver its activities, it is important to also consider the potential impact that might be achieved with alternative uses of public funding. Therefore, we undertook an **analysis of the costs and benefits associated with almost 600 UK government regulatory impact assessments**, in order to compare the return on investment (measured using the benefit-to-cost ratio) associated with these alternative publicly funded government interventions with that of the University.[138]

[135] This relates to the University's total operating expenditure, excluding capital expenditure, depreciation and amortisation, and movements in pension provisions.
[136] See Transforming Access and Student Outcomes in Higher Education (TASO, 2024).
[137] Based on value for money (VfM) categories used by the Department for Levelling Up, Housing and Communities' appraisal guide (see Department for Levelling Up, Housing and Communities (2023), Section 3.32). As acknowledged by TASO, these categories should only be considered as example categories, since the range of benefit-to-cost ratios associated with each category can vary across different sectors.
[138] Estimates of the total economic benefit and total economic costs were web-scraped from the individual regulatory impact assessments published by a number of UK government departments and public sector agencies (including the Cabinet Office; the Department for Business, Energy & Industrial Strategy; the Department for Business, Innovation and Skills; the Department for Digital, Culture, Media & Sport; the Department for Education; the Department for International Trade; the Department for Transport; the Department of Energy and Climate Change; the Department of Health & Social Care; the Education Funding Agency; the Highways Agency; HM Revenue and

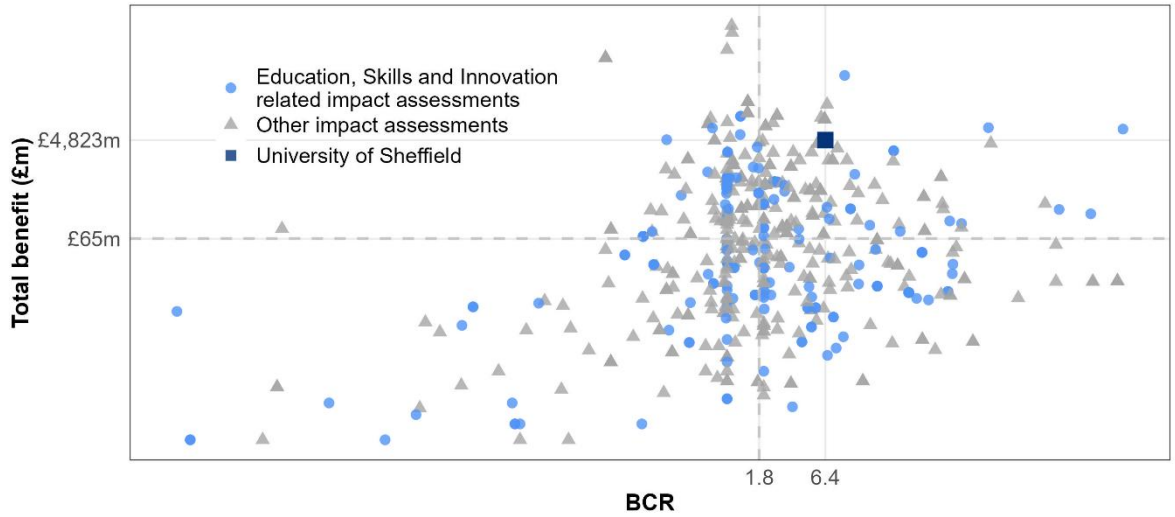
Table 13 presents summary results for the benefit-cost ratio and total benefit across this wide range of regulatory impact assessments. In simple terms, the economic impact of the University of Sheffield significantly outperforms the majority of other comparable impact studies according to these two metrics, which means that public investment in the core teaching and research activities undertaken by the University of Sheffield generates substantially higher than average returns for the UK economy. Specifically, the median economic benefit across all of these government programmes/projects stands at **£65 million**, with a median benefit-to-cost ratio of **1.8**. In comparison, the University of Sheffield's activities generate an estimated economic benefit of **£4.82 billion**, with a benefit-to-cost ratio of **6.4**. In addition, Figure 38 plots the benefit-to-cost ratio and total benefit for each of the almost 600 regulatory impact assessments, alongside the equivalent metrics for the University of Sheffield. Relative to other government interventions, the University is located in the top right-hand quadrant of the chart, indicating both **relatively large economic benefits for the UK economy and a relatively high return on investment** (i.e. benefit-to-cost ratio).

Table 13 Comparison with benefit-to-cost ratios for UK government interventions

Measure	Minimum	Median	Maximum
Benefit-to-cost ratio	0	1.8	1,772.7
Total benefit	£0.01m	£65m	£528,122m

Note: Based on a total of 579 UK government regulatory impact assessments published between 2010 and 2022.
Source: London Economics' analysis of published UK government regulatory impact assessments (here)

Figure 38 Comparison with benefit-to-cost ratios for UK government interventions



Note: Based on a total of 579 UK government regulatory impact assessments published between 2010 and 2022.
Total benefits and BCRs are depicted on a logarithmic scale. Quadrants are marked using dotted lines at the *median*, such that half of the points sit to the left and right of the line BCR =1.8 and half the points sit above and below the line Total benefits = £65m.
Source: London Economics' analysis of published UK government regulatory impact assessments (here)

7.3 Total impact by region and sector (where available)

In addition to the above total impact on the UK economy as a whole, it was possible to disaggregate *part* of the University's economic impact by sector and region (and estimate the impacts in terms of

Customs; HM Treasury; the Ministry of Defence; and the Office of Communications). In total, 579 regulatory impact assessments published on the UK government's website (here) between 2010 and 2022 were identified as being machine readable and containing non-missing best estimates for total costs and total benefits (thereby allowing for the calculation of a benefit-to-cost ratio).

economic output *as well as* GVA and FTE employment). The strands of impact for which this disaggregation was achievable include:

- The direct, indirect and induced impact of the University's **research activities** (**£338 million**, see Section 2.1)[139];
- The impact of the University's **knowledge exchange activities** (estimated at **£481 million**, see Section 2.2);
- The impact of the University's **international students** (**£1.32 billion**, see Section 4); and
- The impact associated with the University's **operating and capital expenditures** (**£539 million**, see Section 5).

Hence, approximately **£2.68 billion** (**56%**) of the University of Sheffield's total economic impact of **£4.82 billion** can be disaggregated in this way[140].

In terms of the breakdown by region (see Figure 39), the analysis indicates that of this total of **£2.68 billion**, approximately **£1.24 billion** (**46%**) occurred in **South Yorkshire**, with **£272 million** (**10%**) occurring in the **rest of Yorkshire and the Humber**, and the remaining **£1.17 billion** (**44%**) taking place in **other regions** across the UK.

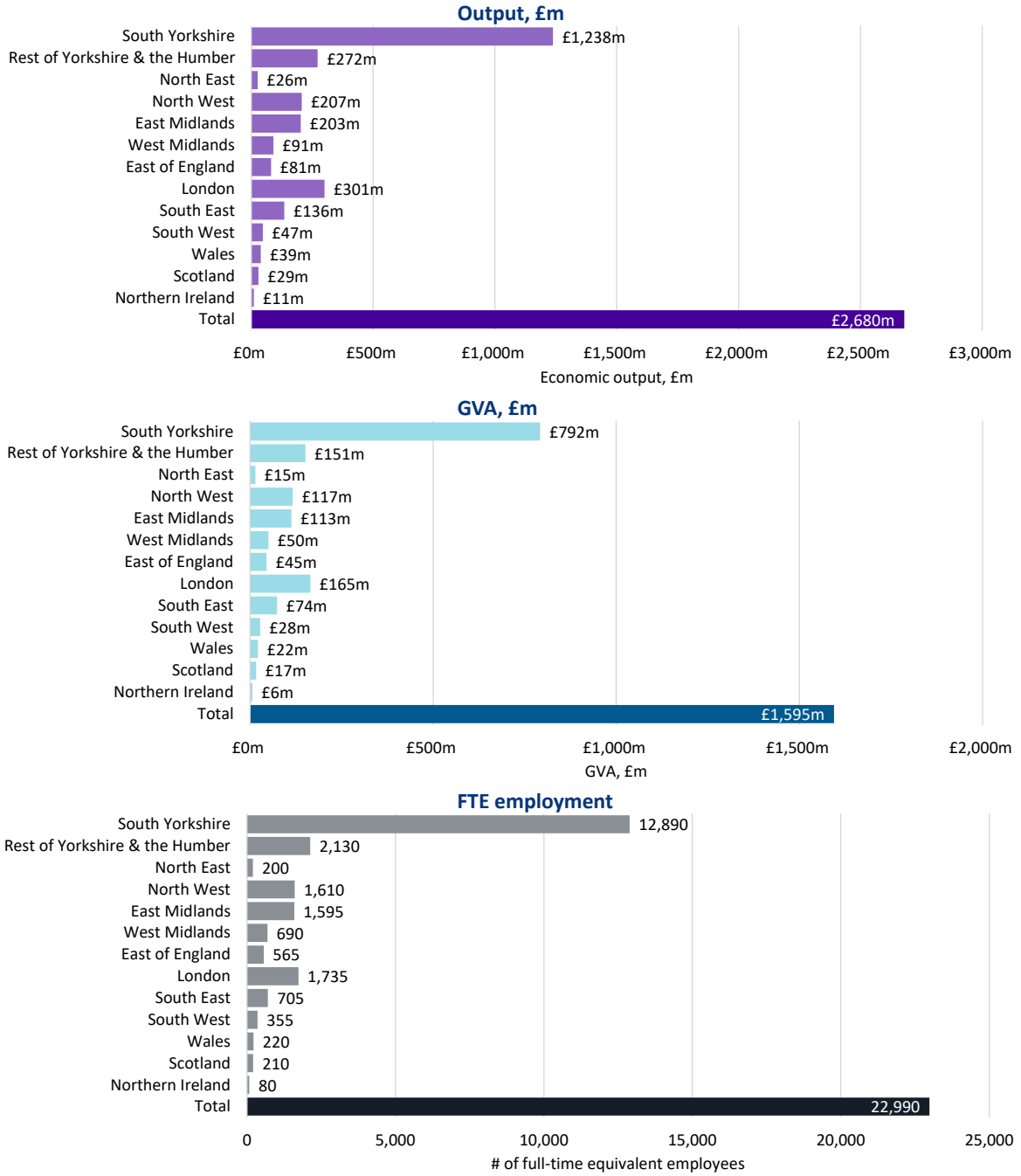
In terms of sector (see Figure 40), the University's activities resulted in particularly large impacts within the **government, health, and education sector** (**£883 million**, **33%**), the **distribution, transport, hotel, and restaurant sector** (**£444 million**, **17%**), the **production sector** (**£322 million**, **12%**), and the **real estate sector** (**£297 million**, **11%**) .

In terms of the number of FTE jobs supported, the results indicate that the University's activities in 2022-23 (where available/identifiable at a regional level) supported a total of **22,990** FTE jobs across the UK economy, with **12,890** of these jobs located in **South Yorkshire**, and a further **2,130** supported in the **rest of Yorkshire and the Humber**. In addition, the impact in terms of gross value added was estimated at **£1.59 billion** across the UK economy as a whole, of which **£792 million** was generated in **South Yorkshire**, and an additional **£151 million** was generated in the **rest of Yorkshire and the Humber**.

[139] Note that this excludes the productivity spillovers associated with the University's research activities, as these cannot be attributed to a region or sector.

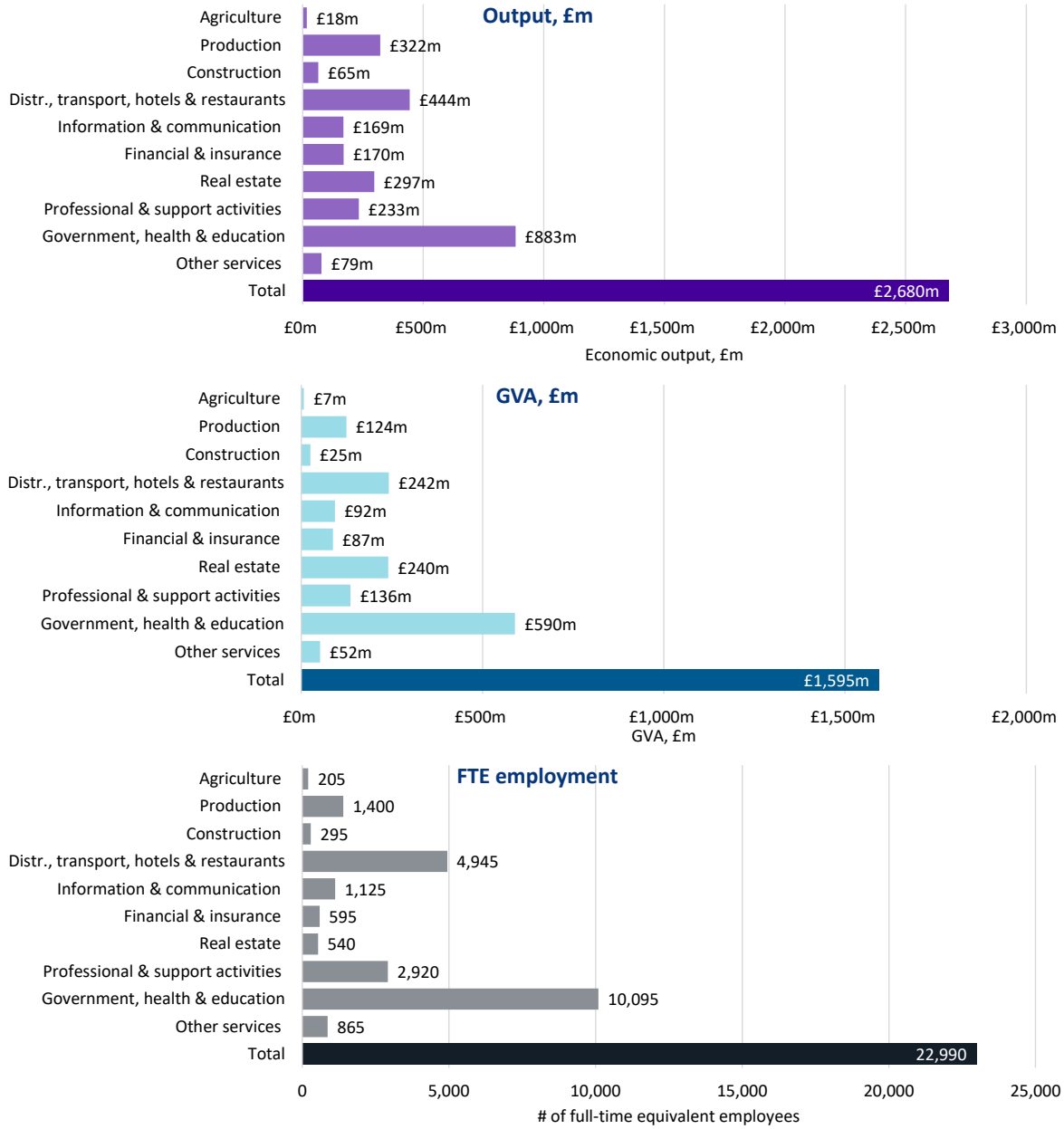
[140] The remaining **£2.14 billion** of impact includes the productivity spillovers associated with the University's research (**£945 million**, where a breakdown by region or sector is not available as it was not possible to assign the geographic location or sectors of businesses benefiting from the productivity spillovers generated by the University's research); and the impact of **teaching and learning activities** (**£1.20 billion**, where a breakdown by region or sector is not available due to graduate mobility (i.e. it is very difficult to determine the region/sector of employment that the University's graduates end up in)).

Figure 39 Total economic impact associated with the University's activities in 2022-23, by region (where identifiable)



Note: Monetary estimates are presented in 2022-23 prices, discounted to reflect net present values (where applicable), rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. The figure only contains the **£2.68 billion** (of the University's total **£4.82 billion** (in economic output terms)) of economic impact that can be attributed to a region. ***Source: London Economics' analysis***

Figure 40 Total economic impact associated with the University's activities in 2022-23, by sector (where identifiable)



Note: Monetary estimates are presented in 2022-23 prices, discounted to reflect net present values (where applicable), rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. The figure only contains the **£2.68 billion** (of the University's total **£4.82 billion** (in economic output terms)) of economic impact that can be attributed to a sector. ***Source: London Economics' analysis***

Index of Tables, Figures and Boxes

Tables

Figures

Boxes

ANNEXES

Annex 1 References

Advanced Manufacturing Research Centre (2022). 'Economic impact and influence: why the AMRC matters to UK manufacturing'.
https://www.amrc.co.uk/news/economic-impact-and-influence-why-the-amrc-matters-to-uk-manufacturing

Beauhurst and Parkwalk (2024). 'Equity investment into spinouts 2024'.
https://www.beauhurst.com/research/equity-investment-into-spinouts-2024/

Callender, C., Wilkinson, D., Gibson, A., and Perkins, C. (2011). 'The impact of higher education for part-time students'.
https://dera.ioe.ac.uk/id/eprint/10333/1/evidence-report-36-impact-of-he-for-pt-students.pdf

Department for Business, Innovation and Skills (2011a). 'The returns to Higher Education Qualifications'.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32419/11-973-returns-to-higher-education-qualifications.pdf

Department for Business, Innovation and Skills (2011b). 'Estimating the value to the United Kingdom of Education Exports'.
https://assets.publishing.service.gov.uk/media/5a75663040f0b6397f35e1ff/11-980-estimating-value-of-education-exports.pdf

Department for Business, Innovation and Skills (2014a). 'Rates of Return to Investment in Science and Innovation'.
https://assets.publishing.service.gov.uk/media/5a7f02a840f0b62305b8490b/bis-14-990-rates-of-return-to-investment-in-science-and-innovation-revised-final-report.pdf

Department for Business, Innovation and Skills (2014b). 'Insights from International Benchmarking of the UK Science and Innovation System'.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/277090/bis-14-544-insights-from-international-benchmarking-of-the-UK-science-and-innovation-system-bis-analysis-paper-03.pdf

Department for Education (2023). 'Eligibility rules for home fee status and student finance from the 2021/22 academic year following the UK's exit from the EU'.
https://www.gov.uk/government/publications/student-finance-eligibility-2021-to-2022-academic-year/eligibility-rules-for-home-fee-status-and-student-finance-from-the-2022-to-2023-academic-year-onwards

Department for Education (2024a). 'LEO Graduate outcomes provider level data'.
https://explore-education-statistics.service.gov.uk/find-statistics/graduate-outcomes-leo-provider-level-data

Department for Education (2024b). 'Student loan forecasts for England – financial year 2023-24'.
https://explore-education-statistics.service.gov.uk/find-statistics/student-loan-forecasts-for-england

Department for Levelling Up, Housing and Communities (2023). 'DLUHC appraisal guide'.
https://www.gov.uk/government/publications/dluhc-appraisal-guide

Elnasri, A., & Fox, K. J. (2017). 'The contribution of research and innovation to productivity.' Journal of productivity analysis, 47, 291-308.
https://www.researchgate.net/profile/Kevin-J-Fox/publication/316568973_The_contribution_of_research_and_innovation_to_productivity/links/5a78246945851541ce5aa7d3/The-contribution-of-research-and-innovation-to-productivity.pdf

Flegg, A. T., Lamonica, G. R., Chelli, F. M., Recchioni, M. C., & Tohmo, T. (2021). 'A new approach to modelling the input-output structure of regional economies using non-survey methods'.
https://doi.org/10.1186/s40008-021-00242-8

Flegg, A. T., & Tohmo, T. (2014). 'Estimating Regional Input Coefficients and Multipliers: The Use of FLQ is Not a Gamble'.
https://doi.org/10.1080/00343404.2014.901499

GLA Economics (2019). 'The London input-output tables'.
https://www.london.gov.uk/sites/default/files/london-input-output-tables-working-paper-97.pdf

Haskel, J., & Wallis, G. (2010). 'Public support for innovation, intangible investment and productivity growth in the UK market sector'.
https://docs.iza.org/dp4772.pdf

Haskel, J., Hughes, A., and Bascavusoglu-Moreau, E. (2014a). 'The economic significance of the UK science base: a report for the Campaign for Science and Engineering'.
https://spiral.imperial.ac.uk/bitstream/10044/1/13751/2/Haskel%202014-04.pdf

Haskel, J., Hughes, A., and Bascavusoglu-Moreau, E. (2014b). 'The economic significance of the UK science base: a report for the Campaign for Science and Engineering. Briefing note'.
https://www.sciencecampaign.org.uk/app/uploads/2023/03/The-Economic-Significance-of-the-UK-Science-Base.pdf

Hermannsson, K. (2016). 'Beyond Intermediates: The Role of Consumption and Commuting in the Construction of Local Input–Output Tables'.
https://doi.org/10.1080/17421772.2016.1177194

Higher Education Statistics Agency (2024a). 'Higher Education Provider Data: Finance'.
https://www.hesa.ac.uk/data-and-analysis/finances

Higher Education Statistics Agency (2024b). 'Higher Education Provider Data: Business and Community Interaction'.
https://www.hesa.ac.uk/data-and-analysis/business-community

Higher Education Statistics Agency (2024c). 'Country of permanent address (PERMADDCOUNTRY)'.
https://www.hesa.ac.uk/collection/22056/datadictionary.html?element=EntryProfile_PERMADDCOUNTRY

Higher Education Statistics Agency (2024d). 'Higher education staff data'.
https://www.hesa.ac.uk/data-and-analysis/staff

Higher Education Statistics Agency (2024e). 'HE Graduate Outcomes Data'.
https://www.hesa.ac.uk/data-and-analysis/graduates

HM Treasury (2022). 'The Green Book. Central Government Guidance on Appraisal and Evaluation'.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

Imperial College London (2010). 'University research contributes £45 billion a year to the UK economy, according to new impact study'.
http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_16-3-2010-13-6-57

Jahn, M. (2016). 'Extending the FLQ formula: A location quotient-based interregional input-output framework'.
https://doi.org/10.1080/00343404.2016.1198471

Jahn, M., Flegg, A. T., & Tohmo, T. (2020). 'Testing and implementing a new approach to estimating interregional output multipliers using input-output data for South Korean regions'.
https://doi.org/10.1080/17421772.2020.1720918

Jones, B., & Summers, L. (2020). 'A Calculation of the Social Returns to Innovation'.
https://www.nber.org/system/files/working_papers/w27863/w27863.pdf

London Economics (2018). 'The economic impact of the Group of Eight in Australia'.
https://londoneconomics.co.uk/wp-content/uploads/2018/08/Go8_London-Economics-Report.pdf

London Economics (2024a). 'Updated constituency-level data on the benefits and costs of international students'.
https://londoneconomics.co.uk/blog/publication/updated-constituency-level-data-on-the-benefits-and-costs-of-international-students/

London Economics (2024b). 'General Election Briefings: Examination of higher education fees and funding across the UK – February 2024'.
https://londoneconomics.co.uk/blog/publication/general-election-briefings-examination-of-higher-education-fees-and-funding-across-the-uk/

London Economics (2024c). 'The economic impact of higher education teaching, research, and innovation'.
https://www.universitiesuk.ac.uk/what-we-do/policy-and-research/publications/economic-impact-higher-education

National Centre for Social Research and Institute for Employment Studies. (2023). 'Student Income and Expenditure Survey 2021 to 2022.'
https://assets.publishing.service.gov.uk/media/65674cf6750074000d1dee46/Student_Income_and_Expenditure_Survey_2021_to_2022_report.pdf.

Nomis (2014). 'Location of usual residence and place of work by age'.
https://www.nomisweb.co.uk/census/2011/wu02uk

Nomis (2023). 'Business Register and Employment Survey'.
https://www.nomisweb.co.uk/datasets/newbres6pub

Office for Budget Responsibility (2024). 'Economic and fiscal outlook – March 2024'.
https://obr.uk/efo/economic-and-fiscal-outlook-march-2024/

Office for National Statistics (2022a). 'Earnings and hours worked, industry by two-digit SIC: ASHE Table 4'.
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry2digitsicashetable4

Office for National Statistics (2022b). 'Estimates of the population for the UK, England, Wales, Scotland and Northern Ireland'.
https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

Office for National Statistics (2022c). 'Impact of coronavirus (COVID-19) using Input-Output Supply and Use Tables, UK: 2019 to 2020'.
https://www.ons.gov.uk/economy/grossdomesticproductgdp/articles/impactofcoronaviruscovid19usinginputoutputsupplyandusetablesuk/2019to2020

Office for National Statistics (2022d). 'Regional gross disposable household income, UK: 1997 to 2020'.
https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/bulletins/regionalgrossdisposablehouseholdincomegdhi/1997to2020

Office for National Statistics (2022e). 'Gross domestic expenditure on research and development, UK: 2020. Methodological developments'.
https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/ukgrossdomesticexpenditureonresearchanddevelopment/2020#methodological-developments

Office for National Statistics (2022f). 'UK SIC 2007'.
https://www.ons.gov.uk/methodology/classificationsandstandards/ukstandardindustrialclassificationofeconomicactivities/uksic2007

Office for National Statistics (2023a). 'Regional gross value added (balanced) per head and income components'.
https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalregionalgrossvalueaddedbalancedperheadandincomecomponents

Office for National Statistics (2023b). 'Subnational trade in goods'.
https://www.ons.gov.uk/businessindustryandtrade/internationaltrade/datasets/subnationaltradeingoods

Office for National Statistics (2023c). 'Subnational trade in services'.
https://www.ons.gov.uk/businessindustryandtrade/internationaltrade/datasets/subnationaltradeinservices

Office for National Statistics (2023d). 'UK input-output analytical tables - industry by industry'
https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/datasets/ukinputoutputanalyticaltablesindustrybyindustry

Office for National Statistics (2024). 'International geographies'.
https://www.ons.gov.uk/methodology/geography/ukgeographies/eurostat

Office for Students (2022). 'Young participation by area'.
https://www.officeforstudents.org.uk/data-and-analysis/young-participation-by-area/

Office for Students (2024). 'Student Outcomes Data Dashboard'.
https://www.officeforstudents.org.uk/data-and-analysis/student-outcomes-data-dashboard/data-dashboard/

Oxford Economics. (2017). 'The economic impact of universities in 2014-15.'
https://www.oxfordeconomics.com/resource/the-economic-impact-of-universities-in-2014-15/

Research Excellence Framework (2022). 'REF 2021: Results and submissions'.
https://results2021.ref.ac.uk/

Salter, A., & Martin, B. (2001). 'The Economic Benefits of Publicly Funded Basic Research: A Critical Review'.
https://doi.org/10.1016/S0048-7333(00)00091-3

Student Awards Agency Scotland (2023). 'National Statistics Publication: Higher education student support in Scotland, 2022-23'.
https://www.saas.gov.uk/about-saas/stats-2022-23

Student Loans Company (2023a). 'Student support for higher education in England 2023'.
https://www.gov.uk/government/statistics/student-support-for-higher-education-in-england-2023

Student Loans Company (2023b). 'Student support for higher education in Wales 2023'
https://www.gov.uk/government/statistics/student-support-for-higher-education-in-wales-2023

Student Loans Company (2023c). 'Student support for higher education in Northern Ireland 2023'.
https://www.gov.uk/government/statistics/student-support-for-higher-education-in-northern-ireland-2023

TASO (2024). 'Framework for economic evaluation: Guidance'.
https://cdn.taso.org.uk/wp-content/uploads/2024_Guidance_Framework_for_economic_evaluation.pdf

Times Higher Education (2024). 'World University Rankings 2025'.
https://www.timeshighereducation.com/world-university-rankings/latest/world-ranking

University of Sheffield (2023). 'Financial statements for the year ended 31 July 2023'.
https://www.sheffield.ac.uk/finance/annual-report-financial-statements

Van Elk, R., ter Weel, B., van der Wiel, K., & Wouterse, B. (2019). 'Estimating the Returns to Public R&D Investments: Evidence from Production Function Models'.
https://link.springer.com/article/10.1007/s10645-019-09331-3

Walker, I., and Zhu, Y. (2013), 'The impact of university degrees on the lifecycle of earnings: Some further analysis''. Department for Business Innovation and Skills Research Report 112.
https://assets.publishing.service.gov.uk/media/5a7b8cc5e5274a7202e17e36/bis-13-899-the-impact-of-university-degrees-on-the-lifecycle-of-earnings-further-analysis.pdf

Whatuni (2024). 'Whatuni Student Choice Awards: The best UK unis of 2024, decided by students'.
https://www.whatuni.com/student-awards-winners/

Annex 2 Technical annex

A2.1 Multi-regional Input-Output tables

A2.1.1 Derivation of economic multipliers from multi-regional Input-Output tables

This section provides further detail on the economic multipliers utilised in this analysis, as first introduced in Section 2.1.3. The economic multipliers are calculated based on the UK's 41 International Territorial Level 2 (ITL2) regions.[141]

The multi-regional Input-Output analysis is undertaken by 'regionalising' UK Input-Output tables for 2019 (see Office for National Statistics (2023d)).[142] This technique relies on the assumption that there is 'common technology' (i.e. identical input structures) across all regions. In other words, for each unit of output produced by a sector, the analysis assumes that the same number of units of input from each supplying sector are required, regardless of the region that the producing sector is located in[143]. However, a region's producing sector may not be able to source all of its required inputs from its own region's supplying sectors. The extent to which firms source production inputs from within their *own* regions is determined using Flegg Location Quotients,[144] which are based on employment data by sector and ITL2 region (see Nomis, 2023). Trade *between* different regions is then determined using a gravity model[145], based on the distance between each of the ITL2 regions, whether regions border each other, and the size (measured in GVA) of the supplying and producing sectors (based on GVA data by sector and region (Office for National Statistics, 2023a)).

The multi-regional Input-Output analysis also relies on a wide range of other data, including data on GVA components by sector and ITL2 region (Office for National Statistics, 2023a); employment by sector and ITL2 region (Nomis, 2023); gross disposable household income by ITL2 region (Office for National Statistics, 2022d); total residents by Local Authority (converted to ITL2 regions) (Office for National Statistics, 2022b); mean weekly total paid hours worked by industry, for full-time vs. part-time employees (Office for National Statistics, 2022a); employed residents by Local Authority of usual residence and workplace (converted to ITL 2 regions) (Nomis, 2014); and UK imports into each ITL2 region and exports by each ITL2 region by sector, separately for goods and services (Office for National Statistics, 2023b and 2023c).

In terms of sector breakdown, the original UK-level Input-Output tables are broken down into 105 relatively granular sectors. However, the wide range of regional-level data required to generate the multi-regional Input-Output model is not available for such a granular sector breakdown. Instead, the multi-regional Input-Output model is broken down into 10 more high-level sector groups (see Table 14 below).

[141] For more information, see Office for National Statistics (2024). The classification is based on the ITL boundaries established as of January 2021.
[142] While more recent UK Input-Output tables have been published (for 2020), they are affected by the impact of the Covid-19 pandemic, so 2019 tables are used instead to be more reflective of a 'typical' year (see Office for National Statistics (2022c) and Office for National Statistics (2023d) for more details).
[143] i.e. all firms within a given industry (irrespective of their region) use the same production techniques and have the same input structures to produce their outputs. This assumption helps simplify the Input-Output analysis, by treating each industry as if it were a single, homogeneous entity.
[144] See Flegg & Tohmo (2014) and Flegg et al. (2021) for more detail on the implementation of Flegg Location Quotients. Similar location quotient techniques have been used to generate other Input-Output tables in the UK for different regions, such as for London (see GLA Economics (2019)) and the Glasgow City Region (see Hermannsson (2016)).
[145] Based on the specification and parameters given by Jahn (2016) and Jahn et al. (2020).

While Input-Output analyses are a useful tool to assess the total economic impacts generated by a wide range of activities, it is important to note several key limitations associated with this type of analysis. For example:

- Input-Output analyses assume that inputs are complements, and that there are constant returns to scale in the production function (i.e. that there are no economies of scale). The interpretation of these assumptions is that the prevailing breakdown of inputs from all sectors (employees, and imports) is a good approximation of the breakdown that would prevail if total demand (and therefore output) were marginally different.
- Input-Output analyses do not account for any price effects resulting from a change in demand for a given industry/output.
- Input-Output models are 'static' in nature, in the sense that they assume fixed relationships between inputs and outputs, not accounting for changes in technology, prices, or production methods over time.
- Given the complexity of the analysis and reliance on a wide range of industry-level data, the sectors included within Input-Output models are often highly aggregated, therefore masking likely differences between different industries.
- Input-Output models typically do not account for potential supply constraints, i.e. they assume that overall supply can meet any level of demand.

A2.1.2 Industry classifications for multi-regional Input-Output analysis

Table 14 provides an overview of the high-level industry classifications used throughout the multi-regional Input-Output analysis.

Table 14 Industry grouping used as part of the multi-regional Input-Output analysis

Industries included in original UK Input-Output table	High-level industry group [and UK SIC Codes]
Crop and animal production, hunting and related service activities	Agriculture [1-3]
Forestry and logging	
Fishing and aquaculture	
Mining and quarrying	Production [5-39]
Manufacture of food products, beverages, and tobacco products	
Manufacture of textiles, wearing apparel and leather products	
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	
Manufacture of paper and paper products	
Printing and reproduction of recorded media	
Manufacture of coke and refined petroleum products	
Manufacture of chemicals and chemical products	
Manufacture of basic pharmaceutical products and pharmaceutical preparations	
Manufacture of rubber and plastic products	
Manufacture of other non-metallic mineral products	
Manufacture of basic metals	
Manufacture of fabricated metal products, except machinery and equipment	
Manufacture of computer, electronic and optical products	
Manufacture of electrical equipment	
Manufacture of machinery and equipment n.e.c.	
Manufacture of motor vehicles, trailers and semi-trailers	
Manufacture of other transport equipment	
Manufacture of furniture; other manufacturing	
Repair and installation of machinery and equipment	
Electricity, gas, steam, and air conditioning supply	

Industries included in original UK Input-Output table	High-level industry group [and UK SIC Codes]
Water collection, treatment and supply	
Sewerage; waste collection, treatment, and disposal activities; materials recovery; remediation activities and other waste management services	
Construction	Construction [41-43]
Wholesale and retail trade and repair of motor vehicles and motorcycles	Distribution, transport, hotels, and restaurants [45-56]
Wholesale trade, except of motor vehicles and motorcycles	
Retail trade, except of motor vehicles and motorcycles	
Land transport and transport via pipelines	
Water transport	
Air transport	
Warehousing and support activities for transportation	
Postal and courier activities	
Accommodation and food service activities	
Publishing activities	Information and communication [58-63]
Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	
Telecommunications	
Computer programming, consultancy and related activities; information service activities	
Financial service activities, except insurance and pension funding	Financial and insurance [64-66]
Insurance, reinsurance and pension funding, except compulsory social security	
Activities auxiliary to financial services and insurance activities	
Real estate activities excluding imputed rents	Real estate [68.1-2-68.3]
Imputed rents of owner-occupied dwellings	
Legal and accounting activities; activities of head offices; management consultancy activities	Professional and support activities [69.1-82]
Architectural and engineering activities; technical testing and analysis	
Scientific research and development	
Advertising and market research	
Other professional, scientific, and technical activities; veterinary activities	
Rental and leasing activities	
Employment activities	
Travel agency, tour operator reservation service and related activities	
Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support activities	
Public administration and defence; compulsory social security	Government, health & education [84-88]
Education	
Human health activities	
Social work activities	
Creative, arts and entertainment activities; libraries, archives, museums, and other cultural activities; gambling and betting activities	Other services [90-97]
Sports activities and amusement and recreation activities	
Activities of membership organisations	
Repair of computers and personal and household goods	
Other personal service activities	
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	

Note: 'n.e.c.' = not elsewhere classified

Source: London Economics' analysis, based on Office for National Statistics (2023d) and UK SIC Codes (see Office for National Statistics, 2022f)

A2.2 Impact of the University's research and knowledge exchange activities

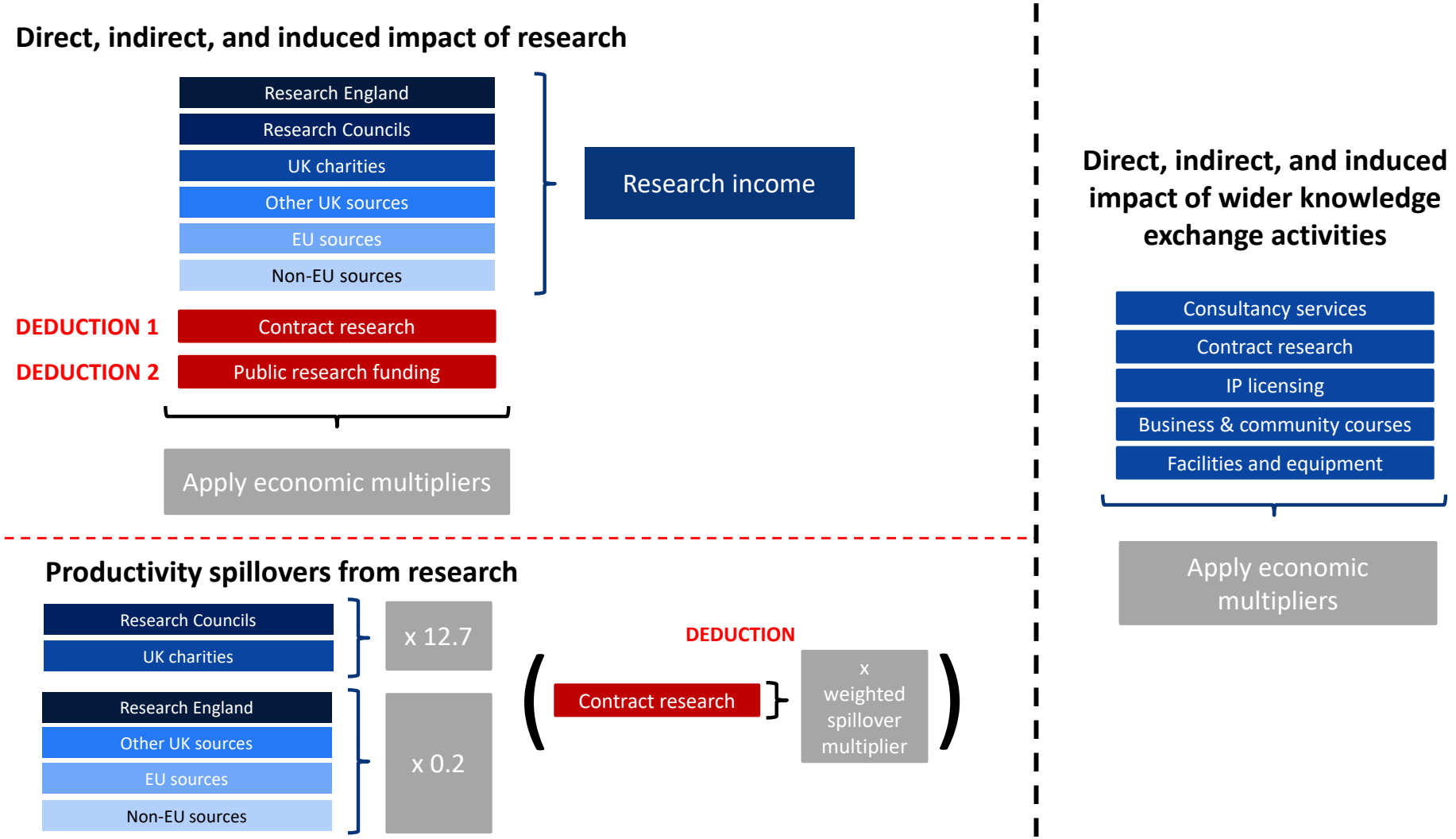
A2.2.1 Overview of the analysis of research and wider knowledge exchange activities

Figure 41 provides an overview of the methodological approach adopted to analyse the economic impact of the University of Sheffield's research and wider knowledge exchange activities[146], in terms of:

- The direct, indirect, and induced impact of research (Section 2.1.3);
- The productivity spillovers from the University's research (Section 2.1.4); and,
- The direct, indirect, and induced impact of the University's wider knowledge exchange activities (Section 2.2).

[146] For simplicity, the chart here excludes the impact of the University's spinout and start-up companies.

Figure 41 Overview of the analysis of the impact of research and wider knowledge exchange activities



Note: Research funding includes collaborative research funding, which is divided into public, cash and in-kind funding. Cash and public fall under and are included in the research categories. In-kind contributions are excluded from the analysis, since these contributions do not represent a cash transaction for which we can robustly apply economic multipliers. To avoid double-counting, contract research funding is deducted from the impact of research, as this is already included within the impact of wider knowledge exchange activities.

Source: London Economics analysis

A2.2.2 Regional and sectoral impact of research and knowledge exchange activities

The total direct, indirect, and induced impact of the University of Sheffield's research and knowledge exchange activities can also be broken down by **region** as well as by **sector**, and can be presented in GVA and FTE employment terms.[147] These disaggregated estimates are presented in Figure 42 and Figure 43, respectively.

Considering the breakdown by **region**, in terms of **economic output** (top panel), almost **40%** of the total impact of **£819 million**[148] associated the University's research and knowledge exchange activities occurred in **South Yorkshire** (**£307 million**, **38%**), with an additional **£69 million** (**8%**) generated throughout the **rest of the Yorkshire and the Humber region**. There were also significant impacts occurring in other regions, particularly in **London** (**£174 million**, **21%**).

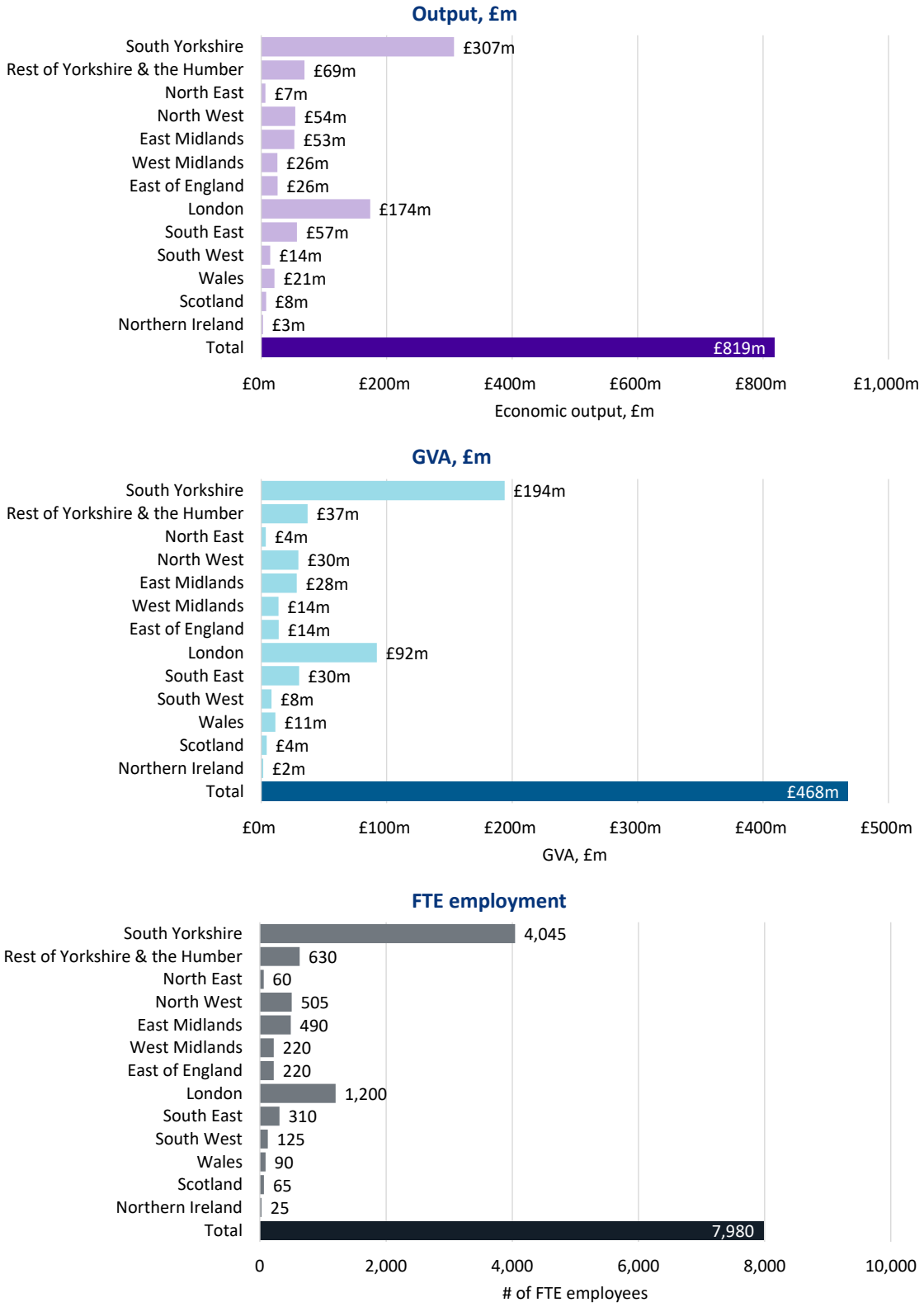
The impact in terms of **GVA** (middle panel) was estimated at **£468 million** across the UK economy as a whole, of which **£194 million** occurred in **South Yorkshire** (and **£37 million** was generated **elsewhere in Yorkshire and the Humber**). Finally, of the estimated **7,980 FTE jobs** (bottom panel) that were supported by the University's research and knowledge exchange activities across the UK as a whole, the majority (approximately **4,045**) were located in **South Yorkshire** (with an additional **630** supported **elsewhere in Yorkshire and the Humber**).

In terms of **sector**, the University's research and knowledge exchange activities resulted in particularly large impacts within the **government, health and education** sector (**£285 million**), the **distribution, transport, hotel and restaurant** sector (**£118 million**), and the **information and communication** sector (**£99 million**).

[147] Note that this breakdown does *not* include the productivity spillovers associated with the University's research (as it is not possible to assign a geographic location or sector to each business benefiting from productivity spillovers generated by the University of Sheffield's research).

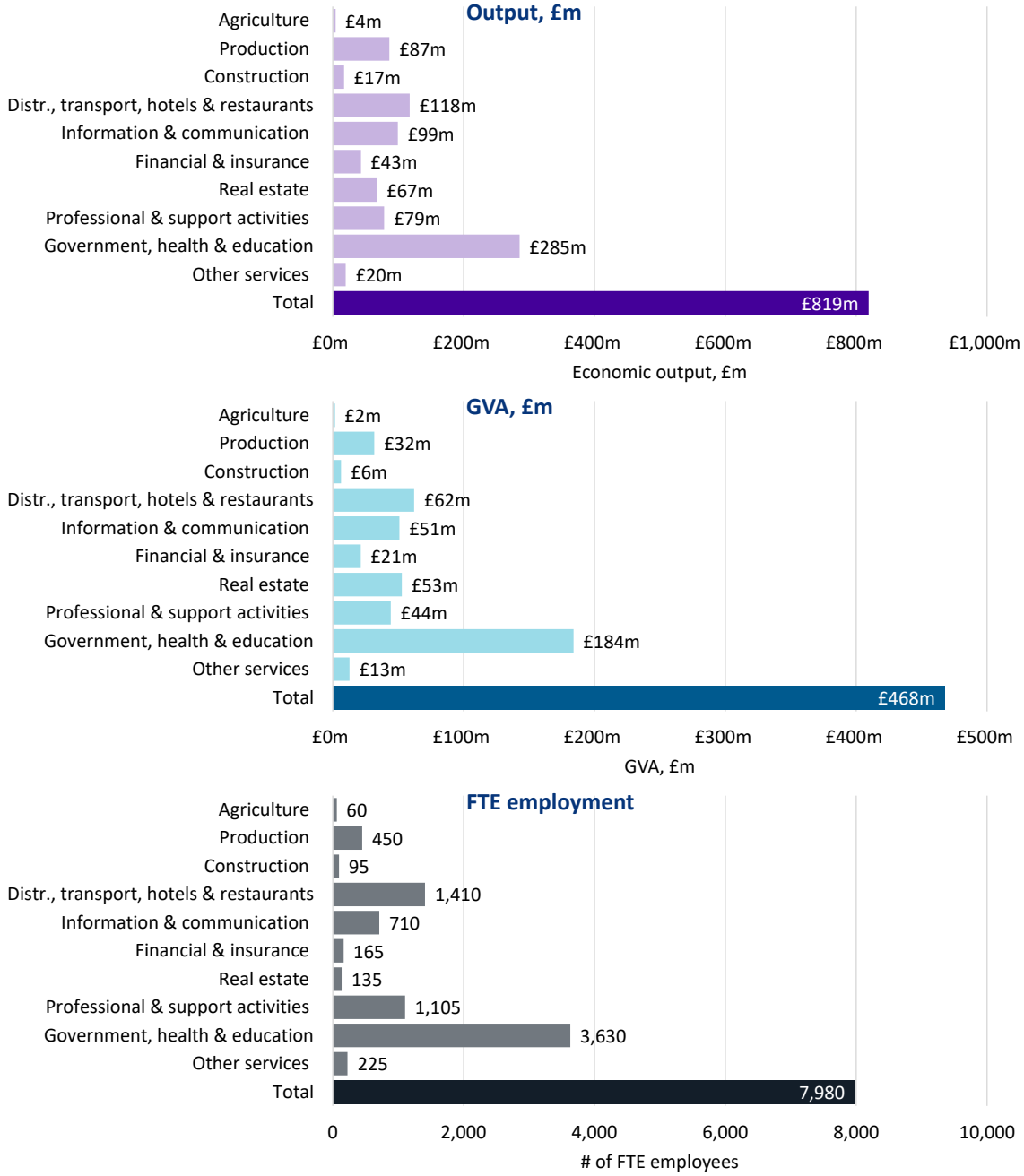
[148] Note again that this is the total impact that can be broken down by region and sector, i.e. the impact of research and knowledge exchange activities *excluding* productivity spillovers.

Figure 42 Direct, indirect and induced economic impact associated with the University of Sheffield's research and knowledge exchange activities in 2022-23, by region



Note: Monetary estimates are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. The estimates here *exclude* a total of **£945 million** of productivity spillovers (in economic output terms) associated with the University's research.
Source: London Economics' analysis

Figure 43 Direct, indirect and induced economic impact associated with the University of Sheffield's research and knowledge exchange activities in 2022-23, by sector

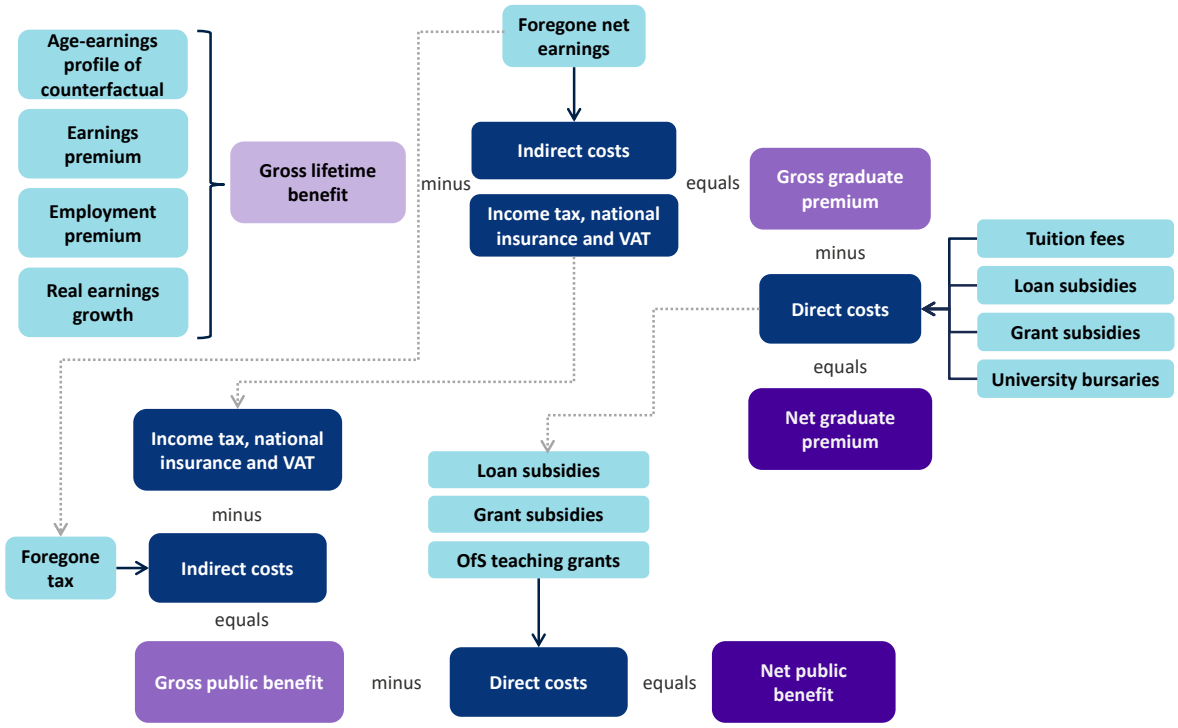


Note: Monetary estimates are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. The estimates here *exclude* a total of **£945 million** of productivity spillovers (in economic output terms) associated with the University's research.
Source: London Economics' analysis

A2.3 Impact of the University's teaching and learning activities

Section 3 outlined our analysis of the **economic impact of teaching and learning activities** associated with the cohort of first-year UK domiciled students who started higher education qualifications at the University of Sheffield in the 2022-23 academic year. In the following, we provide further details on the underlying methodological approach used to arrive at our estimates of this impact.

Figure 44 Overview of the assessment of the gross and net graduate premium and gross and net Exchequer benefit



Source: London Economics' analysis based on Department for Business, Innovation and Skills (2011a)

A2.3.1 Adjusting for completion rates

Section 3.1 provided an overview of the number of UK domiciled students *starting* qualifications or modules at the University in 2022-23. However, to aggregate the individual-level impacts of the University's teaching and learning activity, it is necessary to adjust the number of 'starters' to account for **completion rates**.

To achieve this, we used information published by the Office for Students (OfS) on the historical completion outcomes of University of Sheffield students, broken down by study mode and study intention (i.e. level of study)[149]. In other words, these completion data include the number of students who completed their intended qualification (or module). The remaining proportions of students (who did not complete their intended qualification) were modelled as completing at 'other undergraduate' level (for students who originally enrolled in first degrees or other undergraduate qualifications) or 'other postgraduate' level (for students who originally intended to complete higher degrees or other postgraduate qualifications)[150].

[149] See Office for Students (2024). Data are based on full-time 2015-16 to 2018-19 entrants, and part-time 2013-14 to 2016-17 entrants to the University of Sheffield, tracking their completion outcomes by 2022-23. Completion rates are defined as 'the proportion of students that were observed to have gained a higher education qualification (or were continuing in the study of a qualification) four years and 15 days after they started their course (six years and 15 days for part-time students)'.

[150] In other words, we assume that students who discontinued their studies at least complete one or several standalone modules associated with their intended qualification, so that these students' completion outcomes were modelled as either completion at 'other undergraduate' or 'other postgraduate' level. As a result, the total assumed completion rates sum up to 100%.

Table 15 Assumed completion rates of University of Sheffield student entrants

Completion outcome	Study intention				
	Other undergraduate	First degree	Other postgraduate	Higher degree (taught)	Higher degree (research)
Full-time students					
Other undergraduate	100%	6%	-	-	-
First degree	-	94%	-	-	-
Other postgraduate	-	-	100%	3%	8%
Higher degree (taught)	-	-	-	97%	-
Higher degree (research)	-	-	-	-	92%
Total	**100%**	**100%**	**100%**	**100%**	**100%**
Part-time students					
Other undergraduate	100%	85%	-	-	-
First degree	-	16%	-	-	-
Other postgraduate	-	-	100%	15%	24%
Higher degree (taught)	-	-	-	85%	-
Higher degree (research)	-	-	-	-	76%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Data are based on full-time 2015-16 to 2018-19 entrants, and part-time 2013-14 to 2016-17 entrants to the University of Sheffield, tracking their completion outcomes by 2022-23. Completion rates are defined as 'the proportion of students that were observed to have gained a higher education qualification (or were continuing in the study of a qualification) four years and 15 days after they started their course (six years and 15 days for part-time students)'. Totals may not sum due to rounding.

Source: London Economics' analysis based on data published by the Office for Students (2024)

Table 15 presents the resulting completion rates applied throughout the analysis. For example, we assume that, of those students starting a full-time first degree at the University of Sheffield in 2022-23, **94%** complete the first degree as intended, while the remaining **6%** undertake one or more of the credits/modules associated with their degree before discontinuing their studies (modelled as completion at 'other undergraduate' level). Similarly, at postgraduate level, we assume that of those individuals starting a full-time postgraduate taught degree, **97%** complete the qualification as intended, while the remaining **3%** undertake one or more of the credits/modules associated with the intended degree before dropping out (in this case, modelled as completion at 'other postgraduate' level). In all these cases, **the analysis of the impact of teaching and learning calculates the estimated returns associated with the *completed* qualification/standalone module(s)**.

A2.3.2 Defining the gross graduate premium and gross public purse benefit

As summarised in Section 3.2, to measure the economic benefits of higher education qualifications, we estimate the **labour market value associated with these qualifications**, rather than simply assessing the labour market outcomes achieved by individuals *in possession* of higher education qualifications. The standard approach to estimating this labour market value is to undertake an **econometric analysis** where the 'treatment' group consists of those individuals in possession of the qualification of interest, and the 'counterfactual' group consists of those individuals with comparable personal and socioeconomic characteristics but with the next highest level of qualification. The rationale for adopting this approach is that the comparison of the earnings and employment outcomes of the treatment group and the counterfactual group 'strips away' (to the greatest extent possible with the relevant data) those other personal and socioeconomic characteristics that might affect labour market earnings and employment (such as gender, age, or sector of employment), leaving just the labour market gains attributable to the qualification itself (see Figure 45 for an illustration of this). The treatment and counterfactual groups, and details of the econometric approach, are presented in Annex A2.3.3 and Annex A2.3.4, respectively.

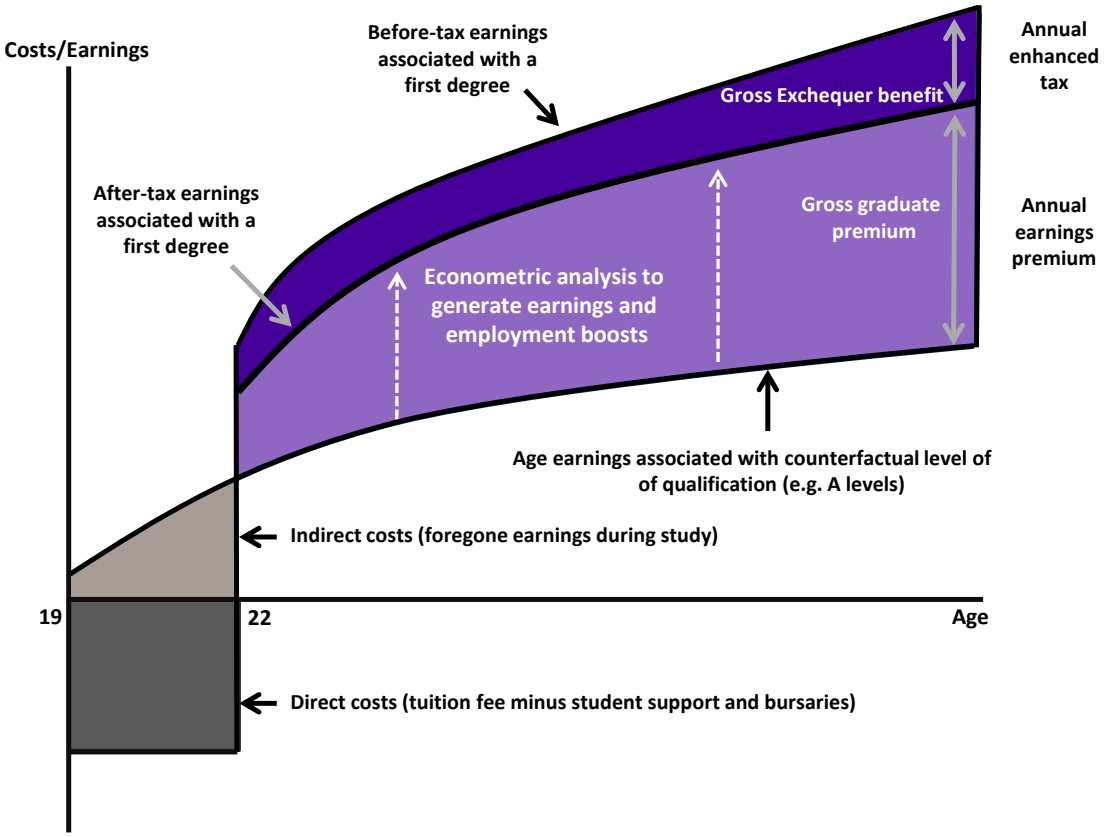
Throughout the analysis, the assessment of earnings and employment outcomes associated with higher education qualification attainment (at all levels) is undertaken separately by **gender**, reflecting the different labour market outcomes between men and women. Further, the analysis is adjusted for the specific **subject composition** of students studying at the University of Sheffield, to reflect the fact that there is significant variation in post-graduation labour market outcomes depending on the subject of study. In addition, given the fact that part-time students generally undertake and complete higher education qualifications later in life than full-time students, the analysis for part-time students applies a **'decay function'** to the returns associated with qualification attainment, to reflect the shorter period of time in the labour market[151].

To estimate the **gross graduate premium**, based on the econometric results, we then estimate the **present value of the enhanced post-tax earnings** of individuals in possession of different higher education qualifications (i.e. after income tax, National Insurance and VAT are removed, and following the deduction of foregone earnings) relative to an individual in possession of the counterfactual qualification (see Annex A2.3.6 for more detail).

The **gross benefits to the Exchequer** from the provision of higher education are derived from the enhanced taxation receipts that are associated with a higher likelihood of being employed, as well as the enhanced earnings associated with more highly skilled and productive employees. Based on the analysis of the lifetime earnings and employment benefits associated with higher education qualification attainment and administrative information on the relevant taxation rates and bands (from HM Revenue and Customs), we estimate the **present value of additional income tax, National Insurance and VAT associated with higher education qualification attainment** (by gender, level of study, mode of study, and prior attainment). Again, please refer to Annex A2.3.6 for more detailed information on the calculation of the gross Exchequer benefit.

[151] See Annex A2.3.5 for more information.

Figure 45 Estimating the gross graduate premium and gross Exchequer benefit



Note: The analysis assumes that the opportunity costs of foregone earnings associated with higher qualification attainment are applicable to full-time students only. For part-time students, we have assumed that these students are able to combine work with their academic studies and as such, do not incur any opportunity costs in the form of foregone earnings. This illustration is based on an analysis of the University of Sheffield's student cohort data for 2022-23, where the mean age at enrolment for full-time first degree students stands at 19, and the average study duration for full-time first degree students is 3 years (also see Annex A2.3.5).
Source: London Economics

A2.3.3 Qualifications and counterfactuals considered in the econometric analysis

Our econometric analysis of the earnings and employment returns to higher education qualifications (described in more detail in Annex A2.3.4) considered **five different higher education qualification groups** (i.e. five **'treatment' groups** for HE qualifications):

- **Three at postgraduate level** (higher degree (research), higher degree (taught) and 'other' postgraduate qualifications[152]); and
- **Two at undergraduate level** (first degrees and 'other' undergraduate qualifications[153]).

[152] 'Other' postgraduate relates to Labour Force Survey variables HIQUAL8, HIQUAL11, HIQUAL15 and HIQUAL22 value labels 'Postgraduate Certificate in Education', 'Other postgraduate degree or professional qualification' and 'Don't know', for individuals who selected 'Higher degree' (other than Masters or Doctorate degree). The specific composition of the treatment group here is based on the composition of individuals undertaking each type of qualification in the relevant University of Sheffield student cohort. Courses which are not offered by the institution will thus be excluded from the treatment group.
[153] 'Other' undergraduate relates to Labour Force Survey variables HIQUAL8, HIQUAL11, HIQUAL15 and HIQUAL22 value labels 'other degree', 'diploma in higher education', and 'other higher education below degree'. Interviewers are instructed to use 'other higher education below degree' only if the respondent states that they have 'something from higher education but they do not know what it is'. It is therefore not possible to provide examples of typical qualifications that would normally fall under this category. The response option serves the purpose of confirming that higher education qualifications have been achieved but that the respondent is unaware of the actual qualification title itself. Again, the specific composition of the treatment group here is based on the composition of individuals undertaking qualifications at this level in the 2022-23 University of Sheffield student cohort.

Table 16 presents these different undergraduate and postgraduate qualifications (i.e. treatment groups) considered in the analysis, along with the associated **counterfactual group** used for the marginal returns analysis in each case. As outlined above, we compare the earnings of the group of individuals in possession of each higher education qualification to the relevant counterfactual group, to ensure that we assess the economic benefit associated with the qualification itself (rather than the economic returns generated by the specific characteristics of the individual in possession of the qualification). This is a common approach in the literature and allows us to control for other personal, regional, or socioeconomic characteristics that might influence *both* the determinants of qualification attainment as well as earnings/employment.

Specifically, for the analysis of marginal labour market returns, postgraduate qualification holders are compared to first degree holders, while for individuals holding first degrees or 'other undergraduate' level qualifications, the counterfactual group consists of individuals holding any (academic or vocational) qualification at Regulated Qualifications Framework (RQF) Level 3 as their highest qualification (i.e. 2 or more GCE 'A' Levels or equivalent)[154, 155].

Table 16 Treatment and comparison groups used to assess the marginal earnings and employment returns to higher education qualifications

Treatment group – highest qualification	Comparison group - highest qualification
Higher education qualifications	
Higher degree (research)	First degree
Higher degree (taught)	First degree
Other postgraduate	First degree
First degree	RQF Level 3 (academic or vocational) qualifications[1]
Other undergraduate	RQF Level 3 (academic or vocational) qualifications
Other	
RQF Level 3 (academic or vocational) qualifications[2]	5 or more GCSEs grade A*-C

Note: 1. The analysis for first degrees (only) is weighted to reflect the specific prior attainment levels among UK domiciled students in the 2022-23 University of Sheffield cohort. Specifically, the analysis is weighted to reflect the proportions of students in possession of 2 or more GCE 'A' Levels or other academic (or vocational) qualifications (at RQF Level 3) as their highest attainment prior to starting their learning at the University of Sheffield.
2. Similar to the counterfactual group for first degrees, the analysis for the treatment group here is weighted to reflect the proportions of students in possession of 2 or more GCE 'A' Levels or other equivalent (vocational or academic) qualifications (at RQF Level 3) as their highest attainment prior to starting their learning at the University of Sheffield. ***Source: London Economics***

In addition, we also included a separate specification comparing the earnings associated with RQF Level 3 qualifications to possession of 5 or more GCSEs at grades A*-C (or equivalent). This additional analysis was undertaken to provide an indication of the fact that the academic 'distance travelled' by a (very small) proportion of students in the 2022-23 University of Sheffield cohort is **greater** than might be the case compared to those in possession of levels of prior attainment 'traditionally' associated with higher education entry[156]. Similarly, for other students within the cohort, the academic 'distance travelled' is **lower** than the traditional prior attainment level (e.g. a small

[154] Historically (across all UK higher education institutions), students starting first degrees or other undergraduate qualifications were in possession of 2 or more GCE 'A' Levels as their highest level of prior attainment. However, as this is no longer the case for all HE institutions and subject areas, the analysis reflects the fact that approximately 9% of first degree students in the 2022-23 University of Sheffield cohort started their degrees with RQF Level 3 qualifications *other than* GCE 'A' Levels (or equivalent (e.g. Internal Baccalaureates)) as their highest prior attainment.
[155] In terms of prior attainment, note that for 113 students in the 2022-23 cohort of UK domiciled University of Sheffield students, previous attainment levels were specified as 'Not known' or 'Other qualification level not known'. For these students, we imputed their prior attainment level using a group-wise imputation approach, based on the most common prior attainment among students in the cohort undertaking qualifications at the same level (separately by study mode).
[156] e.g. there is a (very) small number of students in the 2022-23 cohort of UK domiciled University of Sheffield students who only held qualifications at RQF Level 2 as their highest prior attainment before starting their learning at the University.

proportion of students undertaking first degrees at the University of Sheffield had previously already completed a sub-degree level (i.e. 'other undergraduate') qualification).

In instances where the level of prior attainment for students at the University of Sheffield was higher or lower than the 'traditional' counterfactual qualifications outlined in Table 16, the analysis used a **'stepwise' calculation of additional lifetime earnings**. For example, to calculate the earnings and employment returns for a student **in possession of an 'other undergraduate' qualification undertaking a first degree at the University of Sheffield**, we *deducted* the returns to undertaking an 'other undergraduate' qualification (relative to the possession of an RQF Level 3 qualification) from the returns to undertaking a first degree (again relative to the possession of an RQF Level 3 qualification). Similarly, to calculate the returns for a student **in possession of 5 GCSEs A*-C (or equivalent) undertaking a first degree at the University**, we *added* the returns to achieving an RQF Level 3 qualification (relative to the possession of 5 GCSEs A*-C) to the returns to undertaking a first degree (relative to the possession of an RQF Level 3 qualification)[157].

A2.3.4 Marginal earnings and employment returns to higher education qualifications

Marginal earnings returns

To estimate the impact of qualification attainment on earnings, using information from the Labour Force Survey (LFS), we estimated a standard **ordinary least squares** linear regression model, where the dependent variable is the natural logarithm of hourly earnings, and the independent variables include the full range of qualifications held alongside a range of personal, regional, and job-related characteristics that might be expected to influence earnings. In this model specification, we included individuals who were employed on either a full-time or a part-time basis. This approach has been used widely in the academic literature.

The basic specification of the model was as follows:

$$ln\ (\omega_i) = \alpha + \beta X_i + \epsilon_i \quad \text{for } i = 1 \text{ to n}$$

where ln(ω_i) represents the natural logarithm of hourly earnings, $\epsilon_i$represents an error term, α represents a constant term, i is an individual LFS respondent, and X_i provides the independent variables included in the analysis, as follows:

- Highest qualification held;
- Age;
- Age squared;
- Ethnic origin;
- Disability status;
- Region of work;
- Marital status;
- Number of dependent children under the age of 16;
- Full-time / part-time employment;

[157] In some instances, this stepwise calculation might result in *negative* lifetime returns to achieving higher education qualifications. As this seems illogical and unlikely in reality, any negative returns in these instances were set to zero. Hence, the analysis implicitly assumes that all calculated gross returns (*before* the deduction of any foregone earnings or other costs) can only be greater than or equal to zero (i.e. there can be no wage or employment *penalty* associated with any HE qualification attainment, irrespective of the level of prior attainment).

- Temporary or permanent contract;
- Public or private sector employment;
- Workplace size; and
- Yearly dummies.

Using the above specification, we estimated earnings returns in aggregate and **for men and women separately**. Further, to analyse the benefits associated with different education qualifications over the lifetime of individuals holding these qualifications, the regressions were **estimated separately across a range of specific age bands** for the working age population, depending on the qualification considered. The estimated marginal earnings returns also take account of the specific subject mix of UK domiciled students in the 2022-23 University of Sheffield cohort.[158] As a result, the estimated marginal wage returns **adjust for the specific subject composition of the University of Sheffield's student cohort**, where possible.[159] In addition, as outlined in Annex A2.3.3, the marginal wage returns for first degrees also reflect the specific prior level of attainment of first degree students in the 2022-23 University of Sheffield cohort (i.e. where the analysis is adjusted for the proportions of students in possession of GCE 'A' levels or other types of RQF Level 3 qualifications as their highest prior attainment on entry).

Further, note that the analysis of earnings premiums was undertaken at a national (UK-wide) level. However, to adjust for differences across the Home Nations, these UK-wide earnings premiums were then combined with the relevant differential direct costs facing the individual and/or the public purse for students domiciled in the different Home Nations and studying in England.

To estimate the impact of higher education qualifications on labour market outcomes using this methodology, we used information from **pooled Quarterly UK Labour Force Survey data between Q1 2010 and Q4 2023**[160].

The resulting estimated marginal wage returns to the different qualifications of interest are presented in Table 17. In the earnings regressions, the coefficients provide an indication of the additional effect on hourly earnings associated with possession of the respective higher education qualification relative to the counterfactual level of qualification. To take an example, the analysis suggests that men aged between 36 and 40 in possession of a first degree achieve a **28.8%** hourly earnings premium compared to comparable men holding only an (academic or vocational) RQF Level 3 qualification as their highest level of attainment (weighted to reflect the specific prior attainment levels of first degree students in the 2022-23 University of Sheffield cohort (i.e. predominantly GCE 'A' Levels or equivalent). The comparable estimate for women aged between 36 and 40 stands at **39.5%**.

[158] This subject mix adjustment was made by applying weights in the LFS regressions reflecting the proportion of students in the cohort enrolled in each subject area. The HESA Common Aggregation Hierarchy (CAH) was used to classify subject areas. The following subject groups were distinguished: (1) Medicine & dentistry, (2) Subjects allied to medicine, (3) Biological and sports sciences, (4) Psychology, (5) Veterinary Sciences, (6) Agriculture, food & related studies, (7) Physical sciences, (8) General and others in sciences, (9) Mathematical sciences, (10) Engineering & technology, (11) Computing, (13) Architecture, building & planning, (14) Humanities & liberal arts (non-specific), (15) Social sciences, (16) Law, (17) Business & management, (19) Language & area studies, (20) Historical, philosophical & religious studies, (22) Education and teaching, (23) Combined & general studies, (24) Media, journalism and communications, (25) Design, and creative and performing arts, and (26) Geography, earth and environmental studies.

[159] Note that the LFS data did not include information on subjects for students undertaking 'other undergraduate' qualifications. Therefore, the subject mix adjustment factors for other undergraduate qualifications were instead based on the subject-level returns to first degrees, weighted by the number of students in the cohort undertaking other undergraduate qualifications in each subject, and multiplied by the overall ratio of the marginal earnings returns to other undergraduate qualifications relative to first degrees (across all subjects).

[160] All earnings information within the data was adjusted to June 2022 prices.

Table 17 Marginal earnings returns to higher education qualifications (weighted across subjects), in % (following exponentiation), by gender and age band

Qualification level (vs. counterfactual)	Age band								
	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Men									
Level 3 (vs. 5+GCSEs)[1]	8.2%	12.9%	20.7%	23.4%	19.6%	22.5%	18.4%	22.8%	17.2%
Other undergraduate (vs. Level 3)[2]			17.0%	19.2%	26.2%	22.9%	23.7%	26.0%	38.5%
First degree (vs. Level 3)[2]	12.5%	20.1%	27.4%	28.8%	32.3%	28.3%	33.5%	37.9%	29.7%
Other postgraduate (vs. first degrees)[3]		10.1%							
Higher degree (taught) (vs. first degrees)[3]	5.4%	4.3%	7.6%	8.4%	7.3%	9.0%	7.3%	10.6%	14.8%
Higher degree (research) (vs. first degrees)[3]	29.3%	16.9%	15.6%	15.7%	22.8%	37.3%	31.9%	26.0%	52.0%
Women									
Level 3 (vs. 5+GCSEs)[1]	6.3%	10.0%	9.7%	17.0%	20.4%	14.2%	15.8%	15.5%	14.9%
Other undergraduate (vs. Level 3)[2]	3.5%	8.9%	14.1%	26.1%	26.5%	27.3%	26.9%	25.2%	29.8%
First degree (vs. Level 3)[2]	10.5%	20.4%	32.7%	39.5%	39.7%	39.4%	40.5%	37.9%	28.8%
Other postgraduate (vs. first degrees)[3]		4.6%	7.3%	11.2%	15.7%	12.9%	22.0%	14.5%	26.9%
Higher degree (taught) (vs. first degrees)[3]	6.9%	6.1%	13.2%	17.1%	19.8%	22.3%	18.5%	30.2%	20.4%
Higher degree (research) (vs. first degrees)[3]	12.4%	20.4%	31.7%	40.9%	37.3%	43.9%	47.1%	52.2%	58.1%

Note: Regression coefficients have been exponentiated to reflect percentage wage returns. In cases where the estimated coefficients are not statistically significantly different from zero (at the 10% level), the coefficient is assumed to be zero; these are displayed as gaps in the table.

[1] Returns to holding RQF Level 3 qualifications are estimated relative to 5 or more GCSEs at A*-C (or equivalent) (weighted to reflect the proportion of first degree entrants in the 2022-23 University of Sheffield cohort holding GCE 'A' levels (or equivalent) vs. other RQF Level 3 qualifications as their highest prior qualification on entry).

[2] Returns to other undergraduate qualifications and first degrees are estimated relative to individuals holding a Level 3 (academic or vocational) qualification as their highest qualification. Returns to first degrees are estimated relative to individuals holding RQF Level 3 qualifications as their highest qualification (weighted by the proportion of first degree entrants in the 2022-23 University of Sheffield cohort holding GCE 'A' levels (or equivalent) vs. other RQF Level 3 qualifications as their highest prior attainment).

[3] Returns to higher degree (taught), higher degree (research), and 'other' postgraduate qualifications are estimated relative to first degrees.

Source: London Economics' analysis of pooled Quarterly Labour Force Survey data for 2010 Q1 - 2023 Q4

Marginal employment returns

To estimate the impact of qualification attainment on employment, we adopted a **probit model** to assess the likelihood of different qualification holders being in employment or otherwise. The basic specification defines an individual's labour market outcome to be either in employment (working for payment or profit for more than 1 hour in the reference week (using the standard International Labour Organisation definition) or not in employment (being either unemployed or economically inactive)). The specification of the probit model was as follows:

$$Probit(EMPNOT_i) = \alpha + \gamma Z_i + \epsilon_i \quad \text{for } i = 1 \text{ to n}^{161}$$

The dependent variable adopted represents the binary variable $EMPNOT_i$, which is coded 1 if the individual is in employment and 0 otherwise.[162] We specified the model to contain a constant term (α) as well as a number of standard independent variables, including the qualifications held by an individual (represented by Z_i in the above equation), as follows:

- Highest qualification held;
- Age;

[161] Where i is again an individual LFS respondent.

[162] The probit function reflects the cumulative distribution function of the standard normal distribution.

- Age squared;
- Ethnic origin;
- Disability status;
- Region of usual residence;
- Marital status;
- Number of dependent children under the age of 16; and
- Yearly dummies.

Again, ϵ_i represents an error term. Similar to the methodology for estimating earnings returns, the described probit model was estimated in aggregate and **separately for men and women**, with the analysis further split by respective **age bands**, and adjusted for the specific **subject mix** of students in the 2022-23 cohort of UK domiciled students enrolled at the University of Sheffield. Further, and again similar to the analysis of earnings returns, the employment returns were estimated at the national (i.e. UK-wide) level. In addition, the marginal employment returns for first degrees again reflect the specific prior level of attainment of first degree students in the 2022-23 University of Sheffield cohort (i.e. the proportions of students in possession of GCE 'A' levels (or equivalent) vs. other types of RQF Level 3 qualifications as their highest prior attainment on entry).

Table 18 Marginal employment returns to higher education qualifications (weighted across subjects), in percentage points, by gender and age band

Qualification level	Age band								
	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Men									
Level 3 (vs. 5+GCSEs)[1]	2.4	4.2	2.5	1.5	1.8	1.6			
Other undergraduate (vs. Level 3)[2]					1.9			-2.8	
First degree (vs. Level 3)[2]	-4.6	2.7	1.9	2.2	2.2		3.5		
Other postgraduate (vs. first degrees)[3]	8.6		2.2	1.8	1.9	2.3	3.8		-6.5
Higher degree (taught) (vs. first degrees)[3]	-5.1	-1.6			1.0			3.7	
Higher degree (research) (vs. first degrees)[3]	12.5	3.2		2.1	2.9		3.7	8.6	10.6
Women									
Level 3 (vs. 5+GCSEs)[1]	4.5	4.4	2.7	2.1	2.6	3.4	2.5		
Other undergraduate (vs. Level 3)[2]	3.1		3.5	4.4	3.0	2.6			
First degree (vs. Level 3)[2]		4.5	5.6	6.1	5.5	3.0			
Other postgraduate (vs. first degrees)[3]	4.4		2.4		2.5	4.9		6.6	
Higher degree (taught) (vs. first degrees)[3]	-5.0			1.9	2.4	1.8	4.4	4.3	6.4
Higher degree (research) (vs. first degrees)[3]		-4.1	3.9		4.1	4.7	8.8	10.3	16.0

Note: In cases where the estimated coefficients are not statistically significantly different from zero (at the 10% level), the coefficient is assumed to be zero; these are displayed as gaps in the table.

[1] Returns to holding RQF Level 3 qualifications are estimated relative to 5 or more GCSEs at A*-C (or equivalent) (weighted to reflect the proportion of first degree entrants in the 2022-23 University of Sheffield cohort holding GCE 'A' levels (or equivalent) vs. other RQF Level 3 qualifications as their highest prior qualification on entry).

[2] Returns to other undergraduate qualifications and first degrees are estimated relative to individuals holding a Level 3 (academic or vocational) qualification as their highest qualification. Returns to first degrees are estimated relative to individuals holding RQF Level 3 qualifications as their highest qualification (weighted by the proportion of first degree entrants in the 2022-23 University of Sheffield cohort holding GCE 'A' levels (or equivalent) vs. other RQF Level 3 qualifications as their highest prior attainment).

[3] Returns to higher degree (taught), higher degree (research), and 'other' postgraduate qualifications are estimated relative to first degrees.

Source: London Economics' analysis of pooled Quarterly Labour Force Survey data for 2010 Q1 – 2023 Q4

The resulting estimated marginal employment returns to HE qualifications are presented in Table 18. In the employment regressions, the relevant coefficients provide estimates of the impact of the given qualification on the probability of being in employment (expressed in percentage points). Again, to take an example, the analysis estimates that men aged between 36 and 40 in possession of a first degree are **2.2 percentage points** more likely to be in employment than men of similar age holding only a Level 3 qualification as their highest level of education (again, predominantly including GCE 'A' levels or equivalent). The corresponding estimate for women stands at **6.1 percentage points**.

A2.3.5 'Age-decay' function

Existing economic analyses of the lifetime benefits associated with higher education qualifications to date (e.g. Walker and Zhu, 2013) have typically focused on the returns associated with the 'traditional path' of higher education qualification attainment – i.e. progression directly from secondary level education and completion of a three- or four-year undergraduate degree from the age of 18 or 19 onwards (completing by the age of 21 or 22). These analyses assume that there are direct costs (tuition fees etc.), as well as an opportunity cost (the foregone earnings while undertaking the qualification full-time) associated with qualification attainment. More importantly, these analyses make the implicit assumption that any and all of the estimated earnings and/or employment benefit achieved accrues to the individual.

However, **the labour market outcomes associated with the attainment of higher education qualifications on a part-time basis are fundamentally different than those achieved by full-time students**. In particular, part-time students typically undertake higher education qualifications several years later than the 'standard' full-time student (e.g. the estimated average age at enrolment among students in the 2022-23 cohort completing part-time postgraduate taught degrees at the University of Sheffield is **34**, compared to **26** for corresponding full-time students); generally undertake their studies over an extended period of time; and often combine their studies with full-time employment. Table 19 presents the assumed average age at enrolment, study duration, and age at completion for students in the 2022-23 University of Sheffield cohort[163].

Table 19 Average age at enrolment, study duration, and age at completion among students in the 2022-23 University of Sheffield cohort

Qualification level	Full-time students			Part-time students		
	Age at enrolment	Duration (years)	Age at completion	Age at enrolment	Duration (years)	Age at completion
Other undergraduate	22	2	**24**	31	1	**32**
First degree	19	3	**22**	-	-	**-**
Other postgraduate	28	1	**29**	37	1	**38**
Higher degree (taught)	24	2	**26**	31	3	**34**
Higher degree (research)	27	4	**31**	38	5	**43**

Note: All values have been rounded to the nearest integer. Gaps may arise where there are no students in the 2022-23 University of Sheffield cohort expected to complete the given qualification (there were no students in the cohort expected to complete part-time first degrees). ***Source: London Economics' analysis based on University of Sheffield HESA data***

[163] The assumed average age at enrolment is based on the number of individuals in the cohort assumed to *complete* a given qualification at the University (based on the assumption that some students might complete a different qualification than initially intended, or instead only complete several standalone credits/modules associated with the intended qualification (see Annex A2.3.1 for more information)). In particular, the age at enrolment per qualification (based on the HESA student data provided by the University of Sheffield) is calculated as the weighted average age at enrolment across students in the 2022-23 cohort expected to *complete* the given qualification (weighted by the number of students starting different qualification aims and completing each given qualification, separately by study mode). The assumed average durations of study (by qualification level and mode) are based on separate information provided by the University on the average study duration among students who successfully completed their courses in the 2022-23 academic year.

Given these characteristics, we adjust the methodology when estimating the returns to part-time (and relatively late full-time) education attainment at the University of Sheffield, through the use of an **'age-decay' function**. This approach assumes that possession of a particular higher education qualification is associated with a certain earnings or employment premium, and that this entire labour market benefit accrues to the individual *if* the qualification is attained before the age of 24 (for undergraduate qualifications) or 29 (for postgraduate qualifications).

However, as the age of attainment increases, it is expected that a declining proportion of the estimated earnings and employment benefit accrues to the individual[164]. This calibration ensures that those individuals completing qualifications at a relatively older age will see relatively lower earnings and employment benefits associated with higher education qualification attainment (and perhaps reflect potentially different motivations among this group of learners). In contrast, those individuals attaining qualifications earlier in their working life will see a greater economic benefit.

Table 20 presents the assumed age-decay adjustment factors which we apply to the marginal earnings and employment returns to full-time and part-time students undertaking qualifications in the 2022-23 University of Sheffield cohort. To take an example, we have assumed that a student undertaking a postgraduate taught degree on a full-time basis achieves the full earnings and employment premium identified in the econometric analysis (for their entire working life). However, for part-time postgraduate taught degree students, we assume that because of the late attainment (at age **34** (on average)), these students recoup only **83%** of the corresponding earnings and employment premiums.

[164] E.g. Callender et al. (2011) suggest that the evidence points to decreasing employment returns with age at qualification: older graduates are less likely to be employed than younger graduates three and a half years after graduation; however, there are no differences in the likelihood of graduates undertaking part-time and full-time study being employed according to their age or motivations to study.

Table 20 Assumed age-decay adjustment factors for students in the 2022-23 University of Sheffield cohort

Age	Other undergraduate	First degree	Other postgraduate	Higher degree (taught)	Higher degree (research)
18	100%	100%	100%	100%	100%
19	100%	100%	100%	100%	100%
20	100%	100%	100%	100%	100%
21	100%	100%	100%	100%	100%
22	100%	100%	100%	100%	100%
23	100%	100%	100%	100%	100%
24	98%	98%	100%	100%	100%
25	95%	95%	100%	100%	100%
26	93%	93%	100%	100%	100%
27	90%	90%	100%	100%	100%
28	88%	88%	100%	100%	100%
29	85%	85%	97%	97%	97%
30	83%	83%	94%	94%	94%
31	80%	80%	91%	91%	91%
32	78%	78%	89%	89%	89%
33	75%	75%	86%	86%	86%
34	73%	73%	83%	83%	83%
35	70%	70%	80%	80%	80%
36	68%	68%	77%	77%	77%
37	65%	65%	74%	74%	74%
38	63%	63%	71%	71%	71%
39	60%	60%	69%	69%	69%
40	58%	58%	66%	66%	66%
41	55%	55%	63%	63%	63%
42	53%	53%	60%	60%	60%
43	50%	50%	57%	57%	57%
44	48%	48%	54%	54%	54%
45	45%	45%	51%	51%	51%
46	42%	42%	49%	49%	49%
47	40%	40%	46%	46%	46%
48	37%	37%	43%	43%	43%
49	35%	35%	40%	40%	40%
50	32%	32%	37%	37%	37%
51	30%	30%	34%	34%	34%
52	27%	27%	31%	31%	31%
53	25%	25%	29%	29%	29%
54	22%	22%	26%	26%	26%
55	20%	20%	23%	23%	23%
56	17%	17%	20%	20%	20%
57	15%	15%	17%	17%	17%
58	12%	12%	14%	14%	14%
59	10%	10%	11%	11%	11%
60	7%	7%	9%	9%	9%
61	5%	5%	6%	6%	6%
62	2%	2%	3%	3%	3%
63	0%	0%	0%	0%	0%
64	0%	0%	0%	0%	0%
65	0%	0%	0%	0%	0%

Note: Shaded areas indicate relevant average graduation age per full-time / part-time student at each level of study at the University of Sheffield (also see Table 19): Full-time students Part-time students
Again, note that there were no students in cohort expected to complete part-time first degrees.
Source: London Economics' analysis based on University of Sheffield HESA data

A2.3.6 Estimating the gross graduate premium and gross public purse benefit

The gross graduate premium associated with qualification attainment is defined as the **present value of enhanced post-tax earnings** (i.e. after income tax, National Insurance and VAT are removed, and following the deduction of foregone earnings) relative to an individual in possession of the counterfactual qualification. To estimate the value of the gross graduate premium, it is necessary to extend the econometric analysis (presented in Annex A2.3.4) by undertaking the following elements of analysis (separately by study level, gender, and study mode):

1. We estimated the employment-adjusted **annual earnings achieved by individuals in the counterfactual groups** (e.g., RQF Level 3 qualifications or first degrees), again using pooled Quarterly UK Labour Force Survey data between Q1 2010 and Q4 2023.
2. We inflated these baseline or counterfactual earnings using the marginal earnings premiums and employment premiums (presented in Table 17 and Table 18 in Annex A2.3.4, respectively), adjusted to reflect late attainment (as outlined in Annex A2.3.5), to produce **annual age-earnings profiles associated with the possession of each particular higher education qualification (i.e. treatment group)**.
3. We adjusted these age-earnings profiles to account for the fact that earnings are expected to increase over time (based on average annual earnings growth rate forecasts from the Office for Budget Responsibility (2024)[165]).
4. Based on the earnings profiles generated by qualification holders, and income tax and National Insurance rates and allowances for the relevant academic year[166], we computed the future stream of net earnings (i.e. post-tax)[167]. Using similar assumptions, we further calculated the stream of (employment-adjusted) foregone earnings (based on earnings in the relevant counterfactual group[168]) during the period of study, again net of tax, for full-time students only.
5. We then calculated the **discounted** stream of additional (employment-adjusted) future earnings compared to the relevant counterfactual group (using a standard real discount rate of **3.5%** (Years 1-30) and **3.0%** (Years 31+) as outlined in HM Treasury's Green Book (HM Treasury, 2022)), as well as the discounted stream of foregone earnings during qualification attainment (for full-time students), to generate present value figures. We thus arrive at the **gross graduate premium** (or equivalent) associated with each higher education qualification.
6. The **discounted** stream of enhanced taxation revenues minus the tax income foregone during students' qualification attainment (where relevant) derived in element 4 then

[165] Specifically, we make use of the Office for Budget Responsibility's most recent short-term forecasts (for 2023-24 to 2028-29; see Office for Budget Responsibility (2024), detailed forecast tables: Economy – Table 1.6) and long-term forecasts (for 2029-30 onwards; see Office for Budget Responsibility (2024), supplementary tables: long-term economic determinants) of nominal average earnings growth.

[166] i.e. 2022-23. Note that the analysis assumes fiscal neutrality, that in subsequent years, the earnings tax and National Insurance income thresholds/bands grow at the same rates of average annual earnings growth (again based on Office for Budget Responsibility (2024) forecasts). Further, note that different thresholds and rates for National Insurance contributions applied throughout different parts of the 2022-23 tax year. Here, for simplicity, we use the rates and threshold that applied at the end of 2022-23 (i.e. the rates and thresholds applicable between 6th November 2022 and 5th April 2023 (the last 5 months of the 2022-23 tax year)).

[167] The tax adjustment also takes account of increased VAT revenues for HMT, by assuming that individuals consume 91.3% of their annual income, and that 49% of their consumption is subject to VAT at a rate of 20%. The assumed proportion of income consumed is based on forecasts of the household savings rate published by the Office for Budget Responsibility (2024), while the proportion of consumption subject to VAT is based on OBR forecasts of the standard VAT rate share from the same source.

[168] The foregone earnings calculations are based on the baseline or counterfactual earnings associated with either RQF Level 3 (vocational or academic) qualifications or first degrees. As outlined in Annex A2.3.3, some students in the 2022-23 University of Sheffield cohort were in possession of other levels of prior attainment. To accommodate this, as a simplifying assumption, the foregone earnings for students previously in possession of other undergraduate qualifications (other than first degrees) are based on the earnings associated with possession of a Level 3 qualification as the highest qualification (adjusted for the age at enrolment and completion associated with the relevant higher education qualification undertaken at the University of Sheffield). In addition, the estimated foregone earnings for students previously in possession of postgraduate qualifications are based on the earnings of individuals in possession of first degrees.

provides an estimate of the **gross public benefit** associated with higher education qualification attainment.

Note that the gross graduate premium and gross public benefit for students undertaking qualifications at a level *equivalent to or lower* than the highest qualification that they are already in possession of was assumed to be zero. For example, it is assumed that a student in possession of a first degree undertaking an additional degree at the University of Sheffield will *not* accrue any wage or employment benefits from this additional qualification attainment (while still incurring the costs of foregone earnings during the period of study, if they studied on a full-time basis). Further, note that the analysis of gross graduate premiums and public purse benefits was undertaken at a **national** (UK-wide) level. To adjust for differences across the Home Nations, these UK-wide premiums were then combined with the relevant differential student support costs facing the individual and/or the Exchequer for students domiciled in the different Home Nations and studying in England.

A2.3.7 Estimating the net graduate premium and net public purse benefit

The difference between the gross and net graduate premium relates to **students' direct costs** of qualification acquisition[169]. These direct costs refer to the **proportion of the tuition fee paid by the student**[170] net of any **tuition fee support** or **maintenance support** provided by the Student Loans Company (SLC, for students from England, Wales, and Northern Ireland) or the Students Awards Agency (SAAS, for students from Scotland)[171], minus any **fee waivers or bursaries** provided by the University of Sheffield itself[172]. In this respect, the student benefit associated with public tuition fee loan or maintenance loan support equals the **Resource Accounting and Budgeting charge** (RAB charge)[173], capturing the proportion of the loan that is not repaid. Given the differences in public

[169] Note again that the *indirect* costs associated with qualification attainment, in terms of the foregone earnings during the period of study (for full-time students only), are already deducted from the gross graduate premium.

[170] In terms of tuition fees per student per year, we made use of information published by HESA (2024a) on the total fee income received by the University of Sheffield in 2022-23, separately by domicile, study level and study mode. Data was provided for all undergraduate students combined, postgraduate (taught) students, and postgraduate (research) students (and we assume that students undertaking learning at 'other postgraduate' level are included in the postgraduate (taught) category).
To arrive at the average fees per *full-time* student, we then divided the total fee income for full-time students in 2022-23 by the corresponding number of (first-year and continuing) students studying at the University of Sheffield in 2022-23, again based on HESA student data provided to us by the University. To arrive at the average fees per *part-time student* (ensuring that the fees for part-time students accurately reflect the average study intensity amongst part-time students in the 2022-23 cohort), we adjusted the respective full-time rates for the average study intensity amongst part-time students in the cohort. In turn, the average study intensity (separately by study level) was calculated by dividing the number of part-time students in the cohort in full-time equivalents by the number of students in terms of headcount (again based on HESA student data provided by the University of Sheffield).

[171] The analysis makes use of *average* levels of support paid per student by study mode, domicile, and level (i.e. undergraduate, higher degree (taught) and higher degree (research), and we assume that no funding is available for students undertaking qualifications at 'other postgraduate' level). Our estimates are based on SLC publications on student support for higher education in England, Wales, and Northern Ireland in 2022-23 (see Student Loans Company 2023a, 2023b and 2023c, respectively) and a publication by the Student Awards Agency for Scotland (2023) on student support for higher education in Scotland in 2022-23. To ensure comparability across the different Home Nations, we focus only on core student support in terms of tuition fee grants, tuition fee loans, maintenance grants and maintenance loans (where applicable), but *exclude* any Disabled Students' Allowance and other targeted support. Wherever possible, we focus on the average level of support for the most recent student cohorts available, split by domicile (i.e. 'Home' vs. EU domiciled students). Furthermore, and again wherever possible, we adjusted the average levels of fee and maintenance loans for average loan take-up rates available from the same sources. In addition, the assumed average fee loans or fee grants per student (where applicable) have been capped at the average tuition fees charged per University of Sheffield student in 2022-23 (also see Footnote 170).

[172] Average fee waivers and non-fee waivers (i.e. other bursaries and scholarships) per student were calculated based on information provided by the University of Sheffield on the total amount of bursaries and fee waivers provided to students by the University in 2022-23, by domicile (i.e. UK, EU, and non-EU students), mode, and level of study. To arrive at the average level of funding per student per year, we divided this total funding (by domicile, mode, and level) by the number of (first-year and continuing) students studying at the University in 2022-23 (again, by domicile, mode, and level). The bursary data provided by the University was not broken down into fee waivers/discounts vs. other (non-fee) bursaries. Therefore, for simplicity, we treated all of the resulting average bursaries per student as non-fee bursaries.

[173] For **undergraduate full-time students**, we have assumed a RAB charge of **30%** associated with fee and maintenance loans for English domiciled students (based on Plan 2 RAB charge estimates published by the Department for Education (2024b)), which includes the impact on the RAB charge of the Department's recently announced policy changes in response to the Augar Review of Higher Education

funding support for students from each of the UK Home Nations, the direct costs incurred by students were assessed separately for students from England, Wales, Scotland, and Northern Ireland.

The **direct costs**[174] **to the public purse** include the **teaching grant funding** provided to the University of Sheffield by the Office for Students[175] and the **student support** provided in the form of fee and maintenance loans and grants (where applicable, and where any loan support has been adjusted for the relevant RAB charge). Again, the analysis tailors the cost of student support to the student's specific Home Nation of domicile.

These direct costs associated with qualification attainment to both students and the Exchequer (by study level, study mode and Home Nation domicile) are calculated from start to completion of a student's learning aim. Throughout the analysis, to ensure that the economic impacts are computed in **present value** terms (i.e. in 2022-23 money terms), all benefits and costs occurring at points in the future were **discounted** using the standard HM Treasury Green Book real discount rate of **3.5%/3.0%** (see HM Treasury, 2022). Deducting the resulting individual and Exchequer costs from the estimated gross graduate premium and gross public purse benefit, respectively, we arrive at the estimated **net graduate premium** and **net public purse benefit** per student (see Annex A2.3.8).

A2.3.8 Estimated graduate premiums and public purse benefits

Table 21 presents the gross graduate premiums and gross public purse benefits per student associated with higher education qualification attainment at the University of Sheffield (based on the 2022-23 cohort, and broken down by study mode, level of study, gender[176], and prior attainment) resulting from the above-outlined analysis. Table 22 provides the corresponding estimates of the associated net graduate premiums and net public benefits per student.

(for post-2012 English loan borrowers). We have further assumed a RAB charge of **0%** for Welsh domiciled students, **30%** for Scottish domiciled students, and **14%** for Northern Irish students studying in England, all of which are based on our modelling of the Exchequer costs associated with the current higher education fees and funding systems (for undergraduate students) operating in Wales, Scotland, and Northern Ireland, respectively (see London Economics (2024b)).
For **undergraduate part-time students**, based on the same sources, we have assumed a RAB charge of **24%** for English domiciled students, **7%** for Welsh domiciled students; and **10%** for Northern Irish domiciled students. There are currently no student loans provided to Scottish domiciled undergraduate part-time students (so that no RAB charge assumptions are required).
For the loans for both **full-time and part-time postgraduate taught students** from England, we have assumed a RAB charge of **0%** (based on the Department for Education's (2024) student RAB charge estimates for postgraduate Master's loans (Plan 3) for English domiciled students). In the absence of alternative information, we have also assumed a RAB charge of **0%** for students from Wales and Northern Ireland (and there are no postgraduate loans for Scottish domiciled students studying outside of Scotland (i.e. these loans for Scottish students typically only apply to students studying in Scotland).
Finally, for **full-time and part-time postgraduate research students**, while there were no Doctorate loans available for Scottish domiciled or Northern Irish domiciled students in 2022-23, for students from England and Wales, we have assumed a (Plan 3) RAB charge of **23%** (again based on Department for Education (2024b)).

[174] Again, any indirect costs to the public purse in terms of tax receipts foregone during the period of study (applicable to full-time students only) are already deducted as part of the gross public purse benefits as described above.

[175] This is based on published HESA financial information on the total OfS recurrent teaching grant received by the University of Sheffield in 2022-23 (see HESA, 2024a), divided by the total number of UK domiciled students enrolled at the University in 2022-23 (excluding any EU domiciled students, non-EU domiciled students, and higher degree (research) students, i.e. it is assumed that there is no teaching funding associated with these students; the exclusion of EU students from the calculations was based on the fact that EU domiciled students who started HE qualifications in the UK from 2021-22 onwards are subject to the new post-Brexit rules, and are therefore generally no longer eligible for public teaching grant funding). We then adjusted for the average assumed study intensity among full-time and part-time students, to arrive at separate rates of teaching grant funding by study mode.

[176] In terms of gender, it is important to note that the absolute economic benefits associated with qualification attainment - expressed in *monetary terms* - are often *lower* for women than men, predominantly as a result of the increased likelihood of spending time out of the active labour force. However, reflecting the wider economic literature, the *marginal benefits* associated with qualification attainment - expressed as either the percentage increase in hourly earnings or enhanced probability of employment - are often *greater* for women than for men (also see Annex A2.3.4).

Table 21 Gross graduate premiums and Exchequer benefits per student associated with HE qualification attainment at the University of Sheffield, by study mode, level, gender, and prior attainment

Level of study	Previous qualification and gender													
	GCSE		Level 3		Other undergraduate		First degree		Other postgraduate		Higher degree (taught)		Higher degree (research)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Gross graduate premiums														
Full-time students														
Other undergraduate	£184,000	£96,000	£73,000	£45,000	-£30,000	-£25,000	-£30,000	-£29,000		-£29,000		-£29,000		
First degree	£250,000	£152,000	£145,000	£102,000	£44,000	£32,000	-£26,000	-£33,000		-£33,000	-£26,000	-£33,000		
Other postgraduate		£217,000		£173,000	£53,000	£110,000	-£13,000	£49,000	-£26,000	-£22,000	-£26,000	-£22,000		-£22,000
Higher degree (taught)		£246,000	£199,000	£194,000	£98,000	£127,000	£21,000	£59,000	£3,000	-£11,000	-£39,000	-£36,000		-£36,000
Higher degree (research)							£76,000	£108,000	£68,000	£44,000	£21,000	£22,000		-£85,000
Part-time students														
Other undergraduate		£94,000	£93,000	£58,000	£0	£0	£0	£0		£0		£0	£0	
First degree														
Other postgraduate			£107,000	£122,000	£38,000	£79,000	£4,000	£49,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)						£117,000	£48,000	£78,000	£42,000	£20,000	£0	£0	£0	
Higher degree (research)							£98,000	£92,000	£96,000	£59,000	£72,000	£50,000	£0	
Gross Exchequer benefits														
Full-time students														
Other undergraduate	£171,000	£90,000	£77,000	£50,000	-£10,000	-£5,000	-£9,000	-£9,000		-£9,000		-£9,000		
First degree	£253,000	£143,000	£164,000	£103,000	£78,000	£48,000	-£3,000	-£5,000		-£5,000	-£3,000	-£5,000		
Other postgraduate		£184,000		£148,000	£74,000	£98,000	£0	£47,000	-£14,000	-£10,000	-£14,000	-£10,000		-£10,000
Higher degree (taught)		£214,000	£214,000	£173,000	£130,000	£120,000	£46,000	£62,000	£28,000	£5,000	-£17,000	-£14,000		-£14,000
Higher degree (research)							£137,000	£116,000	£127,000	£65,000	£79,000	£47,000		-£40,000
Part-time students														
Other undergraduate		£74,000	£78,000	£46,000	£0	£0	£0	£0		£0		£0	£0	
First degree														
Other postgraduate			£104,000	£98,000	£46,000	£65,000	£6,000	£39,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)						£95,000	£51,000	£62,000	£43,000	£16,000	£0	£0	£0	
Higher degree (research)							£103,000	£72,000	£100,000	£46,000	£77,000	£39,000	£0	

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2022-23 University of Sheffield cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at the University of Sheffield is equal to or lower than the level of previous attainment. In these instances, the analysis implicitly assumes that all calculated gross returns (*before* the deduction of any foregone earnings or other costs) can only be larger than or equal to zero (i.e. there can be no wage or employment penalty associated with any higher education qualification attainment). Hence, each grey-shaded cell displays only the assumed underlying foregone earnings. ***Source: London Economics' analysis***

Table 22 Net graduate premiums and Exchequer benefits per student associated with HE qualification attainment at the University of Sheffield, by study mode, level, gender, and prior attainment

Level of study	Previous qualification and gender													
	GCSE		Level 3		Other undergraduate		First degree		Other postgraduate		Higher degree (taught)		Higher degree (research)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Net graduate premiums														
Full-time students														
Other undergraduate	£176,000	£88,000	£65,000	£37,000	-£38,000	-£33,000	-£38,000	-£38,000		-£37,000		-£37,000		
First degree	£238,000	£140,000	£134,000	£90,000	£32,000	£21,000	-£37,000	-£45,000		-£45,000	-£37,000	-£45,000		
Other postgraduate		£209,000		£164,000	£44,000	£101,000	-£22,000	£41,000	-£35,000	-£30,000	-£35,000	-£30,000		-£30,000
Higher degree (taught)		£229,000	£182,000	£177,000	£81,000	£111,000	£4,000	£43,000	-£14,000	-£28,000	-£55,000	-£53,000		-£53,000
Higher degree (research)							£73,000	£106,000	£65,000	£42,000	£18,000	£19,000		-£87,000
Part-time students														
Other undergraduate		£93,000	£92,000	£57,000	-£1,000	-£1,000	-£1,000	-£1,000		-£3,000		-£1,000	-£2,000	
First degree														
Other postgraduate			£104,000	£119,000	£35,000	£77,000	£2,000	£47,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000
Higher degree (taught)						£110,000	£41,000	£71,000	£35,000	£13,000	-£7,000	-£7,000	-£7,000	
Higher degree (research)							£98,000	£92,000	£96,000	£59,000	£72,000	£50,000	£0	
Net Exchequer benefits														
Full-time students														
Other undergraduate	£159,000	£79,000	£66,000	£39,000	-£21,000	-£16,000	-£21,000	-£20,000		-£20,000		-£20,000		
First degree	£237,000	£126,000	£147,000	£87,000	£62,000	£32,000	-£19,000	-£22,000		-£22,000	-£19,000	-£21,000		
Other postgraduate		£182,000		£147,000	£72,000	£97,000	-£1,000	£46,000	-£16,000	-£12,000	-£16,000	-£12,000		-£12,000
Higher degree (taught)		£211,000	£212,000	£170,000	£127,000	£117,000	£43,000	£59,000	£25,000	£2,000	-£20,000	-£17,000		-£17,000
Higher degree (research)							£136,000	£115,000	£126,000	£63,000	£78,000	£46,000		-£42,000
Part-time students														
Other undergraduate		£72,000	£75,000	£43,000	-£2,000	-£2,000	-£2,000	-£2,000		-£1,000		-£2,000	-£2,000	
First degree														
Other postgraduate			£103,000	£97,000	£46,000	£64,000	£6,000	£39,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000
Higher degree (taught)						£94,000	£50,000	£61,000	£41,000	£14,000	-£1,000	-£1,000	-£1,000	
Higher degree (research)							£102,000	£71,000	£99,000	£45,000	£75,000	£38,000	-£1,000	

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2022-23 University of Sheffield cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at the University of Sheffield is equal to or lower than the level of previous attainment. In these instances, the analysis implicitly assumes that all calculated net returns (*before* the deduction of any foregone earnings or other (direct) costs) can only be larger or equal to zero (i.e. there can be no wage or employment penalty associated with any higher education qualification attainment). Hence, each grey-shaded cell displays only the assumed underlying direct *or* indirect costs associated with qualification attainment. ***Source: London Economics' analysis***

A2.4 Impact of the University's international students

A2.4.1 The impact of Brexit on fees and funding for EU students

The UK's exit from the European Union has had several significant impacts on the fees and funding rules for EU domiciled students studying in the UK from 2021-22 onwards.

Specifically, in relation to the **funding costs** associated with international students, in addition to any potential fee waivers and bursaries provided to international students by the University of Sheffield itself, prior to 2021-22, our analysis of the impact of educational exports would also have deducted the cost of public **teaching grants** to fund the University's provision of teaching and learning activities for EU domiciled students, as well as the costs associated with public **tuition fee support** provided to EU domiciled students studying in England. However, following the end of the Brexit transition period, only EU nationals with pre-settled or settled status in the UK are generally eligible for this funding.[177] We expect that the vast majority of first-year EU domiciled students starting HE qualifications in the UK in the 2022-23 academic year (i.e. the academic year of interest here) do *not* have settled or pre-settled status,[178] and therefore assume that there are no public teaching grants or student support costs applicable to the cohort.[179] Given these simplifying assumptions, note that our analysis is likely to *underestimate* the funding costs associated with EU domiciled students in the 2022-23 cohort.

A2.4.2 Additional information on the 2022-23 cohort of non-UK domiciled student students studying at the University of Sheffield

Table 23 presents a detailed breakdown of the 2022-23 non-UK domiciled University of Sheffield cohort, by domicile, level, and mode of study.

[177] The eligibility rules for home fee status and student finance from the 2021-22 academic year following the UK's exit from the EU (Department for Education, 2023) indicate that EU nationals with settled status can be awarded home fee status and fee and maintenance support if they have been resident in the UK (and Islands) for at least 3 years. For EU nationals with pre-settled status, the rules state that 'in practice, the Student Loans Company (SLC) will accept pre-settled status, together with ID documentation, as evidence for the purposes of awarding student support to EU, other EEA and Swiss nationals and their family members. We anticipate that providers will take the same approach when awarding home fee status where the student has 3 years' residence in the UK, Gibraltar, EEA, Switzerland or the British/EU overseas territories'.

[178] HESA does not collect data on the number of EU domiciled students that hold settled or pre-settled status in the UK. In the absence of this information, we have assumed that no EU domiciled students in the 2022-23 cohort have settled or pre-settled status. Note that HESA's definition of domicile states that a student's domicile is the 'country the student lived in for non-educational purposes before starting their Engagement (HESA, 2024c), but does *not* capture students' nationality (i.e. HESA's definition does not align exactly with the definition of EU students in the Department for Education's eligibility rules for student finance (see Department for Education, 2023)).

[179] Note that different rules apply to Irish citizens living in the UK or Ireland, as these students are covered by the UK's Common Travel Area arrangement with Ireland and are generally eligible for home fee status (and therefore supported by public teaching grants) as well as public tuition fee and maintenance support subject to meeting the eligibility criteria on the same basis as UK nationals. Our analysis does not take account of these special arrangements for students from the Republic of Ireland.

Table 23 Non-UK domiciled students in the 2022-23 cohort of University of Sheffield students, by level of study, mode of study and domicile

Level and mode of study	Domicile		
	EU	Non-EU	Total
Full-time			
Other undergraduate	0	0	**0**
First degree	50	1,300	**1,350**
Other postgraduate	5	25	**30**
Higher degree (taught)	65	4,625	**4,690**
Higher degree (research)	30	295	**325**
Total	**150**	**6,245**	**6,395**
Part-time			
Other undergraduate	0	5	**5**
First degree	0	0	**0**
Other postgraduate	25	85	**110**
Higher degree (taught)	20	35	**55**
Higher degree (research)	0	5	**5**
Total	**45**	**130**	**175**
Total			
Other undergraduate	0	5	**5**
First degree	50	1,300	**1,350**
Other postgraduate	30	110	**140**
Higher degree (taught)	85	4,660	**4,745**
Higher degree (research)	30	300	**330**
Total	**195**	**6,375**	**6,570**

Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding. 'Other undergraduate' learning includes Certificates of Higher Education, Higher National Certificates, other certificates or diplomas at undergraduate level, and undergraduate-level credits. 'Other postgraduate' learning includes Postgraduate Certificates in Education, Postgraduate Diplomas in Education, and other postgraduate-level certificates, diplomas, qualifications, and credits.
Source: London Economics' analysis based on University of Sheffield HESA data

A2.4.3 Net tuition fee income per international student

Table 24 presents estimates of the net tuition fee income per international student in the 2022-23 University of Sheffield cohort (over the entire study duration), by domicile, level of study, and mode of study.

Table 24 Net tuition fee income per international student in the 2022-23 cohort of University of Sheffield students, by level, mode, and domicile

Level and mode of study	EU domiciled students		Non-EU domiciled students	
	Full-time	Part-time	Full-time	Part-time
Other undergraduate	£21,000	£4,000	£37,000	£6,000
First degree	£31,000	-	£54,000	-
Other postgraduate	£20,000	£7,000	£22,000	£7,000
Higher degree (taught)	£38,000	£19,000	£43,000	£21,000
Higher degree (research)	£24,000	£7,000	£53,000	£21,000

Note: Gaps may arise where there are no students in the 2022-23 University of Sheffield cohort expected to complete the given qualification (of the given characteristics). All estimates are presented in 2022-23 prices, discounted to reflect net present values, and rounded to the nearest £1,000. ***Source: London Economics' analysis***

A2.4.4 Assumed average stay durations among international student entrants

As outlined in Section 4.2.1, to estimate the non-tuition fee income associated with non-UK students in the 2022-23 University of Sheffield cohort, we adjusted the estimates of non-tuition fee expenditure per academic year from the Student Income and Expenditure Survey (based on English domiciled students) to reflect longer stay durations in the UK for international students.

Following a similar approach as a study for the (former) Department for Business, Innovation and Skills (2011b), we assume that **EU domiciled postgraduate** and **non-EU domiciled undergraduate and postgraduate students** spend a larger amount of time in the UK than prescribed by the duration of the academic year (39 weeks), on average.[180] Hence, we assume that all international postgraduate students (both EU and non-EU domiciled) spend **52 weeks** per year in the UK (as they write their dissertations during the summer). Further, we assume that non-EU domiciled and EU domiciled undergraduate students spend an average of 42 and 39 weeks per year in the UK (respectively). The lower stay duration for EU undergraduate students reflects the expectation that these students, given the relative geographical proximity to their home countries and the resulting relative ease and low cost of transport, are more likely to return home during holidays. These assumptions are summarised in Table 25.

Table 25 Assumed average stay durations (in weeks per year) for non-UK domiciled students, by study level and domicile

Level of study	Domicile	
	EU	Non-EU
Undergraduate	39 weeks	42 weeks
Postgraduate	52 weeks	52 weeks

Source: London Economics' analysis based on Department for Business, Innovation and Skills (2011b)

A2.4.5 Non-fee income per international student

Table 26 presents estimates of the non-tuition fee income per international student in the 2022-23 University of Sheffield cohort (over the entire study duration), by domicile, level of study, and mode of study.

[180] There may be significant variation around these assumed average stay durations depending on individual students' circumstances, such as country of origin, parental income etc.

Table 26 Non-fee income per international student in the 2022-23 cohort of University of Sheffield students, by level, mode, and domicile

Level and mode of study	EU domiciled students		Non-EU domiciled students	
	Full-time	Part-time	Full-time	Part-time
Other undergraduate	£27,000	£17,000	£29,000	£18,000
First degree	£40,000	-	£43,000	-
Other postgraduate	£18,000	£23,000	£18,000	£23,000
Higher degree (taught)	£36,000	£67,000	£36,000	£67,000
Higher degree (research)	£69,000	£108,000	£69,000	£108,000

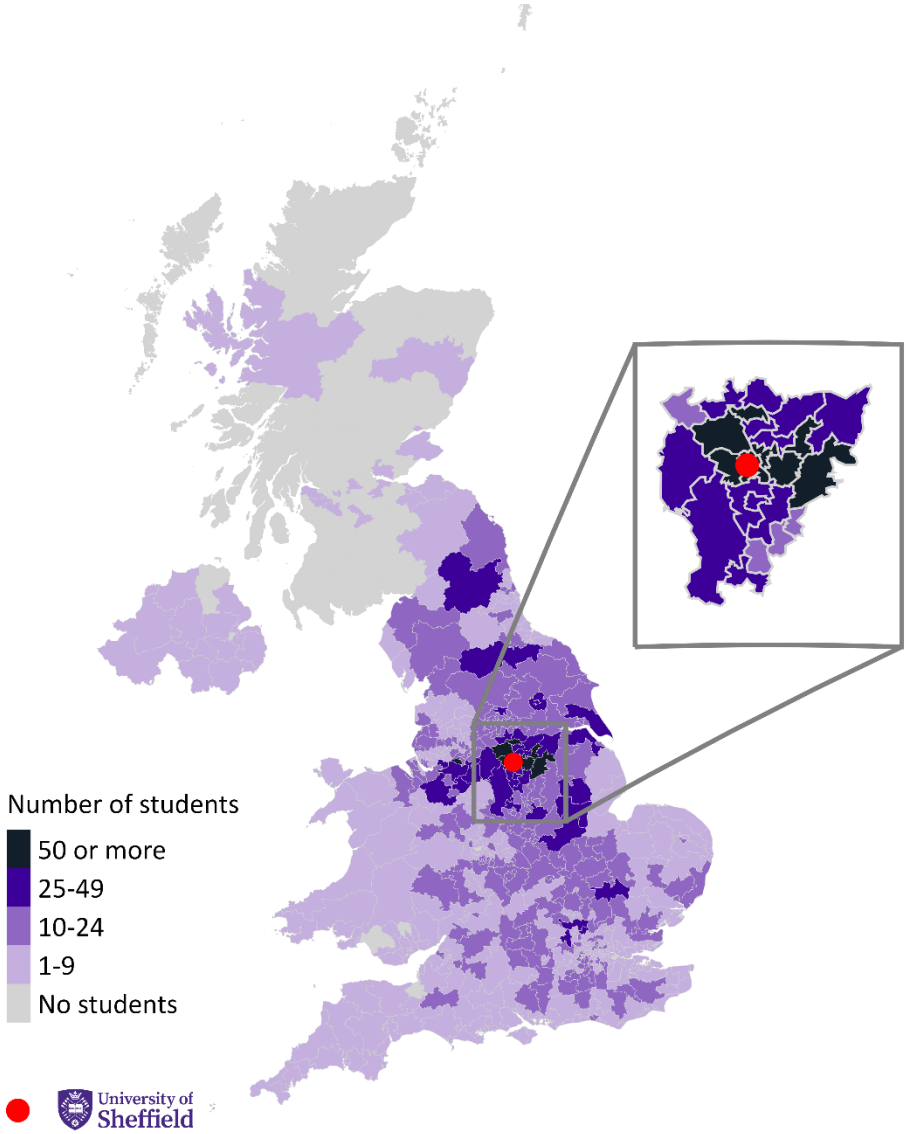
Note: Gaps may arise where there are no students in the 2022-23 University of Sheffield cohort expected to complete the given qualification (of the given characteristics). All estimates are presented in 2022-23 prices, discounted to reflect net present values, and rounded to the nearest £1,000. ***Source: London Economics' analysis***

A2.5 Geographic breakdowns at the Parliamentary Constituency Level

A2.5.1 The 2022-23 cohort of domestic University of Sheffield students by parliamentary constituency

This section provides an additional geographic breakdown of the 2022-23 cohort of domestic University of Sheffield students by **parliamentary constituency**. Figure 46 presents the distribution of the University of Sheffield's 2022-23 cohort of UK domiciled students by domicile at the parliamentary constituency level. The map illustrates that 235 students were from Sheffield **C**entral (**3%**), with **165** coming from **Sheffield Hallam** (**2%**), **130** from **Sheffield Heeley** (**2%**), **125** from **Sheffield Brightside and Hillsborough** (**2%**), **105** from **Rotherham** (**1%**), **100** from **Sheffield South East** (**1%**), **70** from **Rother Valley** (**1%**) and **Penistone and Stocksbridge** (**1%**). Additionally, **55** students were from **Doncaster Central** (**1%**), and **50** students were from **Bassetlaw** (**1%**), **Barnsley North** (**1%**), **Chesterfield** (**1%**), **North East Derbyshire** (**1%**), **Barnsley South** (**1%**), and **Rawmarsh and Conisbrough** (**1%**).

Figure 46 UK domiciled students in the 2022-23 cohort of University of Sheffield students, by parliamentary constituency of domicile



Note: LE received HESA data on 7,091 first year undergraduate UK-domiciled students from the University of Sheffield. Students with an invalid or missing postcode (18 in total) were excluded. This figure is thus based on the postcodes of 7,073 students.
Source: London Economics' analysis based on data from the University of Sheffield, and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data ©Crown copyright and database right 2024.

A2.5.2 The University's procurement expenditure and staff headcount by parliamentary constituency

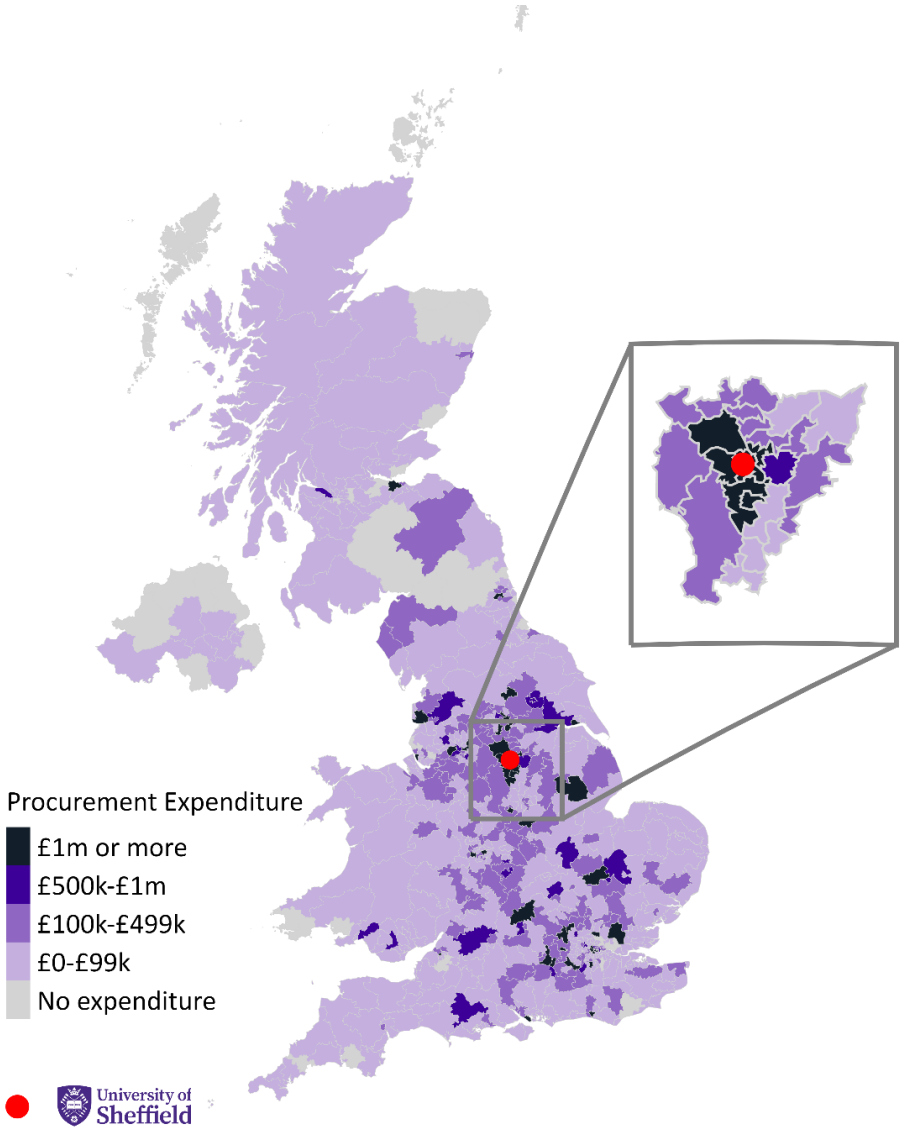
This section provides an additional geographic breakdown of the University of Sheffield's procurement expenditures, staff salary expenditures, and the number of staff by **parliamentary constituency**.

Figure 47 presents the distribution of the University of Sheffield's UK procurement expenditure (based on invoice data for 2022-23) by parliamentary constituency. Approximately **£10 million** (**3%**) was spent in **Sheffield Central** and **Sheffield Brightside and Hillsborough**, with **£7 million** spent in **Sheffield South East** (**2%**), and **£6.5 million** spent in **Sheffield Hallam** (**2%**). Additionally, **£4 million** was spent in **Penistone and Stocksbridge** (**1%**), **£2.3 million** in **Chesterfield** (**1%**), **£1.6 million** in **Rotherham** (**1%**) and in **North East Derbyshire** (**1%**), **£1.4 million** in **Sheffield Heeley** (**0.5%**), **£0.8**

million in **Rother Valley** (**0.3%**), **£0.5 million** in **High Peak** (**0.2%**), and **£0.4 million** in **Derbyshire Dales** (**0.1%**).

Figure 48 illustrates the distribution of the University's staff headcount by parliamentary constituency (based on the postcode of employees' home addresses) in 2022-23. Approximately **2,085** staff lived in **Sheffield Hallam** (**23%**), with **2,040** living in **Sheffield Central** (**23%**). **990** in **Sheffield Heeley** (**11%**), **630** in **Sheffield Brightside and Hillsborough** (**7%**), **525** in **Sheffield South East** (**6%**), and **400** in **Penistone and Stocksbridge** (**4%**). Additionally, **235** staff members lived in **North East Derbyshire** (**3%**), **230** in Rotherham (**3%**), **205** in **Rother Valley** (**2%**), **135** in **Derbyshire Dales** (**2%**), and **135** in **Chesterfield** (**1%**).

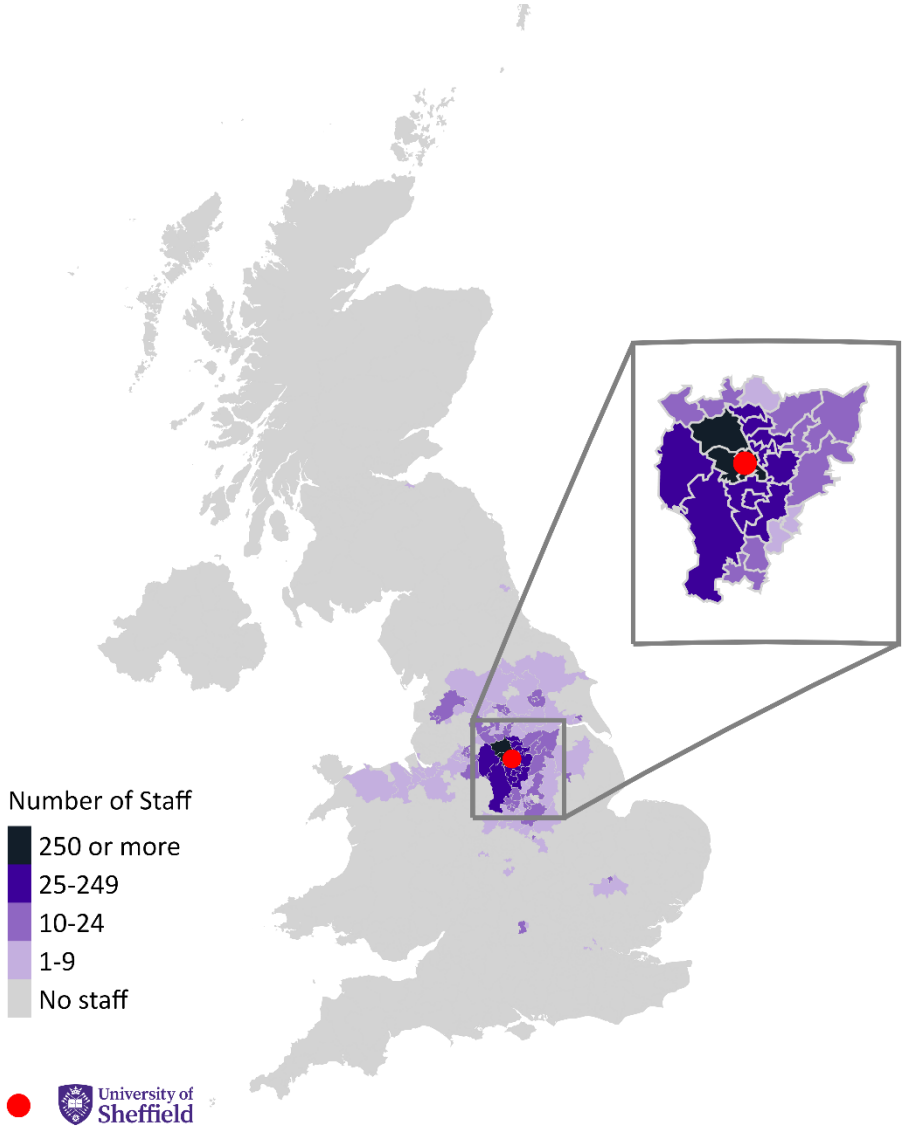
Figure 47 Distribution of the University of Sheffield's procurement expenditure in 2022-23 by parliamentary constituency (of invoice address)



Note: LE received postcode data on £326m of procurement expenditure for the University of Sheffield. Expenditure with a missing or invalid postcode (£4m in total) and any overseas expenditure (£32m in total) was excluded. This figure is thus based on the postcodes of £290m non-staff (procurement expenditure) from the University of Sheffield.

Source: London Economics' analysis based on data from the University of Sheffield, and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data ©Crown copyright and database right 2024.

Figure 48 Distribution of the University of Sheffield's staff (in headcount) in 2022-23 by parliamentary constituency



Note: LE received data on a total of 9,764 staff from the University of Sheffield. Staff with a postcode district that is outside of the UK, invalid or is unknown (180) was excluded. In addition, staff in constituencies with fewer than 5 staff (555) were not included in the data. The figure is thus based on 9,029 staff for which the postcode districts can be mapped. The 'number of staff' is based on the number of staff who were paid at any point during the 2022-23 year, which means that the numbers are not reflective of an average headcount.
Source: London Economics' analysis based on data from the University of Sheffield, and the Office for National Statistics. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data ©Crown copyright and database right 2024.

LE
London
Economics

Somerset House, New Wing, Strand
London, WC2R 1LA, United Kingdom
info@londoneconomics.co.uk
londoneconomics.co.uk
@LE_Education @LondonEconomics
+44 (0)20 3701 7700