The economic and social impact of The University of Manchester

Final Report for The University of Manchester

February 2025

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Executive Summary

London Economics were commissioned by The University of Manchester to analyse the economic and social impact of the University's activities, focusing on the 2022-23 academic year. Specifically, the analysis considers the impact associated with the University's research and knowledge exchange activities, teaching and learning activities, educational exports, operating and capital expenditures, and its contribution to tourism.

The aggregate economic impact of The University of Manchester

The total economic impact on the UK economy associated with The University of Manchester's activities in 2022-23 was estimated at approximately **£7.3 billion** (see Table 1).[1] In terms of the components of this impact, the value of the University's **research and knowledge exchange activities** stood at **£3.0 billion** (**42%** of the total), while the impact associated with the University's **teaching and learning activities** accounted for **£1.6 billion** (**22%**). The impact generated by the **operating and capital expenditures of the University** was estimated to be **£881 million** (**12%**), and the impact of the University's **international students** accounted for **£1.6 billion** (**22%**). The remaining **2%** of the economic impact (**£144 million**) was from the impact of **tourism** activities associated with the University.

The total economic impact associated with The University of Manchester's activities in 2022-23 stood at £7.3 billion.

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

Type of impact		£m	%
	Impact of research and knowledge exchange	**£3,050m**	**42%**
	Research activities	£2,471m	34%
	Knowledge exchange activities	£578m	8%
	Impact of teaching and learning	**£1,583m**	**22%**
	Students	£778m	11%
	Exchequer	£805m	11%
	Impact of international students	**£1,606m**	**22%**
	Tuition fee income	£920m	13%
	Non-tuition fee income	£686m	9%
	Impact of the University's spending	**£881m**	**12%**
	Direct impact	£364m	5%
	Indirect and induced impact	£517m	7%
	Impact of tourism	**£144m**	**2%**
	Direct impact	£59m	1%
	Indirect and induced impact	£84m	1%
Total economic impact		**£7,263m**	**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. The percentage figures in the brackets represent the proportion of total impact in that region associated with the strand/sub-strand of analysis. ***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 knowledge exchange activities, educational exports, institutional expenditures and related tourism 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.

Compared to The University of Manchester's relevant operating costs of approximately **£1.1 billion** in 2022-23,[2] the total impact of the University's activities on the UK economy was estimated at **£7.3 billion**, which corresponds to a **benefit-to-cost ratio of approximately 6.4:1**.

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 **Greater Manchester**, and on the wider **North West**. Specifically, we estimated the direct, indirect and induced economic impacts of the University's research and knowledge exchange activities, the spending of the University's international students, the University's institutional expenditures, and contribution to tourism in the Greater Manchester and North West economies.[3] Approximately **£3.7 billion** (**51%**) of The University of Manchester's total impact can therefore be disaggregated geographically, of which approximately **£2.1 billion** (**56%**) occurred in **Greater Manchester**, and **£2.5 billion** (**68%**) was generated throughout the **North West as a whole**. Compared to the University's relevant operating costs of approximately **£1.1 billion** in 2022-23, this suggests that every £1 million of the University's operational expenditure generates **£6.4 million** of economic output in the UK, of which at least **£1.8 million** is generated in **Greater Manchester**, **£0.4 million** in the **rest of the North West** and **£4.1 million** in the **rest of the UK**.[4]

In terms of the number of full-time equivalent (FTE) jobs supported, the University itself directly employed **10,495** FTE staff in 2022-23, which equates to around **4%** of total employment in Manchester.[5] The analysis indicates that the University's activities supported a total of **31,310** FTE jobs across the UK economy in 2022-23, of which **19,050** were located in **Greater Manchester**, and **22,415** were supported throughout the **North West as a whole**. Compared to the **10,495** FTE jobs directly provided by the University, this suggests that **for every 100 FTE jobs directly provided by the University, around 198 *additional* FTE jobs are created outside the University**, of which **82** are located in Greater Manchester, **32** in the rest of the North West and **85** in the rest of the UK.[6]

The impact of The University of Manchester's research and knowledge exchange activities

The estimated impact of The University of Manchester's research and knowledge exchange activities in 2022-23 stood at £3.0 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 **£377 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 **£267 million** of Exchequer costs and adjusting for double-

[2] This relates to the University's total operating expenditure, excluding capital expenditure, depreciation and amortisation.
[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] Some of this £4.1 million may take place in Greater Manchester and the North West (e.g. through graduate mobility or productivity improvements), but it is not possible to attribute this impact to a specific UK region. Totals do not sum due to rounding.
[5] Based on the University's **11,375** staff (in headcount terms) in 2022-23, compared to total employment in Manchester of **281,300** between July 2022 and June 2023 (based on data from the Annual Population Survey (Nomis, 2024a).
[6] Totals do not sum due to rounding.

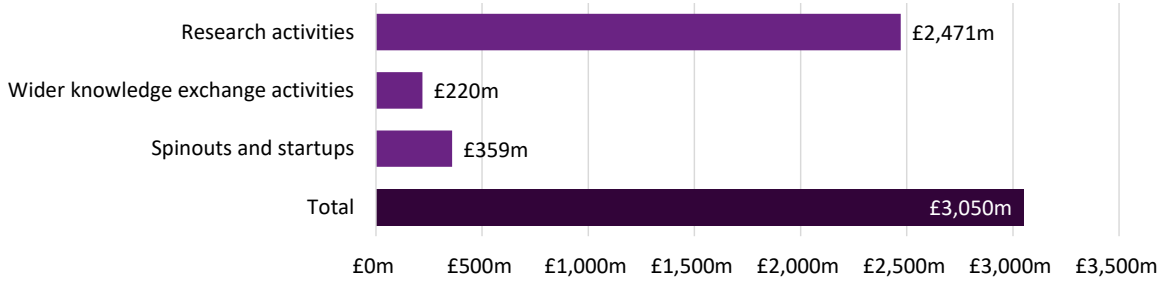
counting with other strands, the **net direct, indirect, and induced impact of the University's research** was estimated at **£526 million**.

In addition, existing academic literature[7] 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 **5.95**, suggesting that **every £1 invested in The University of Manchester's research activities generates an additional annual economic output of £5.95 across the UK economy through positive productivity spillovers to the UK private sector**, resulting in total estimated spillovers of **£1.9 billion**. This results in a total economic impact associated with the University's research activities of **£2.5 billion** in 2022-23.

In addition to The University of Manchester'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 343 **spinout** and **start-up companies** (of which 175 were headquartered in Greater Manchester, with a turnover of **£129 million** and employing **1,195** FTE staff); **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. The analysis estimates that these knowledge exchange and commercialisation activities generated a total of **£578 million** of impact across the UK economy in 2022-23.

The combined economic impact associated with The University of Manchester's research and knowledge exchange activities in 2022-23 was therefore estimated to be **£3.0 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 **10,760** FTE jobs, of which **6,040** are located in **Greater Manchester**, with a total of **7,305** jobs supported throughout the **North West as a whole**.

Figure 1 Total economic impact of The University of Manchester'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 Manchester's teaching and learning activities

With the University ranking 6th in the UK and 34th in the world in the QS World University Rankings 2025,[8] and as the third largest higher education institution in the UK,[9] The University of Manchester's teaching and learning activities provide substantial benefits to the UK economy. The

[7] See Haskel and Wallis (2010), and Haskel et al. (2014a).
[8] See QS (2024).
[9] Based on student data published by the Higher Education Statistics Agency (see HESA, 2024e).

analysis of the impact of these activities estimates the **enhanced employment and earnings benefits to graduates** and the **additional taxation receipts to the public purse** associated with higher education qualification attainment at the University.[10] The analysis is tailored to the characteristics of the **9,805** UK domiciled students who started a higher education qualification at the University in the 2022-23 academic year. Of these students, around **1 in 4** (**23%**) came to the University from **Greater Manchester** with a further **1 in 4** (**24%**) from **London and the South East** (combined).

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[11] qualification as their highest level of prior attainment) stands at approximately **£97,000** (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 **£102,000**.[12]

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 Manchester 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 **£1.58 billion** (see Table 2). This total is split roughly evenly between the Exchequer and students/graduates: **£805 million** (**51%**) of the total economic benefit is accrued by the Exchequer, while the remaining **£778 million** (**49%**) is accrued by students/graduates undertaking qualifications at The University of Manchester.

The total economic impact of teaching and learning generated by the 2022-23 cohort of University of Manchester students stood at £1.6 billion.

[10] 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 Manchester alumni. Rather, the findings from the analysis are adjusted to reflect the characteristics of the 2022-23 cohort of University of Manchester 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).

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

[12] 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 Manchester'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	**£731m**	**£30m**	**£7m**	**£10m**	**£778m**
Undergraduate	£535m	£23m	£3m	£8m	**£568m**
Postgraduate	£196m	£7m	£4m	£2m	**£210m**
Exchequer	**£756m**	**£31m**	**£7m**	**£11m**	**£805m**
Undergraduate	£558m	£24m	£3m	£9m	**£594m**
Postgraduate	£198m	£7m	£4m	£2m	**£211m**
Total	**£1,487m**	**£61m**	**£14m**	**£22m**	**£1,583m**
Undergraduate	£1,092m	£47m	£6m	£17m	**£1,162m**
Postgraduate	£394m	£14m	£8m	£5m	**£421m**

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 Manchester's educational exports

With The University of Manchester 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 **9,580** non-UK domiciled students who started qualifications at The University of Manchester in the 2022-23 academic year. Of these students, **390** (**4%**) were EU domiciled, and **9,190** (**96%**) were from non-EU jurisdictions.

Combining the estimated tuition fee income (net of The University of Manchester'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 **£634 million**. Around **56%** of this income (**£357 million**) was generated from international students' (net) tuition fee expenditure accrued by The University of Manchester, while the remaining **44%** (**£277 million**) was generated from these students' non-tuition fee expenditure (e.g. including costs related to accommodation, subsistence, course-related purchases, and travel).

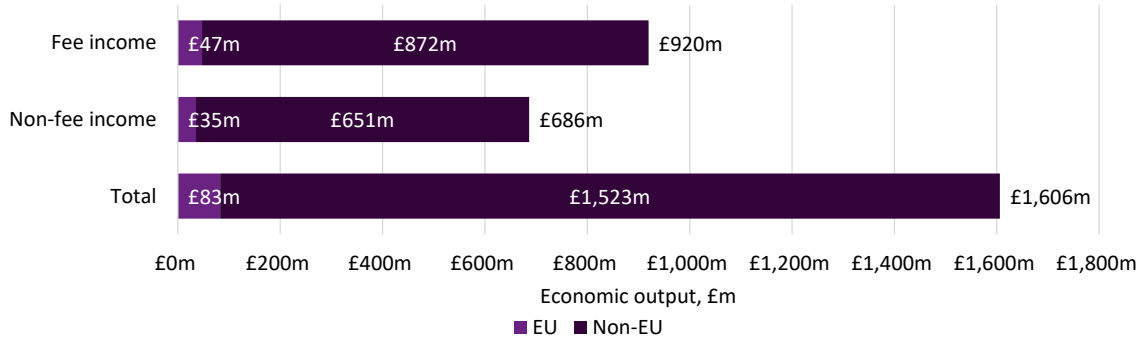
The total (direct, indirect, and induced) economic impact associated with this income was again estimated using relevant economic multipliers, identifying the extent to which the expenditures of international students generate additional activity throughout the UK economy. We thus estimate that the **total 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 Manchester cohort amounts to **£1.6 billion**. Of this total, **£920 million** was associated with international

The impact of the export income generated by the 2022-23 University of Manchester cohort of international students stood at £1.6 billion.

students' (net) **tuition fees**, and **£686 million** was associated with their non-fee expenditures over the duration of their studies at The University of Manchester (see Figure 2).

In employment terms, these educational exports supported an estimated **13,180 full-time equivalent jobs** across the UK as a whole, including **8,210** supported in **Greater Manchester** and a total of **9,590** jobs supported throughout the **North West as a whole**.

Figure 2 Impact of The University of Manchester'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 Manchester's expenditure

The impact of the University's expenditure on the UK economy in 2022-23 stood at £881 million.

The University of Manchester's significant physical footprint supports jobs and promotes economic growth throughout Greater Manchester 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 University of Manchester incurred a total of **£1.2 billion** of expenditure (including **£1.1 billion** of operating expenditure[13] and **£79 million** of capital expenditure). From this total, we deducted **£857 million** to avoid double-counting across other areas of economic impact, which resulted in a net direct impact of **£364 million**.

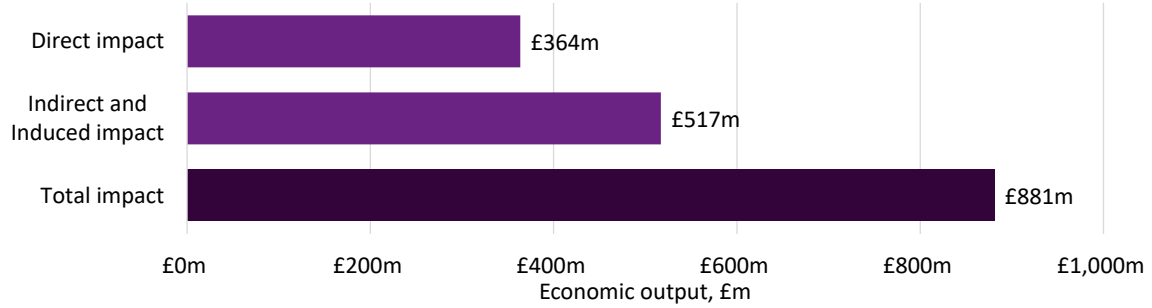
In addition, the University's income in 2022-23 stood at **£1.3 billion**, which was larger than that of Manchester City, Manchester United, or Manchester Airports Group.[14]

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 **£881 million** (see Figure 3). The majority of this impact (**£499 million, 57%**) occurred in **Greater Manchester**, and a total of **£600 million** (**68%**) was accrued throughout the **North West**

[13] The total operational expenditure (excluding capital expenditure) of the University stood at **£1.2 billion**. From this, for the purpose of the analysis, we excluded a total of **£96 million** in depreciation and amortisation costs, 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] See here, here and here for the relevant 2022-23 financial statements.

as a whole. In addition, around one-third (**31%**) of the University's procurement expenditure took place in Greater Manchester.

Figure 3 Impact associated with The University of Manchester'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

In terms of the number of FTE jobs supported, the University's expenditures[15] supported a total of **6,065** FTE jobs across the UK economy in the 2022-23 academic year, of which **3,960** were based in **Greater Manchester**, while **4,550** jobs were supported across the **North West as a whole**.

In total, the University employed **10,495** FTE staff in 2022-23, of which around **three-quarters** (**74%**) lived in Greater Manchester.

The impact of The University of Manchester's contribution to tourism

As a final strand of impact, the University attracts a range of visitors to Manchester, including business visitors, friends and family visiting the University's staff and students, and participants in study trips to the University.

To understand the economic impact associated with the University's contribution to tourism through the attraction of these visitors, we estimated the number of visitors to Manchester in 2022-23 that were associated with the University's presence. The analysis focuses only on visits to Manchester that involved overnight stays by visitors from overseas, as it is assumed that any domestic (day or overnight) visits to Manchester would have displaced activity from other regions of the UK (and should not be considered 'additional' to the UK economy). Out of a total of **1,230,000** overnight visits from overseas visitors to Manchester, we estimate that approximately **51,000** resulted from the University's activities. Combined with information on the average trip expenditure per visitor, the **direct impact** of the University's contribution to tourism was estimated at **£59 million**.

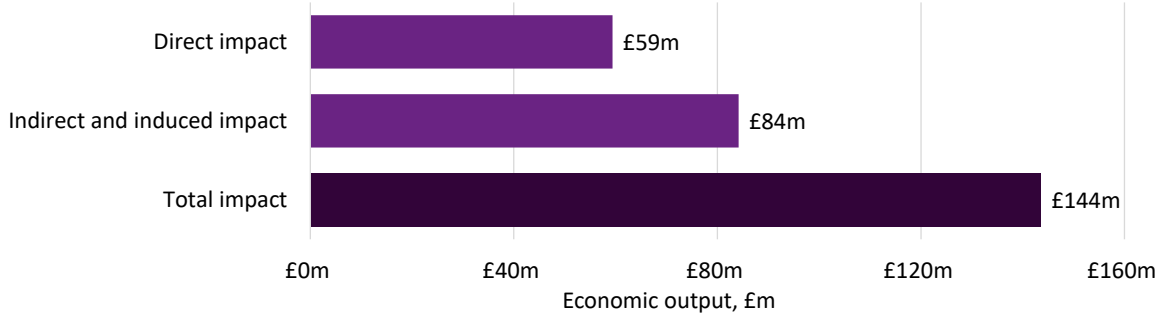
[15] Again, after adjusting for double-counting with the other strands of economic impact considered here.

As with the University's research and knowledge exchange activities, educational exports, and the spending of the University, this visitor expenditure results in subsequent rounds of expenditure throughout the UK economy. Again, this is measured by the **indirect, and induced impacts** associated with these expenditures, estimated by applying relevant economic multipliers to the direct impact. Using this approach, the analysis indicates that the **total direct, indirect, and induced impact** of the visitor expenditure generated by The University of Manchester stood at approximately **£144 million** (see Figure 4).

The impact of the University's contribution to tourism in 2022-23 stood at £144 million.

In terms of the number of FTE jobs supported, the University's contribution to tourism activities supported an estimated **1,295** FTE jobs across the UK economy in the 2022-23 academic year, of which **840** were based in **Greater Manchester**, while **970** jobs were supported across the **North West as a whole**.

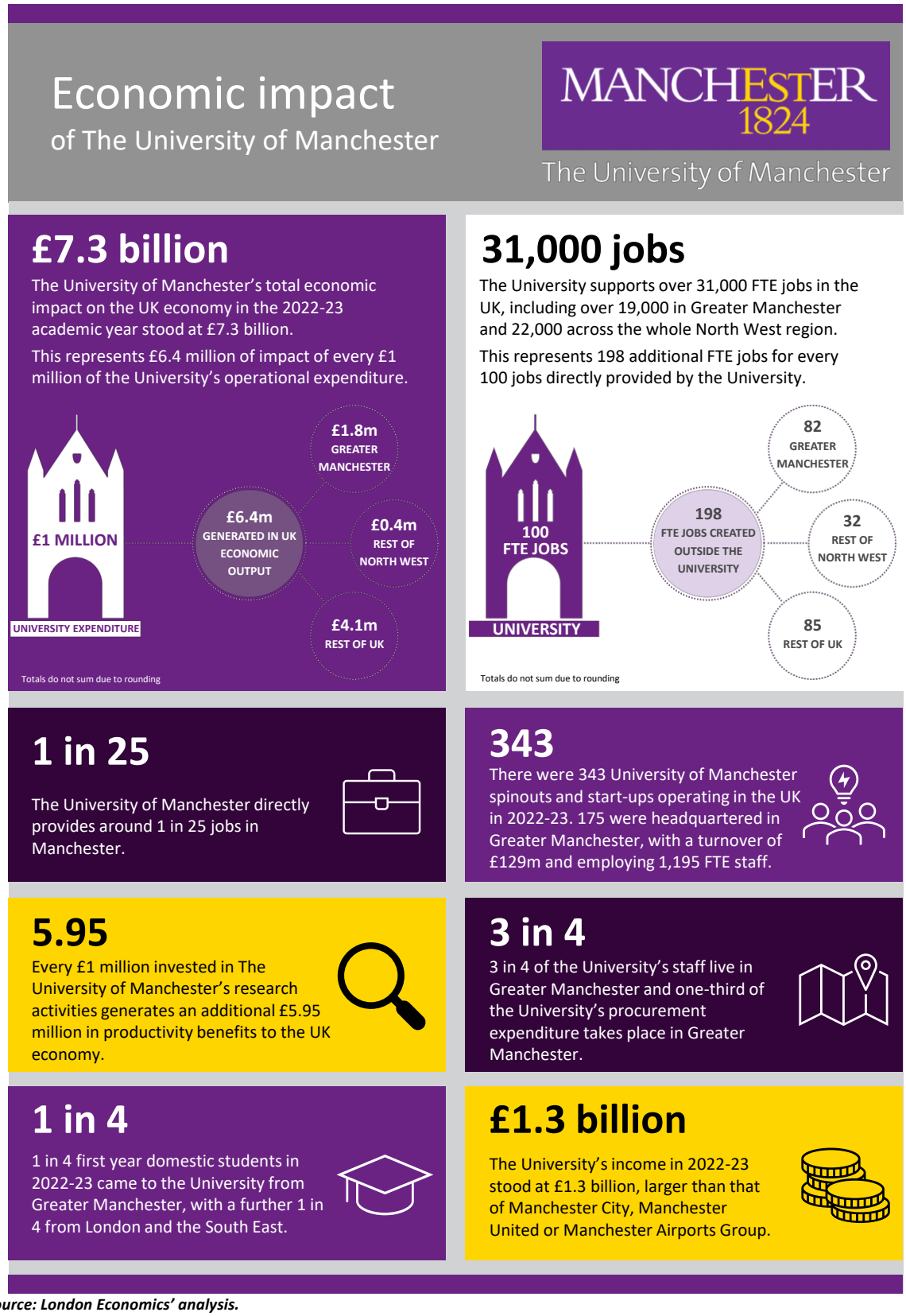
Figure 4 Impact associated with The University of Manchester's contribution to tourism in 2022-23 (£m)



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

Figure 5 summarises a range of key impact statistics for The University of Manchester in the 2022-23 academic year.

Figure 5 The University of Manchester's key statistics from 2022-23



Source: London Economics' analysis.

1 Introduction

London Economics were commissioned to assess the **economic and social impact of The University of Manchester on the United Kingdom**, focusing on the 2022-23 academic year. As the third largest higher education institution in the UK,[16] 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 Manchester's **research and knowledge exchange activities**;
- The economic contribution of the University's provision of **teaching and learning**;
- The impact of the University's contribution to **educational exports**;
- The impact of the University's **operating and capital expenditures**; and
- The impact of the **tourism activity** associated with The University of Manchester.

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

Section 2 focuses on the impact of The University of Manchester'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; facilities 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 Manchester. 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 **9,805** 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 **9,580** international students commencing their studies at The University of Manchester 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 Greater Manchester 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.

[16] Based on student data published by the Higher Education Statistics Agency (see HESA, 2024e).

The University also attracts a range of visitors to Manchester, including business visitors, friends and family visiting the University's staff and students, and participants in study trips to the University. The **impact of the tourism expenditures of these visitors** on the UK economy is estimated in **Section 6**.

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

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

This section outlines our estimates of the economic impact of The University of Manchester'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 Manchester's research

In this section, we outline our analysis of the **economic impact of The University of Manchester'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 Manchester 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 Manchester's research income in 2022-23

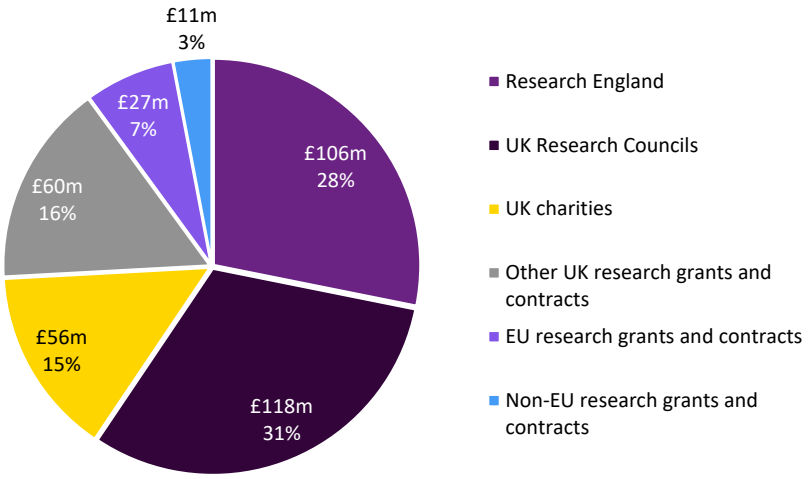
To estimate the **direct impact** generated by The University of Manchester's research activities, we used information from the Higher Education Statistics Agency (HESA) on the total research-related income accrued by the University in the 2022-23 academic year. This includes:

- 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.
  - **Non-EU sources**, including charities, industry and commerce, and other sources.
- **Recurrent research funding** allocated to the University by Research England.

Aggregating across these sources, the total research-related income accrued by The University of Manchester in the 2022-23 academic year stood at **£377 million** (see Figure 6).[17] Approximately **£106 million** (**28%**) of this income was received through recurrent research grant funding from **Research England**, with an additional **£118 million** (**31%**) received from the **UK Research Councils**, **£56 million** (**15%**) from **UK charities**, and **£60 million** (**16%**) from **other UK sources**.[18] In addition, in terms of funding from international sources, **£27 million** (**7%**) of the University's research-related income was derived from **EU research grants and contracts**, and the remaining **£11 million** (**3%**) was from **non-EU sources**.

[17] 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).
[18] This income from 'other UK sources' includes **£43 million** from UK central government bodies, local authorities, and health and hospital authorities; **£16 million** from UK industry, commerce and public corporations; and **£1 million** from other sources.

Figure 6 Research income received by The University of Manchester in 2022-23, £m by source



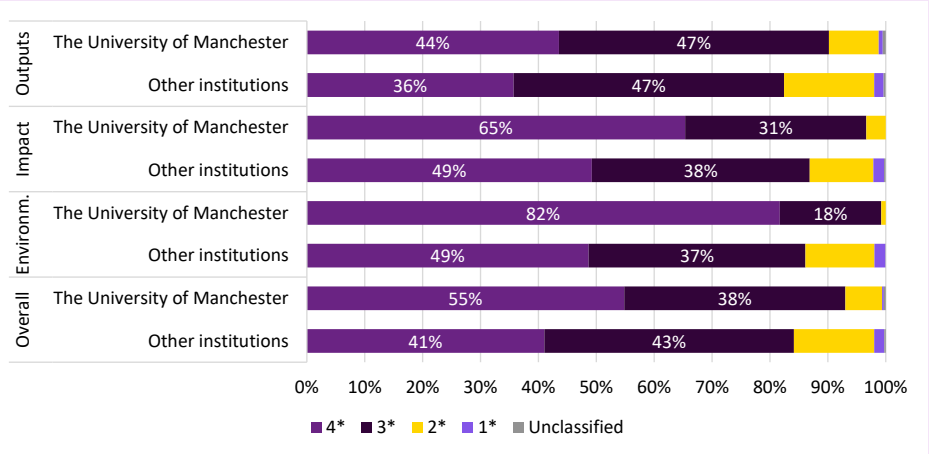
Note: All values are presented in 2022-23 prices and rounded to the nearest £1 million.
Source: London Economics' analysis based on data provided by the Higher Education Statistics Agency (HESA, 2024a)

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

The results from the 2021 Research Excellence Framework (REF)[19] highlight the University's world-leading research contributions.

Overall, over half (**55%**) of the University's submissions were rated as **4* (world-leading)** and **38%** were rated as **3* (internationally excellent)**, compared to **41%** and **43%** respectively across all other UK higher education institutions (HEIs; see Figure 7). The University performs strongly across all aspects of the REF, with **99%** of the University's submissions rated as 4* or 3* for **quality of its research environment** (compared to **86%** at all other institutions), **97%** rated as 4* or 3* for the **impact of its research** (compared to **87%** for all other institutions) and **90%** rated as 4* or 3* for **quality of research outputs** (compared to **82%** for all other institutions).

Figure 7 REF 2021 ratings for The University of Manchester vs. all other UK higher education institutions



Source: London Economics' analysis of REF 2021 results (see Research Excellence Framework (2022))

[19] See Research Excellence Framework (2022).

The University of Manchester's specific strengths in certain areas were highlighted by the University **ranking top in the UK in terms of overall research quality**[20] for Physics; **2nd** for Allied Health Professions, Dentistry, Nursing and Pharmacy; **2nd** for Classics; **4th** for Sociology; and **4th** for Biological Sciences. The University also ranked in the **top 10 in the UK for overall research quality** for a further **18** subjects. In addition, the University **ranked within the top 10 institutions in terms of its research impact**[21] in **17** subjects (including Classics; Art and Design; Philosophy; History; English Language and Literature; Modern Languages and Linguistics; Area Studies; Sociology; Business and Management Studies; Economics and Econometrics; Physics; Earth Systems and Environmental Sciences; Biological Sciences; Psychology, Psychiatry and Neuroscience; and Allied Health Professions, Dentistry, Nursing and Pharmacy).

2.1.2 Adjustment for double counting with knowledge exchange activities

The **£377 million** of research income received by The University of Manchester in 2022-23 includes the income generated by the University from its **collaborative research** and **contract research**.[22] However, the income from these two activities is *also* recorded separately within HESA's Higher Education Business and Community Interaction Survey (HE-BCI) data,[23] 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).

The income from these sources is included in *both* the data on the University's research-related income and 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 **£48 million** out of the **£377 million** of total research income received by the University in 2022-23.[24]
- In terms of **contract research**, we account for this activity within the impact of The University of Manchester's wider knowledge exchange activities (see Section 2.2). Therefore, to avoid double-counting, we deduct **£50 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 **£327 million**.

[20] Based on the proportion of submissions that were rated 4* in terms of overall research quality.
[21] This income from 'other UK sources' includes **£43 million** from UK central government bodies, local authorities, and health and hospital authorities; **£16 million** from UK industry, commerce and public corporations; and **£1 million** from other sources.
[22] 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.
[23] See Higher Education Statistics Agency (2024b).
[24] The **£48 million** in collaborative research funding is made up of **£44 million** of public funding and **£4 million** of collaborative cash contributions. Note that any income in terms of in-kind contributions to collaborative research (**£10 million**) is excluded here, since these contributions do not represent a cash transaction for which we can robustly apply economic multipliers.

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

2.1.3 Total direct, indirect, and induced impact of The University of Manchester's research activity

The analysis then assesses the total **direct, indirect, and induced economic impacts** on the UK economy associated with The University of Manchester's research activity in 2022-23. While the direct impact reflects the research income that the University received in the 2022-23 academic year,[25] 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 Manchester 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 Manchester'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).
- **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.[26]

The direct, indirect, and induced impacts are measured in terms of monetary economic output,[27] gross value added (GVA),[28] and full-time equivalent (FTE) employment supported.[29] In addition to measuring these impacts on the UK economy as a whole, the analysis is broken down by geographic region[30] and sector.

[25] Net of contract research income, as discussed above.
[26] 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 Manchester's research activities in *gross* terms.
[27] In this analysis, economic output is equivalent to income or expenditure (e.g. the direct research income that The University of Manchester accrued in 2022-23).
[28] 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).
[29] Full-time equivalent jobs represent the total number of full-time jobs supported, accounting for part-time positions on an equivalent full-time basis.
[30] 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 (2024a)). Within the overall North West region, the analysis thus distinguishes between Cumbria, Cheshire, Greater Manchester (where The University of Manchester is located), Lancashire and Merseyside.

These impacts of The University of Manchester's research activities were estimated using **economic multipliers** derived from Input-Output tables,[31] which measure the total production output of each 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[32]) with a range of regional-level data to achieve a granular breakdown by sector *and* region.[33]

To estimate the total direct, indirect, and induced impact, we apply the relevant average economic multipliers[34] derived from the Input-Output analysis associated with organisations in the **government, health, and education sector in Greater Manchester**.[35] These multipliers (for the impact on Greater Manchester, all of the North West, 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 Manchester generates a *total* of **£2.42 million** of impact throughout the UK economy on average, of which **£1.37 million** is accrued in Greater Manchester (and **£1.65 million** is generated throughout the whole of the North West). In terms of employment, we assume that, for every **1,000** FTE staff employed directly by The University of Manchester, a total of **1,940** staff are supported throughout the UK, of which **1,270** are supported in Greater Manchester (and a total of **1,460** are supported throughout the North West as a whole).

Table 3 Economic multipliers associated with The University of Manchester's research activities

Location of impact	Output	GVA	FTE employment
Greater Manchester	1.37	1.32	1.27
North West	1.65	1.56	1.46
Total UK	2.42	2.22	1.94

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 Manchester'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), educational exports (see Section 4), operational and capital expenditures (see Section 5), and its contribution to tourism (see Section 6).

Adjusting for public costs

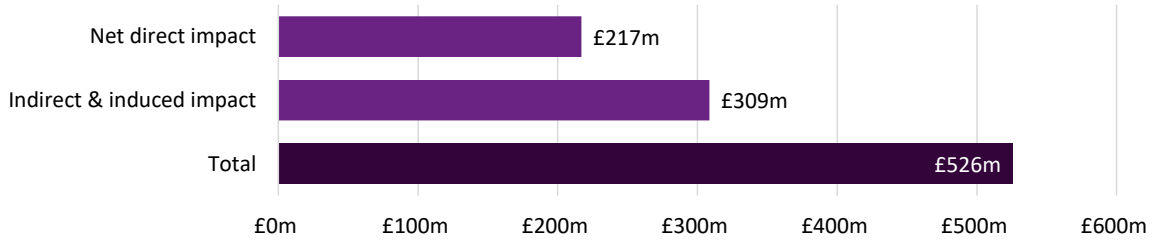
To arrive at the ***net* total impact** of the University's research activities on the UK economy (**net of public costs**), we deducted the **costs to the public purse** of funding these activities. These public

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

costs include the funding provided to the University by the UK Research Councils (**£118 million**), recurrent research grants provided by Research England (**£106 million**), and other research income from UK central government bodies, local authorities, and health and hospital authorities (**£43 million**).[36] These total public purse costs (**£267 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 Manchester's research activity in 2022-23 was estimated at **£526 million**, with a (net) direct impact of **£217 million** (see Figure 8).

In terms of GVA and FTE employment, the total direct, indirect, and induced impact associated with the University's research was estimated at **£306 million** and **4,800** FTE jobs, respectively.[37]

Figure 8 Net direct, indirect, and induced impacts associated with The University of Manchester'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

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.[38] For example, spillovers are enabled through direct R&D collaborations between universities and firms (such as Knowledge Transfer Partnerships), the publication and

[36] This is included within the **£60 million** of income from 'other UK research grants and contracts' in Figure 6 (which also includes **£16 million** of income from UK industry and **£1 million** from other UK sources).
[37] 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 Greater Manchester'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 Manchester are the same as for other institutions operating in Greater Manchester'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).
[38] 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.

dissemination of research findings, or through university graduates entering the labour market and passing on their knowledge to their employers.

In order to estimate the productivity spillovers associated with The University of Manchester'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 6). Specifically, we assign a multiplier of **12.7**[39] to the University's research funding from **UK Research Councils and UK charities**[40] (amounting to **£173 million**), and a multiplier of **0.2**[41] to **all other research funding** received by the University in 2022-23 (amounting to **£204 million**).[42] 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 Manchester's research activities in 2022-23 of approximately **5.95** – i.e. **every £1 invested in the University's research activities generates additional annual economic output of £5.95 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.[43] Applying this weighted average multiplier to the direct impact of research (i.e. **£327 million**, excluding contract research),[44] we estimate that the research conducted by The University of Manchester in 2022-23 resulted in **total market sector productivity spillovers** of **£1,946 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)[45] 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,[46, 47] 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

[39] This is based on a key study by Haskel and Wallis (2010). For more detail, see Box 2.
[40] Where the vast majority of funding provided by UK charities relates to projects commissioned through an open competitive process.
[41] This is based on a study by Haskel et al. (2014a). Again, see Box 2 for more detail.
[42] 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.
[43] 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 Manchester 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 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.
[44] Note that by applying this weighted average multiplier, we implicitly assume that the source of The University of Manchester's contract research income is representative of all other research income received by the University (in the absence of information related to the source of its contract research income).
[45] Also, see Imperial College London (2010) for a summary of Haskel and Wallis's findings.
[46] 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.
[47] This is undertaken by regressing total factor productivity growth in the UK on various measures of public sector R&D spending.

spillovers from public R&D expenditure originating from the UK Research Councils.[48] 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.[49] 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),[50] interacted with measures of industry research activity, and total factor productivity within the different market sectors.[51] Their findings imply a 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)**.[52]

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 it is currently not possible to replicate and update the analysis using more recent data.[53] Therefore, aside from these two key analyses, there is only

[48] 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.

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

[50] 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.

[51] 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.

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

[53] 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).

relatively limited economic literature available on the productivity spillovers associated with publicly funded research. For example:[54]

- 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,[55] 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**[56] (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 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%.[57]

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 Manchester'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 Manchester's research activities.

[54] 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.
[55] 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.
[56] See London Economics (2018). The authors find an elasticity of 0.175, which we converted to a research spillover of 9.76.
[57] See also Salter and Martin (2001).

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 **6.11**. 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 **5.03**. 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 **5.19**.

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**	**5.95**	**£1,946m**
Alternative 1	12.7	0.5	6.11	£1,999m
Alternative 2	10.7	0.2	5.03	£1,645m
Alternative 3	10.7	0.5	5.19	£1,698m

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

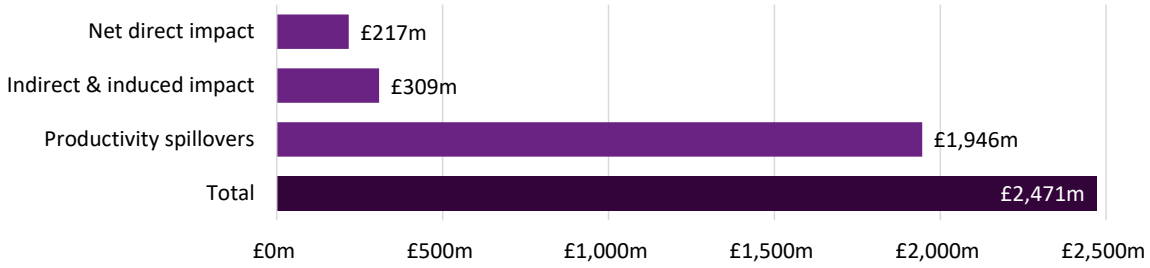
Using these alternative weighted average research multipliers, we are able to evaluate the impact of alternative multiplier assumptions on the estimated total productivity spillovers associated with The University of Manchester's research in 2022-23. As shown in the last column of Table 4, these alternative estimates range from a lower bound of **£1.65 billion** to **£2.00 billion**.

2.1.5 Aggregate impact of The University of Manchester's research

Combining the **direct, indirect, and induced economic impact** of The University of Manchester's research (**£526 million**) with the **productivity spillovers** associated with this research (**£1,946 million**), we estimate that the total economic impact associated with the University's research activities in 2022-23 stood at approximately **£2.47 billion** (see Figure 9).

Comparing this impact to the **£267 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 Manchester's research activities generate an estimated total of £9.26 million in economic impact across the UK.**

Figure 9 Total impact of The University of Manchester'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

Creative Manchester

Founded in 2018, Creative Manchester is a research platform at The University of Manchester. It initially launched within the School of Arts, Languages and Cultures as an endowment-funded project offering academics, researchers and creatives the chance to partner and become involved in Manchester's arts and culture across the North West. The platform's purpose is to convene, develop, and sustain interdisciplinary research communities across The University of Manchester and raise awareness of creativity as a practice.

Over the past two years Creative Manchester has worked with partners to secure around £10 million of research funding. The platform engages with researchers, policymakers, artists, arts and cultural organisations, as well as community groups. Strategic industry partners include UNESCO Manchester City of Literature, Factory International, Local Authorities, the British Council and Manchester Camerata. Creative Manchester's network extends to more than 500 researchers across a variety of disciplines. The platform's support extends to a wide range of work, from the development of digital creativity through Createch to the organisation of the Greater Manchester Festival of Libraries with UNESCO City of Literature, demonstrating their ability to have local impact with global partnerships.

Recently, Creative Manchester successfully led the Greater Manchester Creative Health Partnership bid to the Arts Council England on behalf of the Greater Manchester Civic University Board (GM CUB). The GM CUB is a partnership of the five universities in Greater Manchester and the Greater Manchester Combined Authority. This three-year project will examine social inequalities in creative health outcomes, with the long-term aim of changing perceptions around the impact of creative health. Focused on addressing social inequalities in creative health outcomes. The project aligns closely with the Greater Manchester Civic University Board's priorities and will involve a collaborative effort with the Greater Manchester Combined Authority (GMCA) and partner institutions.

Creative Manchester has three research themes:

- Creative Industries and Innovation;
- Creativity, Health and Wellbeing; and
- Creative and Civic Futures.

These provide a focus for collaboration and align with regional priorities, underscoring the platform's relevance in the context of the University, place-based organisations and businesses. Creative Manchester now stands as an integral part of the city and region's collaborative approach to creativity.

2.2 Economic impact of The University of Manchester's knowledge exchange activities

In addition to its research activities, the University generates significant economic impacts through a range of knowledge exchange activities. Specifically, here, 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).

2.2.1 Economic impact of The University of Manchester's spinout and start-up companies

To assess the **direct impact** associated with The University of Manchester'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 **88** spinout companies and **255** student and staff start-ups that were active and based in the UK in 2022-23,[58] where available. The information on each company's turnover and employment was sourced in partnership with The University of Manchester and was supplemented with Bureau van Dijk's FAME database (based on Companies House information).[59] 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.[60]

It is important to note that the analysis presented in this section is likely to underestimate the total impact of The University of Manchester'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

[58] The analysis in relation to spinouts includes firms with some University of Manchester 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 88 spinouts for 2022-23, all of which were active and UK based. In terms of start-ups, we received data from the University on a total of 282 start-ups, from which we exclude 27 companies that were inactive, non-UK based or which could not be matched to FAME in 2022-23.

[59] 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 Manchester'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). We identified non-zero turnover for 48 of the 88 active spinouts, and employment data for 60. For start-ups, we identified non-zero turnover data for 12 of the 255 active start-up companies, and employment data for 139. 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 provided by The University of Manchester was based on each company's 2022-23 financial year, which does not necessarily coincide with the 2022-23 academic year and varies across companies. These data from the University were supplemented with FAME data from the 2021-22 financial year, as the data for 2021-22 were more consistently available than data from 2022-23.

[60] 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.

of the total turnover, GVA, or employment of The University of Manchester'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).

- 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.

Using this approach, the **direct impact** of The University of Manchester's spinout companies in 2022-23 was estimated at **£110 million** in economic output (i.e. turnover) terms, **580 FTE staff**, and **£63 million** of GVA. Similarly, the direct impact associated with the activities of the University's **start-up companies** in 2022-23 was estimated at **£34 million** in economic output terms, **1,240 FTE staff**, and **£20 million** of GVA.

In terms of the location of these companies, of the University's total of **343** UK-based active spinout and start-up companies in 2022-23, over half (**175**, **51%**) were headquartered in Greater Manchester, generating **£129 million** in turnover and employing a total of **1,195** FTE staff.

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 **£359 million** across the UK economy (including **£274 million** associated with spinouts, and **£85 million** from start-ups), of which approximately **£180 million** occurred in Greater Manchester, and **£232 million** was generated in the North West as a whole (see Table 5).
- The estimated total number of FTE jobs supported stood at **3,960** (including **1,290** associated with the University's spinouts, and **2,665** associated with its start-ups), of which **1,600** were located in Greater Manchester, and **2,205** were located in the North West as a whole.
- The corresponding estimate in terms of GVA stood at **£201 million** (**£153 million** from spinouts and **£48 million** from start-ups), of which **£103 million** and **£131 million** occurred in Greater Manchester and the North West as a whole, respectively.

[61] Again, this was based on ITL2 regions.

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

Location of impact	Output, £m	GVA, £m	# of FTE employees
Spin-out companies			
Greater Manchester	£133m	£76m	450
North West	£175m	£99m	755
Total UK	£274m	£153m	1,290
Start-up companies			
Greater Manchester	£47m	£27m	1,150
North West	£57m	£32m	1,455
Total UK	£85m	£48m	2,665
Total			
Greater Manchester	£180m	£103m	1,600
North West	£232m	£131m	2,205
Total UK	£359m	£201m	3,960

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

Turing Innovation Catalyst

The Turing Innovation Catalyst (TIC) was established in April 2023 with £5 million of seed funding secured from the GM Innovation Accelerator scheme, a two-year pilot programme run by Innovate UK to link local R&D strengths with businesses in the region.

TIC's vision is to play a leading role in creating a city region where responsible and ethical use of Artificial Intelligence (AI) is supercharging the growth of careers, businesses and the regional economy. Its mission is to provide practical support, expertise and connectivity for companies and individuals developing AI-first companies, products and careers.

Led by The University of Manchester, TIC brings together a consortium of leading AI-focused businesses, regional and national R&D organisations, specialist skills providers, accelerators and investors to provide access to Venture Building, Accelerator and Investor Programmes, Skills and Talent Programmes and Collaborative R&D Projects. This is part of the TIC's mission to develop the AI ecosystem in Greater Manchester.

The TIC model capitalises on the University's AI R&D base. This includes over 900 AI-focused academics, with connections into the national AI R&D system, and its ability to act as a 'neutral broker' to bring together all stakeholders and create an identifiable and accessible epicentre of the AI ecosystem. With a base on the £1.7 billion Sister innovation district – the University's joint venture with Bruntwood SciTech, the TIC will play a key role in catalysing a deep tech cluster in the region over the next decade.

In the 12 months between September 2023 and August 2024, TIC has:

- Worked with 38 PhD-led ventures to explore commercialisation opportunities and provide them with the entrepreneurial skills needed to launch new startups.
- Supported more than 50 AI-first start-ups to scale on its accelerator programme.
- Connected 24 SMEs with University academics on quick turnaround R&D projects to shorten development cycles and drive commercialisation of leading AI technologies.
- Delivered a portfolio of skills programmes to improve access to AI careers for women and underrepresented communities. Over 9,000 women and non-binary learners have attended one of TIC's AI courses ranging from an introductory four-week course, to a more advanced 16-week bootcamp.
- Taken the lead in creating a new AI Skills Strategy for the region.
- Delivered more than 50 events across Greater Manchester to energise the AI ecosystem.

As an ecosystem-focused and -led institution, TIC is blazing a trail for new ways of working that will allow the University to fulfil its potential as a driver of regional economic growth and prosperity.

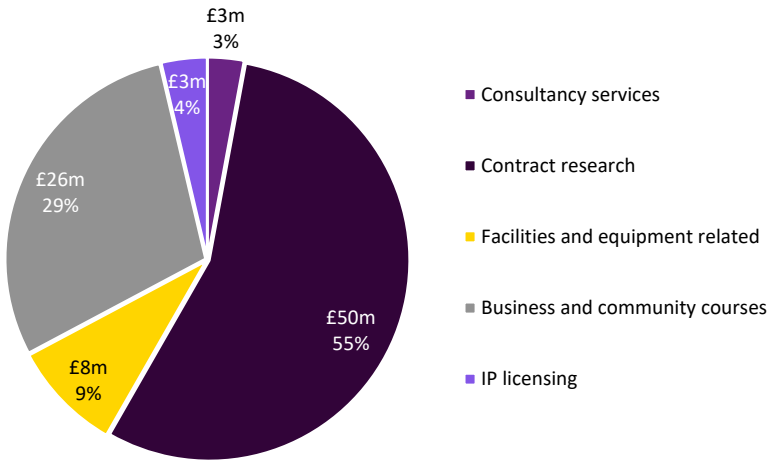
2.2.2 Economic impact of The University of Manchester's wider knowledge exchange activities

In addition to spinouts and start-ups, we estimate the **economic impact of The University of Manchester'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:[62]

- **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 Greater Manchester.[63]

Figure 10 Income from knowledge exchange activities received by The University of Manchester 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 Manchester's wider knowledge exchange activities is made up of **£3 million** of income from consultancy services, **£50 million** associated with contract research activities, **£26 million** generated from business and community courses, **£8 million** associated with the hire of The University of Manchester's research facilities, and **£3 million** of IP licensing income.

[62] 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).
[63] 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 Manchester are the same as for other institutions operating in Greater Manchester's government, health, and education sector.

The total direct impact of these activities in 2022-23 therefore stood at **£91 million** (see Figure 10), with an associated impact in GVA terms of **£58 million**, supporting **1,030** 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 Greater Manchester. 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 Manchester's **wider knowledge exchange activities**. The analysis estimates that, in 2022-23, the University's wider knowledge exchange activities generated a total of **£220 million** of economic output across the UK economy (including **£124 million** generated in Greater Manchester, and **£149 million** occurring in the North West as a whole). The total GVA impact was estimated at **£128 million**, with an estimated **2,005 FTE jobs** supported across the UK economy.

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

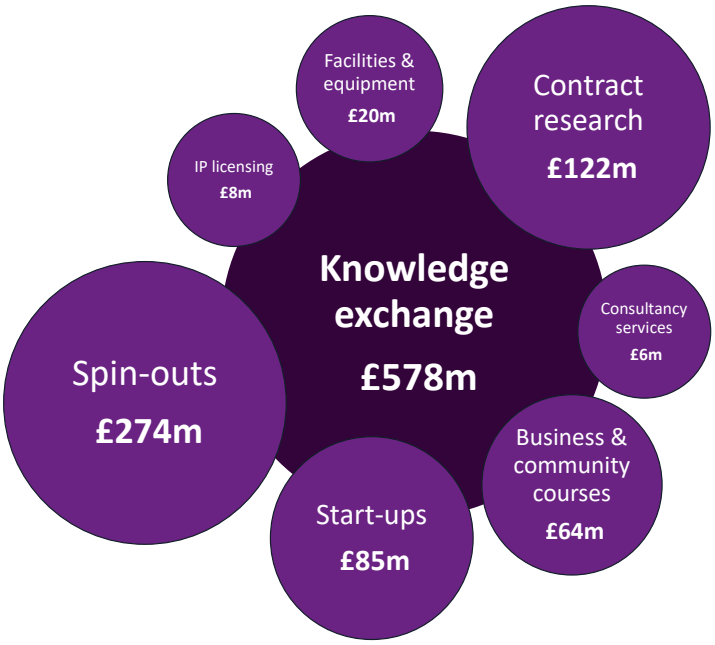
Type of impact	Output, £m	GVA, £m	# of FTE employees
Greater Manchester	£124m	£76m	1,310
North West	£149m	£90m	1,500
Total UK	£220m	£128m	2,005

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

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 Manchester in 2022-23 *directly* generated an estimated **£235 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 **£578 million** (see Figure 11). The corresponding estimates in GVA and employment terms stood at **£328 million** and **5,965 FTE jobs**.

Figure 11 Total economic impact associated with The University of Manchester'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 Manchester's research and knowledge exchange activities

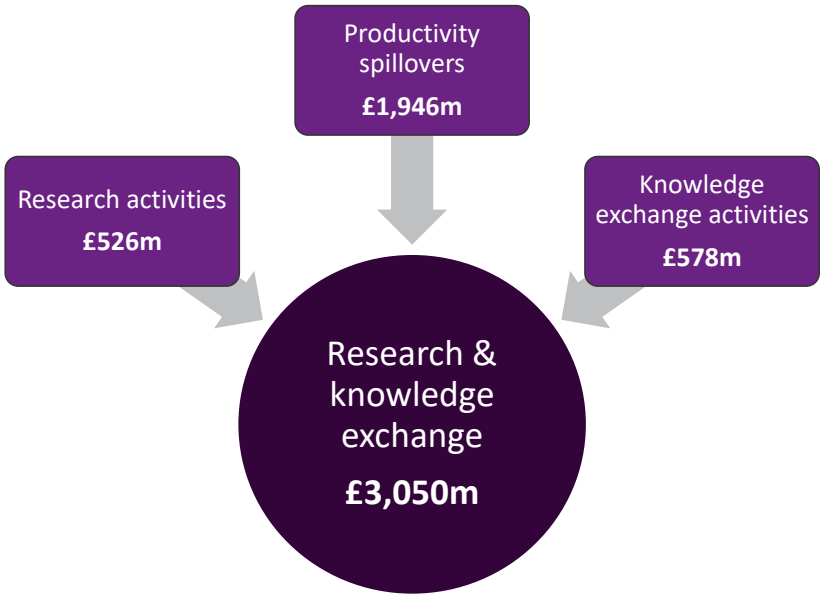
Combining all of the above estimates, the total impact on the UK economy associated with The University of Manchester's research and knowledge exchange activities in 2022-23 was estimated to be approximately **£3.05 billion** (see Figure 12). In terms of the components of this impact:

- The University's **research activities** accounted for **£526 million**.
- The associated **productivity spillovers** to the wider UK economy stood at **£1,946 million**.
- The impact associated with the University's **knowledge exchange activities** was estimated at **£578 million**, including **£359 million** from the spinout and start-up companies associated with the University, and **£220 million** associated with the University's wider knowledge exchange activities.

The total impact of The University of Manchester's research and knowledge exchange activities in 2022-23 stood at £3.05 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 12 Total impact of The University of Manchester'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

Graphene Engineering Innovation Centre (GEIC)

Graphene is a 2D material made from honeycomb sheets of carbon around one atom thick. First isolated at The University of Manchester in 2004, it is the lightest, strongest, thinnest, best heat and electricity conducting material ever discovered. It has the potential to transform a wide range of existing sectors, as well as creating entirely new ones.

Together with its partners in business and local government, the University has invested in three flagship facilities: the National Graphene Institute (an academic-led research centre developing the new physics of 2D materials); the Graphene Engineering Innovation Centre (GEIC) (providing industry-led application development); and the Henry Royce Institute (the national centre for advanced materials, which aims to accelerate the invention and take-up by industry of new materials).

Innovation-oriented work takes place across the University's entire graphene ecosystem, but the focus of business engagement is the GEIC. Opened in 2020, the GEIC helps companies develop and launch new technologies, products and processes that exploit the properties of graphene and other 2D materials. The GEIC is staffed by a dedicated team of experienced Application Specialists and Technicians providing the capacity to react quickly to industry needs.

The GEIC is home to nine 'Tier 1' partners who have dedicated lab space, and more than 20 'Tier 2' partners who utilise the common facilities for exploratory projects. The GEIC has a particular focus on working with SMEs in the Greater Manchester area. Through its EU-funded 'Bridging the Gap' programme the GEIC worked with over 100 SMEs to help them improve an existing, or create a new, product using 2D materials. This created 75 new jobs. Beneficiaries have been able to leverage new funding, secure investment to develop and test product ideas, scale-up their operations, make connections and prepare funding applications.

The GEIC's support also produced multiple start-ups, including Concretene. Concretene produces a graphene enhanced concrete that reduces the amount of cement needed by up to 30% and speeds up curing time from 28 days to 12 hours, offering a dramatic reduction in carbon footprint. It has since raised £8 million in seed funding via a long-standing spin-out Nationwide Engineering as it looks to commercialise further. The new company is in the process of sponsoring a 0.5 FTE chair and a research team in the University.

Other successes of GEIC include:

- £3.6 million investment into Graphene Innovation Manchester (GIM), which granted them a base at the GEIC lab and access to labs and diagnostic facilities. GIM has also recently been announced as a partner in a very significant $1 billion deal in the United Arab Emirates.
- £4.5 million investment into AEH Innovative Hydrogel to develop a sustainable growing material for indoor farming.
- £450,000 funding to Vector Homes, which enabled the team to continue to work on the development and launch of the sustainable homes full-time.
- £500,000 of seed equity investment in the Molymem spin out to help scale up their activities to develop a breakthrough water filtration technology.
- £1 million of private investment to Water-cycle Technologies to scale experiments up.
- £1 million of private investment to Nanoplexus to scale up MXene manufacturing.

- £2.8 million of private investment to Smart IR to scale up their technology.

Embracing a fail-fast approach, the GEIC emphasises the importance of quickly identifying and addressing project challenges or failures. By running agile, low-cost pilots and experiments, the centre enables rapid learning and iteration, ultimately improving the likelihood of successful outcomes and reducing the risk associated with innovation.

As part of the University's advanced materials ecosystem, the GEIC will play an important role in delivering Greater Manchester's and the government's Investment Zone ambition to catalyse an advanced materials and manufacturing supercluster in the region.

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

With the University ranking 6th in the UK and 34th in the world in the QS World University Rankings 2025,[64] The University of Manchester'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. We consider the labour market benefits associated with enhanced qualification attainment and skills acquisition to **both the individual and the public purse**.

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

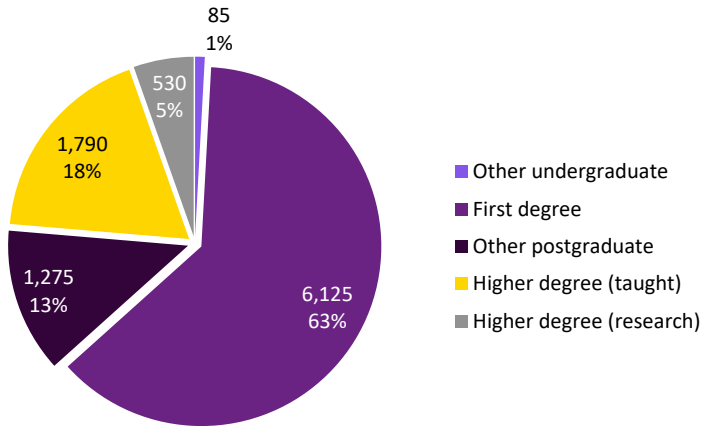
The analysis of the economic impact of the University's teaching and learning activities is based on the **2022-23 cohort of UK domiciled students**. In other words, instead of the University's entire student body of **46,860** students in the 2022-23 academic year (including both UK and non-UK domiciled students, *irrespective* of when these individuals may have started their studies), the analysis in this section focuses on the **9,805** UK domiciled[65] students **starting higher education qualifications (or standalone modules/credits) at the University in 2022-23.**[66]

In terms of **level of study** (see Figure 13), **63%** (**6,125**) of students in this cohort of UK domiciled students were undertaking **first degrees**, with a further **1,790** students (**18%**) undertaking **postgraduate taught degrees**, and **530** students (**5%**) enrolled in **postgraduate research degrees**. An additional **1,275** (**13%**) students were undertaking **other postgraduate qualifications**,[67] while the remaining **85** (**1%**) students were enrolled in **other undergraduate qualifications**.[68]

In relation to **mode of study** (see Figure 14), **7,950** (**81%**) students in the cohort were undertaking their studies with The University of Manchester on a full-time basis, while the remaining **1,855** (**19%**) were enrolled on a part-time basis. As presented in Table 7, most full-time students in the cohort were undertaking first degrees (**77%** of full-time students). Instead, part-time students were predominantly enrolled in other postgraduate qualifications (**54%** of part-time students) or higher degree (taught) qualifications (**38%** of part-time students).

[64] See QS (2024).
[65] A proportion of EU and non-EU domiciled students undertaking their studies at The University of Manchester 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.
[66] We received HESA data on a total of 19,420 first-year students from The University of Manchester. From this total, we excluded 25 students who did not have a stated gender, and 9,580 non-UK domiciled students (who are instead considered as part of the analysis of educational exports (see Section 4)). Figures may not add up precisely due to rounding.
[67] 'Other postgraduate' learning includes Postgraduate Certificates in Education and other postgraduate-level certificates, diplomas, and credits.
[68] 'Other undergraduate' learning includes Certificates or Diplomas of Higher Education and undergraduate-level credits.

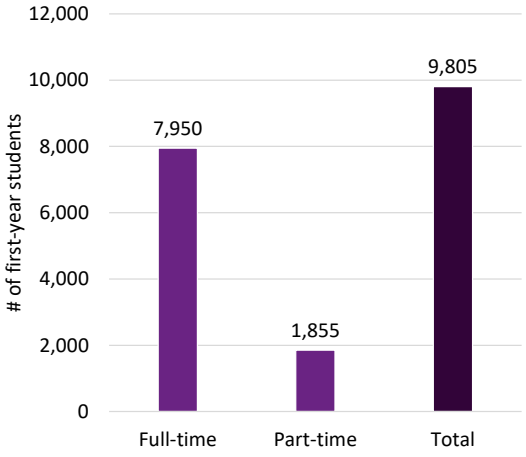
Figure 13 UK domiciled students in the 2022-23 University of Manchester cohort, by level of study



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 or Diplomas of Higher Education and undergraduate-level credits. 'Other postgraduate' learning includes Postgraduate Certificates in Education and other postgraduate-level certificates, diplomas, and credits.
Source: London Economics' analysis based on University of Manchester HESA data

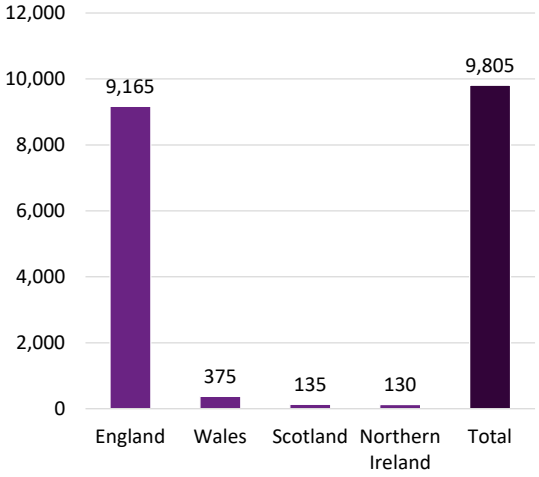
In terms of **domicile** (see Figure 15), the vast majority of students in the cohort (**9,165**, **94%**) were domiciled in England. A further **375** (**4%**) students were from Wales, and the remainder were domiciled in Scotland (**135**) and Northern Ireland (**130**).

Figure 14 UK domiciled students in the 2022-23 University of Manchester cohort, 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 Manchester HESA data

Figure 15 UK domiciled students in the 2022-23 University of Manchester cohort, 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 Manchester HESA data

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

Level and mode of study	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Full-time					
Other undergraduate	0	0	0	0	**0**
First degree	5,735	240	50	95	**6,120**
Other postgraduate	265	5	5	5	**280**
Higher degree (taught)	1,035	30	20	10	**1,090**
Higher degree (research)	425	15	10	5	**455**
Total	**7,455**	**295**	**85**	**115**	**7,950**
Part-time					
Other undergraduate	80	5	0	0	**85**
First degree	0	0	0	0	**0**
Other postgraduate	930	35	25	5	**995**
Higher degree (taught)	630	35	30	5	**700**
Higher degree (research)	70	5	0	0	**80**
Total	**1,710**	**80**	**55**	**15**	**1,855**
Total					
Other undergraduate	80	5	0	0	**85**
First degree	5,735	240	50	95	**6,125**
Other postgraduate	1,195	40	25	15	**1,275**
Higher degree (taught)	1,665	65	45	15	**1,790**
Higher degree (research)	495	20	15	5	**530**
Total	**9,165**	**375**	**135**	**130**	**9,805**

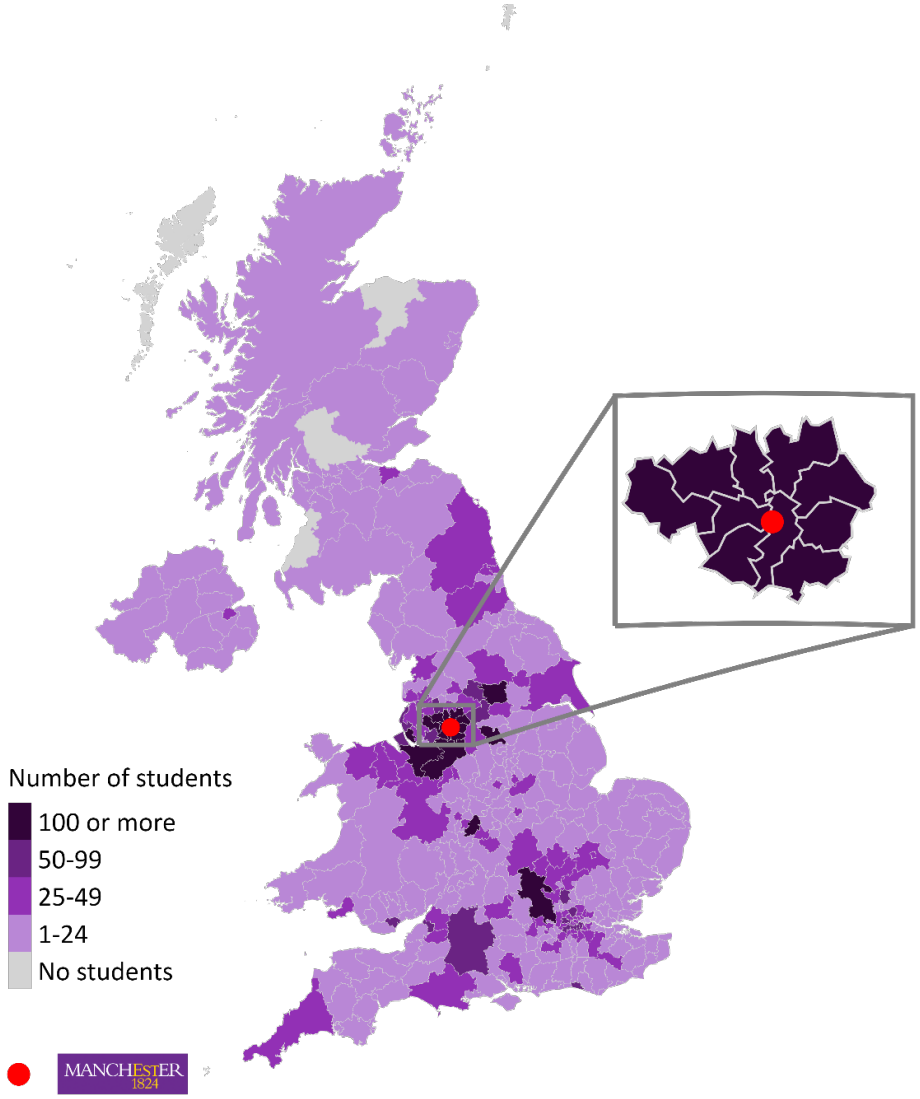
Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding. 'Other undergraduate' learning includes Certificates or Diplomas of Higher Education and undergraduate-level credits. 'Other postgraduate' learning includes Postgraduate Certificates in Education and other postgraduate-level certificates, diplomas, and credits. There were fewer than 5 part-time first degree students in the 2022-23 cohort (rounded to 0 in the table), and no full-time 'other undergraduate' students.
Source: London Economics' analysis based on University of Manchester HESA data

Figure 16 presents the distribution of The University of Manchester's 2022-23 cohort of UK domiciled students by domicile at the Local Authority level. The map illustrates the University's importance as an anchor institution in its local region, with approximately **23%** (**2,235**) of the University's first-year UK domiciled students in 2022-23 coming from **Greater Manchester**, including **7%** (**725**) from Manchester itself, **3%** (**250**) from Trafford, **2%** (**215**) from Stockport, and **2%** (**200**) from Salford. Further, an additional **1-2%** each of students (between **110** to **165** students each) came to the University from Oldham, Tameside, Bolton, Bury, Rochdale, and Wigan. More broadly, a total of **36%** (**3,500**) of students were domiciled in the **North West** before starting their studies at The University of Manchester.

Alongside the University's 'draw' from its local surroundings, the map also shows its attractiveness to students from other parts of the UK. **13%** of the University's UK domiciled student starters came to the University from **London**, **11%** came from the **South East**, **8%** came from **Yorkshire and the Humber**, **6%** were domiciled in the **West Midlands**, and **6%** came from the **East of England**.

For a more detailed breakdown of student numbers by Local Authority and parliamentary constituency, see Table 30 and Table 31 in Annex A3.1.

Figure 16 UK domiciled first-year students in the 2022-23 University of Manchester cohort, by Local Authority of domicile



Note: Based on HESA data on a total of 9,855 first-year students from The University of Manchester. Domicile refers to a student's permanent home address before starting their qualification at The University of Manchester. Totals may not sum due to rounding.
Source: London Economics' analysis based on data from The University of Manchester 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.

Service Learning

Formed 200 years ago to educate the workers of Manchester, the University has continued to build on these civic foundations, developing social responsibility as its third goal. The University's approach to service learning draws from this heritage, aligning teaching and learning with the civic needs of the city. Encompassing the University's core strategic goals, service learning ensures social responsibility and civic engagement remain central to the world-leading teaching and learning at Manchester. This transformative initiative allows students to address real-world challenges with their academic knowledge.

By tackling real-world practical challenges, students become active agents of positive change, develop a deeper understanding of social challenges, enhance their empathy, citizenship and cultural competence, and build practical skills essential for their future careers. The University benefits from fostering deeper partnerships with local, national and global communities, and external partners will be able to draw on the talents of our significant student body. Students from across all three University faculties have been engaged with service learning.

One example of the University's approach to service learning is their dental students' work with the homeless communities of Manchester. Unfortunately, Manchester has the highest rate of homelessness in the North of England. Although the ultimate hope for these individuals is to be housed, another big concern is their health and wellbeing. University dentistry students have been trying to address oral hygiene amongst the homeless population through several ventures via the Homeless Healthcare Society. Working with local partners such as Mustard Tree and the Wellspring Centre, and co-creating with service users, students have developed dental care packs and information for the homeless community. Distributing the packs to service users has provided opportunities for the students to talk to the communities about their dental problems, helping to resolve current dental issues and providing preventative advice. This work has improved the students' communication skills and built an in-depth understanding of the challenges some communities face accessing dental care.

Another approach to service learning is the University's Living Lab, which develops research projects with external organisations that help them meet their sustainability goals. The projects are framed in relation to the United Nations' Sustainable Development Goals. Students can select a living-lab project and address the issue as part of their core assessment. A quality research report is then shared with the relevant organisation. University Living Lab projects enable students to make a difference through their studies and gain key skills and experience in an accessible manner. Projects are broad and diverse, including topics from fuel poverty to the role of green spaces in cities.

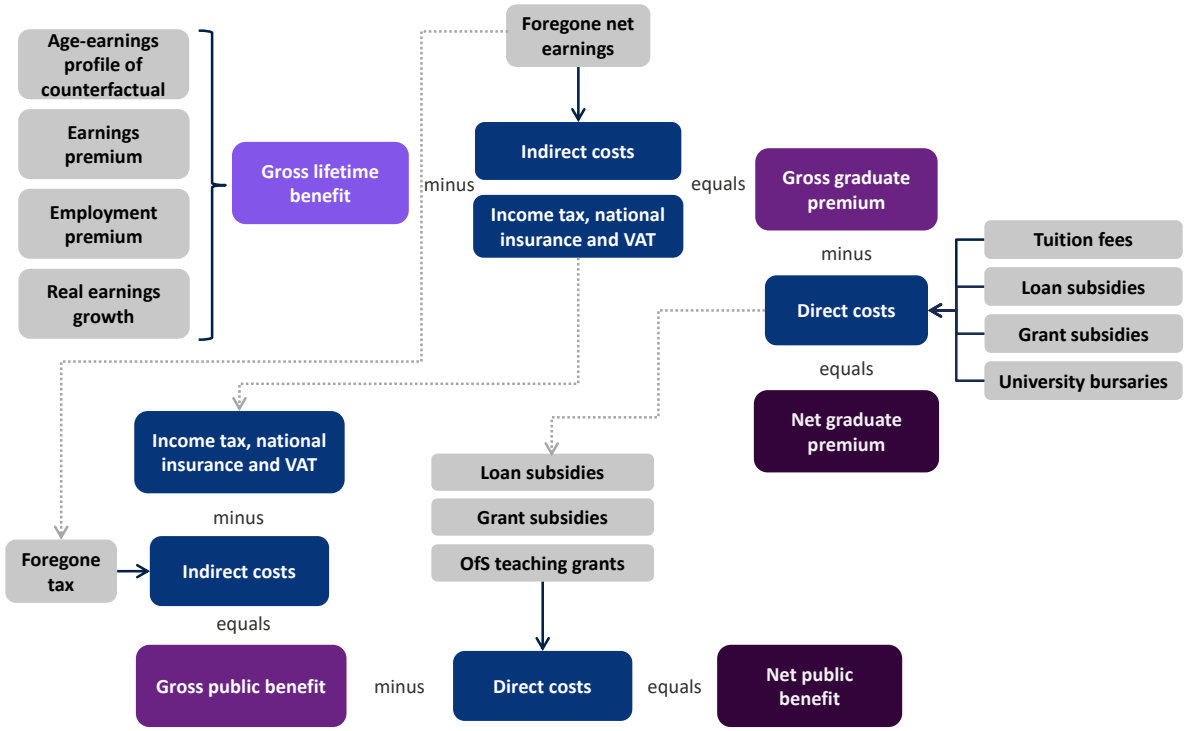
Through service learning – and other opportunities such as student volunteering – students are able to share their knowledge skills for the sustainable growth of the city and region.

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 Manchester. 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 17):[69]

- 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.
- 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.

Figure 17 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)

[69] 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 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.[70]

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 £97,000.

Table 8 presents the net graduate premiums and net Exchequer benefits achieved by UK domiciled students[71] starting qualifications at The University of Manchester in 2022-23 (on average across men and women[72] and across students from all domiciles). The analysis estimates that the average **net graduate premium** achieved by a representative[73] student in the 2022-23 cohort completing a **full-time** first degree at The University of Manchester (with an RQF Level 3 qualification as their highest level of prior attainment[74]) is approximately **£97,000** in today's money terms. At postgraduate level, the net (post)graduate premiums for representative[75] students completing a full-time postgraduate taught or postgraduate research degree at The University of Manchester (relative to a first degree) stand at **£77,000** and **£132,000**, 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 **£81,000** (vs. **£77,000** for full-time students). The fact that part-time students tend to complete their studies later in life[76] (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-time students can be either lower or higher than the corresponding net graduate premiums achieved by full-time students.

[70] 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 Manchester alumni. Rather, the findings from the analysis are adjusted to reflect the characteristics of the 2022-23 cohort of University of Manchester 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.

[71] 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.

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

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

[74] 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.

[75] This is based on an average age at graduation in the 2022-23 cohort of 25 for full-time higher degree (taught) students and 31 for full-time higher degree (research) students.

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

The net public purse benefit for a representative full-time first degree student stands at £102,000.

The public purse also benefits significantly from higher education qualification attainment at The University of Manchester. 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 **£102,000** in 2022-23 money terms. The corresponding net Exchequer benefits for representative students completing full-time postgraduate taught or postgraduate research degrees (relative to first degrees) were estimated at approximately **£84,000** and **£115,000**, respectively.

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 **£78,000**.

Table 8 Net graduate premium and net Exchequer benefit per UK domiciled student in the 2022-23 University of Manchester 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]	£70,000	-	£61,000	-
First degree[1]	£97,000	-	£102,000	-
Other postgraduate[2]	£49,000	£48,000	£57,000	£44,000
Higher degree (taught)[2]	£77,000	£81,000	£84,000	£78,000
Higher degree (research)[2]	£132,000	£135,000	£115,000	£98,000

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 Manchester 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

3.3.2 Total impact of teaching and learning activities at The University of Manchester

The total economic impact of teaching and learning generated by the 2022-23 cohort of University of Manchester students stood at £1.58 billion.

Combining the information on the number of UK domiciled students in the 2022-23 University of Manchester 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 **£1.58 billion** (see Table 9).

This total impact is split roughly evenly between the Exchequer and students, with **£778 million** (**49%**) of the economic benefit accrued by the Exchequer, and the remaining **£805 million** (**51%**)

accrued by students. In terms of study level, **73%** (**£1.16 billion**) of the total impact is generated by The University of Manchester's undergraduate students, with the remaining **27%** (**£421 million**) generated by the University's postgraduate students. In terms of domicile, reflecting the distribution of students in the cohort, **94%** (**£1.49 billion**) of the total impact is generated by students from England, while the remaining **6%** (**£97 million**) is generated by students coming to Manchester from elsewhere in the UK.

Table 9 Aggregate impact of The University of Manchester'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	**£731m**	**£30m**	**£7m**	**£10m**	**£778m**
Undergraduate	£535m	£23m	£3m	£8m	**£568m**
Postgraduate	£196m	£7m	£4m	£2m	**£210m**
Exchequer	**£756m**	**£31m**	**£7m**	**£11m**	**£805m**
Undergraduate	£558m	£24m	£3m	£9m	**£594m**
Postgraduate	£198m	£7m	£4m	£2m	**£211m**
Total	**£1,487m**	**£61m**	**£14m**	**£22m**	**£1,583m**
Undergraduate	£1,092m	£47m	£6m	£17m	**£1,162m**
Postgraduate	£394m	£14m	£8m	£5m	**£421m**

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 Manchester'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 Manchester'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.[77] 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.[78]

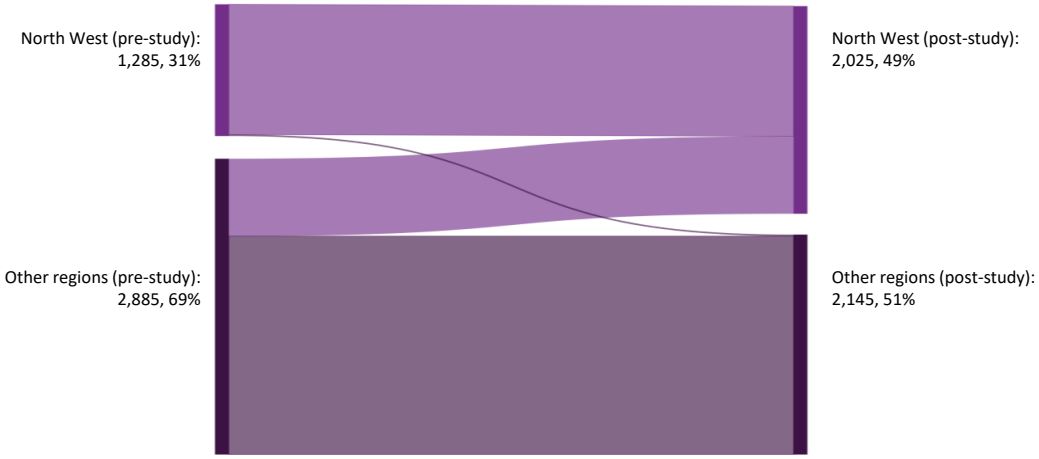
For this analysis, we used data from the Department for Education (2024a), covering the outcomes of three different graduating cohorts in the tax year 2021-22.[79] These include the 2019-20 graduating cohort (at 1 year after graduation), the 2017-18 cohort (at 3 years after graduation), and the 2015-16 cohort (at 5 years after graduation). For all of these cohorts, we examine the **movement**

[77] 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).
[78] 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 any averages across higher education institutions.
[79] This is the latest year for which the LEO data is currently available.

of graduates across regions (i.e. the extent to which the University's students remain in the North West post-graduation).

In terms of **graduate mobility**, Figure 18, Figure 19 and Figure 20 demonstrate the extent to which UK domiciled University of Manchester graduates remain in the North West after study.[80] In total, **49%** of The University of Manchester's graduates remained in the North West 1 year after graduation. Within this total, almost all (**99%**) of the University's students who were originally from the North West[81] remained in the region 1 year after study, with an additional **26%** of students who originally came from other regions staying in the region post-graduation. This resulted in net migration to the North West of **18%** of the relevant graduating cohort 1 year post-study,[82] decreasing to **13%** (see Figure 19) and **9%** (see Figure 20) at 3 and 5 years post-study (but still remaining substantial). These net migration figures are **larger than for any other HEI located in the North West** and demonstrate The University of Manchester's key role as a **local anchor institution** and a **major contributor of skilled graduates to its local economy**.

Figure 18 Location of UK domiciled University of Manchester graduates before and 1 year after study



Note: Based on The University of Manchester'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).

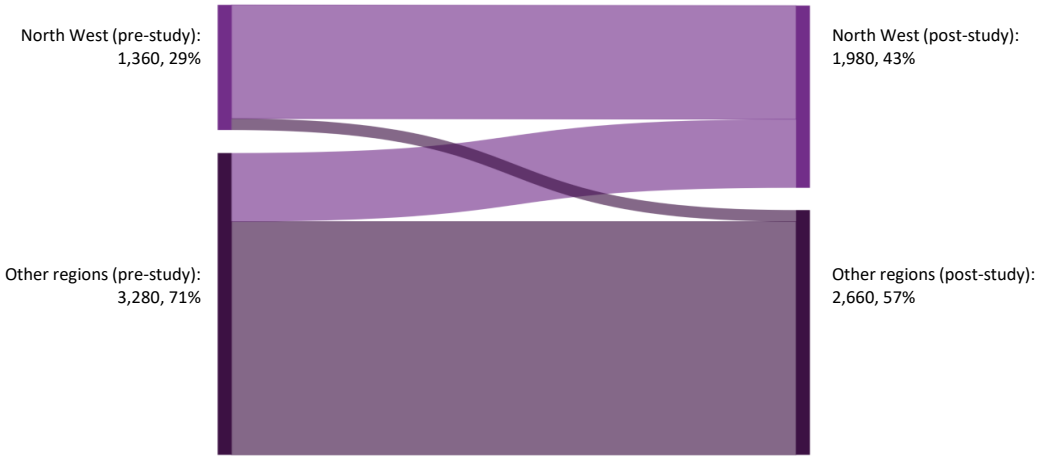
Source: London Economics' analysis using provider-level Longitudinal Education Outcomes data (Department for Education, 2024)

[80] 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 Greater Manchester (or other sub-regional geographical levels).

[81] I.e. who were domiciled in the North West prior to starting their studies at The University of Manchester. As also seen in data for other higher education institutions, this figure is slightly higher than that of a 'typical' year, reflecting the fact that students graduated during the COVID-19 pandemic. The equivalent figure for the 2018-19 graduating cohort stood at **94%**.

[82] From Figure 18, this is based on **31%** of graduates being domiciled in the North West prior to their studies, increasing to **49%** remaining in the region 1 year post-graduation (i.e. a difference of **18 percentage points**).

Figure 19 Location of UK domiciled University of Manchester graduates before and 3 years after study



Note: Based on The University of Manchester'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 20 Location of UK domiciled University of Manchester graduates before and 5 years after study

Note: Based on The University of Manchester'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)

#BeeWell

The wellbeing of young people across the UK is among the lowest in the world. #BeeWell aims to turn this around. Launched in 2019, #BeeWell is a youth-centred programme led by The University of Manchester, The Gregson Family Foundation and the Anna Freud Centre and delivered in partnership with the Greater Manchester Combined Authority (GMCA). Working with schools, community organisations and local government, #BeeWell listens to the voices of young people, acts for change and celebrates young people's wellbeing.

#BeeWell believes that young people's wellbeing is as important as their academic attainment. Using a co-designed survey, #BeeWell listens to the voices of as many young people as possible; publishes the results privately to schools and publicly by neighbourhood; and drives action across society to improve young people's wellbeing. #BeeWell's Mission is to see this approach implemented nationally by 2030.

An initial £2 million was raised to deliver a wellbeing programme across Greater Manchester secondary schools. Co-created with young people, #BeeWell has now been delivered annually in Greater Manchester since 2021. In 2023, it built on this success to also deliver the #BeeWell programme in Hampshire, the Isle of Wight, Portsmouth and Southampton and the #BeeWell survey has been locally adapted in the London Borough of Havering, Milton Keynes and North Devon and Torridge.

#BeeWell is making great headway. It has captured the voices of more than 85,000 young people, acted on the data together with partners and resolutely improved young people's wellbeing. Its impact on young people is being measured through its Youth Steering Group. This process has engaged young people in commissioning activities to improve their wellbeing such as overseeing a £60,000 funding pot from the Greater Manchester Integrated Care Partnership to support LGBTQ+ young people's mental health and wellbeing.

Schools have also benefited. #BeeWell provides them with a confidential school-level dashboard that gives clear insights into the wellbeing of their students, enables anonymous comparisons with similar schools and informs school improvement plans. Schools can receive bespoke one-to-one sessions to support them in interpreting their results and identifying pathways for action, such as through extracurricular activities and boosting physical activity.

To read more about #BeeWell's impact visit www.beewellprogramme.org.

4 The impact of The University of Manchester's educational exports

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 Manchester students, over the entire course of their studies.[83]

In addition to the **direct impact**, captured by the level of (net) fee income (accrued by The University of Manchester 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'.[84] 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 Manchester students

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

In terms of domicile (Figure 21), of the total of **9,580** international students starting higher education qualifications at The University of Manchester in 2022-2023, **390** (**4%**) were domiciled within the European Union, while **9,190** (**96%**) were from non-EU countries. In terms of study mode (Figure 22), most international students in the cohort (**9,520**, **99%**) were undertaking their qualifications on a full-time basis, with only **60** (**1%**) studying on a part-time basis.

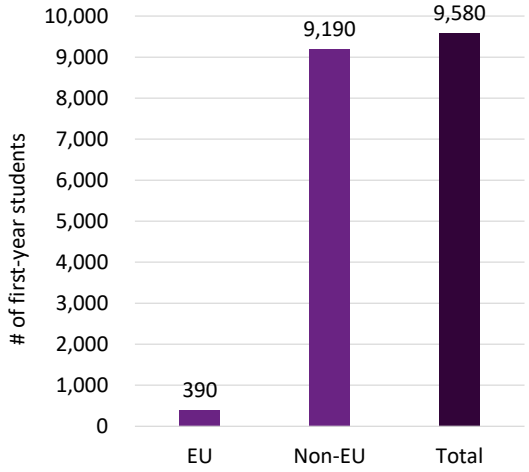
In terms of study level (Figure 23), in contrast to UK domiciled students (see Section 3.1), the majority of non-UK domiciled students in the cohort were undertaking postgraduate qualifications (**6,475, 68%**), including **5,760** students (**60%**) enrolled in postgraduate taught degrees, **645** (**7%**) undertaking postgraduate research degrees, and **70** (**1%**) undertaking other postgraduate qualifications. At undergraduate level, there were **3,105** (**32%**) students undertaking first degrees.[85] Figure 24 presents more detailed information on the country of domicile of international students in the 2022-23 cohort.

[83] Note that other types of export income accrued directly by The University of Manchester (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 educational exports to avoid double-counting.

[84] 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 Manchester). 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 Manchester's own expenditures (see Section 5).

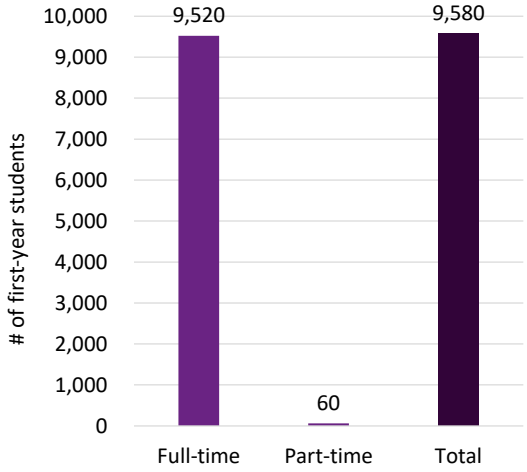
[85] For more detailed information on The University of Manchester's 2022-23 cohort of non-UK domiciled students, please refer to Annex A2.4.2.

Figure 21 Non-UK domiciled students in the 2022-23 cohort of University of Manchester students, by domicile



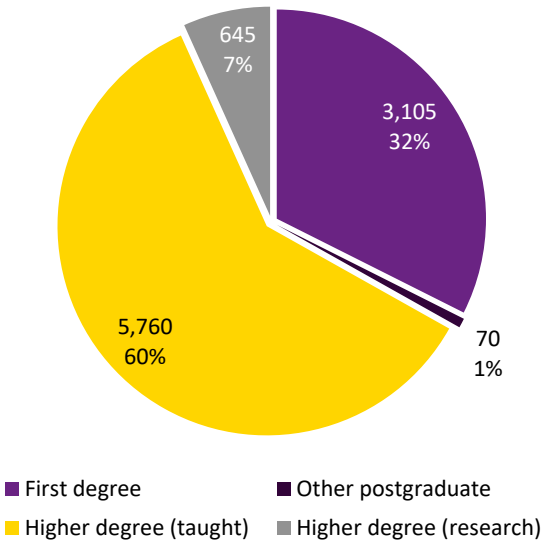
Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
Source: London Economics' analysis based on University of Manchester HESA data.

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



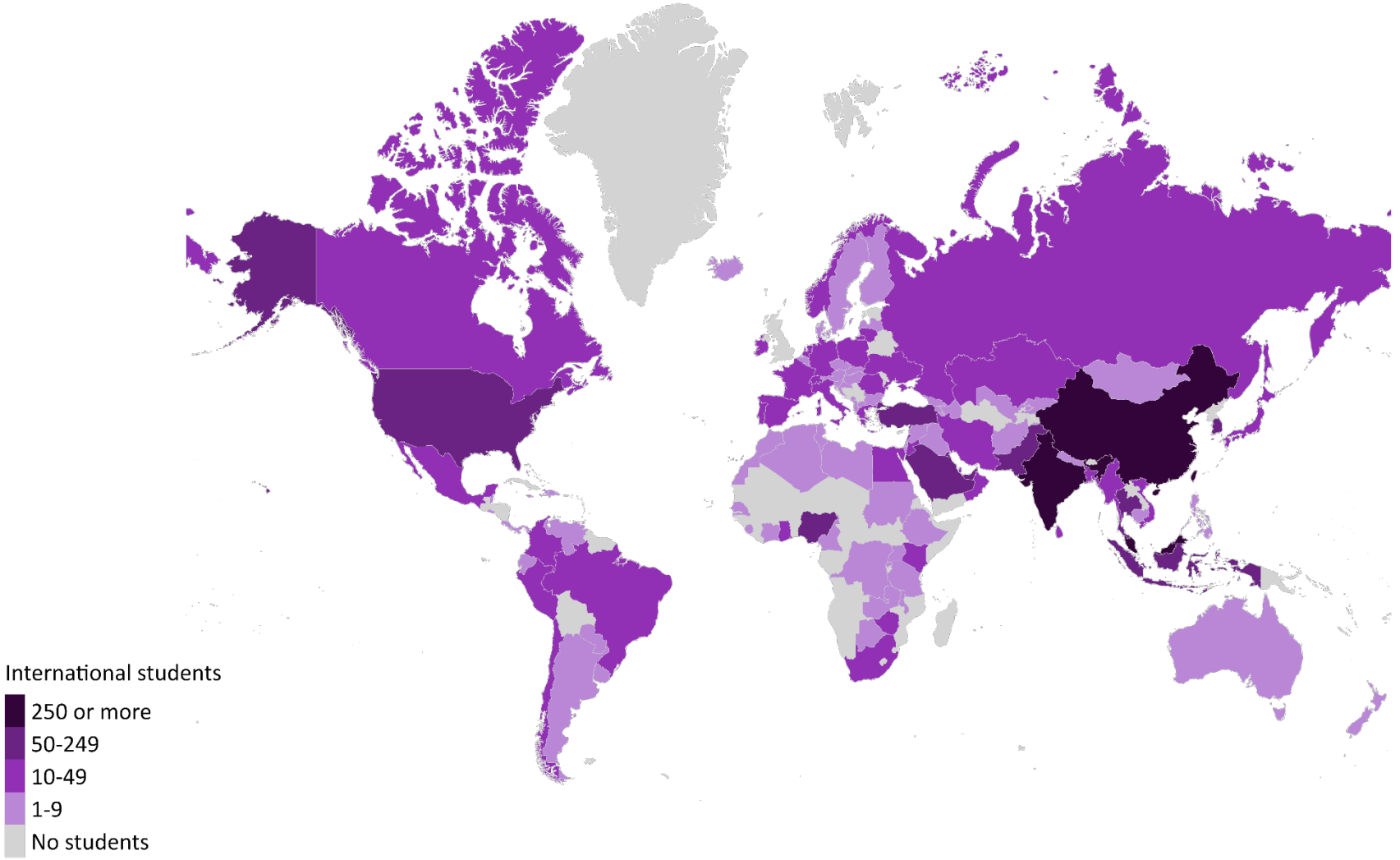
Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
Source: London Economics' analysis based on University of Manchester HESA data.

Figure 23 Non-UK domiciled students in the 2022-23 cohort of University of Manchester 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. There were fewer than 5 non-UK domiciled other undergraduate students in the 2022-23 cohort.
Source: London Economics' analysis based on University of Manchester HESA data.

Figure 24 Non-UK domiciled students in the 2022-23 cohort of University of Manchester students, by country of domicile



Note: Based on data provided by The University of Manchester on 9,595 first year overseas domiciled students from The University of Manchester in 2022-23. Of these students, 90 were excluded as they could not be matched to a country within the World Bank data. Therefore, this figure is based on 9,505 international students.
Source: London Economics' analysis based on University of Manchester and World Bank data.

Equity & Merit Scholarships

Developed in 2007, The University of Manchester's Equity and Merit Scholarships aim to empower young professionals in the Global South to deliver solutions to meet the UN Sustainable Development Goals, helping to create a more prosperous, peaceful and sustainable future for all.

The Equity and Merit programme supports some of the brightest young minds in the Global South, who would otherwise be held back by financial barriers, to make a difference. Students are selected for Master's programmes based on their potential to significantly contribute to sustainable development in their home countries.

Each Master's programme addresses skills and educational gaps that exist, for examples in power engineering, global urban development, communicable and non-communicable diseases and public health. The ensures each Equity and Merit scholarship student not only advances their own skills but also that of the wider society.

The scholarships are jointly funded by the University and its donors. The University covers students' tuition fees in full, and donors pay for the students' living expenses, flights to the UK and visas.

Two types of Equity and Merit scholarships are offered each year:

- Full-time, on-campus Master's (one-year duration); and
- Part-time, distance learning Master's (three to five years duration).

Currently around 40 scholarships (30 for full-time study and ten for online study) are made available each year across areas including engineering, environment, health sciences, development, education, textiles and law. The scheme is open to applicants from Ethiopia, Malawi, Rwanda, Tanzania, Uganda and Zimbabwe.

Since 2007 more than 400 students have benefited from the scheme. Alumni have gone on to make a tangible difference to their home countries in areas of political, economic, health, engineering and environmental leadership. Examples include:

- **Jean de Dieu Uwihanganye** who has gone from strength to strength since his time at Manchester and was made High Commissioner of Rwanda to Singapore, Australia, New Zealand and Indonesia in July 2019.
- **Valentin Olyang'Iri**, a Maasai tribe member from Tanzania, who has used his education in sustainability at Manchester to protect the habitat that he calls home as a researcher in land-rights issues in Tanzania.
- **Diane Mukasahaha** who has used her education to help improve palliative care in Rwanda as the National Coordinator for Palliative Care in the country's Ministry of Health.

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 Manchester in the 2022-23 academic year (by study level, mode, and domicile[86]). Assuming the same average study durations as in the analysis of the impact of The University of Manchester'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 Manchester.[87] These costs were again calculated over students' total study duration and estimated in present value terms.[88] 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)).[89]

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 Manchester. 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).

[86] As in the analysis of The University of Manchester's teaching and learning activities (see Annex A2.3.7), we made use of information provided by The University of Manchester on the average *gross* fee charged per student (before the application of any fee waivers or discount) in 2022-23, separately by study level, mode, and 'home' fee eligibility status (i.e. for students who were eligible to pay 'home' fees, vs. those that were not). In terms of study level, 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). In terms of fee eligibility, we assume that all non-UK domiciled students studying at the University in the 2022-23 cohort were *not* eligible to pay 'home' fees (i.e. that both EU and non-EU domiciled students in the cohort all paid fee rates for overseas students).

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

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

[89] 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 Manchester students, we used estimates from the **2021-22 Student Income and Expenditure Survey** (SIES).[90] 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 Manchester itself (see Section 5)).[91]
- 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.[92]

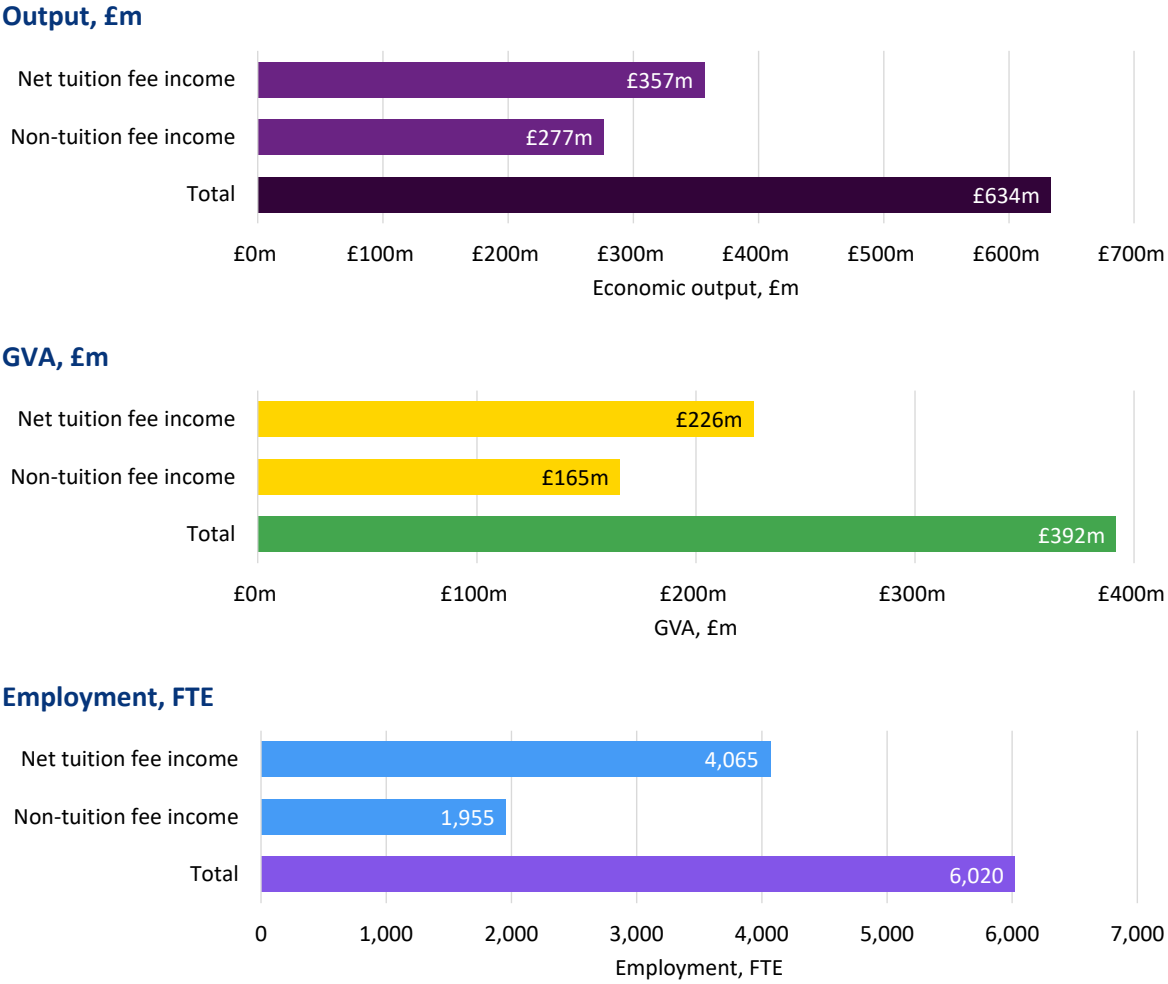
Similarly to tuition fees, we then calculated the non-tuition fee expenditure over the entire duration of students' higher education courses (and discounted to reflect present values). The resulting estimates provide the total average (off-campus) non-fee expenditure per student in 2022-23 prices, by level of study, mode, and domicile.[93] 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 Manchester.

4.2.2 Total direct impact

The total direct economic impact of the expenditures of international students in the 2022-23 University of Manchester cohort (in economic output terms) was estimated at **£634 million** (see Figure 25). More than half of this total (**£357 million, 56%**) was generated from international students' tuition fees accrued by The University of Manchester (net of any fee waivers or bursaries provided by the University), while the remaining **£277 million** (**44%**) was generated from these students' non-tuition fee spending. In terms of student domicile, reflecting the composition of the cohort, most of this impact (**£602 million**, **95%**) was generated by non-EU domiciled students, while **£32 million** (**5%**) was associated with EU students (not presented graphically here).

[90] See National Centre for Social Research & Institute for Employment Studies (2023).
[91] 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 Manchester itself).
[92] 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.
[93] For information on the estimated levels of non-tuition fee income per student, please refer to Annex A2.4.5.

Figure 25 Total direct impact associated with non-UK students in the 2022-23 University of Manchester 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

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.[94] We thus estimate that the export income generated by international students in the 2022-23 University of Manchester cohort directly generates **£392 million** in GVA (**£226 million** from international (net) fee income and **£165 million** from non-fee income) and supports **6,020** FTE jobs (**4,065** from (net) tuition fee income and **1,955** from non-tuition fee income).

[94] To estimate the direct GVA and employment associated with the (net) tuition fee income generated by The University of Manchester's international students, we multiplied this income by the average ratio of GVA to output and FTE employees to output within Greater Manchester'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 Greater Manchester (also based on the multi-regional Input-Output model). In other words, we assume that the non-tuition fee expenditures of The University of Manchester's international students support the same levels of GVA and employment (in relative/proportionate terms) as the expenditure of households located in Greater Manchester more generally.

4.3 Total economic impact associated with The University of Manchester's educational exports

To estimate the total (direct, indirect, and induced) economic impact associated with the export income generated by international University of Manchester students, we again used economic multipliers derived from the above-described multi-regional Input-Output model (see Section 2.1), estimating the extent to which the direct export income 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 Manchester itself)**: The multipliers used to estimate the impact of The University of Manchester's international tuition fee income were calculated based on the inter- and intra-industry flows of goods and services for Greater Manchester's government, health, and education sector as a whole.[95]
- **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 Greater Manchester,[96] and applied to the estimated off-campus non-tuition fee expenditures of overseas students in the 2022-23 cohort of The University of Manchester 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 Manchester (in terms of the impact on Greater Manchester, the North West, and the UK economy as a whole).[97]

[95] This approach is based on the fact that the tuition fee income from international students is accrued by The University of Manchester 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 Greater Manchester'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 Manchester cohort, and then deduct the University's cost of provision (i.e. The University of Manchester's fee waivers and bursaries) to arrive at the *net* direct, indirect and induced impact associated with this income.

[96] In other words, for the purpose of applying relevant economic multipliers, we assume that international students studying at The University of Manchester have similar expenditure patterns as households in Greater Manchester 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).

[97] While the table presents the multipliers for the impacts on Greater Manchester, the North West, 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 7.2.

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

Location of impact and type of income	Output	GVA	FTE employment
Tuition fee income			
Greater Manchester	1.37	1.32	1.27
North West	1.65	1.56	1.46
Total UK	2.42	2.22	1.94
Non-fee income			
Greater Manchester	1.40	1.39	1.43
North West	1.69	1.66	1.72
Total UK	2.48	2.39	2.50

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

Applying these multipliers to the above direct impacts,[98] 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 Manchester cohort amounts to **£1.61 billion** in **economic output** terms (see Figure 26):

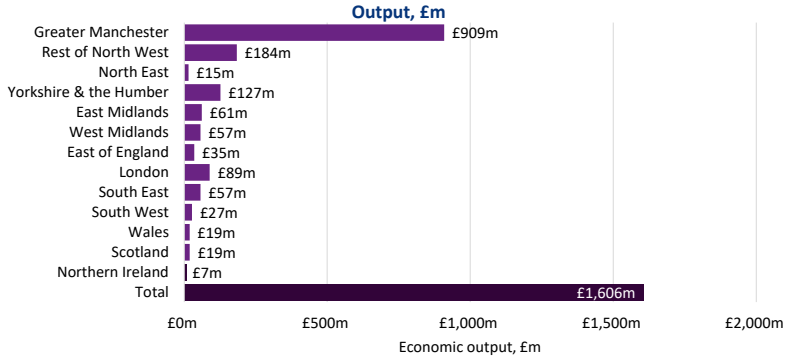
The impact of the export income generated by the 2022-23 University of Manchester student cohort stood at £1.61 billion.

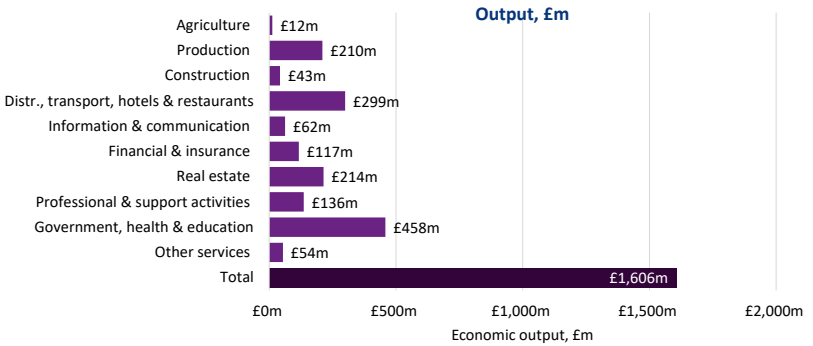
- In terms of the breakdown by type of income, **£920 million** of this impact was associated with international students' (net) **tuition fees**, and **£686 million** was generated by their **non-tuition fee expenditures** over the duration of their studies at The University of Manchester.
- In terms of the breakdown by region, most of this impact (**£909 million**, **57%**) was generated in **Greater Manchester**, with **£184 million**, **11%** generated in the **rest of the North West**, and the remaining **£514 million** (**32%**) occurring in other regions across the UK.
- In terms of sector, the tuition fee and non-tuition fee income generated from The University of Manchester's international students generated particularly large impacts within the **government, health, and education sector** (**£458 million**, **29%**), given that the cohort's tuition fee income is accrued by The University of Manchester itself. In addition, there are relatively large impacts felt within the **distribution, transport, hotel, and restaurant sector** (**£299 million**, **19%**), and the **real estate industry** (**£214 million, 13%**).[99]

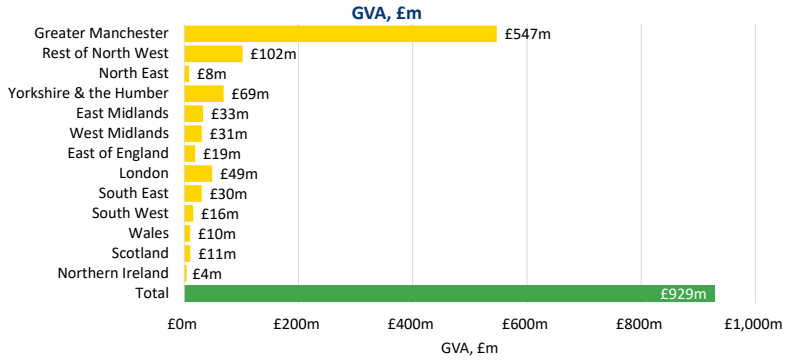
The impact in terms of **GVA** was estimated at **£929 million** across the UK economy as a whole (with **£547 million** generated within Greater Manchester, and **£102 million** generated in the rest of the North West), while the corresponding estimates in terms of employment stood at **13,180 FTE jobs** across the UK as a whole (with **8,210** jobs supported across Greater Manchester, and **1,380** across the rest of the North West).

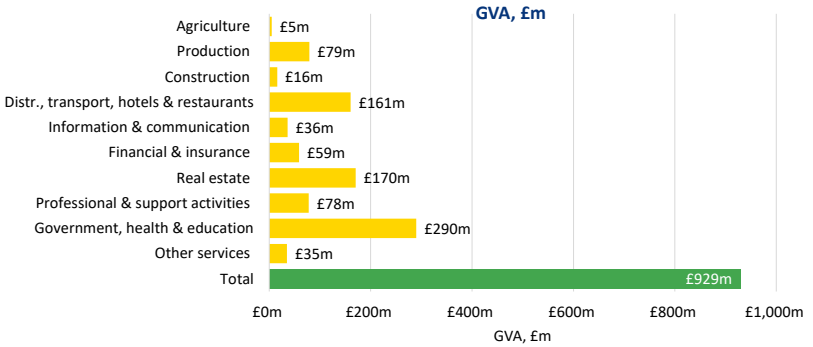
[98] Again, in terms of tuition fee income, note that we apply the relevant multipliers to the *gross* tuition fee income generated by international students in the 2022-23 University of Manchester cohort, and then deduct the University's cost of fee waivers and bursaries to arrive at the *net* direct, indirect and induced impact associated with this income.
[99] Again, for more detail on which industries are included in this high-level sector classification, please refer to Table 17 in Annex A2.1.2.

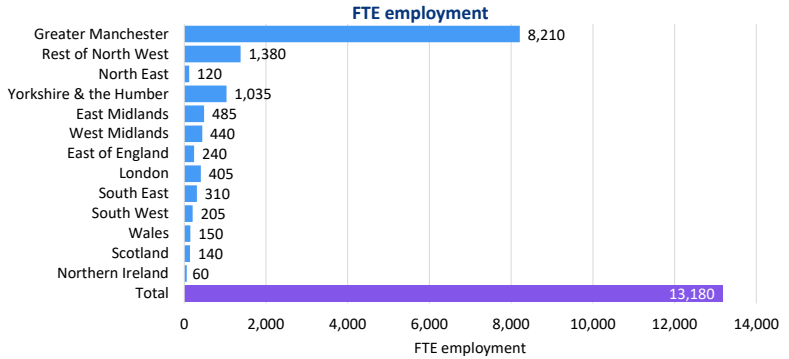
Figure 26 Total economic impact associated with The University of Manchester's educational exports in the 2022-23 academic year, by region and sector

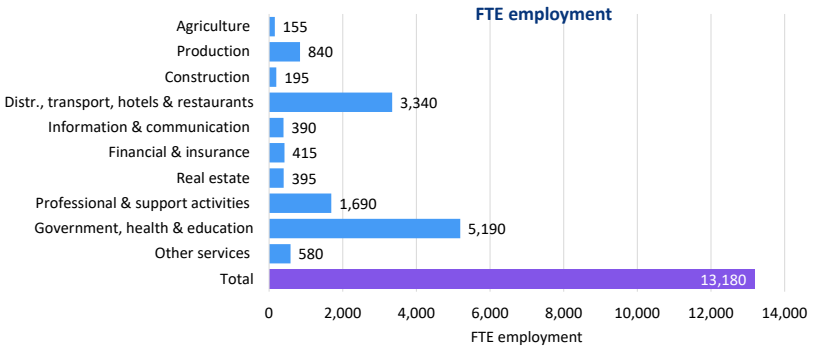












Note: Monetary estimates are presented in 2022-23 prices, discounted to reflect net present values, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. ***Source: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

Great Science Share for Schools

The Great Science Share for Schools (GSSfS) is a global campaign led by The University of Manchester's Science and Engineering Education, Research and Innovation Hub (SEERIH). It involves young people anywhere in the world aged 5-14 years in asking, investigating and sharing a scientific question they care about.

First launched as part of the European City of Science in 2016, GSSfS was awarded patronage of the National Commission for UNESCO in 2024.

GSSfS is based on three simple values: learner-focused science communication; inclusive and non-competitive engagement; and promotion of collaboration at all levels. Young people decide on a scientific question they care about. They develop skills and knowledge to work scientifically, gathering evidence from investigations and draw conclusions. Them they share their learning with new audiences in a range of communication styles.

GSSfS primarily supports teachers and educators in their endeavour to raise the profile and quality of science enquiry in schools and communities. With the young people being the communicators, this is a unique way to gauge the impact of science learning and to increase agency and involvement in science enquiry.

In 2024, 669,190 learners from 40 countries asked, investigated and shared scientific questions. Scientific questions asked related to key challenges set out in the UN's Sustainable Development Goals. Examples of questions included:

- Which fruit or vegetable is most likely to be able to power an electric car?
- How can we change the pitch of a sound?
- What effects does plastic pollution have on wildlife?

In addition, evaluation of GSSfS has shown:

- Increased enthusiasm, excitement and interest in learning science as a subject;
- Pupils are given opportunities to lead, choose and be at the forefront of science investigations;
- Pupils having a desire to 'do more science';
- Improved standards of science questions and answers;
- Pupils' general confidence building (related to science and wider life skills);
- A realisation among pupils that 'science is everywhere' in their lives;
- Confidence building and network generation for teachers;
- Pupils learning an appreciation that science is more than just the investigations they do in class; and
- GSSfS pupils have scored substantially higher than comparator groups in mathematical problem solving and creativity, aspects of openness, and the academic persistence elements of resilience.

5 The impact of The University of Manchester'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 Manchester**. 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 educational exports (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

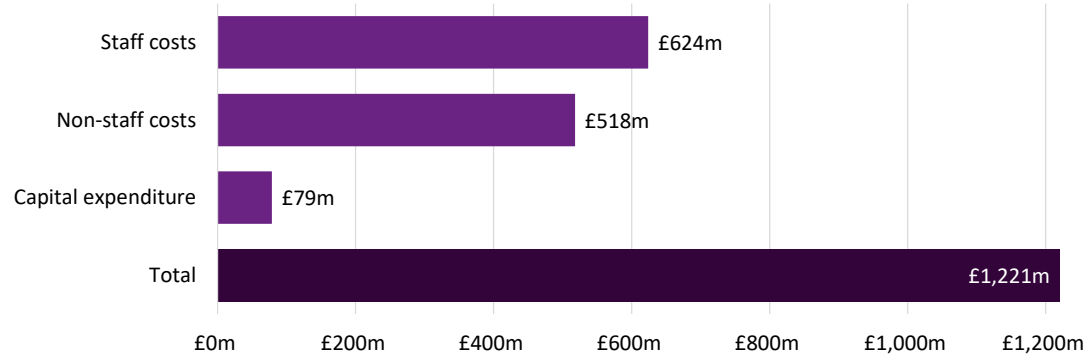
To measure the direct economic impact of the purchases of goods, services, and labour by The University of Manchester, we used information on the University's operational expenditures (including staff and non-staff spending), capital expenditures, as well as the number of staff employed (in terms of full-time equivalent employees), for the 2022-23 academic year.[100]

Based on this, in terms of monetary economic **output** (measured in terms of expenditure), **the gross direct economic impact** associated with The University of Manchester's expenditures stood at approximately **£1.221 billion** in the 2022-23 academic year (see Figure 27). This includes **£624 million** of operating expenditure on staff related costs, **£518 million** of expenditure on other (non-staff) operating expenses,[101] as well as **£79 million** of capital expenditure incurred in that academic year.

In terms of staff, the University employed a total of **10,495** FTE staff in 2022-23[102] (**11,375** in headcount terms), which equates to around **4%** of total employment in Manchester.[103] In GVA terms, the University's gross direct impact stood at **£858 million**.

[100] Based on staff and financial data published by HESA (2024a and 2024d) and The University of Manchester's annual accounts (see University of Manchester, 2023).
[101] The total operational expenditure (excluding capital expenditure) of The University of Manchester in 2022-23 stood at **£1,238 million**. From this, for the purpose of the analysis, we excluded **£96 million** in depreciation costs (from non-staff expenditure) 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 **£1,142 million** in 2022-23 included here. Totals may not add up precisely due to rounding.
[102] Based on data published by HESA (2024d). Note that this excludes staff on atypical contracts.
[103] Based on the University's **11,375** staff (in headcount terms) in 2022-23, compared to total employment in Manchester of **281,300** between July 2022 and June 2023 (based on data from the Annual Population Survey (Nomis, 2024a).

Figure 27 Gross direct economic impact (in terms of output) of The University of Manchester's expenditure in the 2022-23 academic year, 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 Manchester's annual accounts (University of Manchester, 2023).

5.1.2 Net direct impact of the University's expenditures

Before arriving at the net direct impact associated with The University of Manchester'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 **£857 million**, including:

- The total research income (excluding contract research income) received by the University in the 2022-23 academic year (**£327 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 **£91 million**, to avoid double-counting with the impact of the University's wider knowledge exchange activities (Section 2.2).
- **£44 million** in University of Manchester bursary spending for UK-domiciled students,[104] as this was included (as a benefit) in the analysis of the University's teaching and learning activities (Section 3).
- The University's (gross) international fee income associated with the 2022-23 cohort of non-UK students (**£396 million**),[105] to avoid double-counting with the impact of the University's educational exports (Section 4).

After accounting for these deductions, the net direct impact of the University's expenditure in 2022-23 stood at **£364 million**.

[104] 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.
[105] This is slightly larger than the above *net* tuition fee income associated with international students in the 2022-23 cohort (£357 million; see Section 4), as the value deducted here relates to the University's *gross* international fee income *before* the deduction of the University fee waiver/bursary costs associated with these students (since these costs are already deducted when estimating the impact of the University's educational exports).

5.1.3 The University's geographical footprint

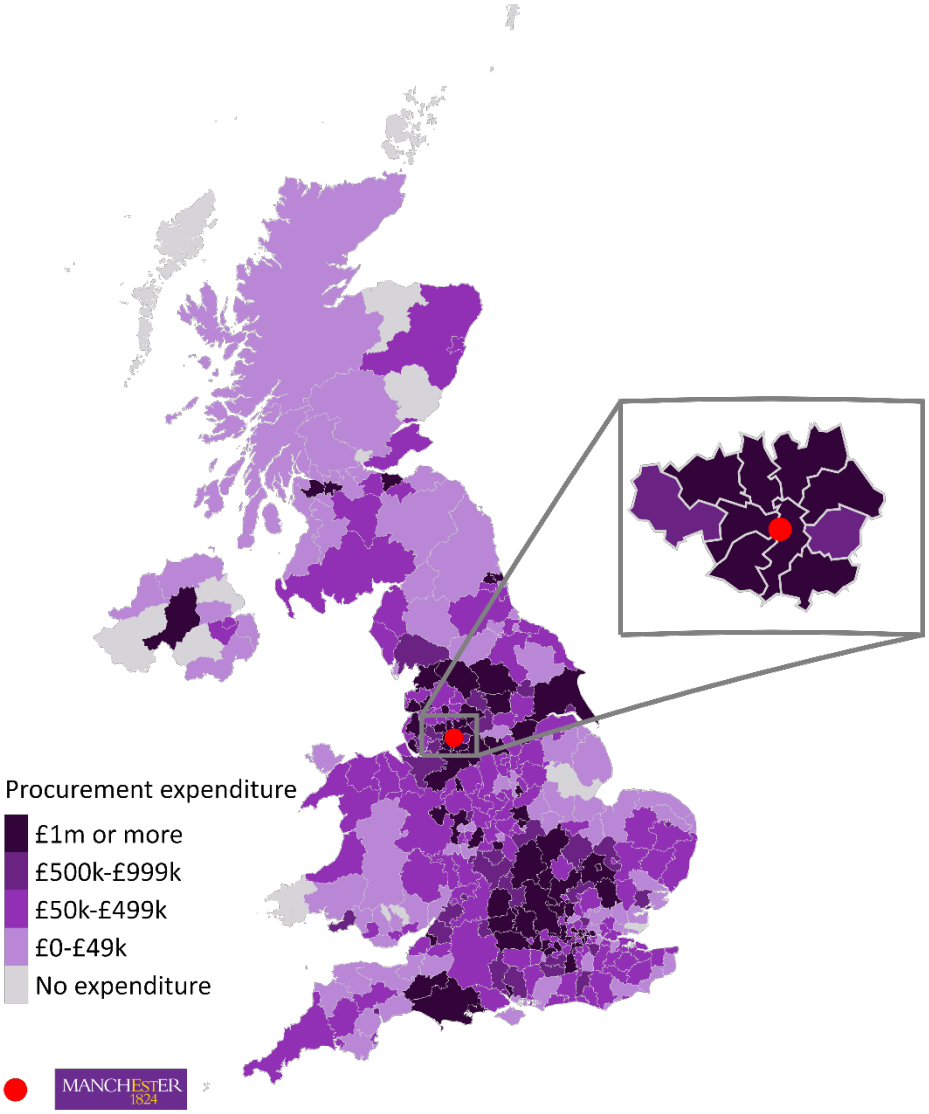
In addition to these total expenditures, we investigated the **geographical breakdown** of The University of Manchester's procurement expenditures, staff salary expenditures and number of staff to demonstrate the University's impact in Greater Manchester and the rest of the UK.

Figure 28 presents the distribution of The University of Manchester's UK procurement expenditure (based on invoice data for 2022-23) by Local Authority. The map illustrates a concentration of procurement expenditure in **Greater Manchester** (**£143 million**, equivalent to approximately **31%** of total expenditure), with **6%** of all UK procurement expenditure taking place in the remainder of the **North West**. Within Greater Manchester, The University of Manchester spent approximately **£98 million** in Manchester, **£14 million** in Salford, **£8 million** in Oldham, **£7 million** in Stockport, **£6 million** in Trafford, **£4 million** in Bolton, **£2 million** in Rochdale, **£2 million** in Bury, **£0.8 million** in Tameside and **£0.5 million** in Wigan. The University also spent significant amounts on goods and services from suppliers in other regions, including **London** (**15%** of UK procurement expenditure),[106] the **South East** (**11%**), the **West Midlands** (**8%**), **Yorkshire and the Humber** (**7%**), and the **East Midlands** (**5%**).

For a more detailed breakdown of procurement expenditure by Local Authority and parliamentary constituency, see Table 32 and Table 33 in Annex A3.2.

[106] It is possible that the data overestimate the level of procurement expenditure occurring in London as compared to other regions, since the invoice data would often reflect suppliers' head office locations, rather than the location where these purchases actually took place.

Figure 28 Distribution of The University of Manchester's procurement expenditure in the 2022-23 academic year by Local Authority (of invoice address)



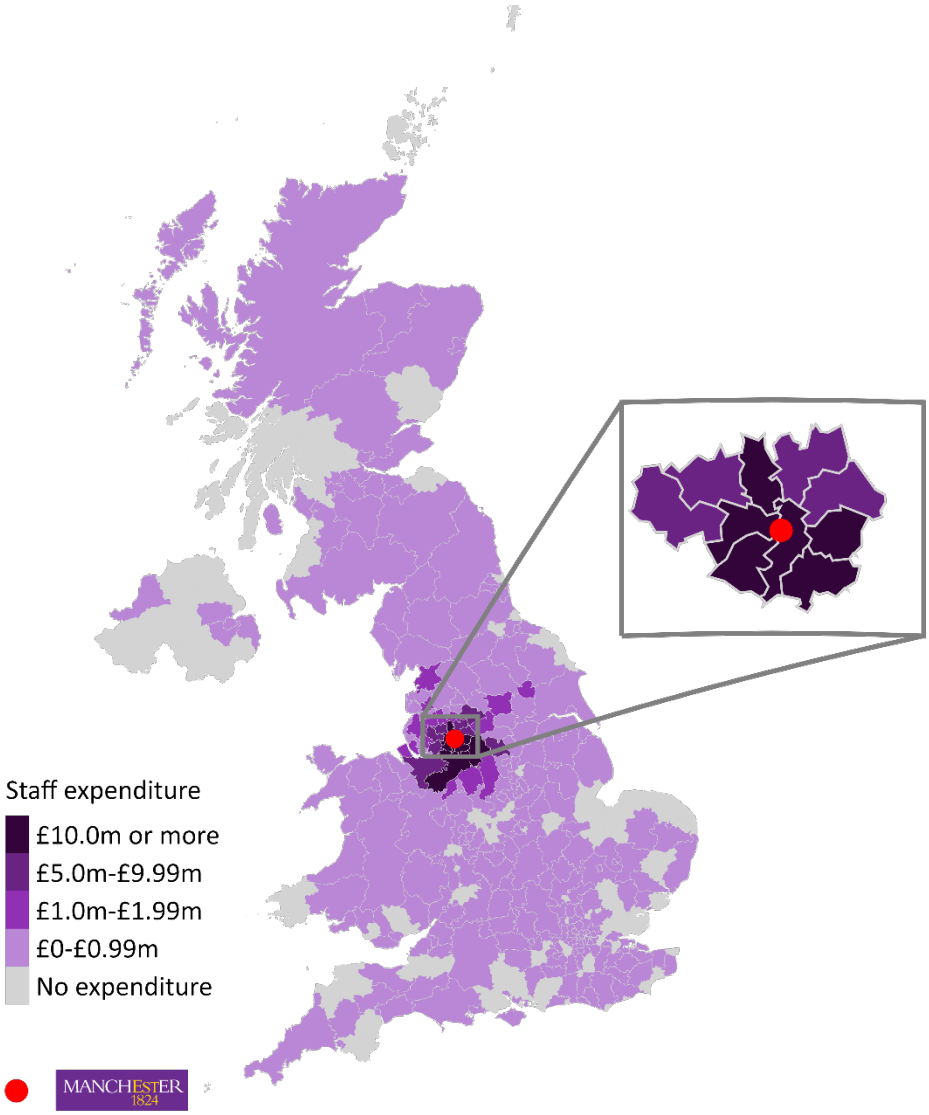
Note: We received data on the invoice postcodes associated with £520 million of procurement expenditure from The University of Manchester. Of this total, we excluded expenditure records from outside of the UK or with an invalid postcode (associated with £59 million of expenditure). As a result of these exclusions, the figure is based on a total of £461 million of procurement expenditure. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from The University of Manchester, 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 29 and Figure 30 illustrate the distribution of the University's staff expenditure and staff headcount by Local Authority (based on the postcode employees' home addresses) in 2022-23. As expected, the maps show a particularly strong concentration of staff in the University's local area, with approximately **74%** of the University's staff living in **Greater Manchester** and **87%** of the University's staff living in the **North West** as a whole. In total, the University spent **71%** of its total salary expenditure on staff living in Greater Manchester in 2022-23, equating to **£365 million**. Within Greater Manchester, there was a particularly strong concentration of staff living in Manchester (**33%** of the University's staff), Trafford (**10%**), Stockport (**10%**) and Salford (**6%**), with a further **4%** in Tameside, **3%** in Bury, **2%** in Oldham, **2%** in Bury, **2%** in Rochdale and **1%** in Wigan. In addition, **5%** of staff lived in Cheshire East, with **2%** living in High Peak and **2%** in Warrington.

For a more detailed breakdown of staff numbers and staff salary expenditure by Local Authority and parliamentary constituency, see Table 34 and Table 35 in Annex A3.3.

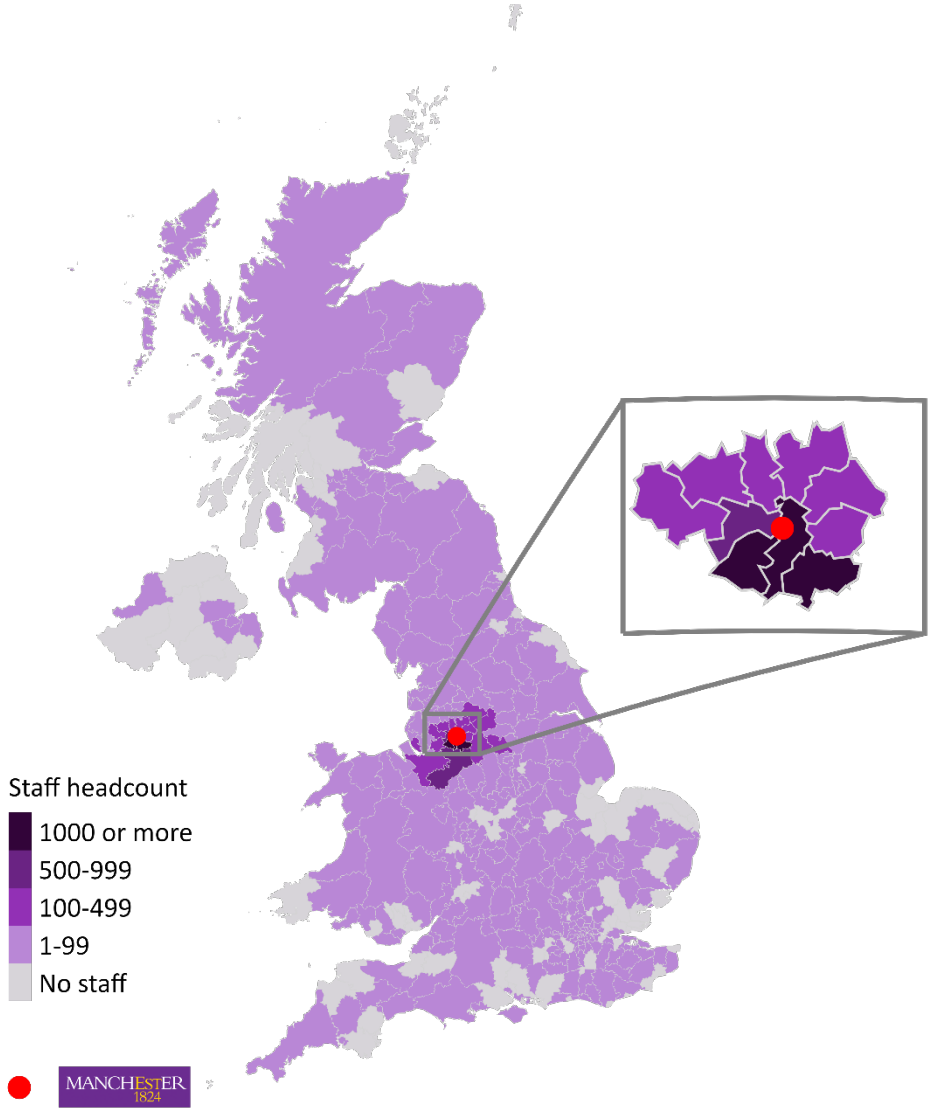
Figure 29 Distribution of The University of Manchester's staff salary expenditure by Local Authority (of home address) in the 2022-23 academic year



Note: We received data on the home address postcodes associated with £523 million of staff expenditure by The University of Manchester. Of this total, we excluded expenditure records from outside of the UK or with an invalid or missing postcode (associated with £12 million of expenditure). As a result of these exclusions, the figure is based on a total of £512 million of staff expenditure. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from The University of Manchester, 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 30 Distribution of The University of Manchester's staff (in headcount) by Local Authority (of home address) in the 2022-23 academic year



Note: We received data on the home address postcode for a total of 12,065 staff (in headcount) from The University of Manchester. Of this total, we excluded staff records with missing or invalid postcodes (270 in total). The figure is thus based on the home addresses of 11,800 staff. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from The University of Manchester, 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.

Real Living Wage

The University was an early adopter of the Real Living Wage, becoming accredited in 2019. Paying a Real Living Wage to its lowest paid staff, who tend to live in its most neighbouring communities, is seen as a key way in which the University meets its civic obligations and responsibilities. The Real Living Wage is an independently calculated rate of pay based on the cost of living and is paid voluntarily by employers. The rate is calculated annually by the Resolution Foundation after analysis of the wage employees must earn to afford a basket of goods equating to a 'decent' standard of living. This basket of goods includes housing, childcare, transport and heating costs. Being accredited also requires employers to have a plan in place to pay contracted workers in their supply chains a Real Living Wage. The University of Manchester has embedded this requirement into its procurement strategy and processes.

As well as paying the Real Living Wage, the University plays an active role with the Living Wage Foundation, which campaigns and advocates locally and nationally for other organisations to commit to paying the Real Living Wage. Locally, the University works with the Greater Manchester Combined Authority, Manchester City Council and Greater Manchester Citizens to help other organisations adopt the Real Living Wage.

The University of Manchester was proud to be part of Manchester City Council's leadership team that worked together to achieve Living Wage City status in 2023. It is also proud to have gained membership of the Greater Manchester Mayor's Good Employment Charter, which necessitates payment of a living wage as one of its seven key criteria. The University is now working with its Greater Manchester Civic University Agreement partners to encourage other organisations across the city region to pay and become accredited real Living Wage employers.

5.2 Indirect and induced impacts of the University's expenditures

As with the economic impact of The University of Manchester's research and knowledge exchange activities (see Section 2) and educational exports (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.[107] We applied the estimated average economic multipliers associated with organisations in Greater Manchester's government, health, and education sector, which mirrors the approach used to assess the impact of the University's international tuition 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 of Manchester itself. Again, this approach asserts that the spending patterns of the University reflect the average spending patterns across organisations operating in Greater Manchester's government, health, and education sector. These multipliers (for the impact on Greater Manchester, the North West and the UK economy as a whole) are presented in Table 11 and are applied to the **net direct impact** of The University of Manchester's expenditures of **£364 million**.

Table 11 Economic multipliers associated with The University of Manchester's spending

Location of impact and type of income	Output	GVA	FTE employment
Greater Manchester	1.37	1.32	1.27
North West	1.65	1.56	1.46
Total UK	2.42	2.22	1.94

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 Manchester's spending

Figure 31 presents the estimated total direct, indirect, and induced impacts associated with the expenditures incurred by The University of Manchester in the 2022-23 academic year (after the above-described adjustments have been made). The aggregate impact of these expenditures was estimated at approximately **£881 million** in economic output terms (see top panel of Figure 31):

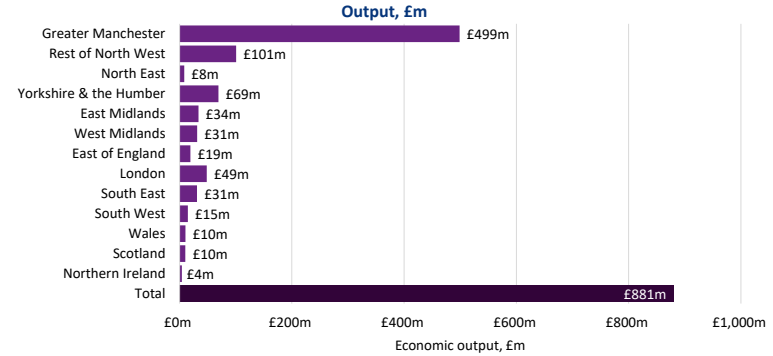
The impact of The University of Manchester's expenditure on the UK economy in 2022-23 stood at £881 million.

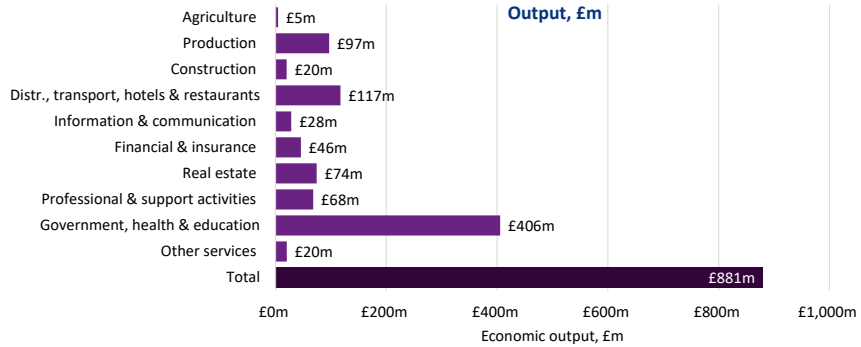
- In terms of region, the majority of this impact (**£499 million, 57%**) was generated in **Greater Manchester**, with an additional **£101 million** (**11%**) generated through the rest of the North West and the remaining **£281 million** (**32%**) occurring in **other regions** across the UK.
- In terms of sector, in addition to the impacts occurring in the **government, health, and education sector** itself (**£406 million, 46%**), there are also large impacts felt within other sectors, including the **distribution, transport, hotel, and restaurant sector** (**£117 million, 13%**), the **production sector** (**£97 million, 11%**), and the **real estate sector** (**£74 million, 8%**).[108]

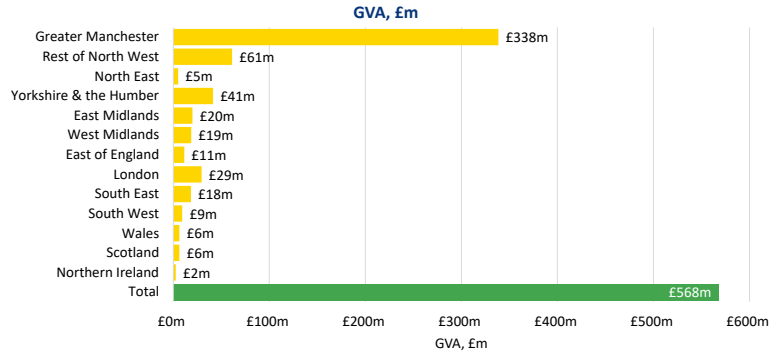
[107] See Annex A2.1 for more information.
[108] Again, for more detail on which industries are included in this high-level sector classification, please refer to Table 17 in Annex A2.1.2.

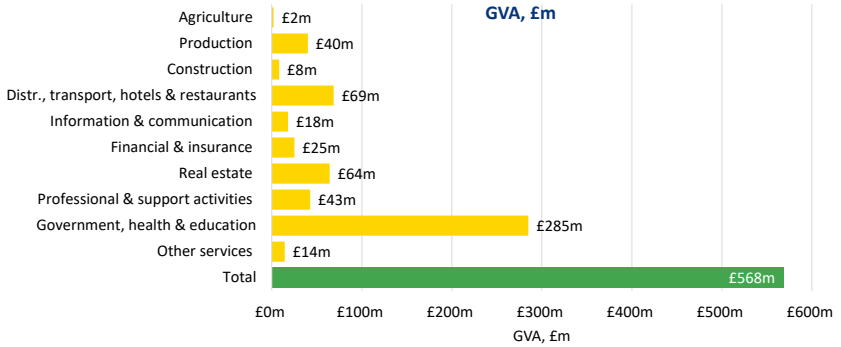
In terms of the number of jobs supported (in FTE), the results indicate that The University of Manchester's spending supported a total of **6,065** FTE jobs across the UK economy in the 2022-23 academic year (of which **3,960** were located in Greater Manchester). In addition, the impact in terms of gross value added was estimated at **£568 million** across the UK economy as a whole (with **£338 million** accrued within Greater Manchester).

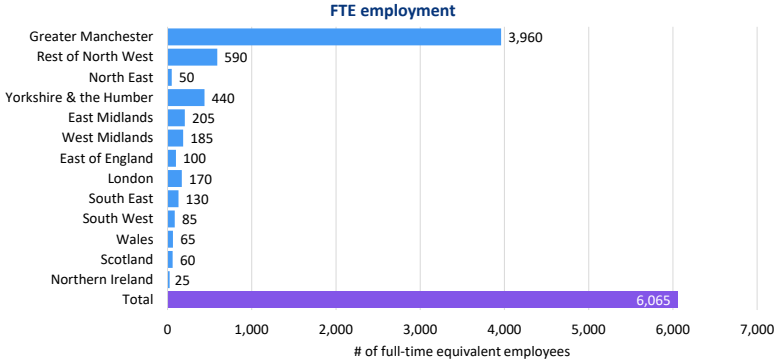
Figure 31 Total economic impact associated with The University of Manchester's expenditures in the 2022-23 academic year, by region and sector

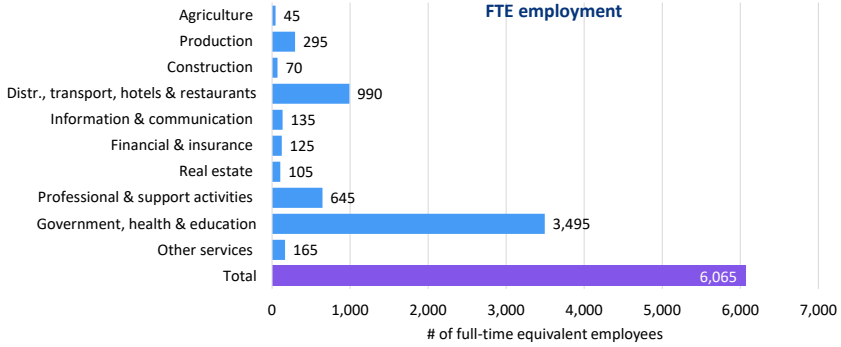












Note: Monetary estimates are presented in 2022-23 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. ***Source: London Economics' analysis***

Social value and construction of the Nancy Rothwell Building

The Nancy Rothwell Building (formerly MECD – Manchester Engineering Campus Development) is among the largest construction programmes ever undertaken in British higher education. But what was unique was not only its scale: it created a benchmark and new record in British higher education for social value creation through the generation of local jobs, apprenticeships, cash grants and pro-bono support for local communities. Working with its construction partner, Balfour Beatty, the University's approach to social responsibility included using its role as a key 'anchor institution' in Greater Manchester to create social value for communities through targeted actions on employment and community development.

The Nancy Rothwell Building faces Manchester's inner-city ward of Ardwick, where more than half the area's population are deprived in one or more dimensions. The brief for building was to construct a new campus addressing future engineering challenges, whilst bringing life-changing impact, in the present, to local communities.

First, a community consultation was undertaken in Ardwick with the support of Manchester City Council. Residents fed back that they wanted to see new job opportunities created, and wanted local community groups to benefit from the diverse skills and financial resources brought about through such a large collaborative project. Second, an innovative procurement programme selected the construction firm Balfour Beatty not only on price and quality criteria, but also on ambitious social value metrics for jobs, education and community development. Thirdly, as part of the contract being awarded, we set highly ambitious social value and considerate construction targets, detailed in the next section.

Outputs included:

- An ambitious target to create one sustained job or apprenticeship for every £1 million of net construction value – i.e. more than 110 jobs and apprenticeships. This was surpassed with 182 jobs and apprentices created, 15 of which went to rehabilitated offenders.
- An agreement to create at least £30,000 of support for local community groups through a new University Construction Community Fund. This was surpassed with 43 local community groups benefiting from £60,000 of support, which helped to renovate a local women's refuge, support the capital programme of a local LGBT centre, establish a local foodbank, support wheelchair access to a local charity building and tackle loneliness among older people.
- A target of a minimum of 40 out of 45 points in the accredited Considerate Constructors Scheme. A maximum score of 45 was achieved because of our demonstrably positive impact on community and the environment.

Using the sector-leading Social Value Portal tool it was estimated that £19.7 million of social value was created for local communities, setting a record for all construction programmes to date in British higher education.

6 The University of Manchester's contribution to tourism

As a final strand of economic contribution, this chapter outlines the analysis of the University's role in attracting a range of visitors to Manchester, including business visitors, friends and family visiting the University's staff and students, and visitors participating in study trips to the University.

To understand the economic impact of tourism associated with the University, we combine information on the number of visits to Manchester associated with the University with information on the average expenditure per visitor. As with the University's research and knowledge exchange activities (see Section 2), educational exports (see Section 4), and operational and capital expenditures (see Section 5), these visitors' expenditures result in subsequent rounds of spending and economic activity within the local economy, captured by the direct, indirect, and induced impacts associated with these expenditures. Again, these impacts are estimated using economic multipliers and are measured in terms of the contribution to **economic output**, **gross value added**, and (full-time equivalent) **employment** in 2022-23.

6.1 Estimating the number of visitors associated with the University's activities

Data from the International Passenger Survey (IPS) published by the Office for National Statistics[109] estimated that, in 2022, there were a total of approximately **1,230,000** overseas overnight visits to Manchester.[110] Domestic visits are not considered in the analysis as they do not contribute additionally to the UK economy.[111] As a result, the remainder of this analysis focuses only on the **1,230,000** trips to Manchester involving overnight stays by visitors from overseas.

In addition to the total number of these overseas overnight visits, a key element of the analysis involves understanding the specific reason for these visits. Based on the IPS data, of the total of **1,230,000** overnight trips to Manchester by overseas visitors, approximately **38%** (**463,000**) were undertaken for the purposes of visiting friends and family, **27%** (**334,000**) were holiday or excursion visits, **23%** (**286,000**) were business trips, **2%** (**20,000**) were study trips to Manchester, and the remaining **10%** (**128,000**) were trips for other purposes. Using this breakdown by purpose of visit to estimate the impact of The University of Manchester's contribution to tourism in 2022-23, we made the following assumptions in relation to the **number of overseas overnight visits to Manchester that resulted from the University's presence**:

- In relation to **business trips**, the University employed approximately **11,375** staff in 2022-23 (in headcount terms, equivalent to **10,495** FTE employees (see Section 5.1)), accounting for around **4%** of the total employed population of Manchester in 2022-23.[112] Based on this, it is assumed that **4%** of business trips to Manchester in 2022-23 were related to the University (corresponding to approximately **12,000** visits/trips).

[109] See VisitBritain (2023b). Number of visits is based on the city's visitors' reported spending on at least one night during their trip.
[110] Data from 2022 are used as they are the most recent data available and cover the majority of the 2022-23 academic year. The ONS was unable to interview at the Eurotunnel from January to June 2022 due to COVID-19 restrictions, so those data were instead modelled by the ONS for consistency.
[111] More specifically, it is likely that any domestic (day or overnight) visits to Manchester would have *displaced* activity from other regions of the United Kingdom. Therefore, following standard evaluation guidance (HM Treasury, 2022), all visitor trips and associated expenditure originating from elsewhere in the United Kingdom - i.e. domestic day trips and domestic overnight trips - are excluded from the analysis.
[112] Using official UK labour market statistics data (Nomis, 2024a), there were approximately **281,300** individuals employed (or self-employed) in Manchester between July 2022 and June 2023.

- With respect to **trips to visit family and friends**, data from HESA[113] indicates that there were approximately **2,525** non-UK nationals employed by the University (representing **0.4%** of the total resident population of Manchester), as well as **18,520** non-UK domiciled students attending the University[114] in 2022-23 (representing around **3.0%** of the resident population). Based on London Economics' previous analysis of the economic impact of international students on the UK economy,[115] it is assumed that, on average, there were **0.8** visits from overseas per non-EU domiciled student or non-EU member of staff, and **3.1** visits from overseas per EU domiciled student or EU member of staff in 2021-22. This represents a weighted average of **1.0** visits per non-UK student and **1.9** visits per non-UK staff at The University of Manchester (weighted by the corresponding EU and non-EU domiciled students and staff at the University in 2022-23).[116] Combined with a 2022 total population estimate for Manchester of **569,000**,[117] it is therefore assumed that approximately **5%** of all overseas visits to Manchester to visit family or friends were to the University's students and staff (equivalent to approximately **24,000** trips in 2022-23).
- In terms of the **study trips** to Manchester,[118] it is assumed that all trips were a result of The University of Manchester, Manchester Metropolitan University, the Royal Northern College of Music, or Luther King House Educational Trust. The University of Manchester accounted for **79%** of the total non-UK domiciled student population across these institutions in 2022-23. It is assumed that study trips by international students are made in proportion to the number of international students at each institution - i.e. that **79%** of all study trips to Manchester in 2022-23 were related to The University of Manchester. This corresponds to approximately **16,000** visits/trips.
- Finally, we assumed that none of the remaining trips to Manchester for **holiday visits** or **other purposes** were as a result of the University.

This methodology is likely to underestimate the tourism impact of the University. Firstly, it does not account for the impact of the University's museums and attractions (such as The University of Manchester Library, the Manchester Museum, the Museum of Medicine and Health, the Jodrell Bank Discovery Centre, the Whitworth Art Gallery, and the Tabley House Collection). Secondly, we only estimate the impact of overseas tourism, given that we focus on the impact of the University

[113] See HESA (2024d).
[114] See HESA (2024e). Note that this includes *all* students enrolled with the University in 2022-23, i.e. including both first-year and continuing students.
[115] See London Economics (2023).
[116] The previous analysis (London Economics, 2023) estimated the number of visits from overseas per EU and non-EU student per year (standing at 3.1 and 0.8, respectively). Here, we then assumed the same average number of visitors per EU and non-EU *staff* employed at The University of Manchester.
[117] See Nomis (2024b).
[118] Overseas overnight study trips refer to study trips by an overseas resident for a period of less than 12 months (see Office for National Statistics (2024b)). These study visits constitute a wide range of potential activities, such as undertaking short courses, language courses, continuing professional development, visiting or exchange student programmes, or summer schools (e.g. The University of Manchester's Summer School programmes). Our approach may overestimate the University's contribution to tourism to some extent, as some of the activities captured within this 'study trip' category may take place outside of higher education institutions, such as within language schools or secondary schools. However, in the absence of further information on the exact location of study trips within Manchester in published International Passenger Survey (IPS) data and considering the size and international reputation of the University, it is likely that the vast majority of overseas study trips to Manchester are attributable to the University. It is also possible that there is some double-counting between the impact of study trips and the impact of international student expenditure (see Section 4) if international students who are undertaking courses shorter than one year are accounted for within IPS study trip figures. However, the average (on- and off- campus) expenditure associated with study visits (£2,430) from the IPS is relatively low compared to the average yearly living cost spending per international student estimated here (between £15,015 and £20,020 for full-time students, depending on study level and domicile), suggesting that the University's international students are not being routinely included in IPS study trip figures. Additionally, some students at the University (e.g. incoming visiting or exchange students) are excluded from the standard HESA registration population and are therefore excluded from the analysis of the impact of international student expenditure, but, depending on their course length, would be included in the impact of tourism expenditure.

on the UK economy. However, the University is likely to bring significant additional impact to Greater Manchester's economy through domestic tourism, which is not accounted for here.

Table 12 presents the resulting estimated number of trips to Manchester by overseas visitors in 2022-23 that were due to The University of Manchester's activities, estimated at a total of **51,000** (or **4%** of all overseas trips to Manchester).

Table 12 Total number of visits to Manchester and University-related visits by overseas overnight visitors in 2022-23

Type of trip	Total visits	Visits associated with the University	% associated with the University
Holidays	334,000	-	-
Study trips	20,000	16,000	79%
Business trips	286,000	12,000	4%
Trips to visit friends and family	463,000	24,000	5%
Other trips	128,000	-	-
Total visits	**1,230,000**	**51,000**	**4%**

Note: All numbers are rounded to the nearest 1,000, and the total values may not add up due to this rounding.
Source: London Economics' analysis

University cultural institutions

The University of Manchester invests in four free-to-access cultural institutions located on campus and across the region. Across these four cultural institutions, the University welcomed 1.3 million in-person visitors and engaged with a further 3 million people online in 2023/24.

Manchester Museum

The University's Manchester Museum has a mission to be the most inclusive, caring and imaginative museum you will encounter. This commitment to care is not only for the collections, but also for people and relationships, with a pro-active commitment to social justice and environmental sustainability. Through a £15 million transformation, the Museum now offers the public more inclusive spaces for learning with new collections such as the South Asia Gallery (the UK's first permanent space to explore the experiences of South Asian diaspora communities), a Lee Kai Hung Chinese Culture Gallery, a Belonging Gallery and a Top-Floor programme providing co-working space with local NGOs, who share the Museum's values of social justice and environmental sustainability.

The Whitworth

The University's Whitworth gallery operates as a convening space between the University and the people of the city. It was founded in 1889 as The Whitworth Institute and Park in memory of the industrialist Sir Joseph Whitworth for 'the perpetual gratification of the people of Manchester' and continues this mission today in new contexts. Today the gallery, its park and gardens are home to the collection of over 60,000 works of art, textiles, sculptures and wallpapers and provide a platform for artists from around the world.

The John Rylands Research Institute and Library

The John Rylands Research Institute and Library promotes research in, and engagement with, the humanities and sciences using its world-leading special collections. Based in one of the finest neo-Gothic buildings in Europe and in the heart of Manchester, it is a dynamic community of world-leading researchers, curators, conservators and imaging specialists, all focused on a core mission to define the human experience over five millennia and up to the current day. Its collections are free to access for the public and globally-significant. The Library also hosts the Ahmed Iqbal Ullah RACE Centre, a specialist library and archive focusing on the history of global majority communities in Greater Manchester (and beyond), as well as anti-racist activism, refugeeism and migration, and the development of thinking about race and ethnicity.

Jodrell Bank Centre for Engagement

For over 75 years, Jodrell Bank has been at the forefront of that quest for understanding and at the heart of ground-breaking discoveries and world-leading research. Jodrell Bank's inspirational story includes revolutionary scientific discoveries, amazing feats of engineering, the dawn of the Space Age and the creation of the Grade I listed Lovell Telescope, an icon of science and engineering. Today Jodrell Bank Observatory is a major visitor attraction and world-leading science research institute, with scientists working at the cutting-edge of modern astrophysics. In 2019 Jodrell Bank was recognised as a site of Outstanding Universal Value and inscribed on the UNESCO World Heritage Site list.

6.2 Direct impact associated with visitor expenditure

The associated **average spending in the UK per overseas visit** was calculated using information on the total visitor spend by trip purpose and the associated number of visits by purpose to Greater Manchester from VisitBritain (2023a). Based on this information, the estimated **51,000** overnight visits to Manchester from overseas visitors in 2022-2023 associated with the University were associated with an average expenditure per trip of **£1,156**. As a result, the **direct impact** associated with the University's contribution to tourism in 2022-23 was estimated at approximately **£59 million.**

In terms of the nature of this visitor expenditure, approximately **£24 million** (**40%**) of this total was spent on shopping, **£13 million** (**22%**) was spent on food and drink, **£11 million** (**18%**) was associated with entertainment, **£9 million** (**14%**) was spent on accommodation, and the remaining **£3 million** (**5%**) was spent on travel.[119]

In addition to economic output (i.e. visitor expenditure), the above estimates can again be converted into gross value added and the number of FTE jobs supported by this expenditure.[120] It is estimated that the visitor expenditure associated with the University's activities directly generated **£33 million** in GVA and supported **660 FTE jobs**.

6.3 Indirect and induced impacts associated with visitor expenditure

As with the impacts of the University's research and knowledge exchange activities (see Section 2), educational exports (Section 4), and operational and capital expenditures (Section 5), the assessment of the indirect and induced economic impacts associated with visitor expenditure is again based on economic multipliers derived from the above-described multi-regional Input-Output model.[121] In particular, given the concentration of visitor expenditure in the distribution, transport, hotels, and restaurants sector and the 'other' services sector,[122] we applied the estimated average economic multipliers associated with organisations in these sectors located in Greater Manchester.

These multipliers (for Greater Manchester, the North West and the UK as a whole) are presented in Table 13 and are applied to the **direct impact** of the visitor expenditure associated with The University of Manchester of **£59 million**.

Table 13 Economic multipliers associated with tourism expenditures related to the University

Location of impact	Output	GVA	FTE employment
Greater Manchester	1.37	1.36	1.27
North West	1.65	1.63	1.46
Total UK	2.42	2.38	1.96

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

[119] This breakdown was estimated using a breakdown of expenditure by type provided by Marketing Manchester (2024).
[120] To estimate the direct GVA and employment associated with overseas visitor expenditure, we multiplied this expenditure by the average ratio of GVA to output and FTE employees to output within Greater Manchester's distribution, transport, hotels and restaurants sector (for any expenditure on shopping, food and drink, accommodation, and travel) and the 'other' services sector (for any expenditure on entertainment).
[121] See Section 2.1.3 and Annex A2.1 for more information.
[122] As above, the estimated visitor expenditure on shopping, food and drink, accommodation, and travel was assigned to the distribution, transport, hotels, and restaurants sector. The estimated visitor expenditure on entertainment as instead assigned to the 'other' services sector.

6.4 Total impact associated with visitor expenditure

Figure 32 presents the estimated total direct, indirect, and induced impacts associated with the above visitor expenditures generated by the University's activities in 2022-23. The aggregate impact of these expenditures stood at approximately **£144 million** in economic output terms (see top panel of Figure 32).

The impact of the University's contribution to tourism in 2022-23 stood at £144 million.

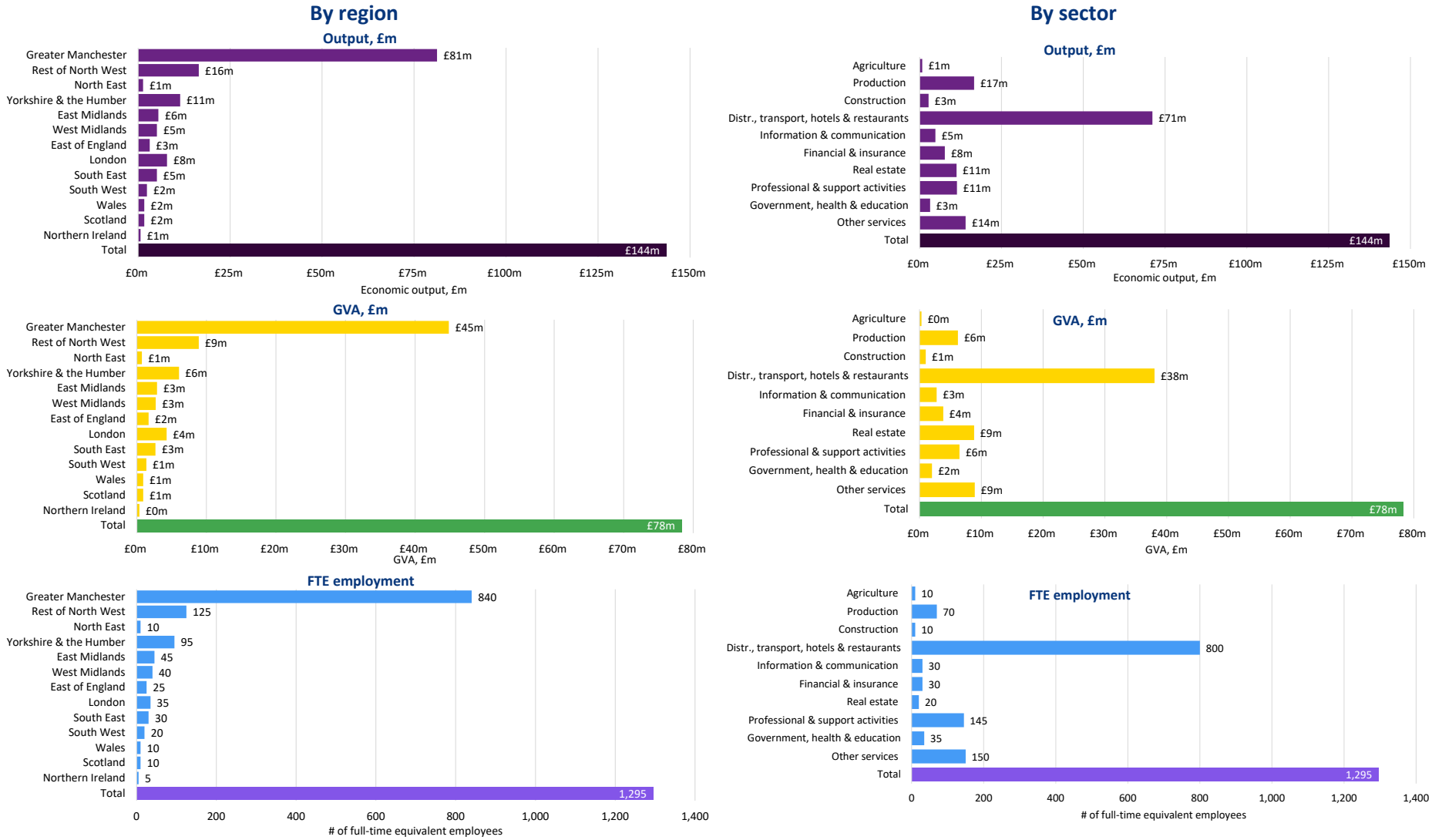
In terms of region, the majority of this impact (**£81 million**, **57%**) was generated in **Greater Manchester**, with an additional **£16 million** (**11%**) generated throughout the rest of the North West and the remaining **£46 million** (**32%**) occurring in **other regions** across the UK.

In terms of sector of impact, in addition to the impacts occurring in the **distribution, transport, hotels and restaurants sector** (**£71 million**, **50%**), there were also large impacts within other sectors, such as the **production sector** (**£17 million**, **12%**), the **'other services' sector** (**£14 million**, **10%**), the **professional and support activities sector** (**£11 million**, **8%**), and the **real estate sector** (**£11 million**, **8%**).[123]

In terms of employment, the results indicate that the visitor spending generated by the University's activities supported a total of **1,295** FTE jobs across the UK economy in 2022-23, of which **840** are located in Greater Manchester and a further **125** in the rest of the North West (presented in the bottom panel of Figure 32). In addition, the impact in GVA terms was estimated at **£78 million** across the UK economy as a whole, of which **£45 million** was generated within Greater Manchester and a further **£9 million** in the rest of the North West (see the middle panel of Figure 32).

[123] Again, for more detail on what industries are included in this high-level sector classification, please refer to Table 17 in Annex A2.1.

Figure 32 Total economic impact associated with the University's contribution to tourism in 2022-23, 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***

7 The total economic impact of The University of Manchester 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 Manchester's activities in the 2022-23 academic year was estimated at approximately **£7.3 billion** (see Table 14). In terms of the components of this impact:

- The University's **research and knowledge exchange activities** accounted for **£3.0 billion** (**42%**) of this impact.
- The economic impact of the University's **teaching and learning activities** stood at **£1.6 billion** (**22%**).
- The impact associated with the University's **international students** was estimated at **£1.6 billion** (**22%**).
- The impact generated by the **operating and capital expenditures** of the University stood at **£881 million** (**12%**).
- The impact of **tourism** activities associated with the University was estimated at **£144 million** (**2%**).

The total economic impact associated with The University of Manchester's activities in 2022-23 stood at £7.3 billion.

Table 14 Total economic impact of The University of Manchester's activities on the UK in 2022-23 (£m and % of total)

Type of impact		£m	%
	Impact of research and knowledge exchange	**£3,050m**	**42%**
	Research activities	£2,471m	34%
	Knowledge exchange activities	£578m	8%
	Impact of teaching and learning	**£1,583m**	**22%**
	Students	£778m	11%
	Exchequer	£805m	11%
	Impact of international students	**£1,606m**	**22%**
	Tuition fee income	£920m	13%
	Non-tuition fee income	£686m	9%
	Impact of the University's spending	**£881m**	**12%**
	Direct impact	£364m	5%
	Indirect and induced impact	£517m	7%
	Impact of tourism	**£144m**	**2%**
	Direct impact	£59m	1%
	Indirect and induced impact	£84m	1%
	Total economic impact	**£7,263m**	**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 of Manchester's relevant operating costs of approximately **£1.1 billion** in 2022-23,[124] the total impact of the University's activities on the UK economy was estimated at **£7.3 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 a number of comparisons.

Firstly, in its framework for economic evaluation guidance, TASO (which is funded by the Office for Students)[125] indicates that **a benefit-to-cost ratio greater than or equal to 4 would be considered to be delivering 'very high' value for money**.[126] As such, according to this wider benchmark used by the UK Central Government, The University of Manchester's activities generate very high levels of value for money.

Secondly, we consider the 'value for money' generated by the University compared to a number of other UK higher education institutions where a comparable methodology has been applied. Table 15 presents the benefit-to-cost ratio for The University of Manchester compared to the corresponding ratios for a number of UK higher education institutions for which London Economics has previously conducted similar economic impact analyses. These ratios have been calculated by comparing each university's total relevant operational costs to the total impact of its activities on the UK economy.[127] As can be seen from this comparison, the benefit-to-cost ratio associated with The University of Manchester's activities (of approximately **6.4:1**) is higher than for most of these comparator institutions.

Table 15 Comparison with benefit-to-cost ratios for other UK higher education institutions

Institution	Academic year covered	Link to study	Economic impact	Benefit-to-cost ratio
University of Manchester	**2022-23**	**-**	**£7.3bn**	**6.4**
University of Cambridge[1]	2020-21	here	£29.8bn	11.7
University of Oxford[1]	2018-19	here	£15.7bn	6.1
University College London[1,2]	2018-19	here	£9.9bn	5.9
University of Edinburgh	2021-22	here	£7.5bn	6.9
University of Glasgow[1,2,3]	2018-19	here	£4.4bn	5.8
University of Birmingham	2021-22	here	£4.4bn	5.7
Cardiff University[1,2]	2020-21	here	£3.7bn	6.4

Note: Economic impact given in the prices of the academic year studied. [1] The analyses for these institutions *included* depreciation costs (as well as movements in pension provisions) in their operational costs when calculating the benefit-to-cost ratio. [2] The analyses conducted for these institutions did not include the value of tourism in their total economic impact (included here). [3] The analyses conducted for the University of Glasgow did not include any analysis of the University's knowledge exchange activities (included here).
Source: London Economics' analysis

[124] This relates to the University's total operating expenditure, excluding capital expenditure, depreciation and amortisation.
[125] See Transforming Access and Student Outcomes in Higher Education (TASO, 2024).
[126] 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.
[127] Note that these ratios are not *exactly* comparable across different institutions, as the total impact of some institutions' activities may include additional strands of impact or exclude certain strands of analysis that have been included here. Additionally, there have been improvements to our methodology over time.

Finally, to further contextualise the findings, given The University of Manchester'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.[128]

Table 16 presents summary results for the benefit-cost ratio and total benefit across this wide range of regulatory impact assessments. 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 Manchester's activities generate an estimated economic benefit of **£7.3 billion**, with a benefit-to-cost ratio of **6.4**. In addition, Figure 33 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 Manchester. 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).

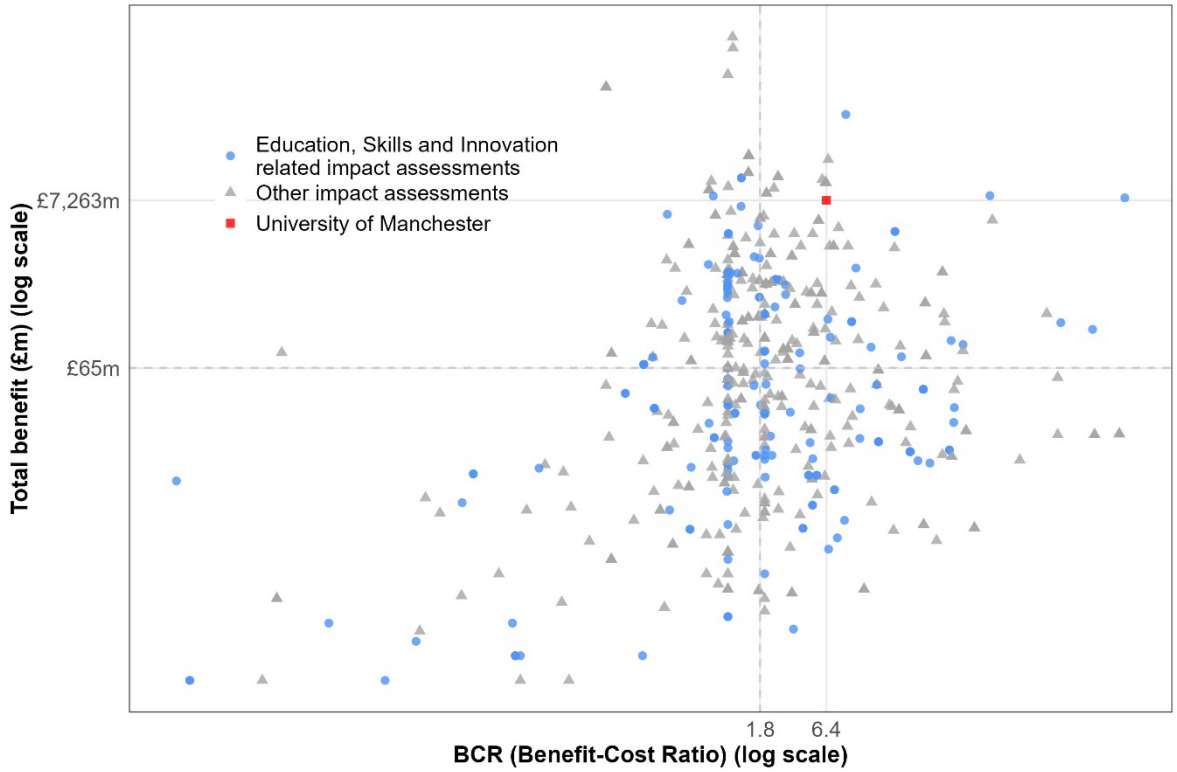
Table 16 Comparison with benefit-to-cost ratios for UK government interventions

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)

[128] 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 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).

Figure 33 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 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** (**£526 million**, see Section 2.1).[129]
- The impact of the University's **knowledge exchange activities** (estimated at **£578 million**, see Section 2.2).
- The impact of the University's **educational exports** (**£1.60 billion**, see Section 4).
- The impact associated with the University's **operating and capital expenditures** (**£881 million**, see Section 5).
- The impact associated with the **tourism activities** associated with the University (**£144 million**, see Section 6).

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

Hence, approximately **£3.73 billion** (**51%**) of The University of Manchester's total economic impact of **£7.26 billion** can be disaggregated in this way.[130]

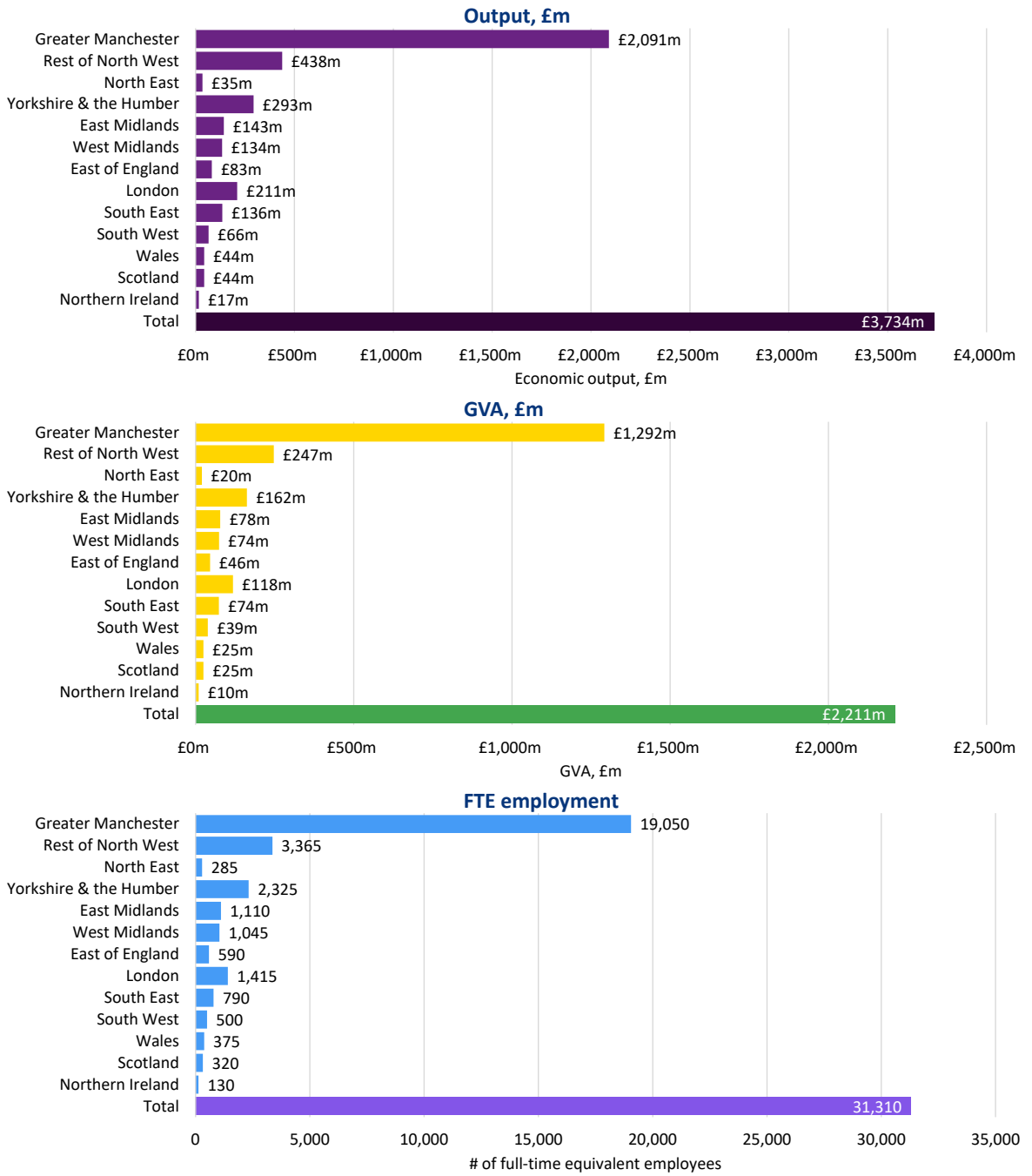
In terms of the breakdown by region (see Figure 34), the analysis indicates that of this total of **£3.73 billion**, approximately **£2.09 billion** (**56%**) occurred in **Greater Manchester**, with **£438 million** (**12%**) occurring in the **rest of the North West**, and the remaining **£1.21 billion** (**32%**) taking place in **other regions** across the UK.

In terms of sector (see Figure 35), the University's activities resulted in particularly large impacts within the **government, health, and education sector** (**£1.22 billion**, **33%**), the **distribution, transport, hotel, and restaurant sector** (**£634 million**, **17%**), the **professional and support activities sector** (**£456 million**, **12%**), the **production sector** (**£440 million**, **12%**), and the **real estate sector** (**£391 million**, **10%**).

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 **31,310** FTE jobs across the UK economy, with **19,050** of these jobs located in **Greater Manchester**, and a further **3,365** supported in the **rest of the North West**. Compared to the **10,495** FTE jobs directly provided by the University (see Section 5), this suggests that nearly **2 additional FTE jobs** are supported in the UK for every FTE job directly provided by the University, of which **0.8** are in Greater Manchester and **1.1** are in the North West. In addition, the impact in terms of gross value added was estimated at **£2.21 billion** across the UK economy as a whole, of which **£1.29 billion** was generated in **Greater Manchester**, and an additional **£247 million** was generated in the **rest of the North West**.

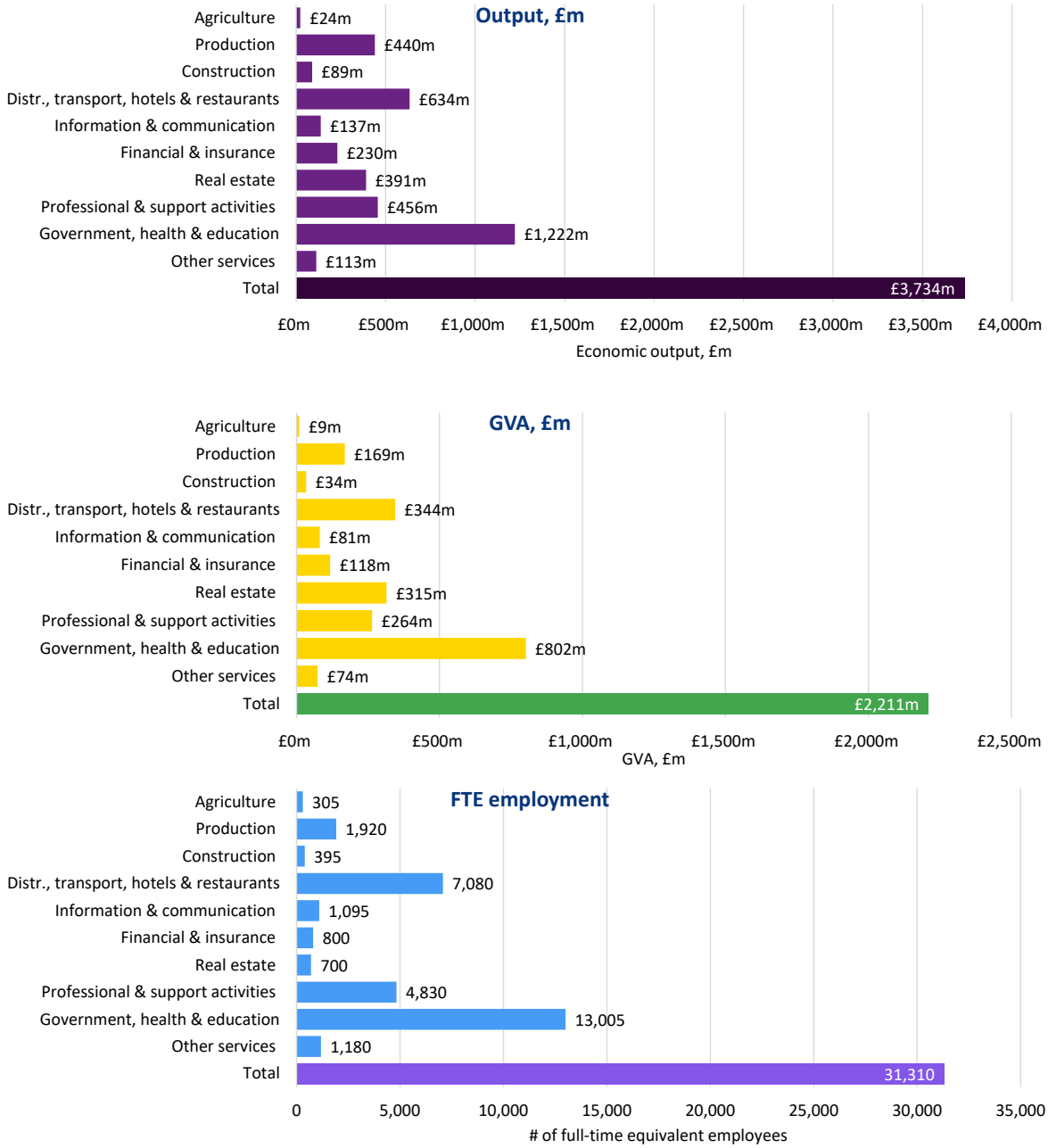
[130] The remaining **£3.53 billion** of impact includes the productivity spillovers associated with the University's research (**£1.95 billion**, where a breakdown by region or sector is not available as it was not possible to assign the geographic location or sectors of businesses benefiting from the productivity spillovers generated by the University's research); and the impact of **teaching and learning activities** (**£1.58 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 34 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 **£3.73 billion** (of the University's total **£7.26 billion** (in economic output terms)) of economic impact that can be attributed to a region. ***Source: London Economics' analysis***

Figure 35 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 **£3.73 billion** (of the University's total **£7.26 billion** (in economic output terms)) of economic impact that can be attributed to a sector. ***Source: London Economics' analysis***

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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.[131]

The multi-regional Input-Output analysis is undertaken by 'regionalising' UK Input-Output tables for 2019 (see Office for National Statistics (2024b)).[132] 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.[133] 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,[134] 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,[135] 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, 2023c and 2023d).

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 17 below).

[131] For more information, see Office for National Statistics (2024a). The classification is based on the ITL boundaries established as of January 2021.
[132] 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).
[133] 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.
[134] 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)).
[135] 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 17 provides an overview of the high-level industry classifications used throughout the multi-regional Input-Output analysis.

Table 17 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 (2023) and UK SIC Codes (see Office for National Statistics, 2022)

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

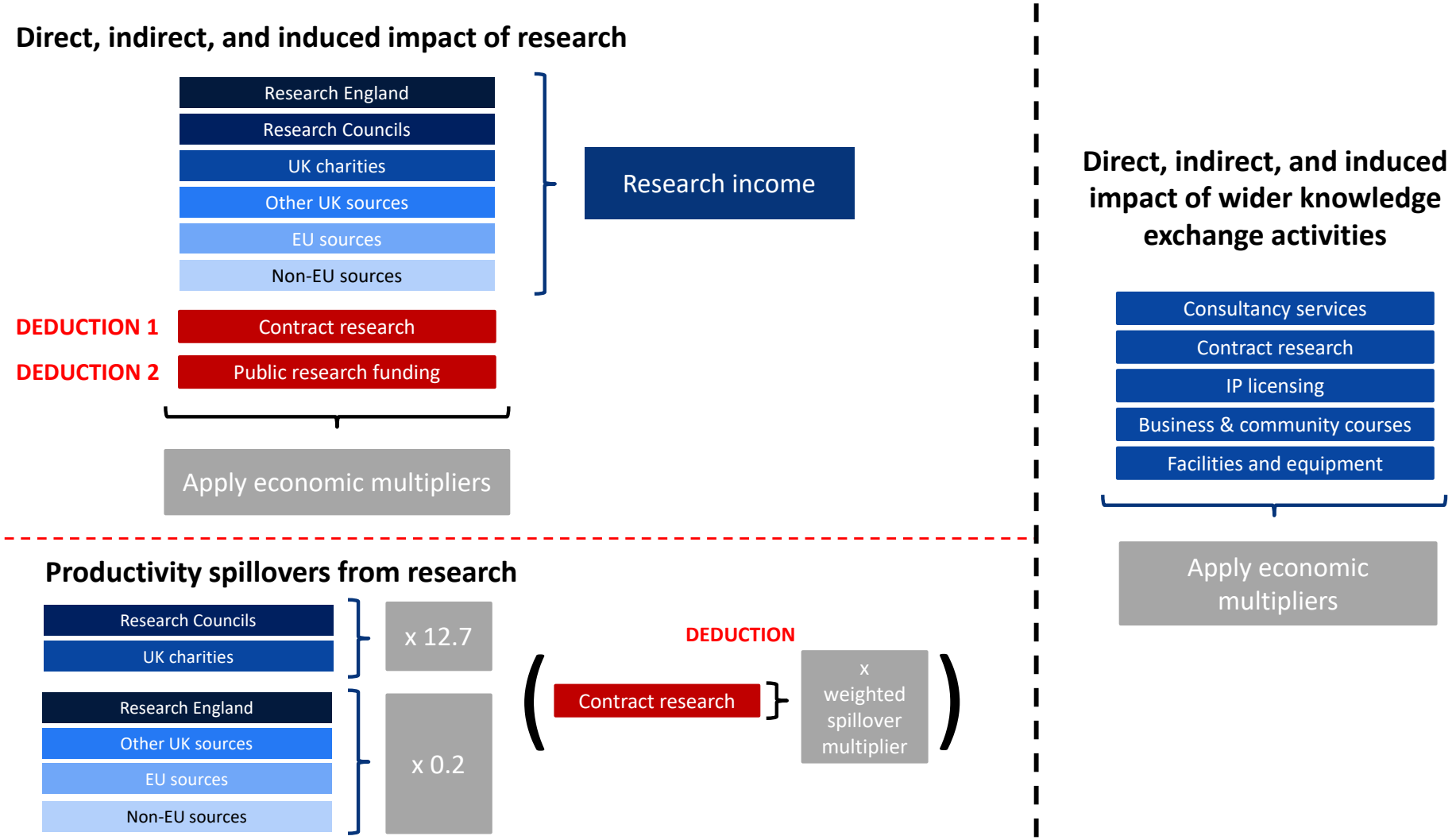
A2.2.1 Overview of the analysis of research and wider knowledge exchange activities

Figure 36 provides an overview of the methodological approach adopted to analyse the economic impact of The University of Manchester's research and wider knowledge exchange activities,[136] 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).
- The direct, indirect, and induced impact of the University's wider knowledge exchange activities (Section 2.2).

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

Figure 36 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 Manchester'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.[137] These disaggregated estimates are presented in Figure 37 and Figure 38, respectively.

Considering the breakdown by **region**, in terms of **economic output** (top panel), **over half** of the total impact of **£1.1 billion**[138] associated with the University's research and knowledge exchange activities occurred in **Greater Manchester** (**£602 million**, **55%**), with an additional **£137 million** (**12%**) generated throughout the **rest of the North West**. There were also significant impacts occurring in other regions, particularly in **Yorkshire & the Humber** (**£86 million**, **8%**).

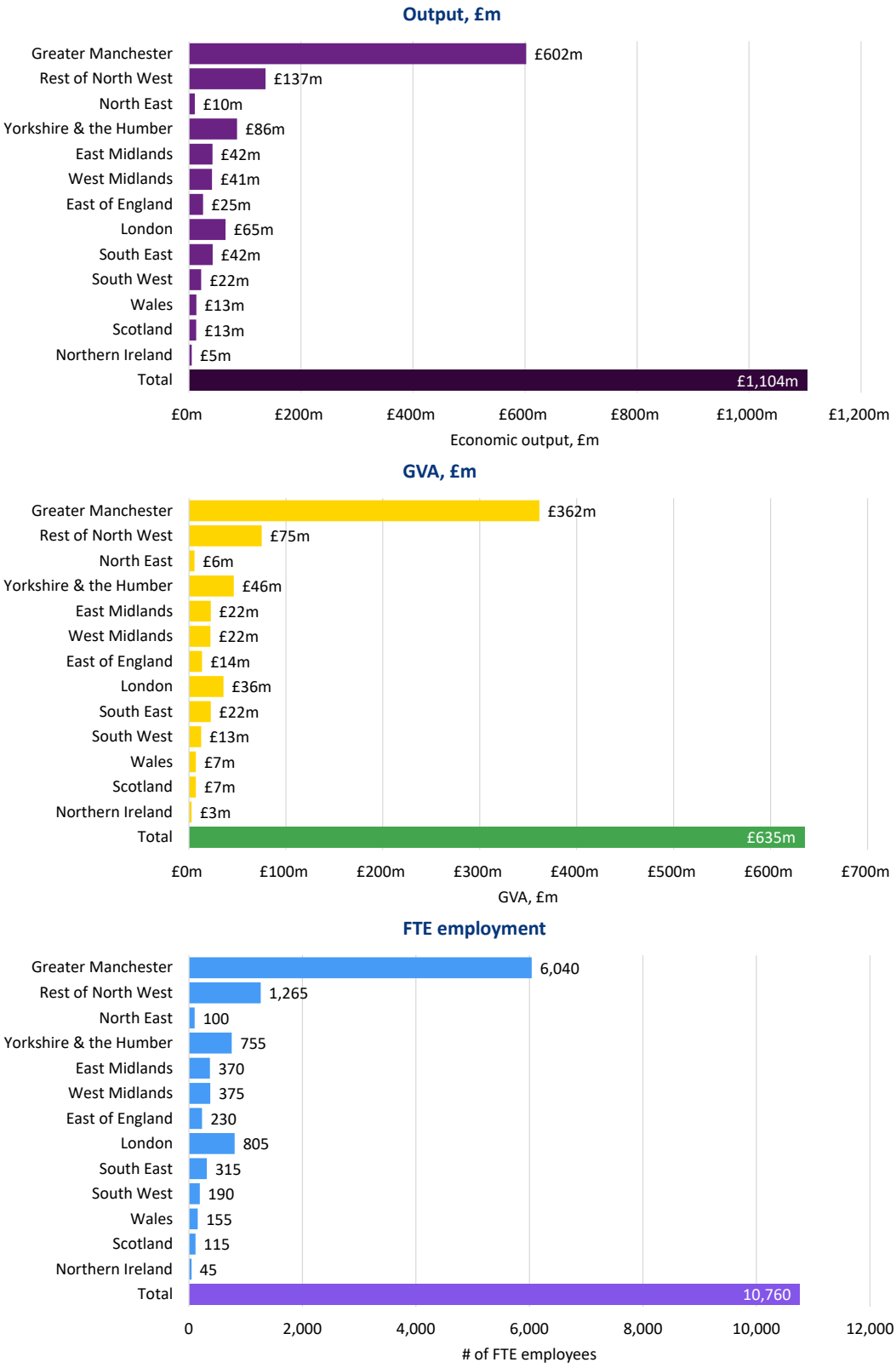
The impact in terms of **GVA** (middle panel) was estimated at **£635 million** across the UK economy as a whole, of which **£362 million** occurred in **Greater Manchester** (and **£75 million** was generated **elsewhere in the North West**). Finally, of the estimated **10,760 FTE jobs** (bottom panel) that were supported by the University's research and knowledge exchange activities across the UK as a whole, the majority (approximately **6,040**) were located in **Greater Manchester** (with an additional **1,265** supported **elsewhere in the North West**).

In terms of **sector**, the University's research and knowledge exchange activities resulted in particularly large impacts within the **government, health and education** sector (**£355 million**), the **professional and support activities** sector (**£240 million**), the **distribution, transport, hotel and restaurant** sector (**£146 million**), and the **production** sector (**£117 million**).

[137] 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 Manchester's research).

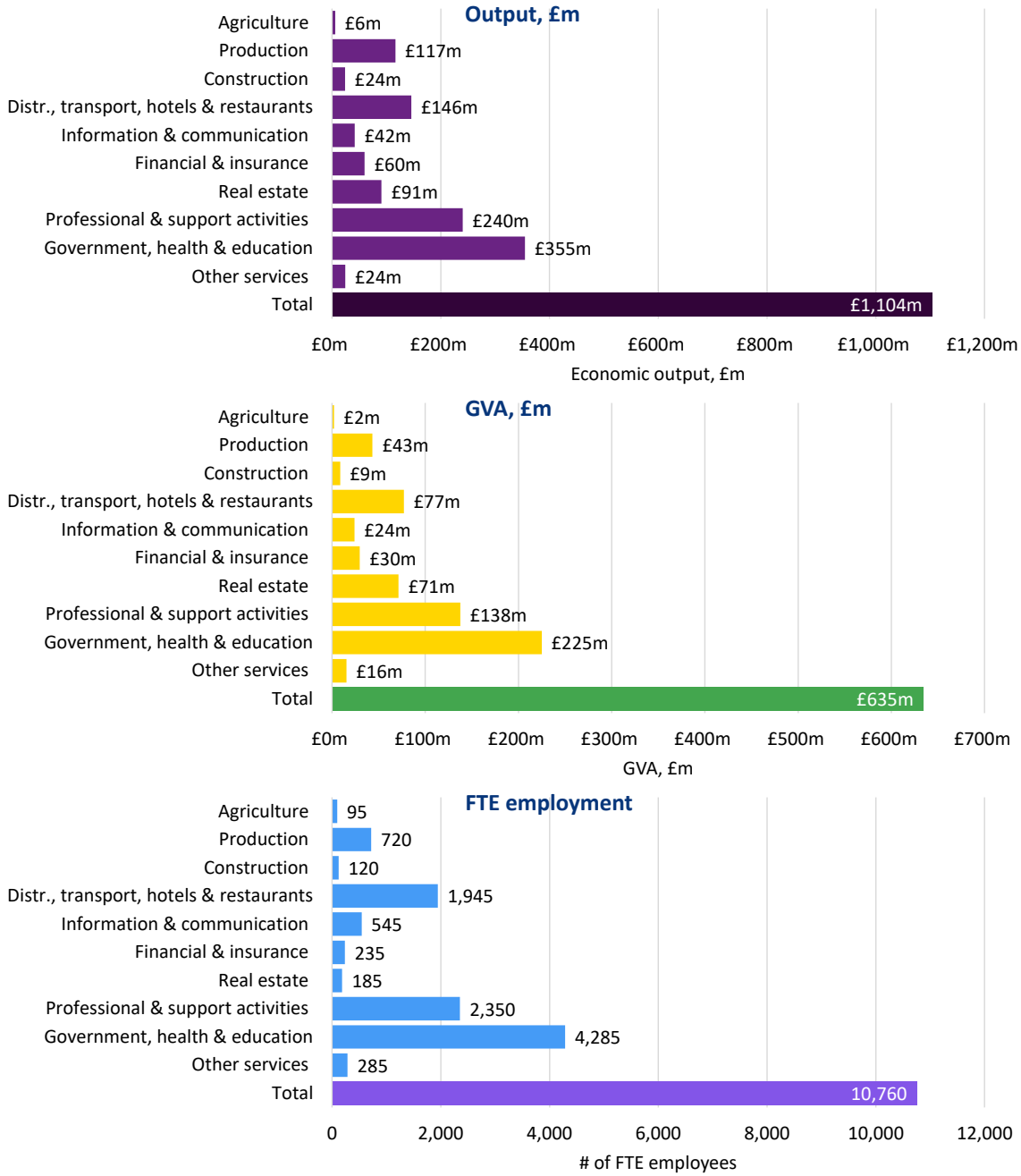
[138] Note again that this is the total impact that can be broken down by region and sector, i.e. the impact of research and knowledge exchange activities *excluding* productivity spillovers.

Figure 37 Direct, indirect and induced economic impact associated with The University of Manchester'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 **£1.95 billion** of productivity spillovers (in economic output terms) associated with the University's research.
Source: London Economics' analysis

Figure 38 Direct, indirect and induced economic impact associated with The University of Manchester'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 **£1.95 billion** 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 Manchester in 2022-23. In the following, we provide further details on the underlying methodological approach used to arrive at our estimates of this impact.

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 Manchester students, broken down by study mode and study intention (i.e. level of study).[139] 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).[140]

Table 18 Assumed completion rates of University of Manchester student entrants

Completion outcome	Study intention				
	Other undergraduate	First degree	Other postgraduate	Higher degree (taught)	Higher degree (research)
Full-time students					
Other undergraduate	-	4%	-	-	-
First degree	-	96%	-	-	-
Other postgraduate	-	-	100%	1%	8%
Higher degree (taught)	-	-	-	99%	-
Higher degree (research)	-	-	-	-	92%
Total	**-**	**100%**	**100%**	**100%**	**100%**
Part-time students					
Other undergraduate	100%	26%	-	-	-
First degree	-	74%	-	-	-
Other postgraduate	-	-	100%	12%	28%
Higher degree (taught)	-	-	-	88%	-
Higher degree (research)	-	-	-	-	72%
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 Manchester, 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.
There were no students in the 2022-23 cohort starting full-time learning at 'other undergraduate' level, resulting in the gaps in the completion rates for this group in the table.
Source: London Economics' analysis based on data published by the Office for Students (2024)

Table 18 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 Manchester in 2022-23, **96%** complete the first degree as intended, while the remaining **4%** undertake one or more of the credits/modules associated with their degree before discontinuing their studies (modelled as

[139] 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 Manchester, 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)'.
[140] 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 at 'other postgraduate' level. As a result, the total assumed completion rates sum up to 100%.

completion at 'other undergraduate' level). Similarly, at postgraduate level, we assume that of those individuals starting a full-time postgraduate taught degree, **99%** complete the qualification as intended, while the remaining **1%** 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, 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 39 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 Manchester, 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.[141]

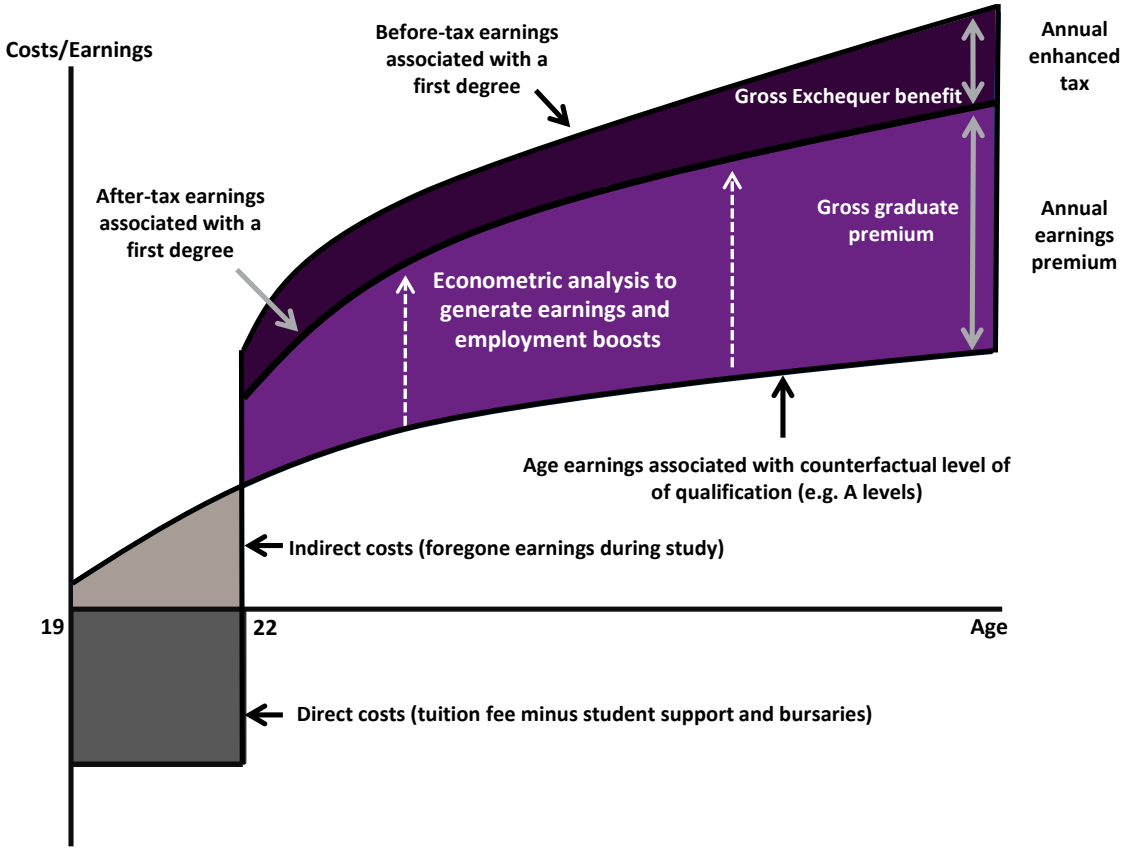
To estimate the **gross graduate premium**, based on the econometric results, we then estimate the **present value of the enhanced post-tax earnings** of individuals in possession of different higher education qualifications (i.e. after income tax, National Insurance and VAT are removed, and following 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 contributions, and VAT associated with higher education qualification attainment** (by

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

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.

Figure 39 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 Manchester'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[142]).

[142] '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 Manchester student cohort. Courses which are not offered by the institution will thus be excluded from the treatment group.

- **Two at undergraduate level** (first degrees and 'other' undergraduate qualifications[143]).

Table 19 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).[144, 145]

Table 19 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 Manchester 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.
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 Manchester in 2022-23. ***Source: London Economics***

[143] '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 Manchester student cohort.

[144] 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 8% of first degree students in the 2022-23 University of Manchester 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.

[145] In terms of prior attainment, note that for 67 students in the 2022-23 cohort of UK domiciled University of Manchester students, previous attainment levels were specified as 'Not known', 'Mature student admitted on basis of previous experience and/or admissions test', 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).

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 incorporate the fact that the academic 'distance travelled' by a (very small) proportion of students in the 2022-23 University of Manchester cohort is **greater** than might be the case compared to those in possession of levels of prior attainment 'traditionally' associated with higher education entry.[146] Similarly, for other students within the cohort, the academic 'distance travelled' is **lower** than the traditional prior attainment level (e.g. a small proportion of students undertaking first degrees at the University 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 Manchester was higher or lower than the 'traditional' counterfactual qualifications outlined in Table 19, 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 Manchester**, 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).[147]

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;

[146] e.g. there is a (very) small number of students in the 2022-23 cohort of UK domiciled University of Manchester students who only held qualifications at RQF Level 2 as their highest prior attainment before starting their learning at the University.

[147] 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).

- 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;
- 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 Manchester cohort.[148] As a result, the estimated marginal wage returns **adjust for the specific subject composition of The University of Manchester's student cohort**, where possible.[149] 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 Manchester cohort** (i.e. where the analysis is adjusted for the proportions of students in possession of GCE 'A' levels vs. 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**.[150]

The resulting estimated marginal wage returns to the different qualifications of interest are presented in Table 20. In the earnings regressions, the coefficients provide an indication of the additional effect on hourly earnings associated with possession of the respective higher education

[148] 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.

[149] 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).

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

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 **27.3%** 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 Manchester cohort (i.e. predominantly GCE 'A' Levels or equivalent)). The comparable estimate for women aged between 36 and 40 stands at **36.5%**.

Table 20 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]	8.3%	13.1%	21.0%	23.7%	20.0%	23.0%	18.8%	23.1%	17.6%
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]	10.7%	18.3%	25.7%	27.3%	30.6%	24.2%	29.3%	34.0%	30.5%
Other postgraduate (vs. first degrees)[3]	7.1%	11.0%	8.1%		7.7%	7.7%			
Higher degree (taught) (vs. first degrees)[3]	6.0%	8.2%	11.3%	10.7%	11.7%	12.0%	12.3%	16.1%	22.8%
Higher degree (research) (vs. first degrees)[3]	34.7%	13.4%	16.8%	16.6%	22.8%	32.4%	32.2%	26.0%	42.2%
Women									
Level 3 (vs. 5+GCSEs)[1]	6.4%	10.1%	9.9%	17.1%	20.7%	14.3%	16.0%	15.7%	15.0%
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]	10.2%	20.0%	30.7%	36.5%	36.8%	35.5%	36.3%	35.1%	26.6%
Other postgraduate (vs. first degrees)[3]	4.8%	6.9%	10.1%	15.1%	17.1%	19.1%	24.0%	20.1%	28.9%
Higher degree (taught) (vs. first degrees)[3]	6.9%	6.4%	15.8%	20.3%	23.2%	27.1%	22.8%	34.4%	24.6%
Higher degree (research) (vs. first degrees)[3]	11.0%	19.8%	26.6%	35.7%	33.2%	43.0%	42.6%	38.8%	52.7%

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 Manchester 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 Manchester 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:

$$Probit(EMPNOT_i) = \alpha + \gamma Z_i + \epsilon_i \quad \text{for } i = 1 \text{ to n}$$[151]

The dependent variable adopted represents the binary variable $EMPNOT_i$, which is coded 1 if the individual is in employment and 0 otherwise.[152] 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;
- 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 studying at The University of Manchester. 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 Manchester 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).

The resulting estimated marginal employment returns to HE qualifications are presented in Table 21. 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 **1.7 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). The corresponding estimate for women stands at **6.0 percentage points**.

[151] Where i is again an individual LFS respondent.
[152] The probit function reflects the cumulative distribution function of the standard normal distribution.

Table 21 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]	-4.8	2.4	1.7	1.7	1.9		3.3	-2.3	-2.8
Other postgraduate (vs. first degrees)[3]		1.5	1.9	1.1	1.9	1.7	3.0		-4.9
Higher degree (taught) (vs. first degrees)[3]	-3.6	-1.4			1.4			3.9	3.5
Higher degree (research) (vs. first degrees)[3]	12.0	2.8		1.7	2.9		4.0	9.0	8.3
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]		4.9	6.0	6.0	5.8	2.7	2.1		
Other postgraduate (vs. first degrees)[3]			3.7	3.8	4.7	4.5	3.2	5.5	5.1
Higher degree (taught) (vs. first degrees)[3]	-5.4			2.3	2.6	2.0	4.7	5.0	5.9
Higher degree (research) (vs. first degrees)[3]			3.0		3.5	4.6	7.8	8.9	17.0

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 Manchester 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 Manchester 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

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 Manchester is **33**, compared to **25** 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 22 presents the assumed average age at enrolment,

study duration, and age at completion for students in the 2022-23 University of Manchester cohort.[153]

Table 22 Average age at enrolment, study duration, and age at completion among students in the 2022-23 University of Manchester 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	19	1	20	37	1	38
First degree	19	3	22	-	-	-
Other postgraduate	25	1	26	36	1	37
Higher degree (taught)	24	1	25	31	2	33
Higher degree (research)	27	4	31	33	6	39

Note: All values have been rounded to the nearest integer. Gaps may arise where there are no students in the 2022-23 University of Manchester cohort expected to complete the given qualification (since there were less than 5 students in the cohort undertaking part-time first degrees, the assumptions for this group have not been presented here). ***Source: London Economics' analysis based on University of Manchester HESA data***

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 Manchester, 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.[154] 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 23 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 Manchester 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 **33** (on average)), these students recoup only **86%** of the corresponding earnings and employment premiums.

[153] 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 Manchester) 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 of Manchester on the average study duration among students who successfully completed their courses in the 2022-23 academic year.

[154] 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 23 Assumed age-decay adjustment factors for students in the 2022-23 University of Manchester 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 Manchester (also see Table 22): Full-time students Part-time students

Again, note that there were fewer than 5 students in the cohort undertaking part-time first degrees, so the assumptions for this group have not been presented here. ***Source: London Economics' analysis based on University of Manchester 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 20 and Table 21 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 published by the Office for Budget Responsibility (2024)[155]).
4. Based on the earnings profiles generated by qualification holders, and income tax and National Insurance rates and allowances for the relevant academic year,[156] we computed the future stream of net earnings (i.e. post-tax).[157] Using similar assumptions, we further calculated the stream of (employment-adjusted) foregone earnings (based on earnings in the relevant counterfactual group[158]) 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

[155] 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.

[156] 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)).

[157] 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.

[158] 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 Manchester 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 Manchester). 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 the estimated **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 Manchester 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.[159] These direct costs refer to the **tuition fee paid by the student**[160] minus 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),[161] and minus any **fee waivers or bursaries** provided by The University of Manchester itself[162]. In this respect, the student benefit associated with public tuition fee loan or

[159] 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.

[160] In terms of tuition fees per student per year, we made use of information provided by The University of Manchester on the average *gross* fee charged per student (before the application of any fee waivers or discount) in 2022-23, separately by study level, mode, and 'home' fee eligibility status (i.e. for students who were eligible to pay 'home' fees, vs. those that were not). In terms of study level, 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). In terms of fee eligibility, we assume that all UK domiciled students studying at the University in the 2022-23 cohort were eligible to pay 'home' fees.

[161] 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 Manchester student in 2022-23 (also see Footnote 160), and were calculated net of any fee waivers provided by The University of Manchester itself (see Footnote 162).

[162] Average fee waivers and non-fee waivers (i.e. other bursaries and scholarships) per student were based on information provided by The University of Manchester on the average fee waiver and other (non-fee) bursaries per student in 2022-23, by study level, mode, and 'home' fee eligibility status. In terms of study level, as with the above-described fee data, the information was provided for all undergraduate students combined, postgraduate (taught) students, and postgraduate (research) students (and we again assume that students undertaking learning at 'other postgraduate' level are included in the postgraduate (taught) category). In terms of fee eligibility, we again assume that all UK domiciled students studying at the University in the 2022-23 cohort were eligible to pay 'home' fees.

maintenance loan support equals the **Resource Accounting and Budgeting charge** (RAB charge),[163] capturing the proportion of the loan that is not repaid. Given the differences in public 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**[164] **to the public purse** include the **teaching grant funding** provided to The University of Manchester by the Office for Students[165] 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 (i.e. separately for English, Welsh, Scottish, and Northern Irish domiciled students studying at The University of Manchester).

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 24 presents the gross graduate premiums and gross public purse benefits per student associated with higher education qualification attainment at The University of Manchester (based on the 2022-23 cohort, and broken down by study mode, level, gender, and prior attainment) resulting from the above-outlined analysis. Table 25 provides the corresponding estimates of the associated net graduate premiums and net public benefits per student.

[163] 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 (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 (2024)).
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)).

[164] 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.

[165] This is based on published HESA financial information on the total OfS recurrent teaching grant received by The University of Manchester in 2022-23 (see HESA, 2024a), divided by the total number of students enrolled at the University in 2022-23 who were eligible to pay 'home' fees (i.e. excluding any students who were not eligible to pay 'home' fees, and further excluding higher degree (research) students, i.e. it is assumed that there is no teaching funding associated with these students). 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 (where the average study intensity (by mode) was calculated by dividing the number of 'home' fee eligible students in full-time equivalents by the corresponding number of students in terms of headcount (again based on HESA student data provided by The University of Manchester)).

Table 24 Gross graduate premiums and Exchequer benefits per student associated with HE qualification attainment at The University of Manchester, 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			£93,000	£60,000	-£9,000	-£9,000	-£8,000	-£10,000						
First degree			£126,000	£95,000	£25,000	£26,000	-£26,000	-£33,000			-£26,000	-£33,000	-£26,000	
Other postgraduate					£83,000	£140,000	£24,000	£81,000	-£21,000	-£19,000	-£21,000	-£19,000	-£21,000	-£19,000
Higher degree (taught)				£223,000	£133,000	£154,000	£74,000	£94,000	£29,000	-£5,000	-£18,000	-£18,000	-£18,000	-£18,000
Higher degree (research)				£208,000	£118,000	£151,000	£68,000	£86,000	£38,000	-£2,000	-£14,000	-£16,000		-£85,000
Part-time students														
Other undergraduate		£69,000			£0	£0	£0	£0		£0	£0	£0		£0
First degree						£7,000								
Other postgraduate			£115,000	£143,000	£43,000	£97,000	£18,000	£70,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)		£222,000	£197,000		£110,000	£134,000	£77,000	£97,000	£51,000	£13,000	£0	£0	£0	£0
Higher degree (research)					£134,000	£129,000	£116,000	£108,000	£101,000	£52,000	£64,000	£42,000	£0	£0
Gross Exchequer benefits														
Full-time students														
Other undergraduate			£84,000	£54,000	-£1,000	-£1,000	-£1,000	-£1,000						
First degree			£145,000	£98,000	£60,000	£43,000	-£3,000	-£5,000			-£3,000	-£5,000	-£3,000	
Other postgraduate					£104,000	£122,000	£37,000	£72,000	-£10,000	-£8,000	-£10,000	-£8,000	-£10,000	-£8,000
Higher degree (taught)				£189,000	£155,000	£134,000	£89,000	£83,000	£42,000	£4,000	-£7,000	-£7,000	-£7,000	-£7,000
Higher degree (research)				£198,000	£185,000	£153,000	£129,000	£97,000	£95,000	£27,000	£43,000	£15,000		-£40,000
Part-time students														
Other undergraduate		£54,000			£0	£0	£0	£0		£0	£0	£0		£0
First degree						£7,000								
Other postgraduate			£114,000	£115,000	£53,000	£79,000	£22,000	£56,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)		£179,000	£196,000		£123,000	£109,000	£82,000	£78,000	£52,000	£11,000	£0	£0	£0	£0
Higher degree (research)					£149,000	£104,000	£125,000	£85,000	£106,000	£41,000	£70,000	£33,000	£0	£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 Manchester cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at The University of Manchester 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 25 Net graduate premiums and Exchequer benefits per student associated with HE qualification attainment at The University of Manchester, 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			£89,000	£56,000	-£12,000	-£13,000	-£12,000	-£14,000						
First degree			£115,000	£84,000	£14,000	£15,000	-£36,000	-£43,000			-£36,000	-£44,000	-£36,000	
Other postgraduate					£73,000	£130,000	£14,000	£71,000	-£31,000	-£29,000	-£31,000	-£29,000	-£31,000	-£29,000
Higher degree (taught)				£213,000	£123,000	£144,000	£64,000	£84,000	£19,000	-£14,000	-£28,000	-£27,000	-£28,000	-£28,000
Higher degree (research)				£265,000	£175,000	£208,000	£125,000	£143,000	£95,000	£54,000	£43,000	£41,000		-£28,000
Part-time students														
Other undergraduate		£69,000			£1,000	£0	£0	£0		£0	£0	£0		£0
First degree						£7,000								
Other postgraduate			£111,000	£138,000	£38,000	£93,000	£14,000	£66,000	-£5,000	-£5,000	-£5,000	-£5,000	-£5,000	-£5,000
Higher degree (taught)		£214,000	£189,000		£101,000	£125,000	£69,000	£89,000	£42,000	£5,000	-£8,000	-£9,000	-£9,000	-£9,000
Higher degree (research)					£158,000	£154,000	£140,000	£132,000	£125,000	£76,000	£88,000	£67,000	£24,000	£24,000
Net Exchequer benefits														
Full-time students														
Other undergraduate			£79,000	£49,000	-£7,000	-£7,000	-£7,000	-£7,000						
First degree			£129,000	£82,000	£44,000	£27,000	-£19,000	-£22,000			-£19,000	-£21,000	-£19,000	
Other postgraduate					£102,000	£121,000	£36,000	£71,000	-£11,000	-£9,000	-£11,000	-£9,000	-£11,000	-£9,000
Higher degree (taught)				£188,000	£154,000	£133,000	£88,000	£82,000	£41,000	£3,000	-£9,000	-£9,000	-£9,000	-£8,000
Higher degree (research)				£196,000	£183,000	£151,000	£128,000	£96,000	£94,000	£26,000	£41,000	£14,000		-£42,000
Part-time students														
Other undergraduate		£52,000			-£3,000	-£2,000	-£2,000	-£2,000		-£2,000	-£2,000	-£2,000		-£2,000
First degree						-£1,000								
Other postgraduate			£114,000	£114,000	£53,000	£78,000	£21,000	£55,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)		£178,000	£195,000		£122,000	£108,000	£81,000	£77,000	£51,000	£10,000	-£1,000	-£1,000	-£1,000	-£1,000
Higher degree (research)					£148,000	£102,000	£124,000	£84,000	£105,000	£40,000	£69,000	£32,000	-£1,000	-£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 Manchester cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at The University of Manchester 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 educational exports

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 Manchester 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.[166] 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,[167] and therefore assume that there are no public teaching grants or student support costs applicable to the cohort.[168] 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 Manchester

Table 26 presents a detailed breakdown of the 2022-23 non-UK domiciled University of Manchester cohort, by domicile, level, and mode of study.

[166] 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'.

[167] 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)).

[168] 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 26 Non-UK domiciled students in the 2022-23 cohort of University of Manchester 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	205	2,900	**3,105**
Other postgraduate	10	20	**30**
Higher degree (taught)	115	5,625	**5,740**
Higher degree (research)	55	590	**645**
Total	**385**	**9,135**	**9,520**
Part-time			
Other undergraduate	0	0	**0**
First degree	0	0	**0**
Other postgraduate	0	40	**40**
Higher degree (taught)	5	15	**20**
Higher degree (research)	0	0	**0**
Total	**5**	**55**	**60**
Total			
Other undergraduate	0	0	**0**
First degree	205	2,900	**3,105**
Other postgraduate	10	60	**70**
Higher degree (taught)	120	5,640	**5,760**
Higher degree (research)	55	590	**645**
Total	**390**	**9,190**	**9,580**

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 Manchester HESA data

A2.4.3 Net tuition fee income per international student

Table 27 presents estimates of the net tuition fee income per international student in the 2022-23 University of Manchester cohort (over the entire study duration), by domicile, level of study, and mode of study.

Table 27 Net tuition fee income per international student in the 2022-23 cohort of University of Manchester 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	£24,000	£2,000	£24,000	
First degree	£67,000		£67,000	
Other postgraduate	£24,000	£5,000	£24,000	£5,000
Higher degree (taught)	£24,000	£9,000	£24,000	£9,000
Higher degree (research)	£21,000	£22,000	£21,000	£22,000

Note: Gaps may arise where there are no students in the 2022-23 University of Manchester 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 Manchester 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.[169] 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 28.

Table 28 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 29 presents estimates of the non-tuition fee income per international student in the 2022-23 University of Manchester cohort (over the entire study duration), by domicile, level of study, and mode of study.

Table 29 Non-fee income per international student in the 2022-23 cohort of University of Manchester 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	£14,000	£17,000	£15,000	
First degree	£40,000		£43,000	
Other postgraduate	£18,000	£23,000	£18,000	£23,000
Higher degree (taught)	£18,000	£45,000	£18,000	£45,000
Higher degree (research)	£69,000	£128,000	£69,000	£128,000

Note: Gaps may arise where there are no students in the 2022-23 University of Manchester 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***

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

Annex 3 Supplementary data by Local Authority and parliamentary constituency

Annex 3 presents data on UK student numbers, staff numbers, staff expenditure and procurement expenditure by Local Authority and 2024 Westminster parliamentary constituency, which supplement the maps presented in Sections 3 and 0.

A3.1 UK domiciled students by Local Authority and parliamentary constituency

Table 30 and Table 31 present the number of UK domiciled first-year students in the 2022-23 University of Manchester cohort by Local Authority and 2024 Westminster parliamentary constituency. For a visual representation of the data by Local Authority, see Figure 16 in Section 3.1.

Table 30 UK domiciled first-year students in the 2022-23 University of Manchester cohort, by Local Authority of domicile

Local Authority	Number of UK domiciled first year students
Manchester	725
Trafford	250
Stockport	215
Salford	200
Leeds	175
Oldham	165
Cheshire East	165
Tameside	160
Bolton	160
Bury	135
Birmingham	125
Rochdale	120
Cheshire West and Chester	110
Wigan	110
Liverpool	110
Buckinghamshire	105
Sheffield	100
Warrington	95
Bradford	95
Barnet	90
Blackburn with Darwen	90
Ealing	90
Kirklees	85
Bristol, City of	85
Wirral	75
Lambeth	70
Wandsworth	70
Brighton and Hove	65
Richmond upon Thames	65
Wiltshire	60
Cardiff	55
Sefton	55
St Albans	50

Local Authority	Number of UK domiciled first year students
Southwark	50
York	50
Elmbridge	50
Preston	50
County Durham	45
West Northamptonshire	45
Chorley	45
St. Helens	45
Bromley	45
Hackney	45
Lewisham	45
Brent	45
Haringey	45
Redbridge	45
Shropshire	45
Calderdale	40
Harrogate	40
Camden	40
East Riding of Yorkshire	40
Croydon	40
Enfield	40
Nottingham	40
South Gloucestershire	40
Newcastle upon Tyne	40
Leicester	35
Northumberland	35
Dorset	35
Oxford	35
Greenwich	35
Hammersmith and Fulham	35
Milton Keynes	35
Belfast	35
Fylde	35
Solihull	35
Wolverhampton	35
Hounslow	35
Flintshire	35
Stoke-on-Trent	35
Harrow	35
Derby	30
Bath and North East Somerset	30
High Peak	30
West Lancashire	30
Wakefield	30
Islington	30
City of Edinburgh	30
Denbighshire	30
Cambridge	30
South Cambridgeshire	30
Dacorum	30
Tunbridge Wells	30
Warwick	30

Local Authority	Number of UK domiciled first year students
North Tyneside	30
Sandwell	30
Kingston upon Thames	30
Merton	30
Sutton	30
Wokingham	30
Central Bedfordshire	30
North Hertfordshire	30
Pendle	30
Newcastle-under-Lyme	30
Knowsley	30
Bedford	30
Hillingdon	30
Kensington and Chelsea	30
Conwy	30
Wrexham	30
South Ribble	30
Waltham Forest	30
Windsor and Maidenhead	25
Cornwall	25
Rossendale	25
Rushcliffe	25
Westminster	25
Swansea	25
Winchester	25
Guildford	25
Sevenoaks	25
Lancaster	25
Vale of White Horse	25

Note: Based on HESA data on a total of 9,855 first-year students from The University of Manchester. Domicile refers to a student's permanent home address before starting their qualification at The University of Manchester. Figures are only presented for Local Authorities with at least 25 UK domiciled student starters in 2022-23. All numbers are rounded to the nearest 5.
Source: London Economics' analysis based on data from The University of Manchester and the Office for National Statistics.

Table 31 UK domiciled first-year students in the 2022-23 University of Manchester cohort, by 2024 Westminster parliamentary constituency of domicile

Parliamentary constituency	Number of UK domiciled first year students
Manchester Rusholme	175
Manchester Central	175
Manchester Withington	150
Gorton and Denton	140
Altrincham and Sale West	120
Salford	110
Stockport	100
Stretford and Urmston	95
Oldham West, Chadderton and Royton	90
Wythenshawe and Sale East	90
Bury South	75
Blackley and Middleton South	75
Worsley and Eccles	75
Cheadle	75
Blackburn	70

Parliamentary constituency	Number of UK domiciled first year students
Stalybridge and Hyde	70
Ashton-under-Lyne	70
Bury North	70
Tatton	70
Bolton South and Walkden	65
Oldham East and Saddleworth	60
Bolton North East	60
Rochdale	55
Bolton West	55
Heywood and Middleton North	50
Macclesfield	50
Warrington South	50
Ealing Central and Acton	45
Harpenden and Berkhamsted	45
Chorley	45
Hazel Grove	40
Esher and Walton	40
Fylde	40
Ribble Valley	40
Mid Cheshire	35
Rossendale and Darwen	35
Hampstead and Highgate	35
Leeds North East	35
Richmond Park	35
Twickenham	35
Pendle and Clitheroe	35
Hornsey and Friern Barnet	35
Liverpool Wavertree	35
Brighton Pavilion	35
Bristol North West	35
Leigh and Atherton	35
Warrington North	35
Chester South and Eddisbury	30
Colne Valley	30
Dulwich and West Norwood	30
High Peak	30
Leeds North West	30
Wigan	30
Bangor Aberconwy	30
Bristol Central	30
Chesham and Amersham	30
Preston	30
Finchley and Golders Green	30
Lewisham West and East Dulwich	30
Tooting	30
Chester North and Neston	30
Hyndburn	30
Liverpool Riverside	30
Makerfield	30
Sheffield Hallam	30
Congleton	30
Ealing North	30

Parliamentary constituency	Number of UK domiciled first year students
Hendon	30
Sheffield Central	30
Tunbridge Wells	30
Wirral West	30
Clwyd East	30
Burnley	25
Keighley and Ilkley	25
St Albans	25
St Helens South and Whiston	25
Belfast South and Mid Down	25
Bath	25
Cambridge	25
Chelsea and Fulham	25
Chipping Barnet	25
Newcastle upon Tyne North	25
St Helens North	25
West Lancashire	25
Barrow and Furness	25
Harrogate and Knaresborough	25
Hitchin	25
Kensington and Bayswater	25
Oxford West and Abingdon	25
Putney	25
York Outer	25
Alyn and Deeside	25

Note: Based on HESA data on a total of 9,855 first-year students from The University of Manchester. Domicile refers to a student's permanent home address before starting their qualification at The University of Manchester. Figures are only presented for parliamentary constituencies with at least 25 UK domiciled student starters in 2022-23. All numbers are rounded to the nearest 5.
Source: London Economics' analysis based on data from The University of Manchester and the Office for National Statistics.

A3.2 Procurement expenditure by Local Authority and parliamentary constituency

Table 32 and Table 33 present the distribution of The University of Manchester's procurement spend in the 2022-23 academic year by Local Authority and 2024 Westminster parliamentary constituency. For a visual representation of the data by Local Authority, see Figure 28 in Section 5.1.

Table 32 Distribution of The University of Manchester's procurement expenditure in the 2022-23 academic year by Local Authority (of invoice address)

Local Authority	Procurement expenditure
Manchester	£98m
Salford	£14m
Mid Ulster	£13m
Stoke-on-Trent	£12m
West Northamptonshire	£11m
Southwark	£11m
City of London	£11m
Camden	£11m
Brent	£10m
West Berkshire	£9m
Glasgow City	£9m
South Staffordshire	£9m

Local Authority	Procurement expenditure
Oldham	£8m
Sheffield	£8m
City of Edinburgh	£7m
Stockport	£7m
Westminster	£6m
Harrogate	£6m
Trafford	£6m
Birmingham	£6m
Bristol, City of	£5m
Cheshire East	£5m
Preston	£5m
Coventry	£5m
Leeds	£5m
Bolton	£4m
West Oxfordshire	£4m
Fylde	£4m
Islington	£3m
Cambridge	£3m
Liverpool	£3m
Slough	£3m
Charnwood	£3m
Oxford	£3m
Kingston upon Thames	£3m
Runnymede	£3m
Craven	£3m
East Riding of Yorkshire	£3m
South Cambridgeshire	£3m
Hyndburn	£2m
Newham	£2m
Wokingham	£2m
South Somerset	£2m
Newcastle upon Tyne	£2m
Telford and Wrekin	£2m
Buckinghamshire	£2m
Milton Keynes	£2m
Bournemouth, Christchurch and Poole	£2m
Kensington and Chelsea	£2m
Doncaster	£2m
Renfrewshire	£2m
Nottingham	£2m
Mole Valley	£2m
Rochdale	£2m
Hounslow	£2m
Vale of White Horse	£2m
Dorset	£2m
West Lancashire	£2m
Bury	£2m
Merton	£2m
Lancaster	£2m
South Oxfordshire	£2m
Watford	£1m
Leicester	£1m

Local Authority	Procurement expenditure
Bracknell Forest	£1m
Lambeth	£1m
Dacorum	£1m
North Tyneside	£1m
Hillingdon	£1m
Uttlesford	£1m
Calderdale	£1m
Tower Hamlets	£1m
High Peak	£1m
Surrey Heath	£1m
North Northamptonshire	£1m
Central Bedfordshire	£1m
Eastleigh	£1m
St Albans	£1m

Note: We received data on the invoice postcodes associated with £520 million of procurement expenditure from The University of Manchester. Of this total, we excluded expenditure records from outside of the UK or with an invalid postcode (associated with £59 million of expenditure). As a result of these exclusions, our analysis is based on a total of £461 million of procurement expenditure. Figures are only presented for Local Authorities with procurement expenditure of at least £1 million. All numbers are rounded to the nearest £1 million.

Source: London Economics' analysis based on data from The University of Manchester and the Office for National Statistics.

Table 33 Distribution of The University of Manchester's procurement expenditure in the 2022-23 academic year by 2024 Westminster parliamentary constituency (of invoice address)

Parliamentary constituency	Procurement expenditure
Manchester Central	£50m
Manchester Rusholme	£35m
Cities of London and Westminster	£16m
Mid Ulster	£13m
Salford	£12m
Manchester Withington	£12m
Stoke-on-Trent Central	£11m
Northampton North	£11m
Bermondsey and Old Southwark	£11m
Holborn and St Pancras	£10m
Brent East	£10m
Newbury	£9m
Stone, Great Wyrley and Penkridge	£9m
Skipton and Ripon	£9m
Glasgow North	£8m
Oldham West, Chadderton and Royton	£7m
Edinburgh North and Leith	£6m
Bristol Central	£5m
Bicester and Woodstock	£5m
Sheffield Central	£5m
Ribble Valley	£5m
Coventry South	£4m
Stretford and Urmston	£4m
Fylde	£4m
Bolton West	£4m
Tatton	£3m
Cambridge	£3m
Islington South and Finsbury	£3m
Slough	£3m

Parliamentary constituency	Procurement expenditure
Oxford West and Abingdon	£3m
Liverpool Riverside	£3m
Loughborough	£3m
Birmingham Ladywood	£3m
Runnymede and Weybridge	£3m
Kingston and Surbiton	£3m
Hazel Grove	£3m
Hyndburn	£3m
Cheadle	£3m
Epsom and Ewell	£2m
Kensington and Bayswater	£2m
West Ham and Beckton	£2m
Yeovil	£2m
Earley and Woodley	£2m
Leeds Central and Headingley	£2m
Telford	£2m
Newcastle upon Tyne Central and West	£2m
Bournemouth West	£2m
St Neots and Mid Cambridgeshire	£2m
Paisley and Renfrewshire North	£2m
Doncaster North	£2m
Worsley and Eccles	£2m
Didcot and Wantage	£2m
Stockport	£2m
Nottingham South	£2m
Kingston upon Hull West and Haltemprice	£2m
West Lancashire	£2m
Ely and East Cambridgeshire	£2m
Wimbledon	£2m
Watford	£1m
Milton Keynes North	£1m
North Dorset	£1m
Penistone and Stocksbridge	£1m
Bracknell	£1m
Newcastle upon Tyne North	£1m
Birmingham Edgbaston	£1m
Altrincham and Sale West	£1m
North West Essex	£1m
Lancaster and Wyre	£1m
Hemel Hempstead	£1m
Calder Valley	£1m
Heywood and Middleton North	£1m
Oldham East and Saddleworth	£1m
Bury South	£1m
Uxbridge and South Ruislip	£1m
Vauxhall and Camberwell Green	£1m
Goole and Pocklington	£1m
Wycombe	£1m
High Peak	£1m
Crewe and Nantwich	£1m
Surrey Heath	£1m
Brentford and Isleworth	£1m

Parliamentary constituency	Procurement expenditure
Birmingham Northfield	£1m
Glasgow North East	£1m
Oxford East	£1m

Note: We received data on the invoice postcodes associated with £520 million of procurement expenditure from The University of Manchester. Of this total, we excluded expenditure records from outside of the UK or with an invalid postcode (associated with £59 million of expenditure). As a result of these exclusions, our analysis is based on a total of £461 million of procurement expenditure. Figures are only presented for parliamentary constituencies with procurement expenditure of at least £1 million. All numbers are rounded to the nearest £1 million.
Source: London Economics' analysis based on data from The University of Manchester and the Office for National Statistics.

A3.3 Staff numbers and expenditure by Local Authority and parliamentary constituency

Table 34 and Table 35 present the distribution of The University of Manchester's staff numbers and staff salary spend in the 2022-23 academic year by Local Authority and 2024 Westminster parliamentary constituency. For a visual representation of the data by Local Authority, see Figure 29 and Figure 30 in Section 5.1.

Table 34 Distribution of The University of Manchester's staff numbers (in headcount) and staff salary expenditure in the 2022-23 academic year by Local Authority (of home address)

Local Authority	Number of staff	Staff salary expenditure
Manchester	3,950	£161m
Trafford	1,225	£58m
Stockport	1,195	£57m
Salford	750	£28m
Cheshire East	515	£26m
Tameside	465	£17m
Bury	350	£14m
High Peak	265	£14m
Oldham	250	£9m
Bolton	210	£8m
Warrington	190	£9m
Rochdale	190	£7m
Wigan	165	£6m
Cheshire West and Chester	135	£7m
Calderdale	125	£6m
Sheffield	105	£5m
Kirklees	100	£5m
Liverpool	100	£4m
Leeds	80	£4m
St. Helens	60	£3m
Chorley	50	£2m
Rossendale	50	£2m
Lancaster	45	£2m
Preston	40	£2m
West Lancashire	30	£2m
Newcastle-under-Lyme	30	£1m
Wirral	30	£1m
Staffordshire Moorlands	25	£1m
Blackburn with Darwen	25	£1m

Note: We received data on the home address postcode for a total of 12,065 staff (in headcount) from The University of Manchester. Of this total, we excluded staff records with missing or invalid postcodes (270 in total). Our analysis is thus based on the home addresses of 11,800 staff. Figures are only presented for Local Authorities with at least 25 University of Manchester staff members in 2022-23. We

received data on the home address postcodes associated with £523 million of staff expenditure by The University of Manchester. Of this total, we excluded expenditure records from outside of the UK or with an invalid or missing postcode (associated with £12 million of expenditure). As a result of these exclusions, our figure is based on a total of £512 million of staff expenditure. Staff numbers are rounded to the nearest 5. Staff expenditure numbers are rounded to the nearest £1 million. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from The University of Manchester and the Office for National Statistics.

Table 35 Distribution of The University of Manchester's staff numbers (in headcount) and staff salary expenditure in the 2022-23 academic year by 2024 Westminster parliamentary constituency (of home address)

Local Authority	Number of staff	Staff salary expenditure
Manchester Withington	1,310	£64m
Manchester Rusholme	1,110	£40m
Manchester Central	880	£35m
Stretford and Urmston	565	£23m
Stockport	535	£24m
Gorton and Denton	490	£18m
Salford	480	£17m
Altrincham and Sale West	445	£24m
Wythenshawe and Sale East	405	£18m
Cheadle	375	£19m
Hazel Grove	285	£14m
Bury South	280	£11m
High Peak	265	£14m
Worsley and Eccles	235	£10m
Macclesfield	215	£12m
Tatton	205	£11m
Stalybridge and Hyde	190	£8m
Ashton-under-Lyne	190	£6m
Blackley and Middleton South	160	£5m
Calder Valley	115	£6m
Congleton	105	£4m
Oldham East and Saddleworth	100	£4m
Bolton South and Walkden	100	£4m
Oldham West, Chadderton and Royton	95	£3m
Heywood and Middleton North	90	£3m
Warrington South	90	£4m
Bolton West	85	£4m
Bury North	85	£4m
Warrington North	80	£3m
Bolton North East	75	£3m
Leigh and Atherton	75	£3m
Rochdale	65	£2m
Colne Valley	55	£3m
Rossendale and Darwen	55	£3m
Chorley	50	£2m
Mid Cheshire	45	£2m
St Helens North	45	£2m
Sheffield Hallam	40	£2m
Liverpool Wavertree	40	£2m
Chester South and Eddisbury	35	£2m
Sheffield Central	35	£2m
Wigan	35	£1m
Lancaster and Wyre	30	£2m

Local Authority	Number of staff	Staff salary expenditure
Chester North and Neston	30	£2m
Makerfield	30	£1m
West Lancashire	30	£2m
Huddersfield	30	£1m
Crewe and Nantwich	25	£1m
Liverpool Garston	25	£1m
Newcastle-under-Lyme	25	£1m
Preston	25	£1m
Staffordshire Moorlands	25	£1m

Note: We received data on the home address postcode for a total of 12,065 staff (in headcount) from The University of Manchester. Of this total, we excluded staff records with missing or invalid postcodes (270 in total). Our analysis is thus based on the home addresses of 11,800 staff. Figures are only presented for parliamentary constituencies with at least 25 University of Manchester staff members in 2022-23. We received data on the home address postcodes associated with £523 million of staff expenditure by The University of Manchester. Of this total, we excluded expenditure records from outside of the UK or with an invalid or missing postcode (associated with £12 million of expenditure). As a result of these exclusions, our figure is based on a total of £512 million of staff expenditure. Staff numbers are rounded to the nearest 5. Staff expenditure numbers are rounded to the nearest £1 million. Totals may not add up precisely due to rounding.

Source: London Economics' analysis based on data from The University of Manchester and the Office for National Statistics.

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