The Economic Impact of the University of Cambridge

Final Report

LE London Economics

March 2023

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Acknowledgements

We would like to acknowledge the useful data, guidance and feedback provided by the University of Cambridge throughout the research, with particular thanks to Matthew Norton, Paul Casciato, Louise Walsh, Craig Brierley, Sarah Fell, Tomas Coates Ulrichsen, Andy Neely, Anne Ferguson-Smith, Elizabeth Warr, Clare Monaghan, Katya Samoylova, Catherine Aman, Anne-Cécile Larribau, and Lawrence Morris. Despite the assistance, responsibility for the contents of this report remains with London Economics.

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Foreword

The mission of the University of Cambridge is to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence. In pursuing this mission, the University rightly focuses on academic excellence. We educate some of the brightest minds from the United Kingdom and from around the world. Cambridge has been the birthplace of many of the world's greatest intellectual achievements, and has nurtured many of the world's leading scientists and scholars – from Isaac Newton to Charles Darwin to Jocelyn Bell Burnell; and from Bertrand Russell to John Maynard Keynes to Mary Beard. Our 121 Nobel Prize Winners[1] attest to this record.

There is an aspect of the University's contribution to society that remains to be fully told – the story of Cambridge's economic contribution to the UK. Alongside their social and cultural impact, Cambridge graduates and academics make a significant contribution to the British economy through research breakthroughs and entrepreneurial activities, as well as through the enhanced value and the skills they bring to their employment. This report by London Economics is a comprehensive attempt to estimate the economic value that the University of Cambridge brings to the UK.

The main findings are:

- **The University's net total economic impact on the UK economy is nearly £30 billion annually.** It supports more than 86,000 jobs across the UK, including 52,000 in the East of England. For every £1 we spend, we create £11.70 of economic impact, and for every £1 million of publicly funded research income we receive, we generate £12.65 million in economic impact across the UK. The University's contribution to the UK economy is almost four times that of the Premier League[2].
- **Cambridge is the most successful cluster and local ecosystem in the UK. Just over £23 billion (78%) of our economic impact is generated by the companies spun out from – or closely associated with – the University, as well as research and commercial activities carried out at the University.** This includes the impact of 178 spinouts and 213 start-up companies that have connections to the University. It is the biggest impact of any university in the UK. Success is the result of long-term, strategic decisions that have established the University at the heart of one of the world's most successful innovation and technology clusters.
- **Very few government interventions bring higher economic benefits than investment in the University.** This finding is from a unique comparison between government investment in Cambridge and a sample of almost 600 impact assessments published by UK government departments and public sector agencies.

The University of Cambridge's activities have changed people's lives for the better because we have been successful at getting research to market, and in doing so helped create significant economic growth both around Cambridge and across the UK. Some of the depth and breadth of this influence is illustrated on the University's UK impact map[3] and global impact map[4], which

[1] Source: https://www.cam.ac.uk/stories/cambridge-nobel-laureates
[2] Source: https://resources.premierleague.com/premierleague/document/2022/01/17/b61d9bb0-1488-4cd1-be25-82be98073252/EYUK-000142222_PL-economic-and-social-contribution_28_Spread_HR_2.pdf (pg. 6; accessed 27.02.23)
[3] Source: https://uk.impactmap.cam.ac.uk/
[4] Source: https://impactmap.cam.ac.uk/

contain examples of economic, health, social, environmental and other research impact mapped to regions of the UK and around the world.

Growing the Cambridge ecosystem into one of the world's leading innovation clusters did not happen by accident. It is the result of a culture of excellence, underpinned by a depth and breadth of teaching, research and innovation that connects the discovery of new knowledge with the expertise to turn these ideas into companies and organisations that change people's lives.

The University has helped harness a winning combination of venture capital, government-supported capital investment and infrastructure funding (e.g. the 2016 Cambridge City Deal) through a very deliberate strategy of investing in innovation and commercialisation over past decades that includes:

- Trinity College establishing the UK's first science park in 1970;
- An enlightened IP policy that encourages further investment;
- A culture that encourages innovation and entrepreneurship;
- The establishment of both a knowledge transfer and early investment arm, Cambridge Enterprise, and a follow-on investment arm, Cambridge Innovation Capital, which makes capital available at all stages of the investment journey from pre-seed to early scaling.

To build on this success, Innovate Cambridge[5] – founded by Cambridge Enterprise, Cambridge Innovation Capital and the University – is joining with more than 100 partners, including AstraZeneca, Microsoft and Arm, to develop an ambitious and broad-ranging vision of innovation for the Greater Cambridge area. The goal is to accelerate progress, and for the Greater Cambridge ecosystem to accomplish in the next ten years the same success as in the past twenty-five years.

Achieving this ambition requires action in three areas of policy: better infrastructure in the city and region including laboratory space, affordable housing and transport; better access to talented, skilled individuals from across the world; and better investment and access to capital. The University and our partners across the UK will continue to work with the government to develop solutions in these areas and grow the economic impact of the University alongside academic excellence.

Dr Anthony Freeling, Acting Vice-Chancellor

[5] Source: https://www.innovatecambridge.com/

Executive Summary

The aggregate economic impact of the University of Cambridge

The total economic impact on the UK economy associated with the University of Cambridge's activities in 2020-21 was estimated at approximately **£29.8 billion** (see Table 1). Compared to the University of Cambridge's total operational costs of approximately **£2.543 billion** in 2020-21[6], this corresponds to a **benefit to cost ratio of 11.7:1**. This compares to an average benefit-to-cost ratio among Russell Group institutions of approximately **5.5:1**[7] and a median benefit-to-cost ratio of **1.8:1** across almost 600 government regulatory impact assessments we analysed[8]. In terms of the components of this impact:

- The value of the University's **research and knowledge exchange activities** (the latter including commercial companies spun out from, or closely associated with, the University and other commercial activity carried out at the University) stood at **£23.119 billion** (**78%** of total);
- The impact generated by the **spending of the University of Cambridge and its Colleges** stood at **£4.686 billion** (**16%**);
- The impact of the University's **educational exports** was estimated at **£716 million** (**2%**);
- The University's **teaching and learning activities** accounted for **£693 million** (**2%**); and,
- The impact of **tourism** associated with the University was estimated to be **£587m** (**2%**).

Table 1 Total economic impact of the University of Cambridge's activities in the UK in 2020-21 (£m and % of total)

Type of impact		£m
	Impact of research and knowledge exchange	**£23,119m**
	Research activities	£5,000m
	Knowledge exchange activities	£18,119m
	Impact of teaching and learning	**£693m**
	Students	£285m
	Exchequer	£408m
	Impact of educational exports	**£716m**
	Tuition fee income	£406m
	Non-tuition fee income	£311m
	Impact of University and College spending	**£4,686m**
	Direct impact	£2,643m
	Indirect and induced impacts	£2,042m
	Impact of tourism	**£587m**
	Direct impact	£233m
	Indirect and induced impact	£354m
Total economic impact		**£29,801m**

Note: Presented in 2020-21 prices (rounded to nearest £1m). Totals may not add up due to rounding. ***Source: London Economics.***

[6] Compared to the £2.643 billion of direct impact of the University and its Colleges expenditures included in Section 5, the £2.543 billion of operating expenditure here excludes capital expenditure (£329.5 million), but includes depreciation costs (£158 million), movements in pension provisions (-£9 million) and the University's transfers to Colleges (£80 million).
[7] See London Economics (2017).
[8] For more details on the analysis of the government regulatory impact assessments, please see Section 7.1.

In addition, it was possible to estimate the impacts for *some* components in terms of GVA and FTE employment:

- The impact of the University of Cambridge's knowledge exchange activities;
- The impact of the University of Cambridge's educational exports;
- The impact generated by the operating and capital spending of the University of Cambridge and its Colleges;
- The impact generated by tourism spending associated with the University of Cambridge.

These strands make up approximately £24,108 million (81%) of the University of Cambridge's total impact of £29,801 million[9]. The GVA and employment figures are presented in Table 2.

Table 2 Total GVA and employment impact of the University of Cambridge's activities in the UK in 2020-21 (£m and FTE)

Type of impact		GVA (£m)	Employment (FTE)
	**Impact of knowledge exchange only[10]**	**£10,048m**	**49,760**
	Direct impact of knowledge exchange activities	£4,151m	20,435
	Indirect and induced impact[11]	£5,898m	29,325
	**Impact of educational exports[12]**	**£426m**	**6,635**
	Tuition fee income	£243m	4,255
	Non-tuition fee income	£184m	2,380
	**Impact of University and College spending**	**£2,557m**	**24,185**
	Direct impact of spending	£1,610m	17,355
	Indirect and induced impacts[13]	£947m	6,830
	**Impact of tourism**	**£326m**	**5,675**
	Direct impact	£133m	2,800
	Indirect and induced impact[14]	£193m	2,875
	Total	**£13,358m**	**86,250**

Note: Presented in 2020-21 prices (rounded to nearest £1m for GVA or 5 for employment). Totals may not add up due to rounding.
Source: London Economics.

[9] The remaining £5,693 million of impact includes the impact of the University of Cambridge's research activities (£5.0 billion) and the impact of teaching and learning activities (£693 million). For these categories, GVA and employment measures were unavailable since, unlike the other strands, the methodology to estimate economic impact does not use economic multipliers, derived from Input-Output tables, which are convertible to GVA and employment measures.
[10] Knowledge exchange activities are the commercial companies spun out from or closely associated with the University and commercial activity carried out at the University, such as consultancy.
[11] This includes spending in University spinouts' supply chains, and the spending of their staff.
[12] Educational exports are overseas student fees and income.
[13] This includes spending in the University's supply chains, and the spending of staff.
[14] This includes spending by staff employed due to tourism.

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

The impact of the University of Cambridge's research and knowledge exchange activities in 2020-21 stood at £23.1 billion.

To estimate the **direct** economic impact associated with the University of Cambridge's research, we used information on the total research-related income accrued by the University in 2020-21, which stood at **£734 million**, the second largest research income received by any UK university in that year. To arrive at the net impact of the University's research activities, we deducted the public costs of funding the University's research. Together, these public costs amounted to **£395 million** in 2020-21, resulting in a **net direct research impact** of **£339 million**.

Existing academic literature[15] suggests strong evidence of **productivity spillovers** from public investment in university research. Applying estimates from the literature, our analysis implies a spillover multiplier such that **every £1 million invested in research at the University of Cambridge results in an additional economic output of £6.35 million across the UK economy**.

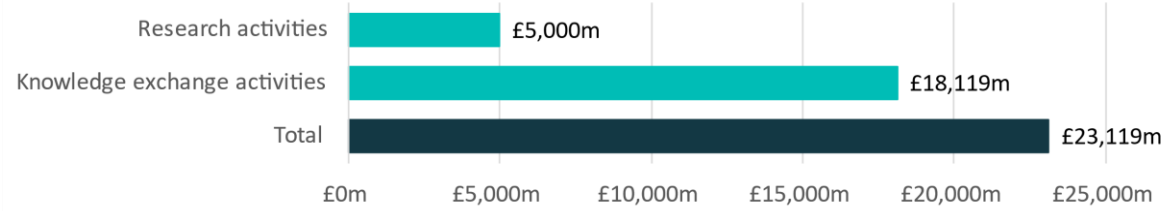
Combining the **net direct impact** of the University of Cambridge's research activities (**£339 million**) with the resulting **productivity spillovers** accrued by other organisations across the UK (**£4,661 million**), the total impact associated with the University of Cambridge's research and knowledge exchange activities in 2020-21 was estimated at **£5,000 million** (see Figure 1).

In addition to the University of Cambridge's research, the analysis estimated the impact associated with **knowledge exchange activities** at the University of Cambridge, including the activities of associated **spinout** and **start-up** companies; **contract research** provided by the University; **consultancy services** provided by the University; **business and community courses**; **facilities and equipment hire**; and **licensing of University IP** to other organisations.

The analysis considers the direct, indirect, and induced economic impacts associated with these activities. The **direct** impact of these activities was based on the turnover of the active spinout and start-up companies, as well as income received by the University of Cambridge for other knowledge exchange activities. The **total direct, indirect, and induced impacts** of these activities was then estimated using relevant **economic multipliers** derived from a (multi-regional) Input-Output model. Using this approach, the analysis estimates that the University of Cambridge's knowledge exchange activities generated a total of **£18,119 million** of impact across the UK economy in 2020-21, driven especially by the success of its **spinout** and **start-up** companies.

The total economic impact associated with the University of Cambridge's research and knowledge exchange activities in 2020-21 was therefore estimated at **£23,119 million** (see Figure 1).

Figure 1 Total impact of the University of Cambridge's research and knowledge exchange activities in 2020-21, £m



Note: All values are presented in economic output in 2020-21 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. ***Source: London Economics' analysis***

[15] See Haskel and Wallis (2010), and Haskel et al. (2014).

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

The analysis of the impact of the University of Cambridge's teaching and learning activities estimates the **enhanced employment and earnings benefits to graduates**, and, separately, the **additional taxation receipts to the Exchequer** associated with higher education qualifications from the University of Cambridge[16].

The total economic impact of teaching and learning generated by the 2020-21 cohort students stands at £693 million.

The analysis is adjusted for the characteristics of the **6,150** UK domiciled students who started a qualification (or standalone module/credit) at the University in the 2020-21 academic year. 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 suggests that the **net graduate premium** achieved by representative English-domiciled students in the 2020-21 cohort completing a **full-time first degree** at the University of Cambridge is approximately **£92,000** (in 2020-21 money terms). Separately, taking account of the benefits (i.e. additional taxation receipts) and costs to the public purse (i.e. student loan write-offs), the analysis indicates that the corresponding **net Exchequer benefit** associated with these students stands at **£104,000**.[17]

The net graduate premiums and net Exchequer benefits (by gender, study mode, study level, domicile, and prior attainment, and adjusted for the subject mix of the cohort) were combined with information on the number of students starting qualifications in 2020-21 and expected completion rates. The aggregate economic impact generated by the University of Cambridge's teaching and learning activities associated with the 2020-21 cohort stood at approximately **£693 million** (see Section 3). This is split between students and the Exchequer, with **£285 million** (**41%**) of the economic benefit generated accrued by students, and the remaining **£408 million** (**59%**) accrued by the Exchequer.

Table 3 Aggregate impact of the University of Cambridge's teaching and learning activities associated with the 2020-21 cohort (£m), by type of impact, domicile, and level of study

Beneficiary and study level	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Students	**£270m**	**£8m**	**£5m**	**£2m**	**£285m**
Undergraduate	£253m	£7m	£4m	£2m	**£267m**
Postgraduate	£17m	£1m	£0m	£0m	**£18m**
Exchequer	**£389m**	**£8m**	**£7m**	**£4m**	**£408m**
Undergraduate	£286m	£6m	£5m	£3m	**£300m**
Postgraduate	£103m	£2m	£3m	£1m	**£108m**
Total	**£659m**	**£16m**	**£12m**	**£6m**	**£693m**
Undergraduate	£539m	£14m	£9m	£5m	**£567m**
Postgraduate	£120m	£2m	£3m	£1m	**£126m**

Note: All estimates are presented in 2020-21 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***

[16] The estimation of the net graduate premiums and net Exchequer benefits is based on a detailed econometric analysis of the publicly available dataset from the Labour Force Survey. The analysis considers the impact of higher education qualification attainment on earnings and employment outcomes; however, as no information is available on the particular HEI attended, the analysis is not specific to University of Cambridge alumni. Rather, the findings from the analysis are adjusted to reflect the characteristics of the 2020-21 cohort of University of Cambridge students (e.g. in terms of mode of study, level of study, subject mix, domicile, gender, average age at enrolment, duration of qualification, and average completion rates).

[17] The full set of net graduate premiums and net Exchequer benefits for all domiciles and characteristics is presented in Annex A2.2.5.

The impact of the University of Cambridge's educational exports

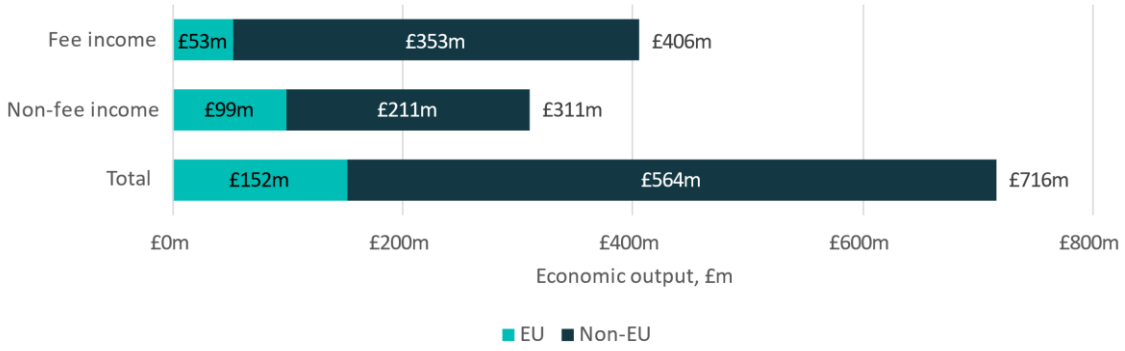
With the University of Cambridge attracting many international students, the University's higher education offer represents a tradeable activity with imports and exports like any other tradeable sector. The economic impact of the University of Cambridge's contribution to educational exports is based on the **direct** injection of **tuition fee and non-tuition fee income** from international students. As with the University of Cambridge's knowledge exchange activities, this income generates **indirect and induced impacts** throughout the UK economy, through supply chain and wage income effects. The analysis focuses on the cohort of **3,385** non-UK domiciled students who started qualifications (or modules/credits) at the University of Cambridge in the 2020-21 academic year. Of these students, **1,010** (**30%**) were EU-domiciled, and **2,375** (**70%**) were from non-EU countries.

Combining the estimates of tuition fee income (net of any Exchequer cost or the University of Cambridge's cost of funding international students) and non-tuition fee income associated with international students in the 2020-21 cohort, the **total export income (i.e. direct impact)** generated by this cohort stood at **£275 million**. More than half of this income (**£157 million**) was generated from international students' (net) tuition fees, whereas the remainder (**£118 million**) was generated from international students' non-tuition fee expenditure.

The impact of the export income generated by the 2020-21 University of Cambridge cohort stood at £716 million.

The total (direct, indirect, and induced) economic impact associated with this export income was again estimated using relevant economic multipliers, estimating the extent to which the direct export income generates additional activity throughout the UK economy. We thus 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 2020-21 University of Cambridge cohort amounts to **£716 million**. Of this total, **£406 million (57%)** of this impact was associated with international students' (net) **tuition fees**, and **£311 million (43%)** was associated with these students' **non-tuition fee expenditures** over the duration of their studies at the University of Cambridge.

Figure 2 Impact of the University of Cambridge's educational exports associated with international students in the 2020-21 cohort (£m), by domicile and type of income



Note: All estimates are presented in 2020-21 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 Cambridge's expenditure

The total impact of the University of Cambridge's expenditure in 2020-21 stood at £4.7 billion.

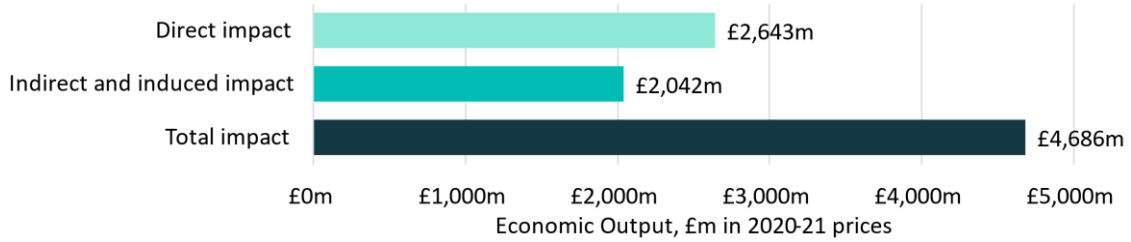
The University of Cambridge's physical footprint supports jobs and promotes economic growth throughout the UK. This is captured by the **direct, indirect, and induced impact** associated with the expenditures of the institution. The **direct impact** of the University of Cambridge's physical footprint was based on the operating and capital expenditures of the University and its 31 Colleges. In 2020-21, the University of Cambridge and its Colleges incurred a total of **£2,643 million** of expenditure (including **£2,314 million** of operating expenses[18] and **£329.5 million** of capital expenditure).

Again, the direct increase in economic activity resulting from the expenditures of the University of Cambridge generates additional rounds of spending throughout the economy (through the University's supply chains, and the spending of staff). Applying the relevant economic multipliers, the **total direct, indirect, and induced impact** associated with the University of Cambridge's expenditures in 2020-21 was estimated at **£4,686 million** (see Section 5).

In terms of **region**, **63%** (**£2,955 million**) of this impact was generated in the East of England, while **37%** (**£1,731 million**) was generated elsewhere in the UK economy.

In relation to the **sector of impact**, in addition to the impacts occurring in the government, health, and education sector itself (**£2,196 million**, **47%**), there are also large impacts felt within other sectors, e.g. including the distribution, transport, hotel, and restaurant sector (**£602 million**, **13%**), the production sector (**£526 million, 11%**), the real estate sector (**£405 million**, **9%**), and the professional & support activities sector (**£347 million**, **7%**).

Figure 3 Impact associated with the University of Cambridge's expenditure in 2020-21 (£m)



Note: All estimates are presented in 2020-21 prices, and rounded to the nearest £1m. Totals may not sum due to rounding

Source: London Economics' analysis based on HESA (2022a) and data provided by the University of Cambridge

In terms of the number of FTE jobs supported, the University of Cambridge's spending supported a total of **24,185** FTE jobs across the UK economy in 2020-21, of which **17,730** were located in the East of England, and the remaining **6,455** jobs were located throughout other regions of the UK.

[18] From the University of Cambridge's and Colleges' total operating expenditure (excluding capital spending) in 2020-21 (£2.543 billion), we excluded £158 million in depreciation costs and -£9 million in movement in pension cost as it is assumed that these are not relevant from a procurement perspective (i.e. these 'non-cash' costs are not accounted for as income by other organisations). Transfers to Colleges from the University (£80 million) were also excluded on the University accounts to ensure no double counting. All estimates are presented in 2020-21 prices, and rounded to the nearest £1m.

The impact of the University of Cambridge's contribution to tourism

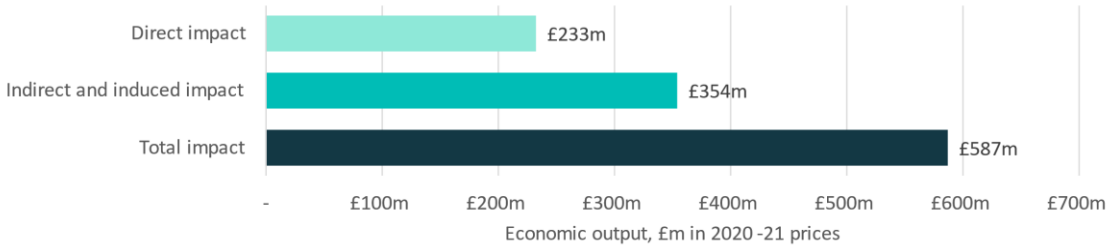
As a final strand of impact, the University attracts a range of visitors to Cambridge, including tourists visiting the University's unique cultural and heritage sites, business visitors, friends and family visiting the University's staff and students, and participants in study trips to the University.

To understand the economic impact associated with the University's contribution to tourism through the attraction of these visitors, we estimate the number of visitors to Cambridge in a typical year that were associated with the University's presence. Due to the impact of the pandemic and the associated restrictions, this analysis (for the 2020-21 *academic year*) is based on visits to Cambridge in the 2019 *calendar year* (i.e. we adopt the most recently available pre-pandemic data to give an indication of the "typical" impact of tourism associated with the University of Cambridge). The analysis focuses only on visits to Cambridge that involved overnight stays by visitors from overseas, as it is assumed that any domestic (day or overnight) visits to Cambridge 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 **462,000** overnight visits from overseas visitors to Cambridge, we estimate that **260,000** 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 **£233 million**.

The impact of the University's annual contribution to tourism stands at £587 million.

As with the University's knowledge exchange activities, educational exports, and the spending of the University and its Colleges, 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 Cambridge stood at approximately **£587 million** (see Figure 4).

Figure 4 Impact associated with the University's annual contribution to tourism (£m)



Note: All estimates are presented in 2020-21 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

1 Introduction

London Economics was commissioned to assess the **economic and social impact of the University of Cambridge in the United Kingdom**, focusing on the 2020-21 academic year. The University of Cambridge contributes to the UK's national prosperity through a range of activities and channels, and the analysis is split into:

- The impact of the University of Cambridge's **research and knowledge exchange activities**;
- The economic contribution of the University of Cambridge's provision of **teaching and learning**;
- The impact of the University of Cambridge's contribution to **educational exports**;
- The impact of the University of Cambridge's **operating and capital expenditures**; and,
- The impact of the **tourism** activity associated with the University of Cambridge.

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

In **Section 2**, we outline our estimates of the impact of the University of Cambridge's research and knowledge exchange activities. To estimate the impact of the world-leading research undertaken at the University of Cambridge, we combine information on the research-related income accrued by the University of Cambridge in 2020-21 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'). The analysis also estimates the direct, indirect and induced impact associated with knowledge exchange activities at the University of Cambridge, including the activities of associated spinout and start-up companies; contract research provided by the University; consultancy services provided by the University; business and community courses; facilities and equipment hire; and licensing of University 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 Cambridge. Through an assessment of the lifetime benefits and costs associated with educational attainment, we estimate the net economic benefits of the University of Cambridge's teaching and learning activity to University of Cambridge students and the public purse (through enhanced taxation receipts), focusing on the cohort of **6,150** UK domiciled students who started higher education qualifications at the University of Cambridge in 2020-21.

In addition to these UK domiciled students, there were a further **3,385** international students in the 2020-21 cohort of University of Cambridge students, contributing 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 fee and non-fee income associated with the University of Cambridge's 2020-21 cohort of international students.

Given that the University of Cambridge is a major employer and supports its core activities through significant expenditures, the University of Cambridge's substantial physical footprint also supports jobs and promotes economic growth throughout the 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 of Cambridge in 2020-21.

The University attracts a range of visitors to Cambridge, including tourists visiting the University's unique cultural and heritage sites, business visitors, friends and family visiting the University's staff and students, and participants in study trips to the University. The impact of these visitors on the UK economy is estimated in **Section 6**.

Section 7 aggregates our findings to provide a total estimate of the economic impact of the University of Cambridge. Within any economic analysis, it is important to understand the counterfactual, in this case alternative uses for public investment. To provide context around the significant economic contribution of the University of Cambridge, we undertook an analysis of almost six hundred government regulatory impact assessments, to compare the return on investment offered by other relevant government interventions with that of the University. The results of this analysis are presented in **Section 7.1**.

In addition to the many economic impacts associated with the University, there are a multitude of **non-economic or societal benefits.** Clearly, these outcomes have significant societal value but as the methods undertaken in this analysis cannot assign a monetary value to this societal impact in any robust way, these have been captured in a series of **case studies** with examples featuring benefits to health, public policy, education, entrepreneurship, culture, community engagement and more. Furthermore, a **survey of University of Cambridge international alumni** (see Section 4.5) demonstrates wider benefits of skills acquisition, including improvements in employability; health and wellbeing outcomes; social capital and cohesion; intergenerational transmission of skills; improved social mobility; the subsequent acquisition of further learning and qualifications; improved communication and autonomy; and improved self-esteem, self-confidence and happiness.

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

In this first chapter, we consider the economic impact of research and knowledge exchange activities.

The University has a rich association with world class academic research and knowledge exchange, and sits at the heart of one of the world's most successful innovation and technology clusters[19]. The Cambridge Cluster is an ecosystem of knowledge-intensive firms and entrepreneurial activities; the University, working in partnership with businesses and other organisations, plays a vital role as a catalyst in supporting research from bright idea right through to commercialisation. This unique and constantly-evolving offering of support, which includes the activities of organisations such as Cambridge Enterprise and Cambridge Innovation Capital (see section 2.2.1), enables the expertise and research emerging from within the University to be disseminated and applied, ensuring positive, widespread and long-lasting impact for society.

2.1 Economic impact of the University of Cambridge's research

In this section, we outline our analysis of the **economic impact of the University of Cambridge's research**. We estimate both the **direct effects** of this research (captured by the research income accrued by the University, net of any public funding), as well as the **productivity spillover effects** from the University's research activities on the whole of the UK economy.

2.1.1 Direct research impact

To estimate the **direct impact** generated by the University's research activities, we used information on the total research-related income accrued by the University in the 2020-21 academic year, including:

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

Aggregating across these sources, the total research-related income accrued by the University of Cambridge in the 2020-21 academic year stood at **£734 million** (see Figure 5), which was the second largest amounts of research income received by any UK university in that year. Approximately **20%** of this income was received through recurrent research grant funding from Research England (**£146 million**), UK charities (**£161 million**, **22%**), and the UK Research Councils (**£200 million**, **27%**). In addition to the **£76 million** (**10%**) accrued from other UK sources[20], the University of Cambridge also received

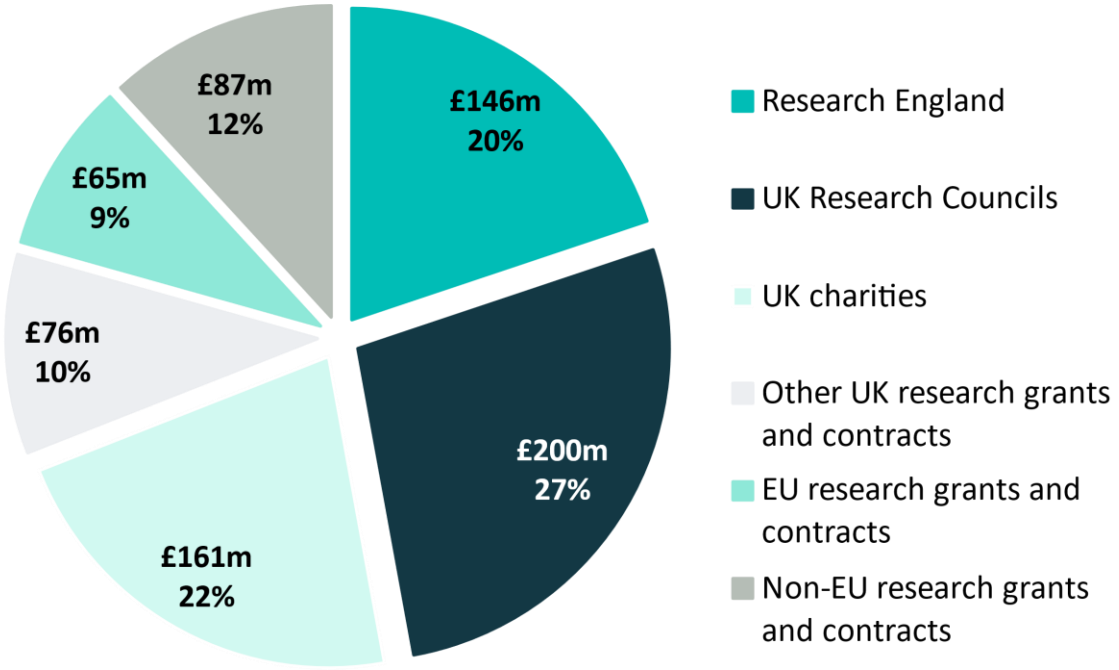
[19] See University of Cambridge (2022). 'Cambridge Innovation in Numbers'. Available at: https://www.cam.ac.uk/sites/www.cam.ac.uk/files/innovation_in_numbers_nov22_0.pdf

[20] This includes £4 million in other research income from UK central government bodies, Local Authorities, and health and hospital authorities. As discussed in further detail below, to arrive at the net direct impact of the University's research activities, this funding is deducted from the University's total research income, as it represents a cost to the public purse.

substantial amounts of research income from both EU (**£65 million, 9%**) and non-EU sources (**£87 million**, **12%**).

To arrive at the net direct impact of the University's research activities on the UK economy, we deducted the **costs to the public purse** of funding the University's research activities from the above total research income in 2020-21. These public costs include the funding provided by the UK Research Councils (**£200 million**), recurrent research grants provided by Research England (**£146 million**), and other research income from UK central government bodies, Local Authorities, and health and hospital authorities (**£49 million**). Deducting these total public purse costs (**£395 million**) from the above total research-related income (**£734 million**), we thus estimated that the **net direct impact** associated with the University of Cambridge's research activity in the 2020-21 academic year stands at **£339 million**.

Figure 5 Research income received by the University of Cambridge in 2020-21, £m by source of income



Note: All values are presented in 2020-21 prices and are rounded to the nearest £1m.
Source: London Economics' analysis based on data provided by the Higher Education Statistics Agency (HESA, 2022)

Connecting research to sustainable growth and productivity

*The **Bennett Institute for Public Policy** is leading a global revolution in economics – changing how wealth is defined and measured, and how it is accounted for sustainably in UK policy.*

The aim of researchers at the Bennett Institute is to help public policy lead to **better outcomes for productivity, nature, society and the economy**.

Dr Matthew Agarwala leads the **Wealth Economy project** with Professor Diane Coyle to understand how economies can achieve prosperous, resilient and, most importantly, sustainable growth. The team has provided two world firsts: a **sovereign credit rating adjusted for biodiversity loss,** and **a rating that includes climate change**. These breakthroughs will allow the financial community for the first time to understand the effects of environmental degradation on sovereign and corporate debt.

Agarwala has worked with the **Office for National Statistics** to develop a statistical standard for measuring social capital. Adopted in 2021, it is now used across UK government.

Referenced by the government as the foundation of the **UK's Levelling Up Strategy**, the team's Wealth Economy approach builds on the ground-breaking work of their Cambridge colleague Professor Sir Partha Dasgupta, who for over half a century has led the way in developing economic statistics that go beyond GDP to include nature and human wellbeing. His 2021 **Dasgupta Review on the Economics of Biodiversity** was commissioned by the **UK Treasury** to review how nature can be at the heart of economics – helping to set the agenda for the **UK Government's 25-year environment plan**.

The team has also worked closely with the **United Nations Statistics Division** on the latest versions of their global accounting standards, as well as the development of online courses to help **Finance Ministries and Central Banks** calculate the worth of their 'natural dividends' – from fish stocks to carbon sinks. They developed a Wealth Economy Guide to support policymakers and practitioners in adopting an inclusive portfolio, and run workshops attended by **decision-makers, advisory bodies** and **civil society organisations**.

Recognising that COVID-19 had "shone a brutal light" on existing inequalities, and the need for greater societal resilience, the Wealth Economy team published their **blueprint for post-pandemic investment** in a world where structural and regional inequality is rife. The 2020 report, 'Building Forward', lays out six 'interconnected capitals': natural, human, social, knowledge-based, institutional and physical – the foundations for a new economic model of inclusive wealth.

Previously, in 2018, Coyle had "trail blazed" a **new local industrial strategy in Manchester**, according to the city's Combined Authority – spearheading an analysis that was accepted in its entirety by the **UK Treasury** – and served as a Commissioner for an **economic review of Cambridge and Peterborough**, influencing how local leaders approached 'natural capital'.

Diane is a Director of the **UK's Productivity Institute,** where she leads a major research theme on **knowledge capital**: the ideas that drive productivity and progress. Investigating the way that **ideas and know-how** permeate our society and the economy, her work illuminates the modern drivers of productivity growth, whether that's how businesses adopt new technologies or the **role of social networks** in determining how well different areas perform.

2.1.2 Productivity spillovers

In addition to the direct 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 induces (positive or negative) external effects on other agents in that market (which are not reflected in the price mechanism). In the context of the economic impact of research activities, existing academic literature assesses the existence and size of **positive productivity and knowledge spillovers**, where knowledge generated through the research 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[21]. For example, spillovers are enabled through direct R&D collaborations between universities and firms, the publication and dissemination of research findings, or through university graduates entering the labour market and passing on their knowledge to their employers.

Of particular interest in the context of research conducted by universities, a study by Haskel and Wallis (2010)[22] investigates evidence of **spillovers from publicly funded Research & Development 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[23, 24], and the relative effectiveness of these channels of public spending in terms of their impact on the 'market sector'. They find strong evidence of the existence of market sector productivity spillovers from public R&D expenditure originating from the UK Research Councils[25]. 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. (2014) 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[26]. The authors investigate the correlation between the combined research conducted by the Research Councils, the higher education sector, and central government itself (e.g. through public research laboratories)[27], interacted with measures of industry research activity, and total factor productivity within the different

[21] 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.
[22] Also, see Imperial College London (2010) for a summary of Haskel and Wallis's findings.
[23] 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.
[24] This is undertaken by regressing total factor productivity growth in the UK on various measures of public sector R&D spending.
[25] 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.
[26] Haskel et al. (2014) use data on 7 industries in the United Kingdom for the years 1995 to 2007.
[27] 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. (2014). In particular, whereas Haskel and Wallis (2010) estimated the impact of research *funding* by the Research Councils on private sector productivity, Haskel et al. (2014) 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.

market sectors[28]. 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)**.

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.

How do these estimates compare to the wider literature?

While these research spillovers are quantitatively large; they are in line with related findings from the (relatively limited) economic literature. A report for the (former) Department for Business, Innovation and Skills (2014) 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.[29] The comparable research multiplier is estimated at 10.71. Moreover, the report finds much higher returns, depending on the precise approach and sample used. Additionally, research from Australia finds a similar research spillover to Haskel and Wallis (2010), albeit with a slightly lower research multiplier of 9.76, which may be expected given the different country studied (Elnasri and Fox, 2017)[30].

There is more limited research associated with general R&D multipliers (for other research income) although a report published for the Department for Business, Innovation and Skills, looking into the international benchmarking of the UK science and innovation system, notes a rate of return in the range of 20 to 50% (Department for Business, Innovation and Skills, 2014).[31] This demonstrates that researchers using different methods and datasets find similar results with regards to estimates of research spillovers.

What are the estimates of the productivity spillovers?

In order to estimate the productivity spillovers associated with the University's research activities, we apply these productivity spillover multipliers from the existing literature to the different types of research-related income received by the University of Cambridge in 2020-21 (again see Figure 5). Specifically, assigning the multiplier of **12.7** to the research funding that the University of Cambridge received from **UK Research Councils and UK charities**[32] in 2020-21 (amounting to **£361 million**), and assigning the multiplier of **0.2** to **all other research funding** received by the University of Cambridge in that academic year (amounting to **£373 million**)[33], we estimate that the research conducted by the University of Cambridge in 2020-21 resulted in **total market sector productivity spillovers of £4,661 million**.

[28] 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.

[29] 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.

[30] See London Economics (2018), *The economic impact of the Group of Eight in Australia* (Section 2.2.1). The authors find an elasticity of 0.175, which converted to a research spillover, equals 9.76.

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

[32] Where the vast majority of funding provided by UK charities relates to projects commissioned through an open competitive process.

[33] 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.

In other words, we infer a weighted average spillover multiplier associated with the University of Cambridge's research activities of approximately **6.35** – i.e. **every £1 invested in the University's research activities generates additional annual economic output of £6.35 across the UK economy**. This captures the impact of the research undertaken by the University in 2020-21 within that same academic year (but excludes any additional (and likely substantial) impacts in subsequent years).[34]

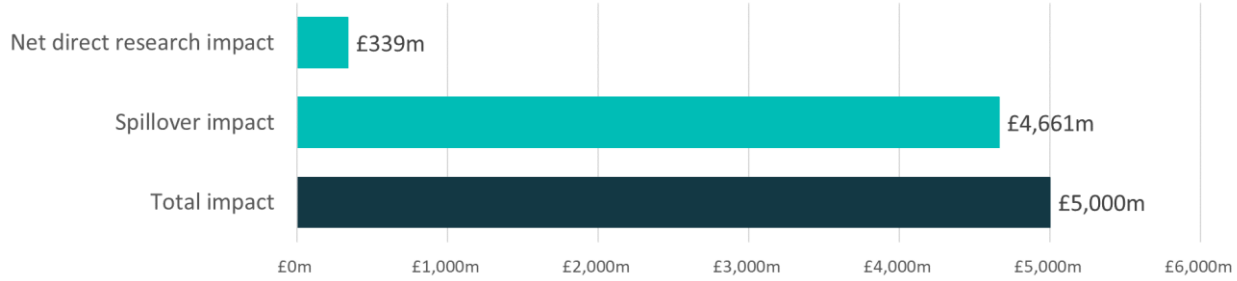
2.1.3 Aggregate impact of the University of Cambridge's research

The estimated impact of the University of Cambridge's research activities in 2020-21 stood at £5.0 billion.

Combining the direct economic impact of the University's research (**£339 million**) with the estimated productivity spillovers associated with this research (**£4,661 million**), we estimate that the total economic impact associated with the University's research activities in 2020-21 stands at approximately **£5,000 million** (see Figure 6).

Comparing the **£395 million** of publicly funded research income received by the University of Cambridge in 2020-21 to the **£5,000 million** impact from research activities, this suggests that **for each £1 million of publicly funded research income, the University of Cambridge's research activities generated an estimated total of £12.65 million in economic impact across the UK.**

Figure 6 Estimated total impact of the University of Cambridge's research in 2020-21, £m



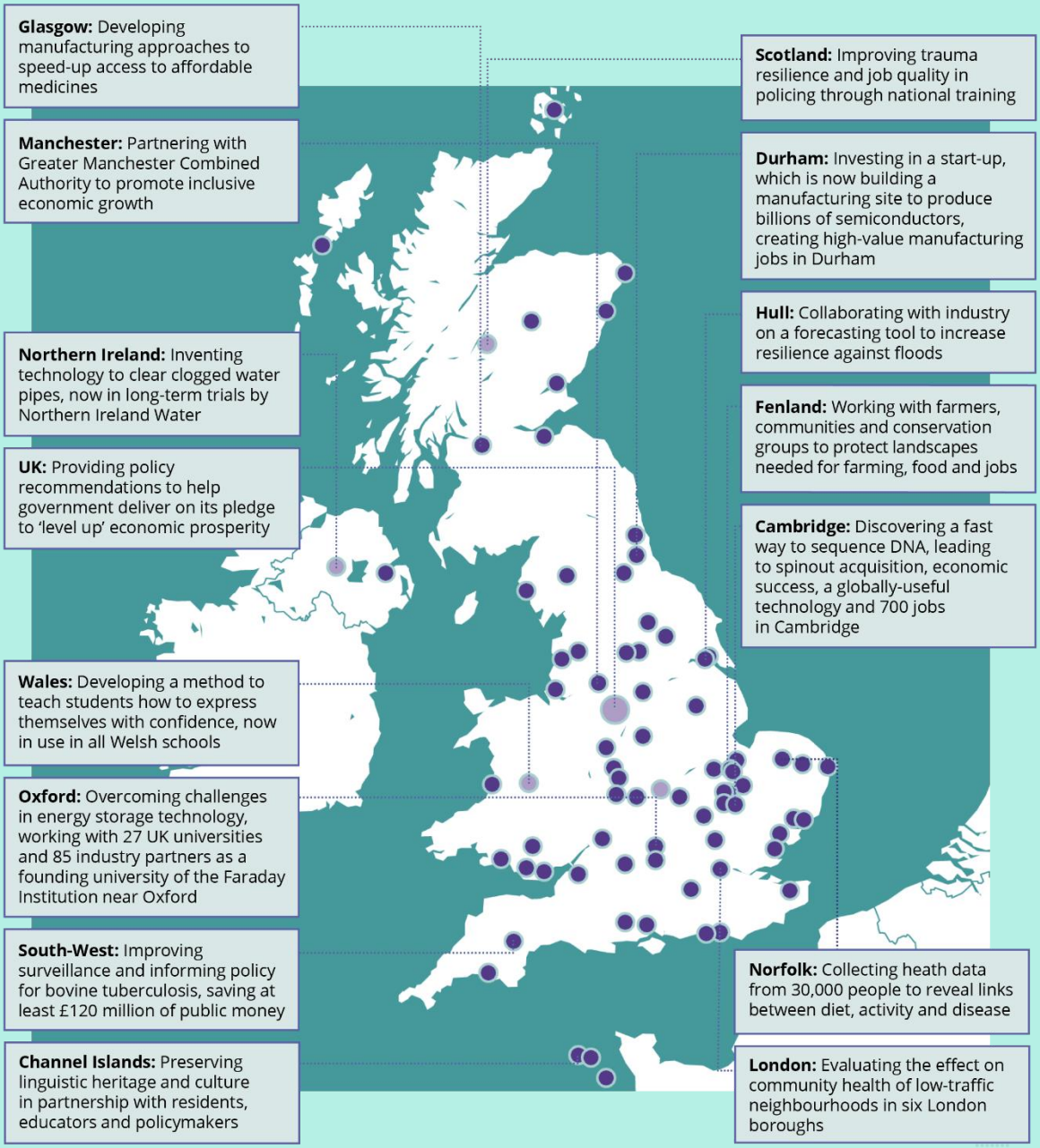
Note: All values are presented in 2020-21 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

[34] Note, however, that following Haskel and Wallis (2010) we take a flow approach rather than a stoke measure, which implicitly assumes a 0% depreciation rate.

Explore the University's UK impact

Locally, regionally and nationally across the UK, research at the University of Cambridge supports communities, improves health, creates jobs, drives economic growth, protects the environment and results in positive benefits for people and places.

The map below shows some of these examples. To explore these and over 120 others in more detail, an interactive **UK impact map** (uk.impactmap.cam.ac.uk) features some of the many ways in which researchers have been helping to solve challenges and improve lives, often through working in partnership with communities, industries, universities and others. Looking beyond the UK, an interactive **global impact map** (impactmap.cam.ac.uk) features case studies from more than 100 countries across all seven continents.



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

In this section, we consider the economic impact of knowledge exchange activities. The methodology of this report focuses on the impact on the UK economy and takes into account impact not just from **spinout and start-up companies** associated with the University of Cambridge, but also the wider knowledge exchange activities at the University, including:

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

Specifically, the analysis captures the direct, indirect, and induced economic impacts associated with each of these knowledge exchange activities, defined as follows:

- **Direct effect:** This measures the direct economic activity generated by each of these activities, captured by the **turnover** of the University of Cambridge's spinout and start-up companies; and the **income received** by the University of Cambridge or **contract value** associated with contract research, consultancy services, business and community courses, facilities and equipment hire, and licensing of University IP.
- **Indirect effect ('supply chain impacts'):** The University of Cambridge, and its associated spinout companies and start-ups spend their income on purchases of goods and services from their suppliers, who in turn spend this revenue purchasing inputs to meet demand from the University or its associated spinout and start-up companies. 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 employees of the University (supported by its income from knowledge exchange activities), and employees at spinouts and start-ups use their wages to buy 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 '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 Cambridge's knowledge exchange activities. An analysis of the *net* economic impact ideally needs to account for two additional factors potentially reducing 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; and
- **Displacement** of economic activity within the region of analysis, i.e. taking account of the possibility that the economic activity generated might result in the reduction of activity elsewhere within the region[35].

[35] It is important to note that, while the analysis 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 IP income received by the University of Cambridge 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 Cambridge's knowledge exchange activities in *gross* terms.

The direct, indirect, and induced impacts are measured in terms of monetary economic output[36], gross value added (GVA)[37], and full-time equivalent (FTE) employment supported. In addition to measuring these impacts on the UK economy as a whole, the analysis is broken down by geographic region and sector.

These impacts of the University of Cambridge's knowledge exchange activities were estimated using **economic multipliers** derived from Input-Output tables, 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[38]. 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 on 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 (for 2016[39]) with a range of regional-level data[40] to achieve a granular breakdown by sector[41] *and* region[42].

2.2.1 The innovation landscape in Cambridge

The University of Cambridge has a **rich knowledge exchange ecosystem**. Unique and constantly-evolving support systems, physical spaces and development opportunities exist to enable the pursuit, dissemination and application of world-leading research and knowledge for the benefit of society and the economic and reputational development of the UK.

By working in partnership with businesses and other organisations, the University is able to turn research into new technologies, therapeutics and applications that will make a **positive difference to people's lives**, both in the UK and around the world.

This has not happened by accident. The University and its Colleges have taken a proactive leadership role in raising the innovation potential of the University and its surrounding environment. This includes decisions such as the development of the **first Science Park** in the UK in 1970, which has resulted in over 30 science and technology parks in the greater Cambridge region today. Or the decision in 2005 to create a **differentiated intellectual property policy** in the University that supported the development of a more liberal and entrepreneurial environment. And the decision to **proactively develop investment capital**

[36] Here, economic output is equivalent to income/turnover (e.g. the direct economic output associated with the University's spinout companies is captured by the turnover of these firms in 2020-21).
[37] 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. the cost of goods and services used in the production process).
[38] Specifically, the analysis makes use of *Type II* multipliers, defined as [Direct + indirect + induced impact]/[Direct impact].
[39] See Office for National Statistics (2020a).
[40] The fundamental idea of the multi-regional Input-Output analysis is that region *i*'s demand for region *j*'s output is related to the friction involved in shipments from one region to another (which we proxy by the distance between the two regions), and that cross-regional trade can be explained by the relative gross value added of the sector in all regions. The multi-regional Input-Output model was derived by combining UK-level Input-Output tables with data on geographical distances between regions; GVA and compensation of employees by sector and region (Office for National Statistics, 2019); employment by sector and region (Office for National Statistics, 2020b); gross disposable household income by region (Office for National Statistics, 2020c); population by region (Office for National Statistics, 2020d); and UK imports into each region and exports by each region, by commodity (Office for National Statistics, 2018).
[41] In terms of sector breakdown, the original UK Input-Output tables are broken down into 64 (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 27 in Annex A2.1 for more information).
[42] 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. 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) in 2016 is a good approximation of the breakdown that would prevail if total demand (and therefore output) were marginally different. In addition, Input-Output analyses do not account for any price effects resulting from a change in demand for a given industry/output.

potential for early-stage companies by establishing **Cambridge Enterprise** seed funds and then to put in place follow-on investment by establishing **Cambridge Innovation Capital**.

The innovation landscape in Cambridge is shaped by many actions that have ensured that the University is providing an environment where ideas can translate into businesses that can flourish and scale at a level comparable with leading international innovation ecosystems.

Innovation, enterprise and commercialisation

Cambridge Enterprise, the University's commercialisation arm headquartered in the West Cambridge Innovation District (see case study on page 15), works with academics to protect, develop and move innovations based on University research towards the market. Early stage innovations are licensed to existing companies for development or spun out as new companies. Liaising with organisations both locally and globally, Cambridge Enterprise offers **expert advice and support in commercialisation** and social enterprise, including help with academic consultancy services, the protection, development and licensing of ideas, new company and social enterprise creation, and seed funding.

The mission of Cambridge Enterprise is to get early stage ideas out of labs and into use, for the benefit of society and the economy. One of the University's greatest commercialisation successes, for instance, is the founding of **Solexa** and its acquisition by Illumina (see case study on page 21). With support and seed funding from Cambridge Enterprise's predecessor organisation, fundamental research became a game-changing technology with global impact.

Solexa is not the only success. In the past 20 years, the University has invested circa **£45 million** in new companies and these companies have leveraged more than **£3 billion** in syndicated investment. The University has been associated with **eight Unicorn businesses** (privately held start-ups with a value of over $1 billion) of 23 born in Cambridge and many University-founded businesses have resulted in **acquisition by major global companies** that now have a presence in Cambridge e.g. Apple, Microsoft, Google etc.

Cambridge Enterprise continues to lead in helping academics translate their innovative research into transformational businesses. In the financial year 2020-2021, Cambridge Enterprise approved **£5.7 million** of investments in **21 companies**, 7 of which were at seed stage. Among these were three companies developing new technologies focused on reducing carbon emissions – **Nyobolt, Echion Technologies and Carbon Re**. These three companies collectively raised over **£70 million** of investment and are helping to move the world to a more sustainable future.

In addition, Cambridge Enterprise supported the licensing of over **115 new technologies** to industry and the substantial growth of its portfolio of over **120 spinout companies**. These companies are creating new research and manufacturing jobs in the UK and positioning the UK as a leader in next generation technologies.

An ecosystem that supports enterprise and commercialisation is crucial. Cambridge Enterprise is part of an extensive infrastructure that helps postdocs, academics and staff plan, launch and fund successful ventures (see Box 1). A good example is **Cambridge GaN Devices (CGD)**, a fabless semiconductor company spun out in 2016 to exploit a revolutionary technology in power devices. It developed from a Postdoc Business Plan Competition winner to raising **$9.5 million** in Series A funding in 2021 and **$19 million** in B round funding in 2022, as well as opening offices at the St Johns Innovation Park in Cambridge **employing over 20 people**. The Series B funding enables CGD to move into mass production of its energy-efficient gallium nitride transistors, which have up to 10 times lower energy loss than silicon transistors.

Box 1 Supporting the entrepreneurial ecosystem

The University provides an array of support for those looking to start new ventures, ranging from talks and networking events through to intensive programmes designed to help those with a viable proposition establish their own company or social enterprise. These programmes include:

Cambridge Enterprise Chris Abell Postdoc Competition
Cambridge Enterprise and the Entrepreneurial Postdocs of Cambridge together run an annual Postdoc Business Plan Competition designed to help accelerate the creation of businesses based on Cambridge research. Now in its eighth year, the competition has led 73 teams through a programme of training, mentoring and business plan iteration. These 73 teams have gone on to raise over £69 million in investment.

Cambridge i-Teams
Multidisciplinary teams of students come together to assess the commercial viability of new technologies and product designs and to learn about the processes involved in turning an idea into a product or business. More than 90 of its projects have resulted in the creation of spin-out companies.

Accelerate Cambridge
This start-up 'accelerator' is a ten-week programme of online lectures, workshops, coaching and mentoring run by Cambridge Judge Business School and is open to anyone living, working or studying in Cambridge. Since 2013, it has supported more than 330 companies and raised more than £516 million in funding.

Impulse
This 12-week programme has been designed for 'high-potential' business cases and is open to both start-ups and intrapreneurs. Participants develop their ideas with the help and advice of entrepreneurial mentors, investors, business experts, partners and sponsors from the Cambridge ecosystem. Impulse alumni have attracted more than £100 million in funding and investments since 2017.

Investment and accelerators

Beyond tech transfer and seed funding, nascent start-ups need investment. In 2013, **Cambridge Innovation Capital (CIC)** was established by the University of Cambridge to invest in and develop IP-rich life science and technology companies emerging from the University or based in the wider Cambridge Cluster – a term that refers to the thousands of knowledge-intensive companies in the Cambridge area. Both the University and the Cambridge University Endowment Fund have invested in funds managed by CIC.

As a preferred investor for the University, CIC benefits from the close collaboration with Cambridge Enterprise in having unparalleled access to investment opportunities in the ecosystem to identify and fund visionaries who build global, category-leading companies.

CIC currently manages over **£500 million** and has invested in **over 30 'disruptive', deep-tech businesses** in sectors such as artificial intelligence, internet of things, quantum technologies, autonomous systems, therapeutics, medtech/diagnostics, digital health and genomics/proteomics[43].

CIC's portfolio includes **CMR Surgical**, based in Cambridge, which is transforming surgery for people through a next-generation surgical robot Versius®. The robot is designed to enable surgeons to perform more minimal access surgery, so that more patients can have access to the highest quality of surgical care. To meet the increasing global demand for Versius®, a large-scale manufacturing facility is being built in Ely, Cambridgeshire.

Both CIC and Cambridge Enterprise have invested in **Riverlane**, which builds ground-breaking software that transforms quantum computers from experimental technology into commercial products. Riverlane also leads a UK-based consortium, which includes world-leading quantum hardware suppliers, the National Physical Laboratory, and the University of Edinburgh, funded by Innovate UK to apply machine learning techniques to find fast, automated and scalable ways to calibrate quantum computers[44].

In order to help accelerate translational research to the point of being businesses ready to receive Series A investment (the first significant round of venture capital funding), **CIC has co-founded two accelerators** in Cambridge: **Start Codon** for life sciences and healthcare businesses, and **Deeptech Labs** for technology businesses. The goal of these accelerators is to speed up the process of going from "bench to product" by compressing years of learning for many companies and researchers into structured and intensive programmes.

As is evident, Cambridge is constantly innovating in how to support the translation of research to create impact. From the first University seed fund to the establishment of CIC, to more recent accelerators like Start Codon and Deep Tech Labs, there is a recognition that Cambridge must proactively shape its own innovation story.

The next chapter of this story is the launch in 2022 of **'Innovate Cambridge'**. This is an ambitious Greater Cambridge initiative, led by Cambridge Enterprise, CIC and the University of Cambridge, which aims to collectively agree on and define an inclusive vision for the future of Cambridge and its innovation ecosystem to be implemented over the next decade.

[43] Please see: https://www.cic.vc/about-us/cic/
[44] Please see: https://www.riverlane.com/news/2022/03/riverlane-leads-uk-consortium-to-build-auto-calibrated-quantum-control-system-deltaflow-control/

West Cambridge Innovation District: building on success

"The development of West Cambridge will continue to drive growth in the UK's physical science and technology sector, nurture the entrepreneurial strengths of the Cambridge Cluster, and foster connectivity and the kind of 'serendipitous collisions', or chance meetings, which spark new ideas and change the world."

Professor Andy Neely, Pro-Vice-Chancellor for Enterprise & Business Relations

The University's West Cambridge campus, a 66-hectare site on the edge of the city, is a **world-leading innovation campus** connecting researchers in technology and the physical sciences with industry and knowledge-intensive businesses, encouraging creativity to flourish in **collaborative workspaces**, and providing support **for entrepreneurship and commercialisation**.

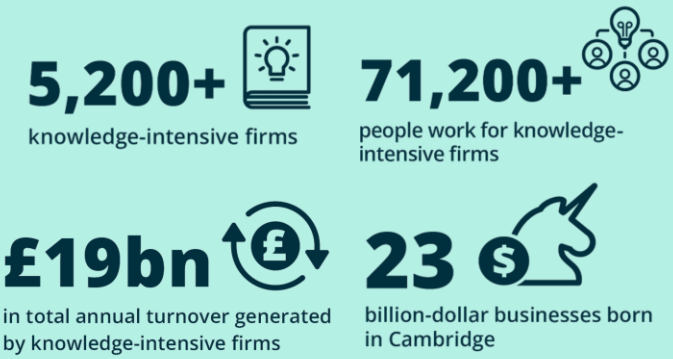
Recent developments have seen the opening of the **University's first shared working space**, the West Hub. The Hauser Forum and IdeaSpace West provide space for industry to work in closer collaboration with researchers, and space for start-ups to **scale their business ideas**. The Maxwell Centre brokers and develops impactful **academic-industry partnerships** that expose academics to business priorities and enable companies to co-create breakthrough solutions.

Fundamental and applied research – from chemical, electronic and civil engineering, to materials and manufacturing, physics and computer science – takes place in cutting-edge laboratories across the district. Further planned expansion will see the completion in 2023 of the new Ray Dolby Centre at the Cavendish Laboratory. The new building will be a major asset for the University – bringing all the research groups in the Department of Physics together, aiding and encouraging collaborations – as well as benefitting the UK in providing **national facilities for all UK Physics departments**, sharing equipment and expertise.

Helping to consolidate and build a thriving ecosystem to **support the growth and commercialisation of ideas** are Cambridge Enterprise and Cambridge Innovation Capital (see section 2.2.1). Together, these companies boast a **world-leading track record** in technology transfer, venture creation, consultancy services and successful investment.

Contributing to the 'Cambridge Cluster'

The University sits at the heart of one of the world's most successful innovation and technology clusters and contributes to its growth through people and ideas, spinouts and start-ups, capital investment, consultancy activity and licensing of discoveries. As of 2022, the cluster has:



Source: https://www.cbr.cam.ac.uk/research/research-projects/the-cambridge-corporate-database-regional-growth/cambridge-cluster-insights/

Impact and ambition

West Cambridge has created the conditions for innovation to flourish: whether it's turning cutting-edge research into commercial ideas, working with industrial partners to drive scientific, societal and economic impact, curating connections between entrepreneur, investor and talented researcher, or developing the next generation of tech innovators.

Starting new ventures

Among the many companies that originate in West Cambridge, more than 300 have been started by graduates and staff of the Department of Computer Science & Technology. These include **Raspberry Pi**, a low-cost computer developed to engage young people in computing that has resulted in sales of 40 million units, supported more than **26,000 UK teachers** with resources and professional development, led to **300 jobs** and created **a market worth $1 billion**; **DeepMind**, pioneers in the responsible use of **artificial intelligence** (AI) to tackle real-world challenges, and which joined forces with **Google** in 2014; and Improbable.io, a **metaverse** company pioneering new ways to connect and build value across interconnected virtual worlds, which has raised **£675m in investment** as of September 2022[45].

Achieving impact at scale

Among West Cambridge's research strengths is the Whittle Laboratory, which is helping to drive **jobs, skills and productivity** through partnerships with **Rolls Royce, Dyson, MHI and Siemens**, and accelerating technology development for **ultralow emission aircraft** and **low-carbon power generation**. The planned New Whittle Laboratory has been designed as an Integrated Technology Accelerator with a radical approach to reducing technology development cycles that aims to halve the time to achieve **zero carbon flight** and to take solutions to scale at speed.

Connecting disciplines and sectors

Recognising that ground-breaking innovations often come at the intersections between disciplines and technology areas, Connect: Health Tech was created to build a highly effective **interdisciplinary** bridge between two Cambridge research hubs and beyond: the West Cambridge district through the Maxwell Centre and the Cambridge Biomedical Campus through the Milner Therapeutics Institute. Connect: Health Tech provides a platform that enables researchers, companies and investors to collaborate with new partners in different disciplines and sectors with common scientific aims.

Transferring knowledge

IfM Engage at the Institute for Manufacturing (IfM) partners with organisations across industry, government and academia to support them in solving complex challenges – including **Audi, Caterpillar, Emerson, GSK, IKEA and Johnson Matthey**. Activities include helping the Royal National Lifeboat Institution to build roadmapping expertise to help the organisation achieve its goal of **halving the number of accidental coastal deaths** and supporting IKEA on a range of projects related to IKEA Industry's **global manufacturing and supply network**.

Mentoring new entrepreneurs

The Maxwell Centre's Impulse for Tech Innovators programme is a **practitioners-led accelerator** specialising in **hands-on, targeted expert mentorship**. Open to applications from universities, entrepreneurs and large companies looking to improve intrapreneurship activities, the programme draws on collective knowledge of a vibrant entrepreneurial community. Impulse has supported around **40 entrepreneurs each year** since 2017, and Impulse alumni ventures to date have raised more than **£100m in funding** and created **over 400 jobs**.

[45] Company information from PitchBook

2.2.2 Economic impact of the University of Cambridge's spinout and start-up companies

To assess the direct impact associated with the University of Cambridge's UK-based spinout and start-up companies, we made use of information on the turnover (as a measure of economic output) and FTE employment associated with a total of **178** University of Cambridge spinout companies and **213** start-ups that were active in 2020-21, (where available)[46]. The information on each company's turnover and employment was based on data provided by the University of Cambridge, supplemented with information from Bureau van Dijk's FAME database (based on Companies House information) to validate and fill any gaps where possible[47]. The direct gross value added generated was 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[48,49].

Of the **178** UK-based University of Cambridge spinout companies that were active in 2020-21, four spinout companies accounted for **94%** of the total revenue of all University of Cambridge spinout companies (based on the employment and turnover data for each spinout company in 2020-21). These spinouts were:

- Solexa (human genome sequencing technology, acquired in early 2007 by Illumina);
- Cambridge Antibody Technology (CAT) (phage display technology to drive the development of human monoclonal antibody therapeutics, acquired in 2006 by AstraZeneca and combined with its acquisition of MedImmume to form its global biologics R&D division) ;
- Xensource (enterprise-class virtual infrastructure solutions, acquired in 2007 by Citrix);
- KuDOS Pharmaceuticals (a biotechnology company focused on oncology therapies, acquired in late 2005 by AstraZeneca).

These four companies were all set up either to translate and commercialise IP that originated from within the University of Cambridge (the University of Cambridge may have released ownership, for example, through the sale of shares and/or IP), or where collaborations and interactions with University researchers were important in enabling the IP generated at a partner institution to be commercialised[50,51].

[46] The analysis includes spinouts with some University of Cambridge ownership but excludes 2 spinouts based on the University's IP that were active in 2020-21 but were non-UK based. Similarly, 3 start-ups were excluded for having a headquarters outside the UK. We also exclude companies that were dissolved prior to 2020-21, or where the company's base was unknown. The analysis of spinouts includes companies that have been acquired, where the activities of the parent company can still be clearly linked to the original spinout. This is in line with the HESA HE-BCI definition. For these cases, we use revenue and employment data associated with the site that was formerly the Cambridge spinout, not that of the parent company. Note also that the information is based on each company's 2020-21 financial year, which does not necessarily coincide with the 2020-21 academic year and varies across companies.

[47] Note that, in spite of using FAME data to fill gaps, it is likely that the combined University of Cambridge/FAME data still provide an incomplete estimate of the total turnover, GVA, or employment of the University of Cambridge'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).

[48] Again, these ratios were derived based on the above-described multi-regional Input-Output model. Each firm's main industry classification was based on information provided by the University of Cambridge, with any gaps again filled using information from FAME. Each firm's main regional location was based on the region of the main registered address of the company recorded in FAME.

[49] The analysis made use of *any* resulting turnover, employment, or GVA information available for a given company, irrespective of whether complete data (i.e. in terms of turnover, GVA *and* employment) was available for that firm. The direct impact is therefore based on a total of 53 spinout firms (out of the 178 active UK-based companies) for which turnover information was available, and 134 spinout firms for which employment information was available. Of the 213 start-ups considered in the analysis, we were able to obtain turnover data for 48, and employment data for 173.

[50] See HESA, Intellectual property, start-ups and spin-offs, available at https://www.hesa.ac.uk/data-and-analysis/business-community/ip-and-startups

[51] In the case of CAT, the core IP originated from the MRC Laboratory of Molecular Biology, an independent, government-funded research institute based in the Cambridge Biomedical Campus. CAT falls into this latter category, whereby interactions with University researchers were important in enabling commercialisation of the IP.

Similarly, three University of Cambridge start-ups accounted for **83%** of the total revenue of all the **213** start-ups (based on the employment and turnover data for each start-up in 2020-21). These start-ups were:

- Abcam (a supplier of protein research tools to life scientists);
- Arm (a semiconductor IP company);
- Jagex (a game developer).

Start-up companies included in the analysis are classified as either staff start-ups (in the case of Abcam), graduate start-ups (in the case of Arm and Jagex) or 'other' start-ups (companies benefiting from investment by the University (including through CIC)). In other words, these start-ups can be linked to the entrepreneurial ambitions of staff and students from the University (although not necessarily based on University IP), and/or there has been investment or formal business or enterprise support from the University, including through CIC (see section 2.2.1).

The seven aforementioned spinout and start-up companies are huge success stories and primarily drive the results of this part of the analysis.

Considering spinout and start-up companies in turn, we adopt the approach outlined above to estimate the direct impact associated with the activities of all the University of Cambridge spinout companies for which data was available. For the academic year 2020-21, this was estimated at **£4,501 million** in economic output (i.e. turnover) terms, **3,790 FTE staff**, and **£2,605 million** of gross value added. In a similar manner, the direct impact associated with the activities of the University of Cambridge's start-up activities in 2020-21 was estimated at **£2,517 million** in economic output terms, **13,640 FTE staff**, and **£1,404 million** of gross value added.

We applied relevant economic multipliers (derived from our above-described Input-Output analysis) to estimate the total direct, indirect, and induced economic impacts of spinout and start-up companies associated with the University of Cambridge. Specifically, we assigned relevant economic multipliers to each active spinout and start-up company in 2020-21, based on each firm's industry classification and the region of its main registered office address. Table 4 presents the resulting average multipliers across all spinout companies and Table 6 presents the corresponding figures for start-ups (weighted by the underlying (direct) turnover, employment, and GVA associated with each firm)[52].

Based on these estimates, in terms of economic output, we assume that every **£1 million** of turnover directly accrued by the University of Cambridge's **spinout** companies generates a *total* of **£2.54 million** impact throughout the UK economy, *of which* **£1.27 million** is generated in the East of England. In terms of employment, we assume that, for every **1,000** (FTE) staff employed by these spinout companies, a *total* of **2,800** staff are supported throughout the UK, of which **1,190** are supported in the East of England.

[52] Again, the table provides multipliers for the impact on the East of England and the UK economy as a whole. A full breakdown of impacts by regions (as well as sector) - across all of the University of Cambridge's knowledge exchange activities – is provided in Section 2.2.5.

Table 4 Economic multipliers associated with the activities of the University of Cambridge's spinout companies

Location of impact	Output	GVA	FTE employment
East of England	1.27	1.31	1.19
Total UK	2.54	2.44	2.80

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, the total economic impact associated with the activities of the University's spinout companies in the 2020-21 academic year was estimated to be **£11,424 million** across the UK economy, of which **£5,729 million** (**50%**) was generated in the East of England (see Table 5). The estimated total number of FTE jobs supported stood at **10,615** (of which **4,510** or **42%** were located in the East of England). The corresponding estimate in terms of GVA stood at **£6,346 million** (of which **£3,419 million** or **54%** occurred in the East of England)[53].

Table 5 Economic impact associated with the University of Cambridge's spinouts in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£5,729m	£3,419m	4,510
Total UK	£11,424m	£6,346m	10,615

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Based on the same approach, we assume that every **£1 million** of turnover directly accrued by the University of Cambridge's start-up companies generates a *total* of **£2.46 million** impact throughout the UK economy, *of which* **£1.51 million** is generated in the East of England. In terms of employment, we assume that, for every **1,000** (FTE) staff employed by these spinout companies, a *total* of **2,480** staff are supported throughout the UK, of which **1,300** are supported in the East of England.

The difference between the average economic multipliers associated with the spinout (Table 4) and start-up (Table 6) companies reflects the differing regional and sectoral make-up of these companies, since some sectors or regions are associate with greater indirect and induced impacts per £1 million of revenue.

Table 6 Economic multipliers associated with the activities of the University of Cambridge's start-up companies

Location of impact	Output	GVA	FTE employment
East of England	1.51	1.52	1.30
Total UK	2.46	2.42	2.48

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

Using these multipliers, the total economic impact associated with the activities of the University's start-ups was estimated to be **£6,189 million** across the UK economy, of which **£3,796 million** (**61%**) was generated in the East of England (see Table 7). The estimated total number of FTE jobs supported stood

[53] Again, a full breakdown of the total impact of all of the University of Cambridge's knowledge exchange activities is provided in Section 2.2.5.

at **33,770** (of which **17,725** or **52%** were located in the East of England). The corresponding estimate in terms of GVA stood at **£3,398 million** (of which **£2,137 million** or **63%** occurred in the East of England)[54].

Table 7 Economic impact associated with the University of Cambridge's start-ups in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£3,796m	£2,137m	17,725
Total UK	£6,189m	£3,398m	33,770

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.

Source: London Economics' analysis

Total impact of the University of Cambridge's spinout and start-up companies

The **total direct impact** of spinout and start-up companies associated with the University of Cambridge is therefore **£7,018 million** in economic output (i.e. turnover) terms, **17,425 FTE staff**, and **£4,009 million** of gross value added[55].

This led to a **total direct, indirect and induced economic impact** of **£17,614 million** across the UK economy, of which **£9,525 million** (**54%**) was generated in the East of England. The estimated total number of FTE jobs supported stood at **44,380** (of which **22,235** or **50%** were located in the East of England)[56]. The corresponding estimate in terms of GVA stood at **£9,744 million** (of which **£5,557 million** or **57%** occurred in the East of England)[57].

[54] Again, a full breakdown of the total impact of all of the University of Cambridge's knowledge exchange activities is provided in Section 2.2.5.
[55] Note totals may not sum using information above due to rounding.
[56] Note totals may not sum using information above due to rounding.
[57] Again, a full breakdown of the total impact of all of the University of Cambridge's knowledge exchange activities is provided in Section 2.2.5.

Rapid genome sequencing: from discovery to spin-out to global technology

Photo credit: Millennium Technology

In August 1997, **David Klenerman** and **Shankar Balasubramanian** had a remarkable idea while enjoying a pint of beer in a Cambridge pub. That brainwave resulted in a technology that could **sequence genomes on a population scale**, bringing with it incalculable benefits to us all. It is used, among other things, to diagnose diseases, improve crops and develop new therapies.

The Cambridge chemists had been using a new technique to observe the synthesis of DNA. Sitting in the pub, they realised that if they could watch the DNA being copied, they would also be reading it at the same time – and very fast. Their idea would result in a **radically new way to sequence DNA**.

They founded the spin-out company **Solexa** and, with support and seed funding from venture capital and the University, began to make this **fast, accurate, low-cost technology available to the world**. In 2007, **Illumina acquired Solexa for £600 million,** keeping an office in Cambridge which today **employs more than 700 people**.

The first genome to be sequenced was completed by the international Human Genome Project between 1990 and 2003 at a cost of more than a billion dollars. A genome can now be sequenced within a day for less than $1,000, and Illumina's highest capacity machine can sequence a genome per hour. During the pandemic, Illumina sequencing underpinned surveillance of coronavirus worldwide, playing a vital role in **tracking the spread of coronavirus** worldwide.

Today, Solexa-Illumina 'next-generation sequencing' is thought to be responsible for as much as **90% of the total DNA and RNA sequenced** globally.

The impact of their work has been widely recognised. In 2021, they were awarded the **Millennium Technology Prize**, one of the world's most prestigious science and technology prizes, by Technology Academy Finland. That same year, the pair were also awarded the 2022 **Breakthrough Prize in Life Sciences** – the world's largest science prize – for the development of next-generation DNA sequencing.

2.2.3 Economic impact of the University of Cambridge's other knowledge exchange activities

In this section we estimate the economic impact of the University of Cambridge's knowledge exchange activities that are separate from the spinout activities. These activities include:

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

IP licensing

To measure the direct impact associated with the University's other IP licensing activities, we made use of data from the Higher Education Business and Community Interaction Survey (HE-BCI)[58] on the total IP licensing income received by the University of Cambridge in the 2020-21 academic year (including income from the sale of shares in spinoffs). This stood at **£13.3 million** (including **£2.1 million** from the sale of share in spinoffs). While this provides an estimate of the direct impact in economic output terms, to arrive at comparable estimates in GVA and employment terms, we multiplied this 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 the East of England.[59] Applying these assumptions, we estimate that the University's IP income in 2020-21 *directly* generates **£9.0 million** in GVA and supports **190** full-time equivalent jobs.[60]

To estimate the total direct, indirect, and induced impacts associated with the University of Cambridge's IP licensing, we then multiplied these direct impacts by the estimated average economic multipliers associated with organisations in the government, health, and education sector in the East of England[61]. These multipliers (for the impact on the East of England and the UK economy as a whole) are presented in Table 8[62]. Based on these estimates, in terms of economic output, we assume that every **£1 million** of IP income accrued by the University of Cambridge generates an *additional* **£1.41 million** of impact throughout the UK economy, of which **£0.52 million** is generated in the East of England. In terms of employment, we assume that, for every **1,000** (FTE) staff employed directly by the University of Cambridge and its Colleges (supported by its IP income), an additional **790** staff are supported throughout the UK, of which **310** are supported within the East of England.

[58] See Higher Education Statistics Agency (2020b).
[59] This approach is based on the fact that the IP income is generated by the University of Cambridge itself. In other words, we assume that the income accrued by the University of Cambridge supports the same levels of GVA and employment (in relative/proportionate terms) as the income accrued by other institutions operating in the East of England's government, health, and education sector. The ratios of GVA to output and employment to output were derived from the above-described multi-regional Input-Output model.
[60] All employment estimates have been rounded to the nearest 5.
[61] i.e. we assume that the expenditure patterns of the University of Cambridge are the same as for other institutions operating in the East of England's government, health and education sector.
[62] A full breakdown of impacts by regions (as well as sector) - across all the University of Cambridge's knowledge exchange activities – is provided in Section 2.2.5.

Table 8 Economic multipliers associated with the University of Cambridge's other knowledge exchange activities

Location of impact	Output	GVA	FTE employment
East of England	1.52	1.45	1.31
Total UK	2.41	2.15	1.79

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, the analysis indicates that the estimated total economic impact associated with the University of Cambridge's IP licensing activities in the 2020-21 academic year stood at approximately **£32.2 million** across the UK economy, of which **£20.3 million** (**63%**) was generated in the East of England (see Table 9)[63]. The estimated total number of jobs supported (in FTE) stood at **340** (of which **250** or **74%** were located in the East of England), while the corresponding estimate in terms of GVA stood at **£19.4 million** (of which **£13.0 million** or **67%** occurred in the East of England)[64].

Table 9 Economic impact associated with the University of Cambridge's IP licensing in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£20.3m	£13.0m	250
Total UK	£32.2m	£19.4m	340

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Consultancy services

In 2020-21, the University of Cambridge received approximately **£23.7 million** in revenues associated with consultancy services, one of the highest amounts across all higher education institutions in the UK for that year. Approximately **£3.1 million** was received for services provided to SMEs, **£6.8 million** from other (non-SME) commercial businesses and **£13.9 million** from non-commercial organisations.

Adopting the same approach as presented previously to estimate the total direct, indirect and induced effect throughout the East of England and the UK economy associated with the contract consultancy income (using the same multipliers presented in Table 8), the analysis indicates that the estimated total economic impact associated with the University of Cambridge's provision of consultancy services in the 2020-21 academic year stood at approximately **£57.2 million** across the UK economy, of which **£36.1 million** (**63%**) was generated in the East of England (see Table 10). The estimated total number of jobs supported (in FTE) stood at **610** (of which **445** or **73%** were located in the East of England), while the corresponding estimate in terms of GVA stood at **£34.5 million** (of which **£23.2 million** or **67%** occurred in the East of England).

[63] Please note it is likely that these estimates of economic impact underestimate the true value of the University's IP, since the number of sales and royalty rates derived from the licensing arrangements are unknown.
[64] Again, a full breakdown of the estimated total impact of the University of Cambridge's knowledge exchange activities is provided in Section 2.2.5.

Table 10 Economic impact associated with the University of Cambridge's consultancy income in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£36.1m	£23.2m	445
Total UK	£57.2m	£34.5m	610

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Box 2 Contract Research and Strategic Partnerships

Research and knowledge exchange is at the heart of the activities of the University of Cambridge, but the activities of the University are not limited to the walls of the University and its Colleges. The University of Cambridge Strategic Partnerships Office (SPO) is just one example of the University reaching out to industry and other research institutions. By helping to facilitate interdisciplinary research collaborations and a wide range of other mutually beneficial activities, SPO ensures that the cutting-edge research taking place at the University of Cambridge can be successfully brought to market to address complex global challenges.[65]

Within the SPO, there is a Directorate responsible for the overall direction and for managing relationships with organisations such as the Greater Cambridge Partnership, while a Public International Partnership Team manages formal collaboration between Cambridge and other universities and research institutions. The Business Partnership Team manages formal relationships between Cambridge and partners in industry. Throughout all initiatives there is a consistent aim to contribute to, and benefit from, the collaborative culture within the Cambridge ecosystem.

The University is working with industry partners to address significant areas of challenge, including:

- Developing life-changing treatments with **AstraZeneca** and **GSK**
- Shaping a positive future for work, starting with mental wellbeing, with **KPMG**
- Making computers and phones more secure with **Arm**
- Targeting carbon zero aviation with **Rolls-Royce** and **Boeing**
- Reimagining the insurance industry (including how to recruit and support neurodiverse team-members) with **Aviva**
- Making the UK's communications networks more resilient with **BT**

Contract research

Reflecting the depth, breadth and impact of the research routinely undertaken by the University of Cambridge, in addition to the research income identified in Figure 5, the University of Cambridge received approximately **£150.8 million** in research contract income in 2020-21, again, one of the highest amounts across all UK institutions for that year. This type of funding typically supports fundamental research, which can lead to future technological breakthroughs (some examples of current initiatives are provided in Box 2). Approximately **£0.5 million** related to income generated from research contracts delivered to SMEs, **£32.3 million** related to income generated from research contracts delivered to other

[65] For more information, see https://www.strategic-partnerships.admin.cam.ac.uk/

(non-SME) commercial businesses and **£118.0 million** of income was associated with research contracts delivered to non-commercial organisations.

Adopting the same approach as presented above to estimate the total direct, indirect and induced effect throughout the East of England and UK economies associated with the consultancy income (and again using the same multipliers presented in Table 8), the analysis indicates that the estimated total economic impact associated with the University of Cambridge's provision of research contract services in the 2020-21 academic year stood at approximately **£363.5 million** across the UK economy, of which **£229.2 million** (**63%**) was generated in the East of England (see Table 11). The estimated total number of jobs supported (in FTE) stood at **3,870** (of which **2,840** or **73%** were located in the East of England), while the corresponding estimate in terms of GVA stood at **£218.8 million** (of which **£147.4 million** or **67%** occurred in the East of England).

Table 11 Economic impact associated with the University of Cambridge's contract research income in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£229.2m	£147.4m	2,840
Total UK	£363.5m	£218.8m	3,870

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Facilities and equipment

In addition to delivering research, the University of Cambridge received approximately **£6.7 million** in income in 2020-21 associated with the hire of its research facilities (often relating to the hire or lease of laboratory space or computing power and capacity etc). Of this total, approximately **£0.8 million** related to income generated from facilities and equipment provided to SMEs. Approximately **£3.1 million** related to income generated from facilities and equipment hire to other (non-SME) commercial businesses and **£2.8 million** was associated with facilities and equipment hire delivered to non-commercial organisations. The total income received illustrates the commercial need (including among SMEs) to be able to access established research infrastructure.

Adopting the same approach as presented previously (and again using the same multipliers presented in Table 8), the analysis indicates that the estimated total economic impact associated with the University of Cambridge's facilities and equipment hire in the 2020-21 academic year stood at approximately **£16.2 million** across the UK economy, of which **£10.2 million** (**63%**) was generated in the East of England (see Table 12). The estimated total number of jobs supported (in FTE) stood at **170** (of which **125** or **74%** were located in the East of England), while the corresponding estimate in terms of GVA stood at **£9.8 million** (of which **£6.6 million** or **67%** occurred in the East of England).

Table 12 Economic impact associated with the University of Cambridge's facilities and equipment hire income in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£10.2m	£6.6m	125
Total UK	£16.2m	£9.8m	170

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Business and community courses

Finally, in this section we consider the income generated from business and community courses. The University of Cambridge received approximately **£15.0 million** in income in 2020-21 associated with business and community courses. Of this total, approximately **£0.9 million** related to income generated from business and community courses delivered to SMEs. Approximately **£8.3 million** related to business and community courses provided to other (non-SME) commercial businesses and **£2.7 million** was associated with business and community courses provided to non-commercial organisations. In contrast to the other research income sources, approximately **£3.1 million** related to business and community courses provided to individuals.

Using the same multipliers presented in Table 8, the analysis indicates that the estimated total economic impact associated with the University of Cambridge's business and community courses in the 2020-21 academic year stood at approximately **£36.1 million** across the UK economy, of which **£22.8 million** (**63%**) was generated in the East of England (see Table 13). The estimated total number of jobs supported (in FTE) stood at **385** (of which **280** or **73%** were located in the East of England), while the corresponding estimate in terms of GVA stood at **£21.7 million** (of which **£14.6 million** or **67%** occurred in the East of England).

Table 13 Economic impact associated with the University of Cambridge's business and community course income in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£22.8m	£14.6m	280
Total UK	£36.1m	£21.7m	385

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.

Source: London Economics' analysis

2.2.4 Total impact of the University of Cambridge's knowledge exchange activities

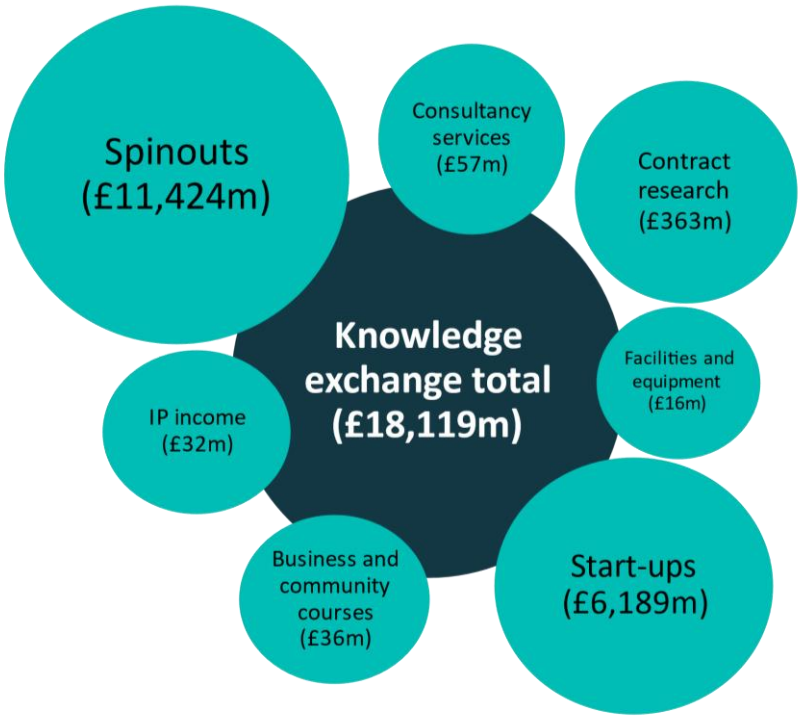
In the 2020-21 academic year, the University of Cambridge's knowledge exchange activities generated an estimated **£18,119 million** across the UK economy, of which **£9,843 million** (**54%**) was generated in the East of England (see Table 14). The estimated total number of jobs supported (in FTE) stood at **49,760** (of which **26,175** or **53%** were located in the East of England), while the corresponding estimate in terms of GVA stood at **£10,048 million** (of which **£5,762 million** or **57%** occurred in the East of England).

Table 14 Economic impact associated with the University of Cambridge's knowledge exchange activities in 2020-21

Location of impact	Output, £m	GVA, £m	# of FTE employees
East of England	£9,843m	£5,762m	26,175
Total UK	£18,119m	£10,048m	49,760

Note: All monetary values are presented in 2020-21 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5. ***Source: London Economics' analysis***

Figure 7 Estimated total economic impact associated with the University of Cambridge's knowledge exchange activity in 2020-21, £m



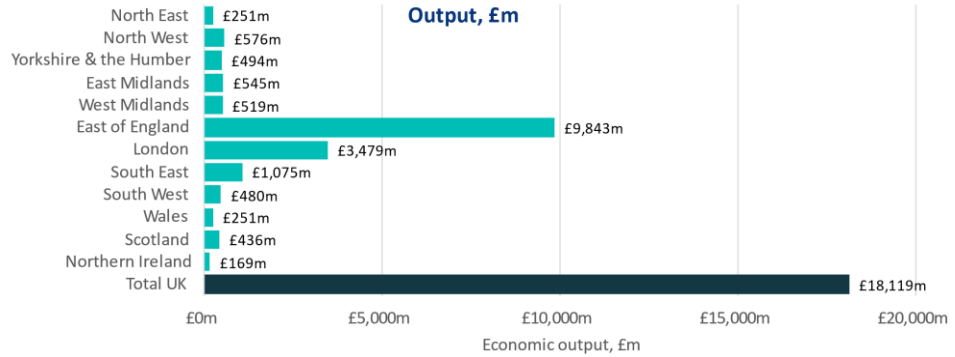
Note: All values are presented in economic output in 2020-21 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated due to rounding. The size of the bubbles is not to scale.
Source: London Economics' analysis

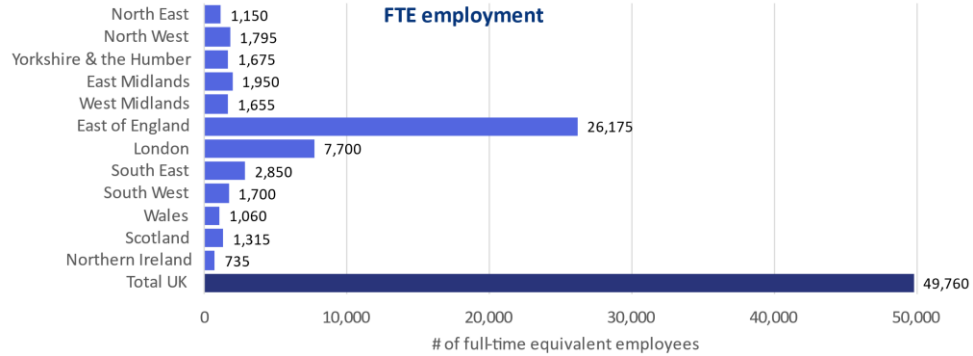
2.2.5 Regional and sectoral impact of the University of Cambridge's knowledge exchange activities

Combining the economic impacts generated by the University's intellectual property licensing, spinout companies, start-ups, contract research, business and community courses, facilities and equipment lease and hire and consultancy services, Figure 8 presents the aggregate impact associated with the University's knowledge exchange impacts in the 2020-21 academic year (across all regions, as well as by sector).

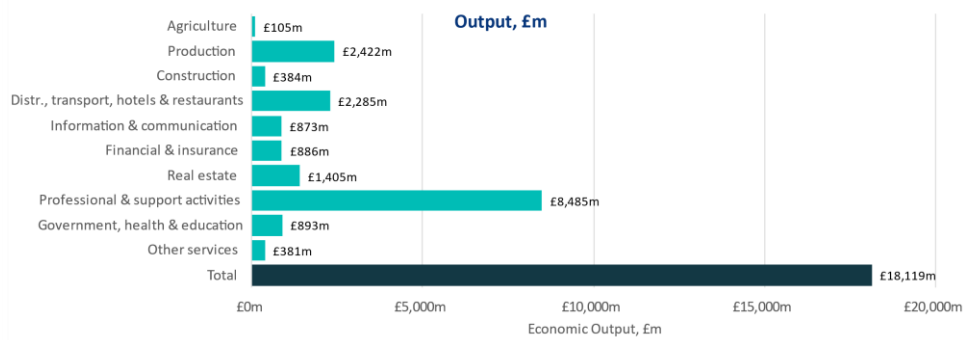
Figure 8 Estimated total economic impact associated with the University's knowledge exchange activities in 2020-21, by region and sector

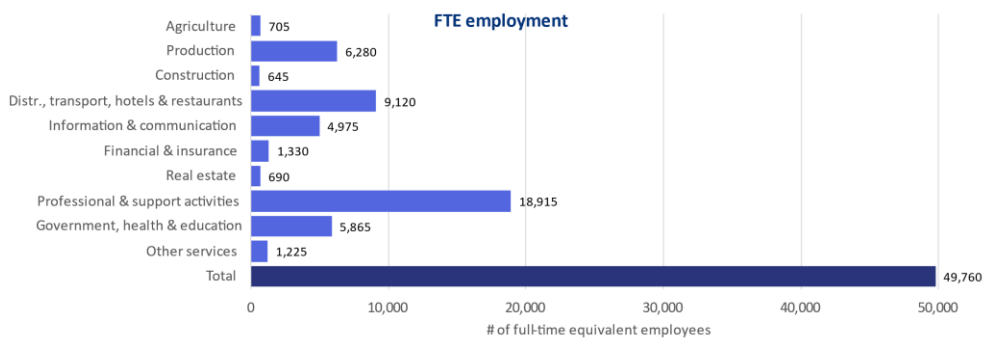
By region





By sector





Note: Monetary estimates are presented in 2020-21 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***

In terms of **economic output** (top panel), the analysis estimates that, in 2020-21, these knowledge exchange activities generated an estimated total of **£18,119 million** of economic output across the UK economy:

- Considering the breakdown by region, while the majority of this impact (**£9,843 million**, **54%**) was generated in **the East of England**, there were also significant impacts occurring in other regions across the UK, particularly in **London** (**£3,479 million**, **19%**), and the **South East** (**£1,075 million**, **6%**)[66].
- In terms of sector, the University's knowledge exchange activities resulted in particularly large impacts within the **professional and support activities sector** (**£8,485 million**, **47%**), the **production sector** (**£2,422 million**, **13%)**, the **distribution, transport, hotel, and restaurant sector (£2,285 million**, **13%**) and the **real estate sector** (**£1,405 million**, **8%**).

In terms of **gross value added** (middle panel), the impact was estimated to be approximately **£10,048 million** across the UK economy as a whole, of which **£5,762 million** was accrued within the East of England. Finally, the University's knowledge exchange activities supported an estimated **49,760 full-time equivalent jobs** across the UK as a whole, of which the majority (approximately **26,175, 52%)** were located within the East of England.

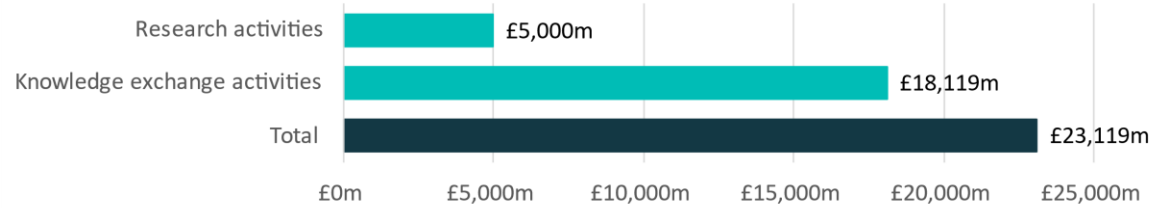
2.3 Total impact of the University of Cambridge's research and knowledge exchange activities

Finally, combining the research and knowledge exchange strands together, Figure 9 presents the total economic impact associated with the University's research and knowledge exchange activities in 2020-21, estimated at **£23,119 million**.

The estimated impact of the University of Cambridge's research and knowledge exchange activities in 2020-21 stood at £23.1 billion.

Of this total, **£5,000 million** was associated with the University of Cambridge's research and productivity spillovers to the rest of the UK economy, while an even larger amount **£18,119 million** was associated with the array of knowledge exchange activities undertaken and supported by the University.

Figure 9 Total impact of the University of Cambridge's research and knowledge exchange activities in 2020-21, £m



Note: All values are presented in economic output in 2020-21 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

[66] These three regions accrue a large share of the economic impact since a number of spinouts and start-ups are headquartered in these regions. In absence of other information, analysis of spinouts and start-ups was done on the basis of the location of company headquarters and may therefore not fully account for the distribution of economic activity across the UK. For example, many businesses with headquarters in London may have operations outside London and the South East.

Our analysis suggests that the majority of the economic impact associated with the University of Cambridge is derived from its research and knowledge exchange activities, in particular through a number of highly successful spinout and start-up companies associated with the University. Our findings underline the huge value of the knowledge exchange activities of the University, driven by individuals and companies with entrepreneurial drive and innovations that lead to impacts at a local, national and global level.

Considering the impact of spinout and start-up companies specifically, several major success stories underline the value both of vibrant knowledge exchange ecosystems and individuals within those environments taking the initiative to drive those ideas to markets. This is what has driven the success of spinout and start-up companies in the past and present, helped by an interlinked ecosystem of research, innovation and knowledge exchange.

Cambridge Biomedical Campus: 60 years of changing lives

"The success [of the Campus] is not just limited to improved healthcare and treatments for patients – we generate jobs and income for businesses across Cambridge and the East of England. We do this through collaboration, with research, industry and the NHS working together to drive innovation which is then shared."

Dr Kristin-Anne Rutter, Executive Director at Cambridge Biomedical Campus

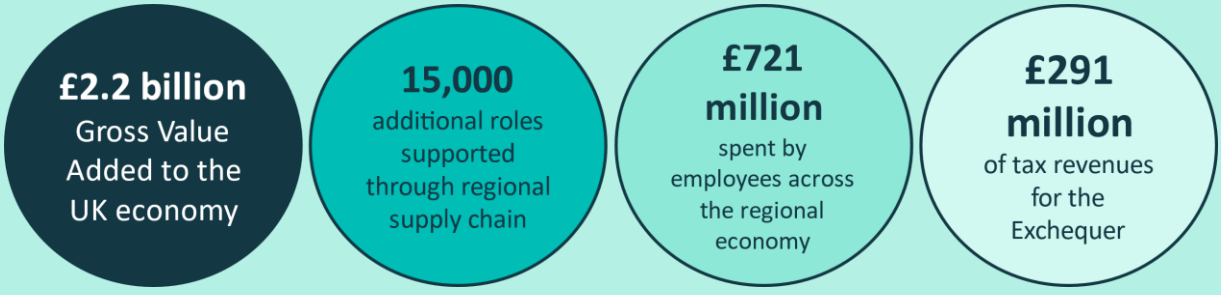
The **Cambridge Biomedical Campus (CBC)** is at the heart of the UK and Europe's leading life sciences cluster. Established in 1962, it has grown to become a **global leader in medical research, education and patient care**. Its **vibrant community of scientists, clinicians, NHS workers and industry** are working together to transform the lives of patients locally, nationally and around the world.

Today, it is home to the University of Cambridge's School of Clinical Medicine, which includes over a dozen departments, together with world-class institutes such as the Cancer Research UK Cambridge Institute, the Wellcome-MRC Institute of Metabolic Science and the Milner Therapeutic Institute, which seeks to bridge the gap between academia and industry. These sit alongside the MRC Laboratory for Molecular Biology, Cambridge University Hospitals and Royal Papworth Hospital, with two major new hospital buildings planned – the Cambridge Cancer Research Hospital and Cambridge Children's Hospital.

The success of the CBC has fuelled the **'Cambridge Phenomenon' – a thriving entrepreneurial ecosystem that has seen the creation of globally significant companies and innovations across bioscience, medicine and technology**. It helped convince pharmaceutical giant AstraZeneca to establish its state-of-the-art global R&D facility on the campus; GSK has operated a clinical trials unit on the CBC for over a decade, and biotech company – and Cambridge spinout – Abcam relocated to the campus in 2019.

Economic benefits

In August 2022, an independent report, separate to London Economics' analysis of the University, by the Centre for Economics and Business Research found that the CBC generated:



Source: Centre for Economics and Business Research (2022)

Discovery and innovation that changes lives

Pioneering research on the CBC has already changed the lives of millions of people worldwide and its rich history of discovery and innovation promises to help many more in the future.

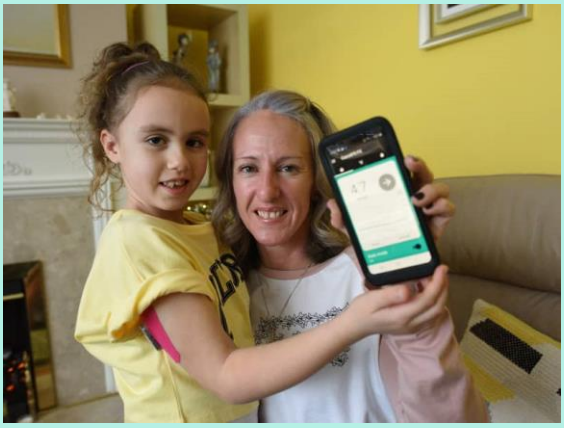
Treating multiple sclerosis: the long road to discovery

Nobel Prize-winning research at the MRC Laboratory for Molecular Biology in the 1970s led Cambridge researchers to develop **Campath-1H**, the world's first monoclonal antibody to be used as a therapy in humans. The drug – now known as alemtuzumab – is used to **treat multiple sclerosis**, the commonest neurological cause of disability in adults. It is licensed in over **70 countries worldwide** and has generated almost **€2 billion in net sales**.

Cytosponge: 'sponge on a string' test to detect oesophageal cancer

Oesophageal cancer is one of the most challenging cancers to treat because it is often detected too late. But there may be an opportunity to detect the disease earlier. Cambridge scientists have developed the **Cytosponge** – a 'sponge on a string' coupled with a lab test that is a remarkably straightforward but effective way of helping determine whether patients with heartburn – a common symptom – have a benign condition or are developing malignancies.

'Life-changing' technology for type 1 diabetes



Sofia Wright (with mother Sam) showing the artificial pancreas app (Credit: Phil Mynott)

Cambridge researchers have developed an app – **CamAPS FX** – which, combined with a glucose monitor and insulin pump, acts as an artificial pancreas, automatically adjusting the amount of insulin it delivers based on predicted or real-time glucose levels. The technology, **described as 'life-changing',** has been shown to be effective in type 1 diabetes patients, from adults through to very young children. It is available through NHS trusts, including Cambridge University Hospitals, and is being trialled for treatment of type 2 diabetes.

Rejuvenating donor organs

There is a nationwide shortage of suitable organs for transplanting, with many donor organs deemed unsuitable. Researchers at Cambridge University Hospitals have developed techniques to allow rejected organs to be kept viable for assessment and successful transplantation. This technology is now used clinically in several kidney transplant centres in the UK, and the Cambridge perfusion protocol has been adapted for clinical use in the Netherlands and the USA.

Tracking the spread of COVID-19

The **COVID-19 Genomics UK (COG-UK) Consortium** played a major role throughout the pandemic, applying large-scale, rapid whole-genome sequencing pioneered in Cambridge to help understand viral transmission and the emergence of new variants of concern, informing public health responses and vaccine development. Led by Cambridge's Professor Sharon Peacock and involving dozens of sequencing hubs and research groups across the UK – including on the CBC and at Wellcome Sanger Institute – COG-UK scientists have sequenced over **3.2 million virus samples, contributing a quarter of all global SARS-CoV-2 sequence data deposited in the international open-access database GISAID.**

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

Economic impact analyses of higher education institutions typically only consider the direct, indirect, and induced economic effects of a university's expenditures (through the institution's extensive supply chains, and the expenditures on its staff), as well as the economic impacts associated with the expenditures of students attending the institution. However, given that one of a university's primary activities is to provide teaching and learning, a simple study of this nature would significantly underestimate the impact of any higher education institution's activities on the UK economy.

In terms of measuring the impact of universities' teaching and learning activities, Atkinson's (2005) report to the Office for National Statistics asserted that the economic value of education and training is essentially the **value placed on that qualification as determined by the labour market**. Based on this approach, in this section of the report, we detail our estimates of the economic impact of the teaching and learning activities undertaken at the University of Cambridge, by considering the labour market benefits associated with enhanced qualification attainment and skills acquisition – to **both the individual and the public purse**.

3.1 The 2020-21 cohort of UK domiciled University of Cambridge students

The analysis of the economic impact of the teaching and learning activities of the University of Cambridge is based on the **2020-21 cohort of UK domiciled students**. In other words, instead of the University of Cambridge's entire student body of **22,155** students in 2020-21 (*irrespective* of when these individuals may have started their studies), the analysis in this section focuses on the **6,150** UK domiciled[67] students **starting higher education qualifications (or standalone modules/credits) in the 2020-21 academic year**[68].

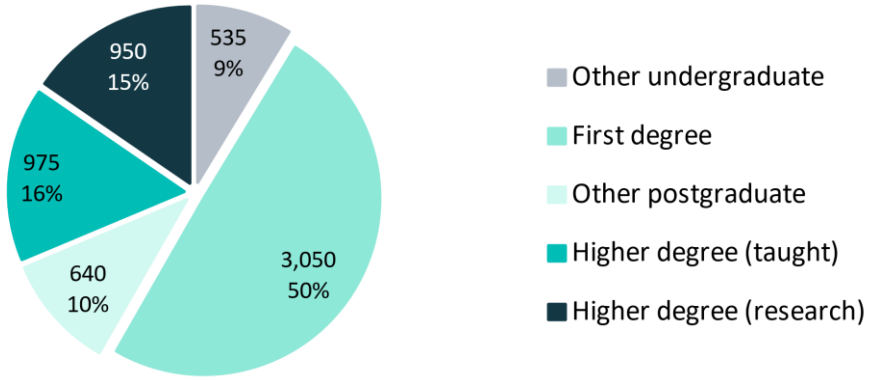
In terms of **level of study** (Figure 10), **50%** (**3,050** students) in this cohort of UK-domiciled students were undertaking **first degrees**, with a further **975** students (**16%**) undertaking **postgraduate taught degrees**, and **950** students (**15%**) enrolled in **postgraduate research degrees**. An additional **535** students (**9%**) were enrolled in **other undergraduate qualifications**, and the remaining **640** (**10%**) were undertaking **other postgraduate qualifications**[69].

[67] It is likely that a proportion of EU and non-EU domiciled students undertaking their studies at the University of Cambridge will remain in the UK to work following completion of their studies; similarly, UK domiciled students might decide to 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, 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 of Cambridge.

[68] We received HESA data on a total of 9,590 first-year students from the University of Cambridge. Of these, we excluded 45 students who did not have a stated gender or age and 3,385 non-UK domiciled students (who are instead considered as part of the analysis of educational exports (Section 4)). Figures may not add precisely due to rounding to the nearest five students.

[69] 'Other undergraduate' learning includes Certificates of Higher Education, other undergraduate-level diplomas and certificates, and undergraduate-level credits. 'Other postgraduate learning' includes taught work for credit at postgraduate level, and other certificates, diplomas, and qualifications at postgraduate level.

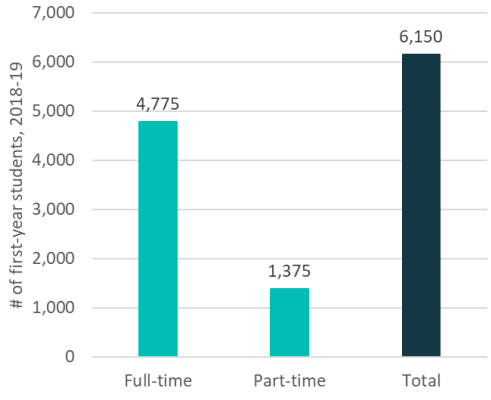
Figure 10 UK domiciled students in the 2020-21 cohort of University of Cambridge students, by level of study



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

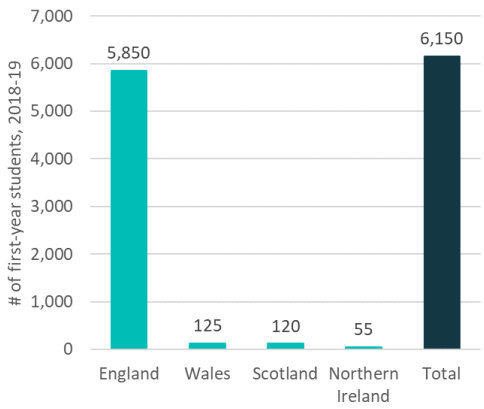
In relation to **mode of study** (Figure 11), **4,775 (78%)** students in the cohort were undertaking their studies with the University of Cambridge on a full-time basis, while the remaining **1,375 (22%)** were enrolled on a part-time basis. As shown in Table 15, the majority of full-time students were undertaking first degrees (**64%** of FT students). Many part-time students in the cohort were enrolled in other undergraduate qualifications (**38%** of PT students) or other postgraduate qualifications(**26%** of PT students).

Figure 11 UK domiciled students in the 2020-21 cohort of University of Cambridge students, by mode of study



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

Figure 12 UK domiciled students in the 2020-21 cohort of University of Cambridge students, by domicile



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

In terms of **domicile** (Figure 12), the vast majority (**5,850**, **95%**) of UK domiciled students in the cohort were from England, with **125** (**2%**) students domiciled in Wales, **120** (**2%**) domiciled in Scotland, and the remaining **55** (**1%**) students domiciled in Northern Ireland.

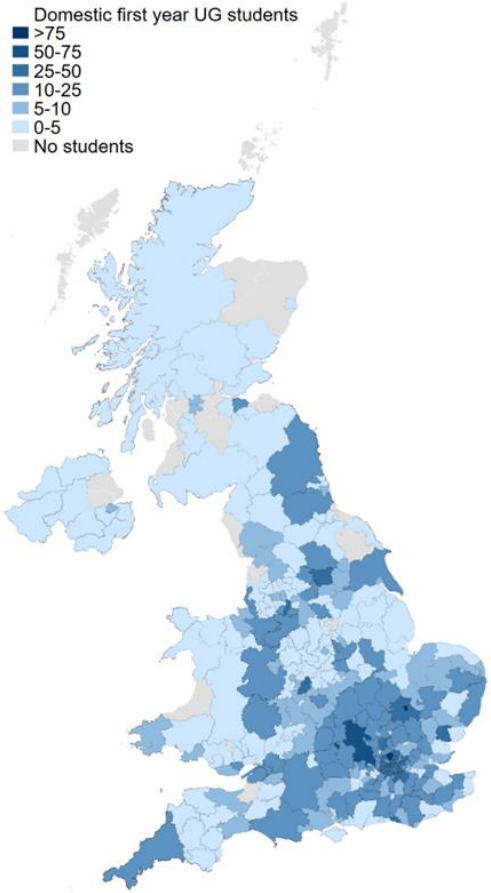
Table 15 UK domiciled students in the 2020-21 cohort of University of Cambridge students, by level of study, mode, and domicile

Level and mode of study	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Full-time					
Other undergraduate	10	0	0	0	**10**
First degree	2,905	75	45	25	**3,050**
Other postgraduate	255	10	10	10	**280**
Higher degree (taught)	740	20	25	5	**790**
Higher degree (research)	615	5	15	5	**645**
Total	**4,520**	**110**	**95**	**45**	**4,770**
Part-time					
Other undergraduate	500	10	10	5	**525**
First degree	0	0	0	0	**0**
Other postgraduate	345	5	5	5	**360**
Higher degree (taught)	185	0	5	0	**185**
Higher degree (research)	300	0	5	0	**305**
Total	**1,330**	**15**	**25**	**10**	**1,375**
Total					
Other undergraduate	510	10	10	5	**535**
First degree	2,905	75	45	25	**3,050**
Other postgraduate	600	10	15	10	**640**
Higher degree (taught)	920	20	30	5	**975**
Higher degree (research)	910	5	25	10	**950**
Total	**5,850**	**125**	**120**	**55**	**6,150**

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

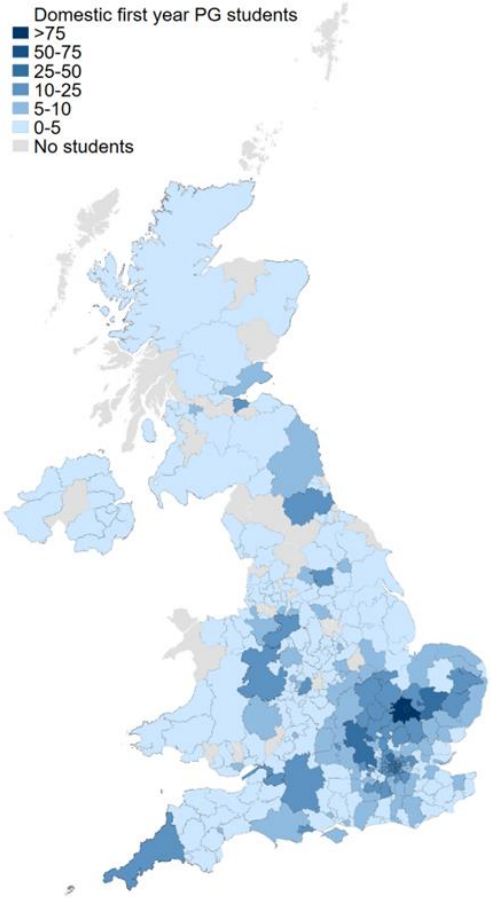
Figure 13 and Figure 14 present the distribution of the 2020-21 cohort studying undergraduate and postgraduate qualifications (respectively) by domicile at the Local Authority level. These maps illustrate the University of Cambridge's geographical draw of students from every region across the UK, particularly among the undergraduate cohort. For postgraduate students, there is a slightly greater concentration of students around Cambridgeshire since a number of students continue their studies at the University following completion of an undergraduate degree.

Figure 13 UK-domiciled undergraduate first year students in the 2020-21 cohort, by Local Authority



Note: LE received HESA data on 3,585 first year undergraduate UK-domiciled students from the University of Cambridge. Students from Guernsey, Jersey and the Isle of Man or those with an unspecified unknown domicile in the UK (fewer than 5 students in total) were excluded.
Source: London Economics' analysis based on data from the University of Cambridge 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 2023.

Figure 14 UK-domiciled postgraduate first year students in the 2020-21 cohort, by Local Authority



Note: LE received HESA data on 2,565 first year UK-domiciled postgraduate students from the University of Cambridge. Students from Guernsey, Jersey and the Isle of Man or those with an unspecified unknown domicile in the UK (fewer than 5 students in total) were excluded.
Source: London Economics' analysis based on data from the University of Cambridge 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 2023.

"Never let your background stop you and don't settle for less"

Victoria Ayodeji, from East London, graduated from the University of Cambridge in 2021 with a degree in Geography. Her work on **access and outreach** was recognised through an **Outstanding Achievement Award at the House of Lords' UK Student Social Mobility Awards** and she has been listed as Powerful Media's **Top 100 Future Leaders**. Here she shares her experiences of getting into Cambridge.

"It was by pure chance that I stumbled across the work of the **Sutton Trust**, **Target Oxbridge** and **IntoUniversity** through a Google search one day after school in 2015 – which is funny when I look back on it as the work of these charities has truly changed my life.

My school had only ever sent one person to Cambridge before. **The Sutton Trust Summer School** was really eye-opening for me, not only because it gave me the ability to experience taster lectures and seminars but also visit the different Cambridge Colleges and see which one I'd like to apply to.

Alongside my degree, I was involved with a wide variety of **access and outreach work** with highlights being my role as a Cambassador and Queens' College BAME Officer. I've closely **mentored 40 young people** with their application to university, almost half of whom have successfully applied to Oxbridge.

I believe there's a lot of **power in sharing your story** as you never know who you are inspiring along the way. I've spoken to hundreds of students in schools across the UK and the response has always been overwhelming. Students send messages to me on social media saying how impactful it is to have a **positive role model from a similar background to them**.

When I visit schools and speak at access and outreach events for young people from **traditionally underrepresented backgrounds** I often say: 'definitely never let your background stop you. If you let your background stand in your way, you might not be able to achieve the things you really want and are passionate about and instead might settle for less – you deserve more and you can aspire to more. Always tap into any **good support networks** available to you, whether that be teachers, friends or family members who believe in you and are advocates for your success'."

3.2 Adjusting for completion rates

The previous section provided an overview of the number of UK-domiciled students *starting* qualifications or modules at the University of Cambridge in the 2020-21 academic year. However, to aggregate individual-level impacts of the University of Cambridge'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 provided by the University of Cambridge on the completion outcomes of students from the University – broken down by study mode, study intention, and study completion[70]. In other words, these completion data include the number of students who completed their intended qualification (or module); completed a different (usually lower) qualification; or discontinued their studies without being awarded a qualification (modelled as completion 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)).[71]

Table 16 presents the resulting completion rates applied throughout the analysis.[72] We assume that, of those students starting a full-time first degree at the University of Cambridge in 2020-21, **98%** complete the first degree as intended, while the remaining **2%** undertake one or more of the credits/modules associated with their degree before discontinuing their studies (modelled as completion at 'other undergraduate' level). At postgraduate level, we assume that of those individuals starting a full-time postgraduate taught degree, **98%** complete the qualification as intended, while the remaining **2%** 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). For those individuals starting a full-time postgraduate research degree, approximately **87%** complete the qualification as intended, with the remaining **13%** assumed to complete 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)**.

[70] Note that, for consistency with our above definition of 'other undergraduate' students, we combined the original separate data for undergraduate-level credits and other undergraduate learning into a single category (and proceeded similarly for postgraduate-level credits and other postgraduate learning).
[71] In other words, we assume that students who discontinued their studies were assumed to at least complete one or several standalone modules associated with their intended qualification, so that these students' completion outcomes were modelled as either completion at 'other undergraduate' or 'other postgraduate' level. As a result, the total assumed completion rates sum up to 100%.
[72] Data is based on 2015-16 entering cohort and excludes individuals who are still studying the course they entered on. Part-time other undergraduate, first degree and higher degree (research) completion rates were not provided due to small sample sizes and are assumed to the be the same as for full-time students.

Table 16 Assumed completion rates of University of Cambridge students

Completion outcome	Study intention				
	Other undergraduate	First degree	Other postgraduate	Higher degree (taught)	Higher degree (research)
Full-time students					
Other undergraduate	100%	2%	0%	0%	0%
First degree	0%	98%	0%	0%	0%
Other postgraduate	0%	0%	100%	2%	13%
Higher degree (taught)	0%	0%	0%	98%	0%
Higher degree (research)	0%	0%	0%	0%	87%
Total	100%	100%	100%	100%	100%
Part-time students					
Other undergraduate	100%	0%	0%	0%	0%
Other postgraduate	0%	0%	100%	9%	14%
Higher degree (taught)	0%	0%	0%	91%	0%
Higher degree (research)	0%	0%	0%	0%	86%
Total	100%	100%	100%	100%	100%

Note: Totals may not sum due to rounding. Data is based on those completing degrees in 2020/21. Part time first degree is not included in this table, since the data provided by the University suggested there were no part-time first degree students in the 2020-21 cohort.
Source: London Economics' analysis based on information provided by the University of Cambridge on the completion outcomes of the five cohorts of students, completing qualifications between 2016-17 and 2020-21.

Box 3 Cambridge Colleges: communities for academic and pastoral support

The University of Cambridge is a confederation of Schools, Faculties, Departments and Colleges. In total, the University has 31 Colleges located across the city and each of which is governed autonomously. As well as being a member of the University and of an academic Faculty or Department, students also belong to a College, an arrangement that offers them pastoral and academic support.

Much of the teaching and learning activities takes place within Colleges. Undergraduate students receive College supervisions – small group teaching sessions – regarded as one of the best teaching models in the world. Colleges also assign undergraduate students with a Director of Studies and College Tutor, who are responsible for their academic welfare and wellbeing.

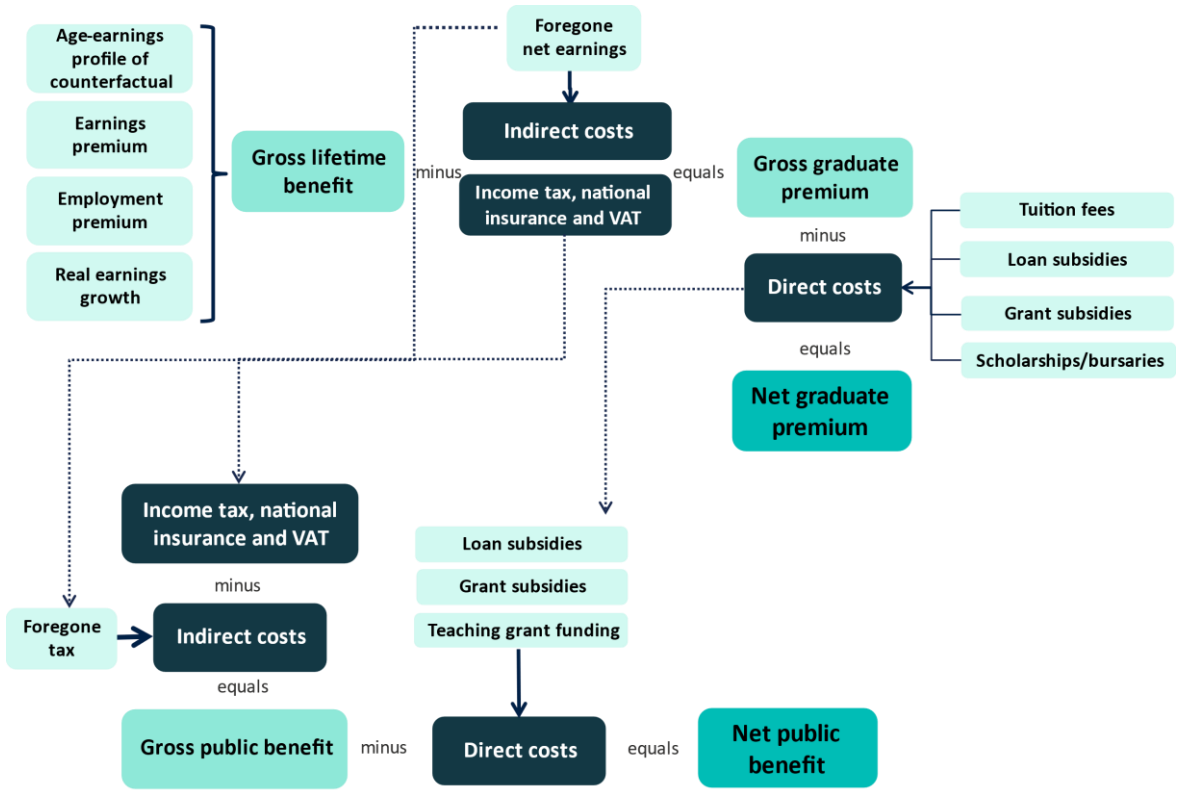
As well as a place of teaching and learning, the Cambridge Colleges are also a home for many students during their studies. Many students live, eat and socialise in their College, an environment in which generations and academic disciplines are able to mix, providing a central social and intellectual hub for students.

3.3 Defining the returns to higher education qualifications

The fundamental objective of the analysis of the impact of the University of Cambridge's teaching and learning activities 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 15):

- 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 earnings 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 present value of the direct costs associated with qualification attainment; and
- Similarly, 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 15 Overview of gross and net graduate premium, and gross and net Exchequer benefit



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

Supporting schoolchildren, parents and teachers across the UK

The University's contribution to teaching and learning extends far beyond the institution. Every year about **300 new teachers** are trained at the Faculty of Education, through which they work with the long-standing Cambridge PGCE partnership involving up to **300 state schools across the Eastern region and beyond**. Outreach and research projects also have wide impact, as in the examples below.

Raising next-generation problem solvers

NRICH, the University's **flagship outreach project** and a joint initiative of the Faculties of Mathematics and Education, recently celebrated 25 years of designing **free, online resources** to give 3-19 year-olds the widest possible opportunities to experience a rich, imaginative and challenging mathematical education. It focuses on building **problem-solving skills**, **perseverance**, **mathematical reasoning**, ability to **apply knowledge creatively** in unfamiliar contexts, and **confidence** in tackling new challenges. NRICH saw particularly high use during COVID-19 school closures, attracting over **10 million visits** and just under **33 million page views**, and was highlighted by the **Department for Education** as a resource for home schooling. Collaboration with the BBC to support online **BBC Bitesize** daily lessons for maths further extended this reach.

> *"It's important that we catch people young and sustain their interest. What's really special about NRICH is that we encourage children to problem solve in different ways, take different approaches, and use and apply their maths. And by doing that, when students leave school, they are truly ready to solve problems."*
>
> **Dr Ems Lord, NRICH Director**

Inspiring a love of nature

The Lost Words **(2017)** – by Dr Robert Macfarlane (Faculty of English) – and its **20 'spell' poems** about species from everyday nature has captured the imagination of children, teachers, musicians, artists and actors across the UK. Crowdfunding campaigns led to the book being donated to all schools in Scotland and Greater London, and 21 English and 3 Welsh counties, resulting in the **mass participation of primary and secondary schools** in learning 'nature literacy'. The book's cultural and creative impact include a flagship BBC Proms concert at the Royal Albert Hall, broadcast live on BBC Radio 3; Seek Find Speak, an Arts Council England (ACE)-funded 'outdoor spoken-word performance', performed for over two years; and Spell Songs, also ACE-funded, a folk-music touring concert and book (shortlisted for the Beautiful Book Award) involving eight artists.

Improving student outcomes through speaking and listening skills

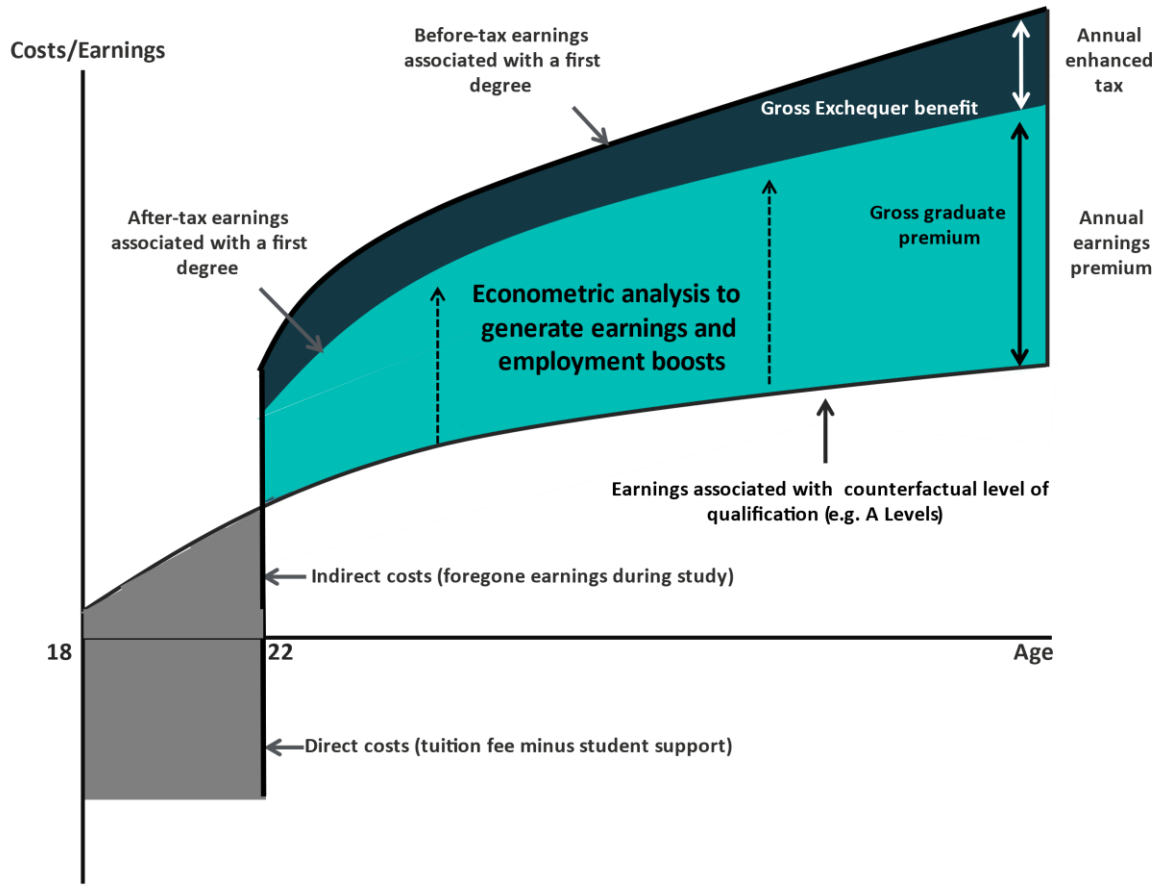
Teaching students how to express themselves with confidence – **'oracy'** – might seem a priority but until researchers at the Faculty of Education developed a teacher-friendly method to teach this skill, none existed. Their **'Oracy Skills Framework'** has informed curriculum development in **over 1,100 schools in the UK and beyond**, and oracy is now in use in all Welsh schools. Their 'Research Lesson Study' supports teachers in working together to develop **oracy-based classroom learning**. Used in around 20% of English schools and increasing numbers of schools in Wales, Scotland and Northern Ireland, it has led to demonstrably **improved skill levels and student outcomes**.

3.4 Estimating the returns to higher education qualifications

3.4.1 Estimating the gross graduate premium and gross public purse benefit

To measure the economic benefits to higher education qualifications, we estimate the **labour market value associated with particular education qualifications**, rather than simply assessing the labour market outcomes achieved by individuals *in possession* of a higher education qualification. 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' 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 16 for an illustration of this). The treatment and counterfactual groups, and details of the econometric approach, are presented in Annex A2.2.1 and Annex A2.2.2 respectively.

Figure 16 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 Cambridge's student cohort data for 2020-21, where the mean age at enrolment for full-time first degree students stands at 18 and requires 4 years to complete.

Source: London Economics

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 undertaken **by subject** to illustrate the fact that there is significant variation in post-graduation labour market outcomes depending on the subject of study, but also to reflect the specific subject composition of students studying at the University of Cambridge. 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[73].

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 A2.2.4 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 combined with administrative information on the relevant taxation rates and bands (from HM Revenue and Customs), we estimated the **present value of additional income tax, National Insurance and VAT associated with higher education qualification attainment** (by gender, level of study, mode of study, and prior attainment). Again, please refer to Annex A2.2.4 for more detailed information on the calculation of the gross Exchequer benefit.

3.4.2 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[74]. These direct costs refer to the **proportion of the tuition fee paid by the student**[75] net of any **tuition fee support** or **maintenance support** provided by the Student Loans Company (SLC, for students from Wales, England and Northern Ireland) or the Students Awards Agency for Scotland (SAAS, for students from Scotland)[76] and minus any **fee waivers or bursaries**

[73] See Annex 2.2.4 for more information.
[74] 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.
[75] We made use of information provided by the University of Cambridge on the average tuition fees charged to students at the University of Cambridge in the 2020-21 academic year, separately by domicile, study mode, and study level (with data 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)). Where fee levels were broken down by subject area, we calculated a simple average of fees across the different subject areas.
[76] The analysis makes use of *average* levels of support paid per student, separately by study mode, study 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)), and domicile. Our estimates are based on publications by the SLC on student support for higher education in England, Wales, and Northern Ireland in 2020-21 (see Student Loans Company 2021a, 2021b and 2021c, respectively) and a publication by the Student Awards Agency for Scotland on student support for higher education in Scotland (see Student Awards Agency for Scotland, 2021). 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 students in public providers only, for the most recent cohorts possible, split by domicile (i.e. 'Home' vs. EU). 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.

provided by the University of Cambridge or its Colleges[77]. In this respect, the student benefit associated with tuition fee loan or maintenance loan support equals the **Resource Accounting and Budgeting charge** (RAB charge)[78], capturing the proportion of the loan that is not repaid. Given the differing approach to public support funding 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 [79].

The **direct costs**[80] **to the public purse** include the **teaching grant funding** administered by the Office for Students (OfS)[81], the **student support** provided in the form of maintenance/fee grants (where applicable), and the **interest rate or write-off subsidies** that are associated with maintenance and tuition fee loans (i.e. the RAB charge). Again, the analysis tailors the cost of student support to the student's specific Home Nation of domicile.

These direct costs associated with qualification attainment to both students and the Exchequer (by qualification 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 2020-21 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%** (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.

[77] Average fee waivers and other bursaries and scholarships per student were calculated based on information on the Cambridge Bursary Scheme and other bursaries, including College funding of bursaries.

[78] For undergraduate full-time students, we have assumed a RAB charge of 31% associated with tuition fee and maintenance loans for English-domiciled students (based on data published by the Department for Education (2022)), 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 approximately 26% for Welsh domiciled students (based on London Economics' modelling of the costs associated with the Welsh higher education funding system, on behalf of the Welsh Government (*unpublished*)); 31% for Scottish domiciled students (based on Audit Scotland (2020)); 26% for Northern Irish students (assumed to be the same as the RAB charge for Welsh domiciled students given the similar loan balance), and 31% for EU students (studying in England, assumed to be the same as for English-domiciled students). For undergraduate part-time students, based on the same sources, we have assumed a RAB charge of 33% for English-domiciled students (see Annex B in Department for Education (2022); note however that this does *not* take account of the impact of the Department's response to the Augar Review); approximately 36% for Welsh domiciled students; 0% for Northern Irish domiciled students (given that these students have a very small loan balance); and, 33% for EU domiciled students (again, assumed to be the same as for English-domiciled students). There is currently no student loan funding provided to Scottish domiciled undergraduate part-time students (so no RAB charge assumptions are required).
For the loans for postgraduate taught students from England, Wales, and Northern Ireland (and for EU students studying in England), we have assumed a RAB charge of 0% for both full-time and part-time students (based on the Department for Education's (2022) student RAB charge estimates for postgraduate Master's loans for English students (again see Annex B of Department for Education(2022a)). There were no postgraduate loans available for Scottish students studying outside Scotland.
Finally, for (full-time and part-time) postgraduate research students, there were no Doctorate loans available for Scottish domiciled or Northern Irish domiciled students. For students from England, Wales and the EU, we assumed a RAB charge of 19% (again based on based on Department for Education (2022)).

[79] Note that, in some instances, the total financial support provided to students (through tuition fee loans and grants, maintenance loans and grants, and fee waivers/other bursaries (where applicable)) may *exceed* the costs of their University of Cambridge tuition fees – i.e. the net graduate premium *exceeds* the gross graduate premium per student (see the results presented in Table 33 and Table 34 in Annex A2.2.5).

[80] Again, any indirect costs to the public purse in terms of foregone income tax, National Insurance and VAT receipts foregone during the period of qualification attainment (applicable to full-time students only) are already incorporated in the gross public purse benefits as described above.

[81] This is calculated as the total teaching grant funding divided by the total number of students enrolled with the University of Cambridge in 2020-21 (excluding any non-EU-domiciled students and higher degree (research) students (i.e. it is assumed that there is no teaching funding associated with these students)).

3.5 Estimated net graduate premium and net Exchequer benefit

Table 17 presents the net graduate premiums and net Exchequer benefits achieved by English-domiciled students[82] undertaking qualifications at the University of Cambridge in the 2020-21 cohort (by study mode, on average across men and women[83]).

The net graduate premium for a representative full-time first degree English-domiciled student stands at £92,000.

The analysis indicates that the **net graduate premium** achieved by a representative[84] English-domiciled undergraduate student in the 2020-21 cohort completing a **full-time first degree** at the University of Cambridge (with GCE 'A' Levels or equivalent as their highest level of prior attainment) is approximately **£92,000** in today's money terms. At postgraduate level, the net (post)graduate premiums for a representative[85] English-domiciled student completing a full-time postgraduate taught or postgraduate research degree at the University of Cambridge (relative to a first degree) stand at approximately **£30,000** and **£16,000**, respectively.

Table 17 Net graduate premium and net Exchequer benefit per English-domiciled student at the University of Cambridge, 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]	£10,000	£8,000	£12,000	£4,000
First degree[1]	£92,000		£104,000	
Other postgraduate[2]	-£10,000	-£5,000	£26,000	£20,000
Higher degree (taught)[2]	£30,000	£12,000	£48,000	£37,000
Higher degree (research)[2]	£16,000	£112,000	£95,000	£128,000

Note: All estimates constitute weighted averages across men and women (weighted by the estimated number of student completers in the 2020-21 cohort) and are presented in 2020-21 prices, discounted to reflect 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. The negative net benefits associated with these qualifications are thus entirely driven by the costs of study (e.g. in terms of foregone earnings during study, or the effective tuition fees (net of any student support or bursaries) paid by students). Data provided to London Economics shows there being zero part-time first degree students in the University of Cambridge 2020-21 cohort, hence the missing estimate for this group.
[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 GCE 'A' Levels.
[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

There are also substantial **net graduate premiums** for **part-time** students. For instance, for a postgraduate research degree (again relative to a first degree) the estimate of the net graduate premium stands at approximately **£112,000** (compared to the **£16,000** for full-time students), and the estimate for a part-time postgraduate taught degree stands at **£12,000** (compared to **£30,000**

[82] The full set of net graduate premiums and net Exchequer benefits for all domiciles (as well as study levels, study modes, and prior attainment levels) is presented in Annex A2.2.5A2.2.5.
[83] For a breakdown of the results by gender, again see Annex A2.2.5.
[84] The analysis is based on an average age at graduation of 22 for students undertaking full-time first degrees at the University of Cambridge in the 2020-21 cohort (also see Annex A2.2.3 for further information).
[85] This is based on an average age at graduation in the 2020-21 cohort of 26 for full-time higher degree (taught) students and 32 for full-time higher degree (research) students.

for full-time students). The fact that part-time students tend to complete their studies later in life[86] (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. Given that part-time net (post)graduate premiums are higher than their full-time equivalents for postgraduate research courses, the latter effect likely dominates the former.

The net public purse benefit associated with a representative full-time first degree English-domiciled student stands at £104,000.

In terms of the benefits to the public purse, the **net Exchequer benefit** for a representative English-domiciled **full-time** first degree student (again with GCE 'A' levels or equivalent as their highest level of prior attainment) stands at approximately **£104,000** in 2020-21 money terms. The net Exchequer benefits for a representative student completing a full-time postgraduate taught or postgraduate research degree (relative to a first degree) were estimated at approximately **£48,000** and **£95,000**, respectively.

Again, there are also substantial net Exchequer benefits associated with **part-time students**. For instance, the net Exchequer benefits for a representative part-time student from England undertaking a postgraduate taught degree or postgraduate research degree (relative to a first degree) stand at approximately **£37,000** and **£128,000** (respectively).

3.6 Total impact of the University of Cambridge's teaching and learning activities

Combining the information on the number of UK domiciled students in the 2020-21 University of Cambridge 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 analysis estimates that the **aggregate economic benefit of the University of Cambridge's teaching and learning activities** associated with the 2020-21 cohort in the UK stands at approximately **£693 million**.

The total economic impact of teaching and learning generated by the 2020-21 cohort of The University of Cambridge students stands at £693 million.

This total impact is split favourably for the Exchequer relative to students, with **£408 million** (**59%**) of the economic benefit accrued by the Exchequer, and the remaining **£285 million** (**41%**) accrued by students (Table 18). In terms of study level, **82%** (**£567 million**) of the estimated economic impact is generated by the University of Cambridge's undergraduate students, with the other **18%** (**£126 million**) generated by the University of Cambridge's postgraduate students. In terms of domicile, **95%** (**£659 million**) of the estimated economic benefit is associated with students from England, **2%** (**£16 million**) from Wales, **2%** (**£12 million**) from Scotland, and the remaining **1%** (**£6 million**) is

[86] Again, see Annex A2.2.3 for more information.

generated by students from Northern Ireland. This is broadly in line with the proportion of students domiciled in each of the Home Nations.

Table 18 Aggregate impact of the University of Cambridge's teaching and learning activities associated with the 2020-21 cohort (£m), by type of impact, domicile, and level of study

Beneficiary and study level	Domicile				
	England	Wales	Scotland	Northern Ireland	Total
Students	**£270m**	**£8m**	**£5m**	**£2m**	**£285m**
Undergraduate	£253m	£7m	£4m	£2m	**£267m**
Postgraduate	£17m	£1m	£0m	(£0m)	**£18m**
Exchequer	**£389m**	**£8m**	**£7m**	**£4m**	**£408m**
Undergraduate	£286m	£6m	£5m	£3m	**£300m**
Postgraduate	£103m	£2m	£3m	£1m	**£108m**
Total	**£659m**	**£16m**	**£12m**	**£6m**	**£693m**
Undergraduate	£539m	£14m	£9m	£5m	**£567m**
Postgraduate	£120m	£2m	£3m	£1m	**£126m**

Note: All estimates are presented in 2020-21 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

It is important to emphasise that these impacts are associated with the 2020-21 cohort of students only. Depending on the size and composition of subsequent cohorts of University of Cambridge students, a comparable estimate of the economic impact associated with teaching and learning activities would be associated with each successive cohort of starters (depending on the prevailing labour market conditions at the time).

150 years as a pioneer in continuing education

"As we look in the post-pandemic context, where the levels of political, economic, societal and technological change seem set to accelerate in unpredictable ways, I believe you will find one constant through the Institute of Continuing Education – adult students drawn together to ask questions, gain insights, expand horizons and learn together for individual and collective benefit within the setting of one of the world's most influential universities."

Dr James Gazzard, Director of Continuing Education

Founded in 1873 by pioneering educationalists Anne Clough, Josephine Butler and James Stuart, the **Institute of Continuing Education (ICE)** has been providing **accessible and flexible higher education courses** for adults from all backgrounds and all prior educational levels of achievement for almost 150 years.

What began with delivering lectures for women across northern England in the 1800s – thought to be the first ever provision of university-led extension education in the world – is now a thriving institute with **over 300 tutors** teaching and supporting over **7,000 course enrolments, in more than a dozen academic fields and over 250 different courses**.

The ethos remains the same: ICE provides a point of access to the educational resources of Cambridge for any motivated adult wishing to gain qualifications flexibly **at any stage of their life**: those managing work and family commitments, engaging with higher education for the first time, returning after an extended break, changing career paths, or simply wanting to exchange ideas and learn alongside others drawn from all walks of life. The variety of life experiences and diversity of backgrounds allow new perspectives to develop amid a shared approach to learning.

Flexible learning

Balancing competing calls on time and finances can be challenging for adult learners. Recognising this, ICE has long offered an **alternative route to a Cambridge education** through its **part-time and flexible learning options**. The purpose-built courses – ranging from short one-day introductory sessions to University of Cambridge undergraduate and postgraduate courses – are available through part-time pathways. Committed to innovation in learning, ICE has been delivering **fully online courses** for over a decade, launched a new **Apprenticeships** agenda in 2019, and formed partnerships with emerging platforms including edX, which hosts online university-level courses in a wide range of disciplines to a worldwide student body generating over 50,000 free-to-access course registrations in 2021–22.

Help with costs

ICE provides some of the most affordable like-for-like courses and offers one of the **most generous bursary schemes** in the sector to help remove or reduce cost as a potential barrier to learning. In June 2020, a **new £1 million scheme** was introduced: the **Cambridge Thousand Futures Bursary** to give up to **1,000 people across the UK an opportunity to enhance their employability or renew their knowledge and skills** with a wide range of part-time online qualifications – from business management or coaching to art history or creative writing. Directed towards those most affected by the COVID-19 pandemic, the Bursary has helped people who were furloughed or lost their jobs, as well as key workers and those most at risk of the virus. Throughout the pandemic, and beyond, these communities of life-wide learners have thrived, learning for both professional and personal growth.

Student stories

Mark: Undergraduate Diploma in Creative Writing

"Coming from a council estate in London, I didn't feel I had the same access to higher education as some other young people, and I've had to work hard to get to the position I'm in today as a senior IT professional. Here at ICE, having the support of a knowledgeable tutor, a structured programme and a positive learning environment has been invaluable. I've been inspired by some excellent staff, the visiting authors and a diverse and talented group of fellow students."

Yemi: Undergraduate Certificate in Strategic Business and Management

"I was furloughed and made redundant last year, but the Cambridge Thousand Futures bursary gave me the opportunity to study on this course, and I'm so grateful. I have over a decade's experience in the education sector and I chose to study on this course to build on my skills as well as learn how to set up my own business in the future. I have loved learning alongside like-minded individuals. It has been such a long time since I wrote an essay that I wasn't quite sure what to expect, but receiving such positive feedback has been really encouraging and given me much more self-confidence."

Mable: Undergraduate Certificate in Coaching

"After starting a family, I returned to study partly to be a positive role model for my three, young daughters. I want them to know that they can be whoever and do whatever they want; that they matter. It's a privilege to learn here alongside like-minded adults as we all juggle our complicated lives. I'm taking Coaching to supplement my ongoing PhD in Psychotherapy that's focused on helping people with mental health issues to flourish. Making people happy and fulfilled is such a rewarding endeavour, and this course is giving me new perspectives on how to do that."

Martin: MSt in History

"I struggled with dyslexia during my schooldays in London. Having not performed well, I left aged 16 and trained as a chef. A year later, I retrained in Information Technology and have worked there ever since. Nearly two decades on from my school difficulties, I decided I wanted to study for a degree, and now I'm hooked on learning. The History faculty at ICE is one of the best in the country. I love discovering new subjects alongside my interesting and diverse classmates, and the Master of Studies has given me a deeper understanding of a subject I'm passionate about."

Bharadwaj: Postgraduate Certificate in Healthcare Data and Informatics

"I was an Academic Foundation Year Two Doctor in the East Midlands and interested in the impact and scope of data-driven technologies in healthcare for some time, so enrolling on this course was a no-brainer for me. For someone at a relatively early stage of their career, the course has served as a great introduction to the landscape of data-driven research within healthcare. Because of this course, I've secured the prestigious Faculty of Medical Leadership and Management National Medical Director's Clinical Fellowship at my top choice organisation."

"I never thought I would be able to study at the University of Cambridge, but my preconceptions have been blown away by the nurturing and supportive environment at ICE."

Christopher, MSt student

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4 The impact of the University of Cambridge's educational exports

With the United Kingdom, and the University of Cambridge in particular, being an attractive destination for many overseas students, the higher education sector is a tradeable industry with imports and exports like any other tradeable sector.

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 of Cambridge**. In particular, we analyse overseas income in the form of tuition fee spending (net of any Exchequer costs) and non-tuition fee (off-campus) expenditures by international (EU and non-EU domiciled) students in the 2020-21 cohort of University of Cambridge students, over the entire course of their studies[87]. The analysis estimates the **direct, indirect, and induced economic impacts** associated with this export income, defined as follows:

- **Direct effect:** This is captured by the level of (net) fee income (accrued by the University of Cambridge itself) and non-fee income (accrued by other organisations providing goods and services to international students) associated with non-UK students in the 2020-21 cohort.
- **Indirect effect ('supply chain impacts'):** The University of Cambridge and local businesses providing other goods and services to international students spend their income on purchases of goods and services from their suppliers, which in turn use this revenue to buy inputs (including labour) to meet these demands. 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 employees of the University of Cambridge (supported by its tuition fee income) and of companies providing goods and services to the University of Cambridge's international students use their wages to buy consumer goods and services. 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 'ripple effect' throughout the economy as a whole[88].

In addition to the impacts associated with the University of Cambridge's educational exports described in the following sections, a similar methodology is applied to estimate the direct, indirect, and induced economic effects associated with knowledge exchange activities (see Section 2.2), the operational and capital expenditures of the University of Cambridge (see Section 5) and tourism (see Section 6).

[87] Note that other types of export income accrued directly by the University of Cambridge (such as research income from international sources, or any other income received from non-UK sources) are taken account of in our analysis of the impact of the University of Cambridge's research activity (Section 2) and the impact of the expenditures of the University of Cambridge (Section 5), and are thus excluded from the analysis of exports to avoid double-counting.

[88] 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 Cambridge). 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 Cambridge's own expenditures (see Section 5).

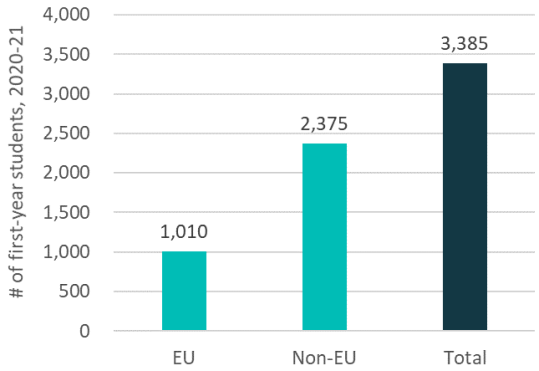
4.1 The 2020-21 cohort of international students at the University of Cambridge

Figure 17, Figure 18, and Figure 19 present information on the number of non-UK domiciled students included in the 2020-21 cohort of University of Cambridge students (by domicile, mode of study, and level of study, respectively).

In terms of domicile (Figure 17), of the total of **3,385** international students starting higher education qualifications at the University of Cambridge in 2020-21, **1,010** (**30%**) were domiciled within the European Union, while **2,375** (**70%**) were from non-EU countries. In terms of study mode (Figure 18), the vast majority of international students in the cohort (**3,375, 100%**) were undertaking their qualifications on a full-time basis, with the remaining **10** (**0%**) studying on a part-time basis.

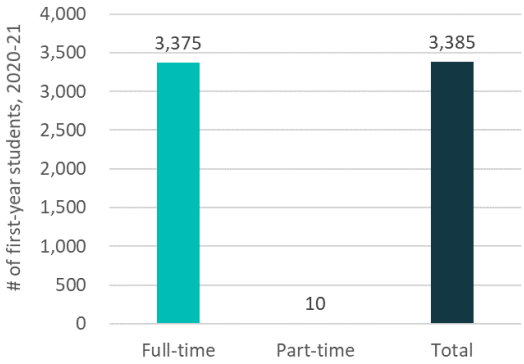
In terms of study level (Figure 19), in contrast to UK domiciled students (see Section 3.1), the majority of non-UK domiciled students in the cohort were undertaking postgraduate qualifications (**2,555**, **75%**), including **1,630** (**48%**) enrolled in postgraduate taught degrees, **905** students (**27%**) undertaking postgraduate research degrees, and **20** (**1%**) undertaking other postgraduate learning. At undergraduate level, there were **795** (**23%**) students undertaking first degrees, while the remaining **35** (**1%**) students were enrolled in other undergraduate learning[89].

Figure 17 Non-UK domiciled students in the 2020-21 cohort of the University of Cambridge, 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 Cambridge's HESA data

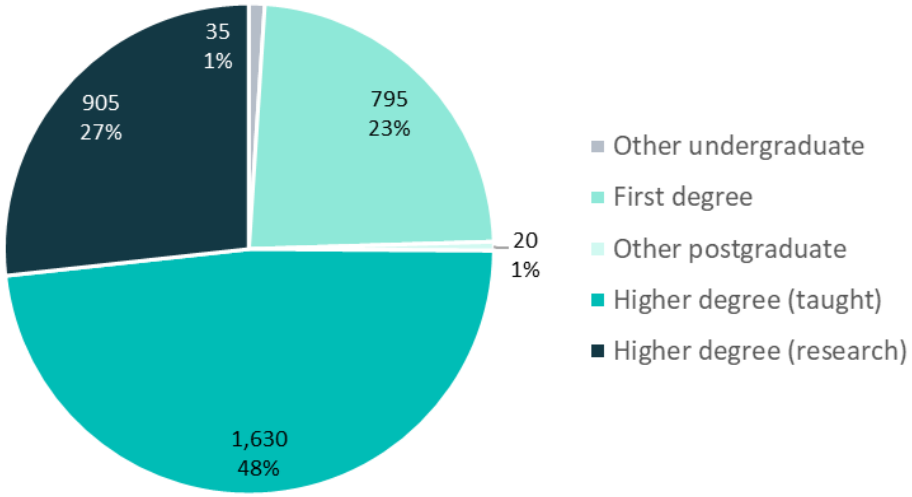
Figure 18 Non-UK domiciled students in the 2020-21 cohort of the University of Cambridge students, by study mode



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 Cambridge's HESA data

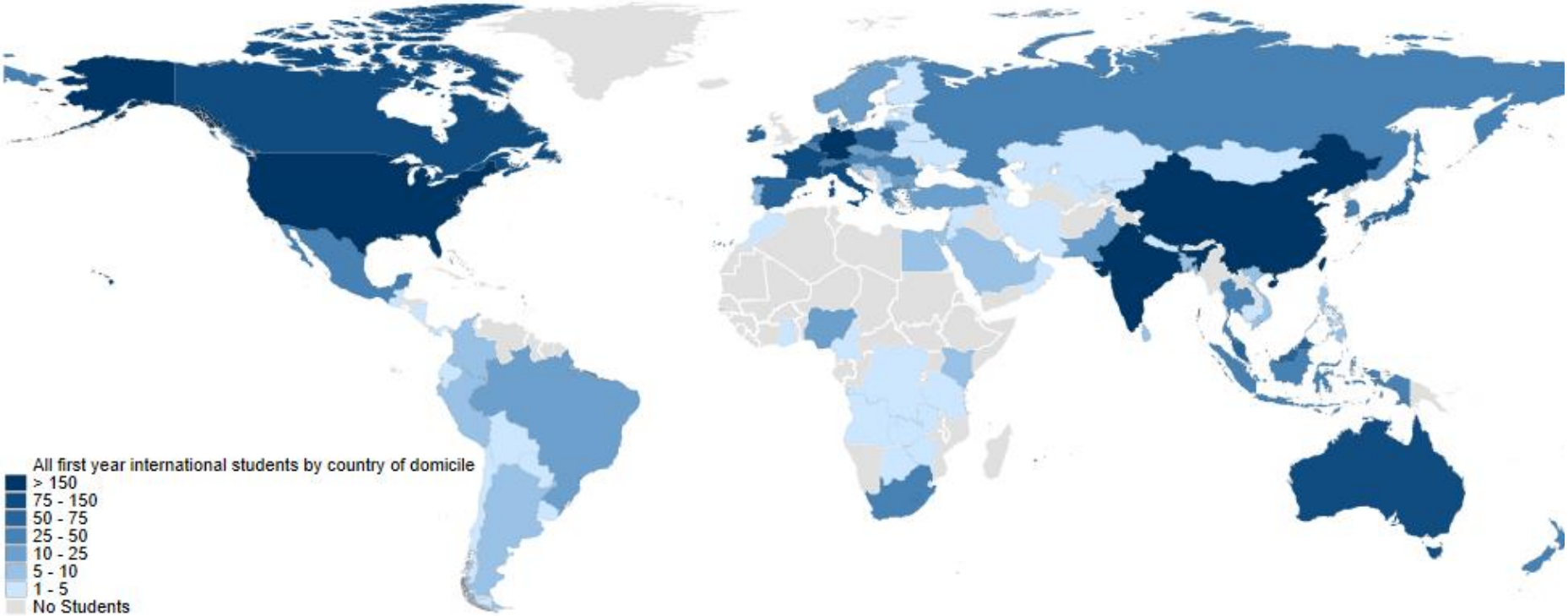
[89] For more detailed information on the University of Cambridge's 2020-21 cohort of non-UK domiciled students, please refer to Annex A2.3.1.

Figure 19 Non-UK domiciled students in the 2020-21 cohort of University of Cambridge 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.
Source: London Economics' analysis based on University of Cambridge's HESA data

Figure 20 All (undergraduate and postgraduate) overseas domiciled first year students in the 2020-21 cohort, by country of domicile



Note: LE received HESA data on the **3,385** first year overseas domiciled students from the University of Cambridge. Due to the administrative boundaries of the mapping file, this map attributes any students from Taiwan to China (36 students).

Source: London Economics' analysis based on data from the University of Cambridge © EuroGeographics for the administrative boundaries and © 2009 Bjørn Sandvik

4.2 Changes in the number of international students at the University of Cambridge over time

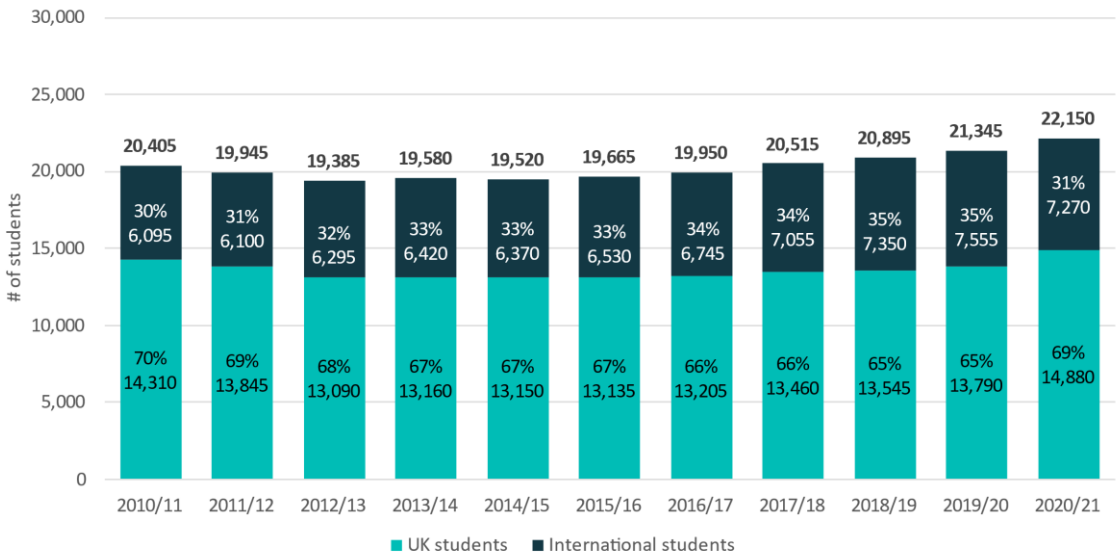
Alongside the analysis of the 2020-21 cohort of non-UK domiciled *first-year* students, we have also examined the trends in the University of Cambridge's *entire* non-UK student body over the past decade (i.e. academic years 2010-11 to 2020-21).

With the University of Cambridge being ranked consistently in the top universities in the world, it is understandably a highly popular destination for international students. There has been a significant increase in the number of non-UK domiciled students enrolled at the University over the last decade, increasing from **6,095** students in 2010-11 to **7,270** students in 2020-21. With the number of UK domiciled students having increased at a similar rate across the period, in part down to the University having its largest cohort of UK domiciled students in 2020-21, the proportion of University of Cambridge's students that are from non-UK domiciles over the period has remained at approximately **30%** in 2010-11 to **31%** in 2020-21 (see Figure 21), although peaked in the previous two academic years (2018-19 and 2019-20) at **35%**.

In terms of the breakdown of these non-UK students by domicile (Figure 22), the overall increase in international students was predominantly driven by an increase in students from non-EU domiciles (**3,875** in 2009-10 to **4,810** in 2020-21), with a relatively smaller (but still significant) increase in students from EU domiciles (**2,220** in 2010-11 to **2,460** in 2020-21). This has resulted in an increase in the number of non-EU domiciled students as a proportion of the total non-UK-domiciled student population, from **64%** in 2010-11 to **66%** in 2020-21.

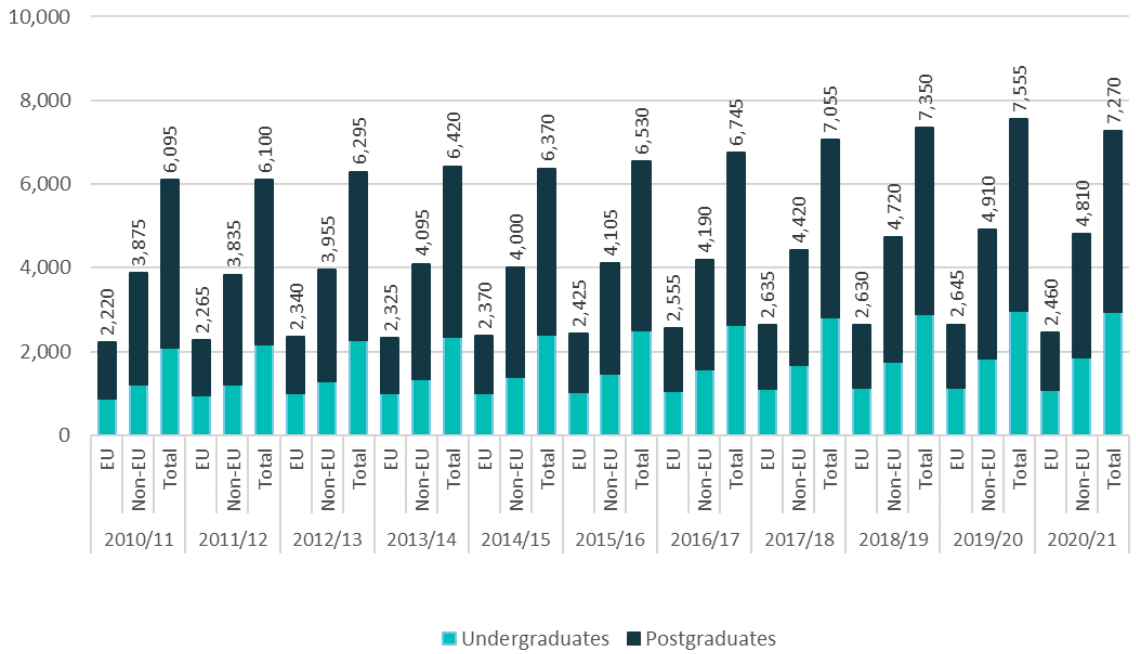
The increase in the number of international students studying at the University of Cambridge occurred across both undergraduate and postgraduate students (Figure 22), with the number of non-UK undergraduate students increasing from **2,105** in 2010-11 to **2,945** in 2020-21, and the number of non-UK postgraduate students rising from **3,990** in 2009-10 to **4,325** in 2020-21. With relatively stronger growth at undergraduate level, there has been a slight increase in the proportion of non-UK domiciled students undertaking undergraduate as compared to postgraduate qualifications, increasing from **35%** in 2010-11 to **41%** in 2020-21.

Figure 21 Total students at the University of Cambridge, 2010-11 to 2020-21, by domicile



Source: London Economics' analysis based on HESA (2011, 2012, 2013, 2014, 2015 and 2021)

Figure 22 Non-UK domiciled students at the University of Cambridge, 2010-11 to 2020-21, by level of study and domicile



Source: London Economics' analysis based on HESA (2011, 2012,2013, 2014, 2015 and 2021)

4.3 Direct impact

4.3.1 Net tuition fee income

To assess the level of ***gross* tuition fee income** associated with international students in the 2020-21 cohort, we made use of data on average tuition fees charged by the University of Cambridge in 2020-21 (by study level, mode, and domicile[90]). Assuming the same average study durations as in the analysis of the impact of the University of Cambridge's teaching and learning activities (see Section 3), 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 2020-21 prices and using the HM Treasury Green Book real discount rate of 3.5% (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 the costs to the UK Exchequer associated with funding higher education for EU-domiciled students studying in

[90] As in the analysis of the University of Cambridge's teaching and learning activities (see Section 3), we used information provided by the University of Cambridge on average tuition fees per *full-time* student charged by the University of Cambridge in 2020-21, separately by domicile (i.e. UK, EU, and non-EU students), study mode, and study level. To arrive at the fees per *part-time* student (ensuring that the estimated fees for part-time students accurately reflect the average study intensity among part-time students in the 2020-21 cohort), we multiplied the respective full-time rates by the average study intensity among part-time students in the cohort. The average study intensity was estimated separately by qualification level and calculated by dividing the number of part-time students in the cohort in full-time equivalents by the number of students in terms of headcount (again based on HESA data provided by the University of Cambridge).

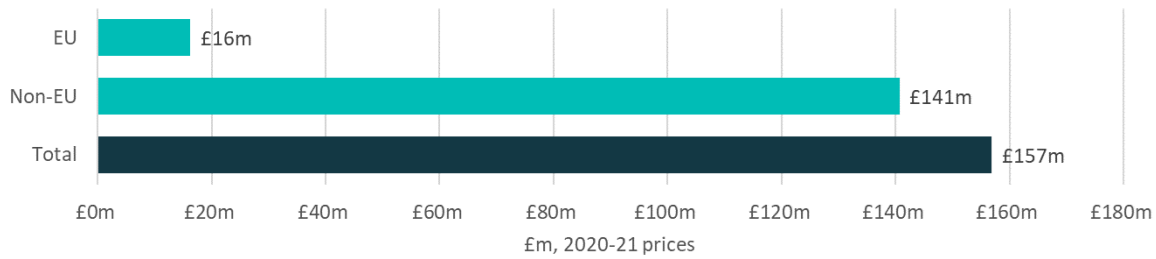
England[91]. These Exchequer costs include the subsidies associated with the tuition fee support provided by the Student Loans Company, in terms of:

- The RAB charge on **tuition fee loans provided to eligible EU domiciled full-time and part-time undergraduate students**;
- The RAB charge on **Master's and Doctorate loans provided to eligible EU full-time and part-time postgraduate students**; and
- The **recurrent teaching grant funding** paid to the University of Cambridge in relation to the provision of teaching to EU domiciled students (by the Office for Students)[92].

In addition to these public purse costs, we also deducted any **fee waivers and bursaries** paid to international students by the University of Cambridge itself[93]. Again, all these costs were calculated over students' total study duration and estimated in present value terms[94].

Combining the estimates per student with information on the number of non-UK students in the 2020-21 cohort, and using the same assumptions on completion rates as for UK domiciled students (as part of the analysis of the impact of teaching and learning (see Section 3)), we arrived at estimates of the total net tuition fee income associated with EU and non-EU students in the 2020-21 cohort of University of Cambridge students. As presented in Figure 23, the **total net tuition fee income** generated by international students in the cohort was estimated at **£157 million**, of which **£16 million** was generated by **EU students**, and **£141 million** was generated by **non-EU students**.

Figure 23 Aggregate net tuition fee income associated with international students in the 2020-21 cohort, by domicile (£m)



Note: All estimates are presented in 2020-21 prices, discounted to reflect net present values, and rounded to the nearest £1m. Values may not add up precisely to the totals due to rounding.
Source: London Economics' analysis

[91] Note that there is no such Exchequer funding associated with non-EU students.
[92] For more information on our assumptions in relation to public student support and recurrent teaching grants, please refer to Section 3.4.2.
[93] Again, see Section 3.4.2for more information on our assumptions in relation to fee waivers and bursaries.
[94] For information on the estimated levels of net fee income per student, please refer to Annex A2.3.2.

Box 4 Supporting improved business practices and employment through the Cambridge MBA

The **Cambridge MBA** at **Cambridge Judge Business School** provides a global business education to mid-career professionals. Currently 210 students representing 46 nationalities are enrolled on the one-year full-time course in Cambridge. A range of scholarships and bursaries are available to Cambridge MBA students.

Graduates from the Cambridge MBA class of 2020/21:

- work in 22 countries recruited by over 100 international employers;
- 98% changed their job function, industry or country and 47% achieved all three;
- 60% are continuing their careers in the UK, 26% across Asia and 8% in North America;
- sectors of choice include strategy consulting, internet/e-commerce, technology and fintech;
- companies employing the most MBA graduates include Amazon, Deloitte, BCG, McKinsey, JP Morgan and Shopee.

The School also offers an **Executive MBA**, for more senior professionals, and specialist Masters programmes in Finance, Accounting, Entrepreneurship and Social Innovation, all of which take post-experience professionals from around the world and support them to advance their knowledge and careers in a global context.

4.3.2 Non-fee income

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

The level of non-tuition fee expenditure by overseas students is often found to be greater than their tuition fee expenditure[95], making these living cost expenditures a significant component of the UK's export income from international students coming to study at UK higher education institutions.

To analyse the level of non-tuition fee expenditure associated with the 2020-21 cohort of international students studying at the University of Cambridge, we used estimates from the **2014-15 Student Income and Expenditure Survey** (SIES)[96]. 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,

[95] See Department for Business, Innovation and Skills (2011b).
[96] See Institute for Employment Studies & National Centre for Social Research (2018). At the time of writing, estimates for a more recent academic year were not available.

separately for full-time and part-time students. For the purpose of this analysis, we made the following adjustments to the 2014-15 SIES estimates:

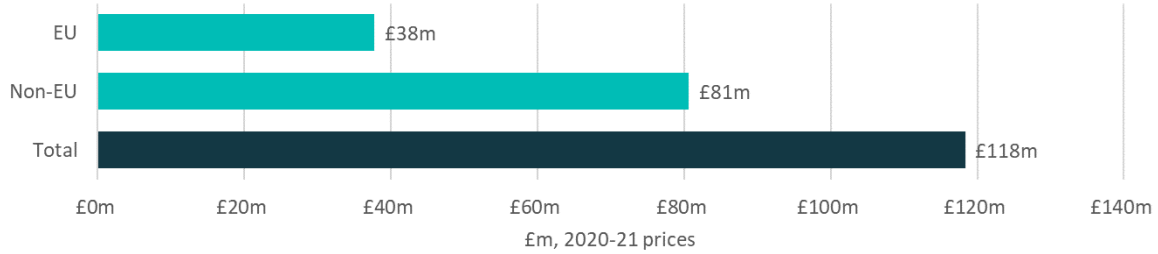
- We excluded estimates of **tuition fee expenditure** (to avoid double-counting with the analysis presented in Section 4.3.1).
- We deducted any **on-campus expenditure** that students might incur (to avoid double-counting with the analysis of the impacts of the expenditure of the University of Cambridge itself (see Section 5))[97].
- 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 longer **average stay durations** in the UK of non-EU students compared to EU students[98].
- We further adjusted the estimates for any **foregone subsistence expenditures in the UK due to international students returning to their home countries during the Covid-19 pandemic** (and due to the suspension of in-person teaching across UK universities). Specifically, we assume that 50% of full-time students in the cohort returned home during the second and third terms of the 2020-21 academic year[99, 100]. Further academic years, we assume, are unaffected by the pandemic. We assume that, during this time, these students did not incur any subsistence expenditure in the UK (e.g. on food, entertainment, etc.), but still incurred all other types of non-fee spending in the UK listed above (e.g. we assume that these students were still liable to pay any accommodation costs in the UK).
- Finally, we **inflated** the estimates to 2020-21 prices[101].

Similar to tuition fees, we then calculated the non-tuition fee expenditure over the entire duration of students' higher education courses (and discounted to reflect present values). The resulting estimates provide the total average (off-campus) non-fee expenditure per student in 2020-21 prices, by level of study, mode, and domicile[102].

Again combining the estimated non-tuition fee income per student with the number of international students in the 2020-21 cohort expected to complete qualifications (or credits/modules) at the University of Cambridge, the **total (off-campus) non-tuition fee expenditure** associated with international students in the 2020-21 cohort was estimated at **£118 million** (Figure 24). Of this total, **£38 million** (**32%**) was associated with **EU students**, whereas **£81 million** (**68%**) was generated by **non-EU students** in the cohort.

[97] 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 Cambridge itself).
[98] 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 A2.3.3.
[99] In other words, we assume that due to the Covid-19 pandemic, the subsistence expenditures of full-time international students in the 2020-21 cohort were 33% lower in 2020-21 (i.e. 50% x 67%) than would otherwise have been the case.
[100] We assume that international part-time students in the cohort did *not* leave the UK due to the pandemic, given that part-time students typically combine their studies with work in the labour market.
[101] Inflation estimates are based on Consumer Price Index inflation estimates provided by the Office for National Statistics (2022).
[102] For information on the estimated levels of non-tuition fee income per student, please refer to Annex A2.3.4.

Figure 24 Aggregate non-fee income associated with international students in the 2020-21 cohort, by domicile (£m)



Note: All estimates are presented in 2020-21 prices, discounted to reflect net present values, and rounded to the nearest £1m. Values may not add up precisely to the totals due to rounding.
Source: London Economics' analysis

4.3.3 Total direct impact

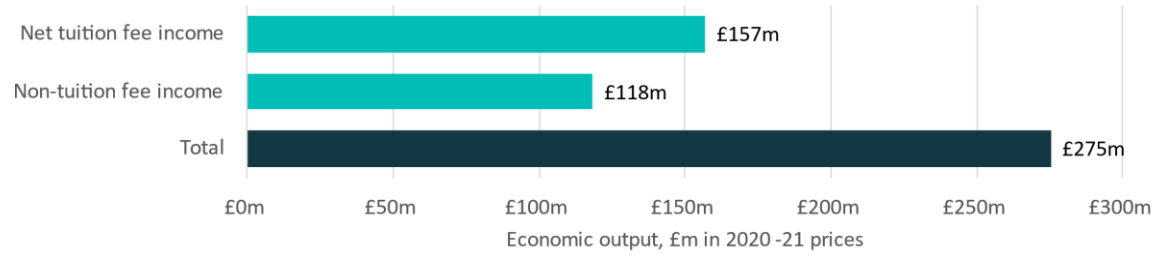
Combining the above estimates of (net) fee and non-fee income, the total direct economic impact of the expenditures of international students in the 2020-21 University of Cambridge cohort (in economic output terms) was estimated at **£275 million** (Figure 25). Slightly under half of this total (**£118 million**) was generated from international students' non-tuition fee spending, while just over a half (**£157 million**) was generated from international students' tuition fees accrued by the University of Cambridge (net of any public costs of provision or fee waivers/bursaries provided by the University of Cambridge). In terms of student domicile, the majority of this impact (**£221 million**, **80%**) was generated by non-EU domiciled students, while **£54 million** (**20%**) was associated with EU students (not presented here).

In addition to economic output (i.e. export income), it was possible to convert the above estimates into gross value added and the number of full-time equivalent jobs supported[103]. We thus estimate that the export income generated by international students in the 2020-21 University of Cambridge cohort directly generates **£179 million** in GVA (**£106 million** from international (net) fee income and **£74 million** from non-fee income), and supports **3,145 full-time equivalent jobs** (**2,250** from (net) tuition fee income and **895** from non-tuition fee income[104]).

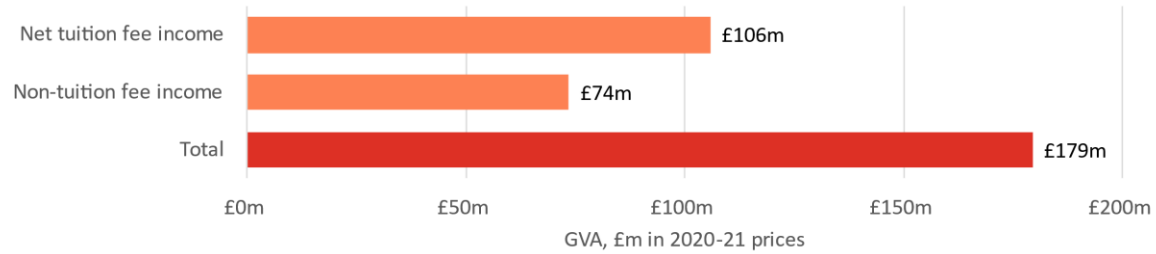
[103] To estimate the direct GVA and employment associated with the (net) tuition fee income generated by the University of Cambridge's international students, we multiplied this income by the average ratio of GVA to output and FTE employees to output within the East of England's government, health, and education sector as a whole (again based on the above-described multi-regional Input-Output model).
To estimate the direct GVA and employment associated with the non-tuition fee income generated by the University of Cambridge'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 the East of England (again based on the multi-regional Input-Output model). In other words, we assume that the non-tuition fee expenditures of the University of Cambridge's international students support the same levels of GVA and employment (in relative/proportionate terms) as the expenditure of households located in the East of England more generally.
[104] The difference in direct employment supported by international students' tuition fee vs. non-tuition fee income is driven by the fact that the underlying ratio of FTE employees to output within the East of England's government, health, and education sector is considerably larger than the corresponding ratio for sectors producing consumer goods and services purchased by households located in the East of England (e.g. including the real estate or production sectors).

Figure 25 Total direct impact associated with non-UK students in the 2020-21 University of Cambridge cohort, by type of impact

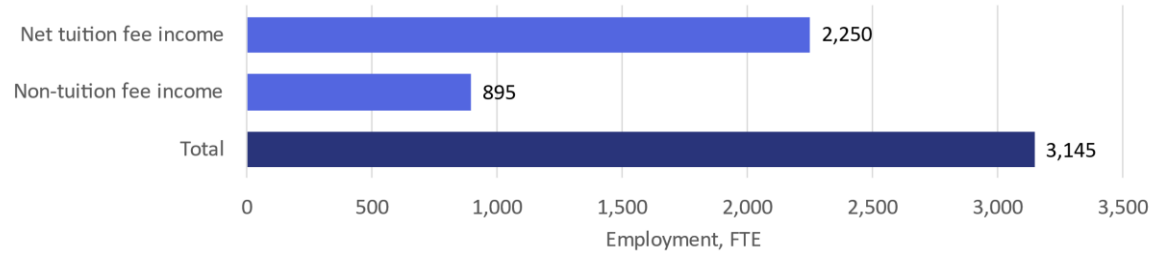
Output, £m



GVA, £m



FTE employment



Note: All monetary estimates are presented in 2020-21 prices, discounted to reflect net present values, and rounded to the nearest £1m. Values may not add up precisely to the totals due to rounding. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

The conservation leader working on climate change solutions

Carolina Proaño-Castro is dedicated to the **conservation and climate adaptation** of Ecuador's Andean Choco region, a hotspot of global biodiversity. As Executive Director of **Fundación Futuro**, she's working with the private sector on **climate change solutions** for the region's people and its forests.

Only seven years ago she was in Cambridge as a student on the University's pioneering **Masters in Conservation Leadership**. This **integrated academic and professional training course** is delivered by the University in partnership with the nine leading conservation organisations of the **Cambridge Conservation Initiative**. Three-quarters of students from developing countries receive a scholarship.

Equipping students with the **applied leadership and management skills** to create positive change in conservation doesn't end upon graduation. The University's vision is to achieve lasting impact, and to do this it has established an **active alumni network**: since the course started in 2010 there are now **over 200 alumni in 85 countries** around the world.

Carolina has become part of this emerging global voice. In 2021, with funding from the Sansom Conservation Leadership Alumni Fund, she prototyped a 'war room' approach for alumni to work together in **rapid response to conservation emergencies** around the world. Her team designed a **citizen-led campaign**, which is now being implemented, to protect the Andean Chocó Biosphere Reserve from mining. Alongside facilitating the **decarbonisation** of Grupo Futuro's holding group of companies, she is now designing **innovative finance mechanisms to conserve, manage and restore the Andean Choco landscape**.

> *"Cambridge has a special place in my heart and has opened several professional doors along my career journey. The Masters in Conservation Leadership specifically has allowed me to broaden my perspective about diversity of views and values around conservation and development around the world. It has allowed me as well to meet amazing professionals globally."*
>
> **Carolina Proaño-Castro, Executive Director of Fundación Futuro**

4.4 Total economic impact associated with the University of Cambridge's educational exports

To estimate the total (direct, indirect, and induced) economic impact associated with the export income generated by international students studying at the University of Cambridge, we used economic multipliers derived from the above-described multi-regional Input-Output model, 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 tuition fee and non-tuition fee income associated with international students in the 2020-21 cohort, including:

- **Multipliers relating to international tuition fee income (accrued by the University of Cambridge itself)**: The multipliers used to estimate the impact of the University of Cambridge's international tuition fee income were calculated based on the inter- and intra-industry flows of goods and services for the East of England's government, health, and education sector as a whole[105].
- **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 the East of England[106], and subsequently applied to the estimated off-campus non-tuition fee expenditures of overseas students in the 2020-21 cohort of University of Cambridge students.

Again, these multipliers are expressed in terms of **economic output**, **gross value added**, and (full-time equivalent) **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 19 presents the economic multipliers applied to the income generated by international students at the University of Cambridge (in terms of the impact on the East of England and the UK economy as a whole)[107]. In terms of economic output, the analysis assumes that every £1 million of **tuition fee expenditure** incurred by international students generates an *additional* **£1.41 million** of impact throughout the UK economy, of which **£0.52 million** is generated in the East of England. In addition, we assume that every £1 million of **non-fee expenditure** incurred by international students generates an *additional* **£1.62 million** of impact throughout the UK, of which **£0.67 million** is located in the East of England.

[105] This approach is based on the fact that the tuition fee income from international students is accrued by University of Cambridge itself. In other words, we assume that the expenditure patterns of University of Cambridge are the same as for other institutions operating in the East of England's government, health, and education sector. Specifically, we apply these multipliers to the *gross* tuition fee income generated by international students in the 2020-21 University of Cambridge cohort, and then deduct the Exchequer/University of Cambridge's cost of provision (i.e. public teaching grants, public student support, and University of Cambridge fee waivers and bursaries) to arrive at the *net* direct, indirect and induced impact associated with this income.

[106] In other words, for the purpose of applying relevant economic multipliers, we assume that international students studying at University of Cambridge have similar expenditure patterns as households in the East of England 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.

[107] While the table presents the multipliers for the impacts on the East of England and the UK as a whole, a full breakdown of the total impacts across all regions (as well as by sector) is provided in Figure 26.

Table 19 Economic multipliers associated with the income from international students in the 2020-21 cohort of University of Cambridge students

Location of impact and type of income	Output	GVA	FTE employment
Tuition fee income			
East of England	1.52	1.45	1.31
Total UK	2.41	2.15	1.79
Non-fee income			
East of England	1.67	1.66	1.70
Total UK	2.62	2.49	2.66

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 economic impacts[108], 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 2020-21 University of Cambridge cohort amounts to **£716 million** of **economic output** (see top panel of Figure 26):

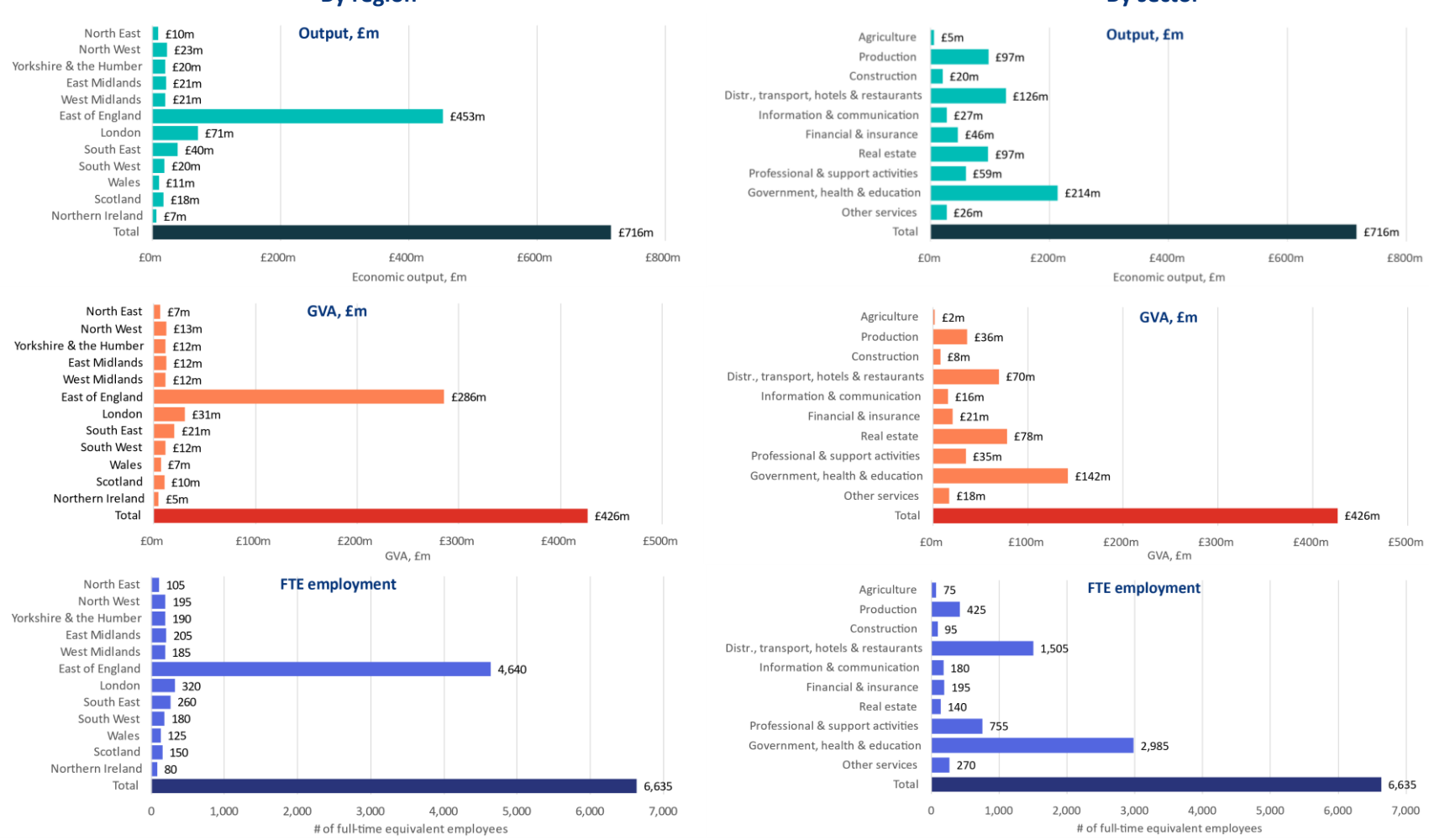
The impact of the export income generated by the 2020-21 University of Cambridge cohort stood at £716 million.

- In terms of the breakdown by type of income from international sources, **£406 million** of this impact was associated with international students' (net) **tuition fees**, and **£311 million** was associated with these students' **non-tuition fee expenditures** over the duration of their studies at the University of Cambridge.
- In terms of the breakdown by region, the majority of this impact (**£453 million**, **63%**) was generated in the **East of England region**, with the remaining **£263 million** (**37%**) occurring in **other regions** across the UK.
- In terms of sector, the tuition fee and non-tuition fee income generated from the University of Cambridge's international students generated particularly large impacts within the **government, health, and education sector** (**£214 million** (**30%**), given that the cohort's tuition fee income is accrued as income by the University of Cambridge itself). In addition, there are relatively large impacts felt within the **distribution, transport, hotel, and restaurant sector** (**£126 million**, **18%**), the **production sector** (**£97 million**, **14%**), and the **real estate industry** (**£97 million**, **13%**)[109].

The impact in terms of gross value added was estimated at **£426 million** across the UK economy as a whole (with **£286 million** generated within the East of England), while the corresponding estimates in terms of employment stood at **6,635 full-time equivalent jobs** across the UK as a whole, with **4,640 jobs** supported across the East of England.

[108] 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 2020-21 University of Cambridge cohort, and then deduct the Exchequer/University of Cambridge cost of provision (i.e. public teaching grants, public student support, and University of Cambridge fee waivers and bursaries) to arrive at the *net* direct, indirect and induced impact associated with this income.
[109] Again, for more detail on what industries are included in this high-level sector classification, please refer to Table 27 in Annex A2.1.

Figure 26 Total economic impact associated with international students in the 2020-21 University of Cambridge cohort, by region and sector



Note: Monetary estimates are presented in 2020-21 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***

The engineer and the plumbers keeping the water running

As a young engineer working in Central America and sub-Saharan Africa, **Francesca O'Hanlon** has seen first-hand how many people are still **unable to access clean drinking water**. Wherever she went, she encountered the same issue: **chlorination is vital for treating water** but the tablets are difficult to use. The dose is often wrong or the tablets don't disperse properly. Automatic chlorine dosers typically cost more than £1,000, far beyond the reach of most communities.[110]

In 2017, Francesca started a **PhD at the Centre for Sustainable Development in the University's Department of Engineering**. On her first day, she had a lightbulb moment. She saw the array of 3D printers available for student use and realised how easy it would be to develop and test a new type of chlorine doser quickly and cheaply.

Teaming up with students Tom Stakes and Becky Donaldson, she founded a **social enterprise**, **BlueTap**, and they began working on it alongside their studies. A year later they won the Cambridge University Entrepreneurs' competition for social enterprises, giving them access to **Cambridge's support for early-stage ventures**, and the **doser is now being piloted in Uganda and Kenya**.

But it's not just about new technology. Central to BlueTap's philosophy is its **commitment to working in partnership with the communities** that will use it. The team runs **workshops to help plumbers and technicians develop business skills** so that both they and the community benefit.

> *"One of our goals is to improve local livelihoods in Uganda and Kenya. The local plumbers sell and maintain our product, which increases their income, but it also means there is someone on the ground who can look after the technology and keep the clean water running in health centres, schools and hospitals."*
>
> **Dr Francesca O'Hanlon, Founder of BlueTap**

[110] See https://www.cam.ac.uk/stories/runningwater

4.5 Wider economic and societal benefits of the University for international students

As well as generating significant export income for the UK economy, through studying at the University of Cambridge, there are a multitude of economic and societal benefits that international students take forward into their lives after university. To assess the wider economic and social impact of the University of Cambridge on its students and society at large, we conducted an **online survey among a large group of University of Cambridge's international alumni** (over the course of three weeks in September 2022). These wider benefits include positive impacts on **social capital and cohesion; intergenerational transmission of skills; the subsequent acquisition of further learning and qualifications; improved communication and autonomy**; and improved **self-esteem** and **self-confidence**. Although it is clear that these outcomes have significant societal value, it is almost impossible to assign a monetary value. As such, we do not attempt to monetise these wider impacts, but instead, demonstrate the impact of learning at the University of Cambridge on international graduates' jobs, lives and prospects.

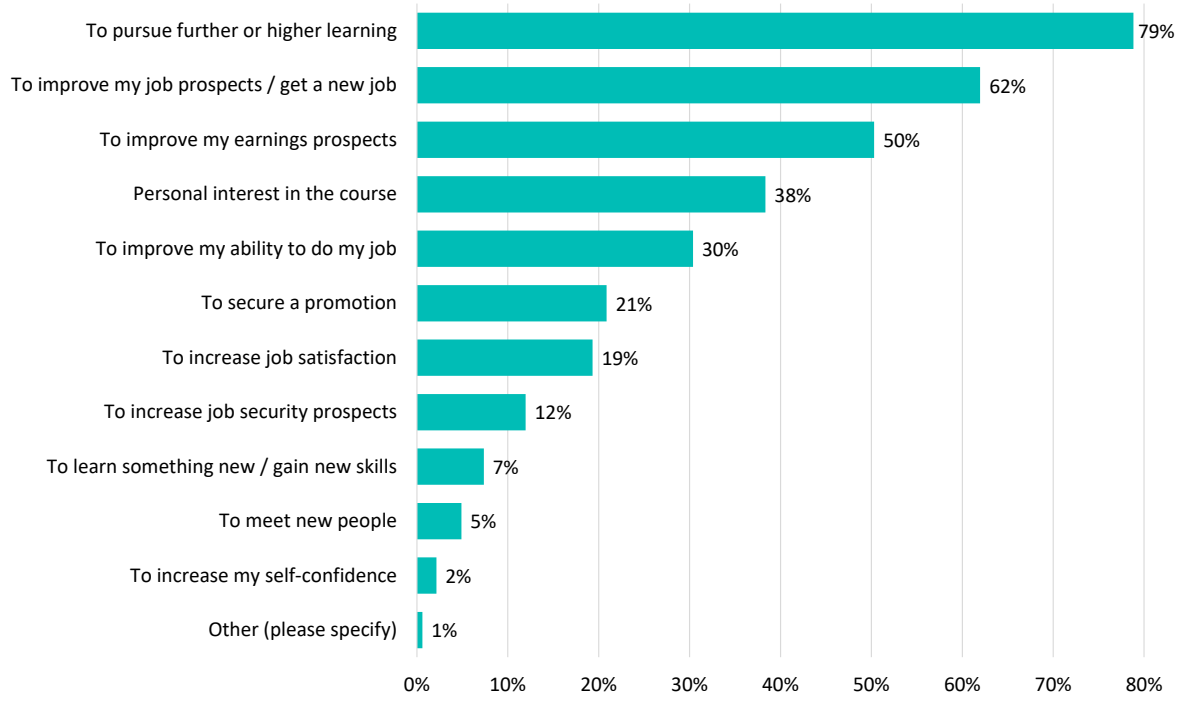
The survey achieved a total of **326 valid responses**[111], and this section summarises the main survey results in terms of **alumni's motivations**, as well as the **impacts** of their University of Cambridge qualifications on their **job-related outcomes, general and job-related skills, personal development, and well-being**.

4.5.1 Understanding students' motivations

Student motivation provides an important insight into how higher education qualifications at the University of Cambridge may have supported graduates' personal and career development. Figure 27 presents the reasons provided by University of Cambridge alumni for **choosing their programme of study**.

[111] Of these 326 responses, 289 of these were complete and 37 were partial responses. The survey was sent to c.1,500 University of Cambridge international alumni, implying a response rate (in terms of complete and valid responses) of approximately 21.7%.

Figure 27 'Thinking about your qualification from the University of Cambridge, what was / were your main reason(s) for choosing this degree programme?'



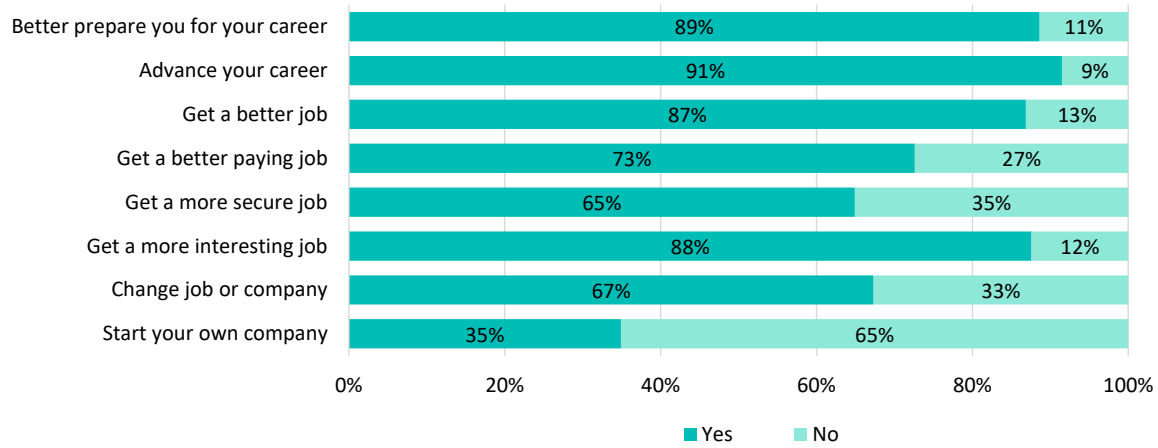
Note: Based on responses from 326 respondents. Respondents could choose multiple response options.
Source: London Economics' analysis of University of Cambridge alumni survey data

The main reasons indicated by respondents for choosing their degree programme were to **pursue further or higher learning** (**79%** of respondents) and **to improve their job prospects** (**62%**). In addition, **50%** of respondents reported that improving their earnings prospects was one of the main motivations for choosing their degree programme. **38%** of respondents stated that their personal interests influenced their decision when deciding which degree programme to study. In terms of personal development, **7%** reported having chosen the programme to learn something new / gain new skills and **5%** reported choosing the programme to meet new people.

4.5.2 Job-related outcomes

To assess the impact of University of Cambridge qualifications on graduates' economic outcomes, the survey asked respondents a number of questions in relation to whether certain aspects of their **career prospects and working lives** had changed following their learning at the University of Cambridge. As presented in Figure 28, approximately **91%** of respondents believed that their degree had **advanced their career; 89%** of respondents believed that their degree had better prepared them for their career; and **87%** believed they were **able to get a better job** (with **88%** indicating that they had obtained a more interesting job, **73%** reporting that they had obtained a better paying job, and **65%** indicating that they had obtained a more secure job). Additionally, over a third (**35%**) of respondents who had started their own company felt that the University and their degree had helped them in this endeavour.

Figure 28 'Overall, would you say that your degree from the University of Cambridge helped you…?'

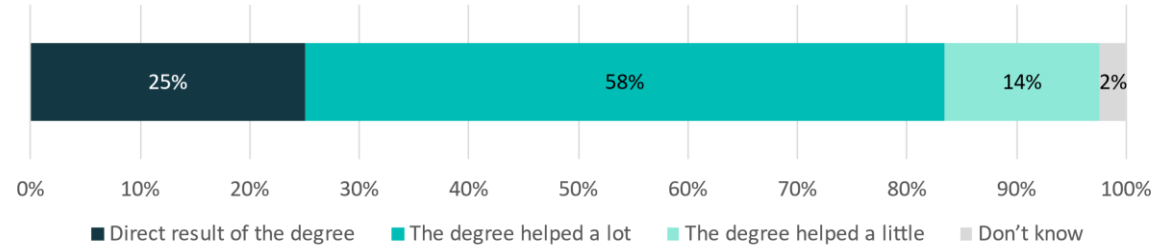


Note: Based on responses from 298 respondents who indicated that they had been employed or self-employed at some point since the completion of their studies at the University of Cambridge *and* were currently employed, unemployed or economically inactive. 'Don't know / Not applicable' responses have been excluded (8 to 149 respondents).
Source: London Economics' analysis of University of Cambridge alumni survey data

Within any economic analysis, it is important to understand the counterfactual; in other words, what might have happened in the absence of the learning experience with the University of Cambridge. The responses are highly informative and demonstrate the causal impact of learning at the University of Cambridge.

As presented in Figure 29, of those alumni that believed that their degree helped them improve their working lives in any of the above-described ways (Figure 28), **25%** indicated that these improvements were a **direct result** of their qualification from the University of Cambridge, with a further **58%** stating that the learning had **helped a lot**. These results demonstrate the very high degree of **additionality** associated with attaining qualifications at the University of Cambridge.

Figure 29 'To what extent do you think this improvement was / these improvements were linked to your degree from the University of Cambridge?'



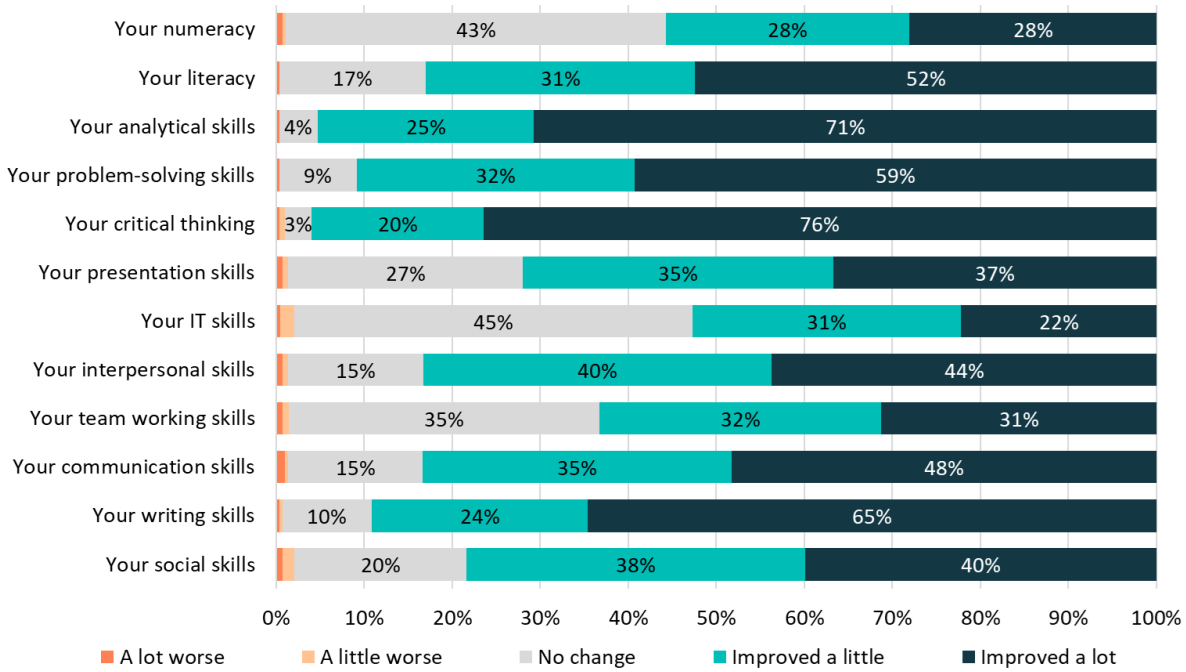
Note: Based on responses from 295 respondents, who answered 'Yes' to at least one of the items in Figure 28.
Source: London Economics' analysis of University of Cambridge alumni survey data

4.5.3 Impact on skills

Figure 30 presents the impact of obtaining a degree from the University of Cambridge on individuals' **general skills and proficiencies**, asking respondents to indicate the extent to which their skills improved following their learning experience at the University of Cambridge. Respondents reported improvements (either by 'a lot' or 'a little') on a wide array of skills, including their **critical thinking** skills (**96%**); **analytical** skills (**96%**); **problem-solving** skills (**91%**);

writing skills (**89%**)[112]; communication skills (**83%**); literacy skills (**83%**); interpersonal skills (**84%**); and social skills (**78%**). In addition, respondents also reported improvements in their team working skills (**63%**), numeracy skills (**56%**) and IT skills (**53%**).

Figure 30 'Following completion of your degree from the University of Cambridge, what impact did this have on your general set of skills?'



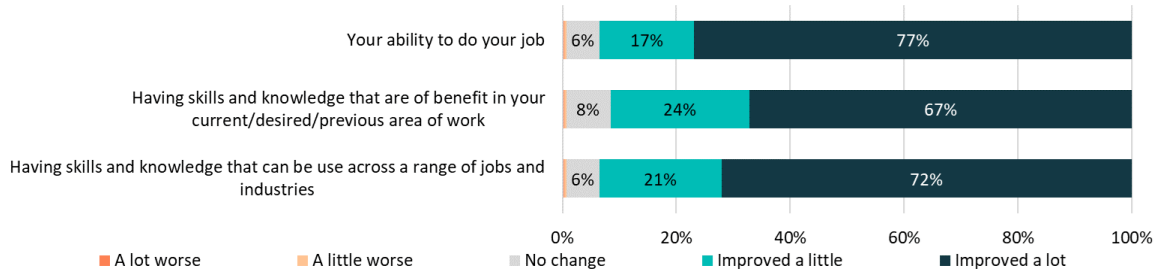
Note: Based on responses from 299 respondents. 'Don't know / Not applicable' responses have been excluded (2 to 60 respondents). Percentages may not sum exactly due to rounding.

Source: London Economics' analysis of University of Cambridge alumni survey data

Figure 31 presents alumni's responses in relation to whether they felt that their **job-related skills** had improved as a result of their degree. Evidencing the impact that the University of Cambridge qualification has had on their employability, the vast majority of respondents (**94%**) reported that their **ability to do their job** had increased either by a 'lot' or a 'little' as a result of their degree; **91%** reported that the **skills and knowledge** they use in their area of work had improved by a 'lot' or a 'little'; and **83%** reported that their **general transferable skills** had improved by a 'lot' or a 'little'.

[112] Totals may not add up precisely due to rounding.

Figure 31 'What impact did your degree from the University of Cambridge have on your job-related set of skills?'



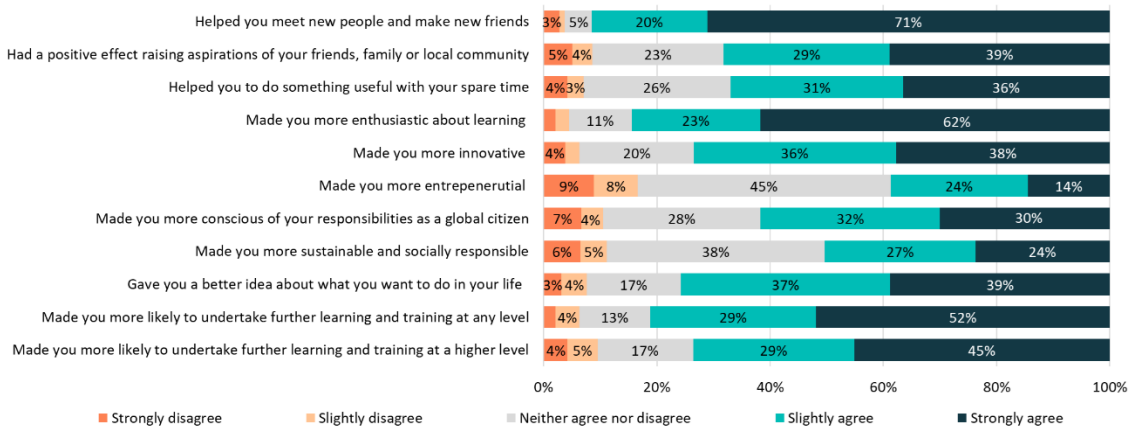
Note: Based on responses from 301 respondents who indicated that they had been employed or self-employed at some point since the completion of their studies at the University of Cambridge *and* were currently employed, unemployed or economically inactive. 'Don't know / Not applicable' responses have been excluded (between 11 and 18 respondents).
Source: London Economics' analysis of University of Cambridge alumni survey data

4.5.4 Personal development and wellbeing

In addition to the above-discussed impact of learning on respondents' working lives and skills, the survey also sought to measure the extent to which learning experiences at the University of Cambridge had an impact on respondents' **personal development, community engagement and well-being**.

Figure 32 explores to what extent alumni agreed with a number of statements relating to their **personal interests and aspirations**, indicating that **91%** of respondents believed that their experience at Cambridge helped them **meet new people and make new friends**; **85%** felt that they had become **more enthusiastic about learning**; **81%** reported that their time at Cambridge made them more likely to undertake further learning and training at any level; **74%** stated that their time at Cambridge made them more **innovative**; and **68%** indicated that their experience had a positive effect on raising aspirations among friends, family or the local community.

Figure 32 'In terms of your personal development, to what extent do you agree or disagree that your experience at the University of Cambridge…?' – Personal interests and aspirations

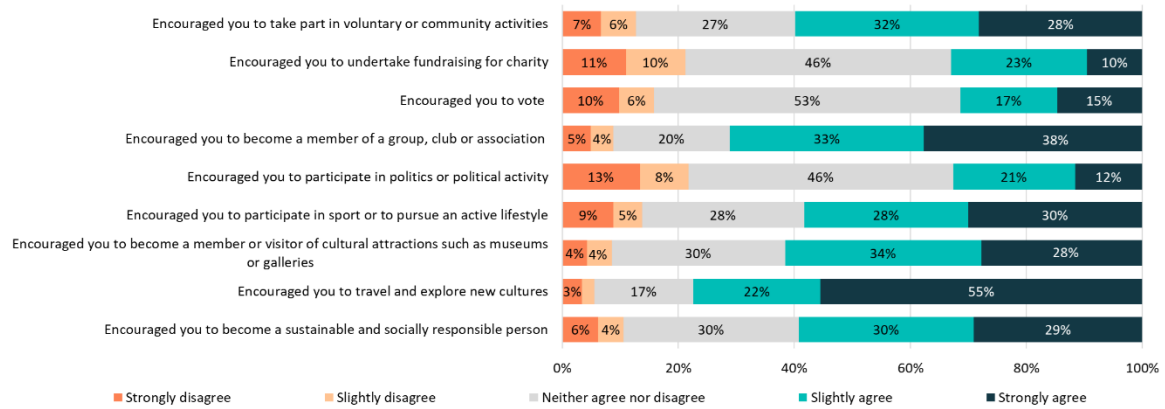


Note: Based on responses from 294 respondents. 'Don't know / Not applicable' responses have been excluded (0 to 23 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Cambridge alumni survey data

In relation to wider **community engagement and community cohesion** (see Figure 33), the analysis indicates that **77%** of respondents believed that their experience at the University of Cambridge encouraged them to travel and explore new cultures; **71%** were encouraged to become

a member of a group, club or association; **62%** reported that their time at the University of Cambridge made them more likely to become a member or visitor of cultural attractions such as museums; **60%** of respondents were more likely to take part in voluntary or community activities; and **59%** felt their experience at the University made them more sustainable and socially responsible.

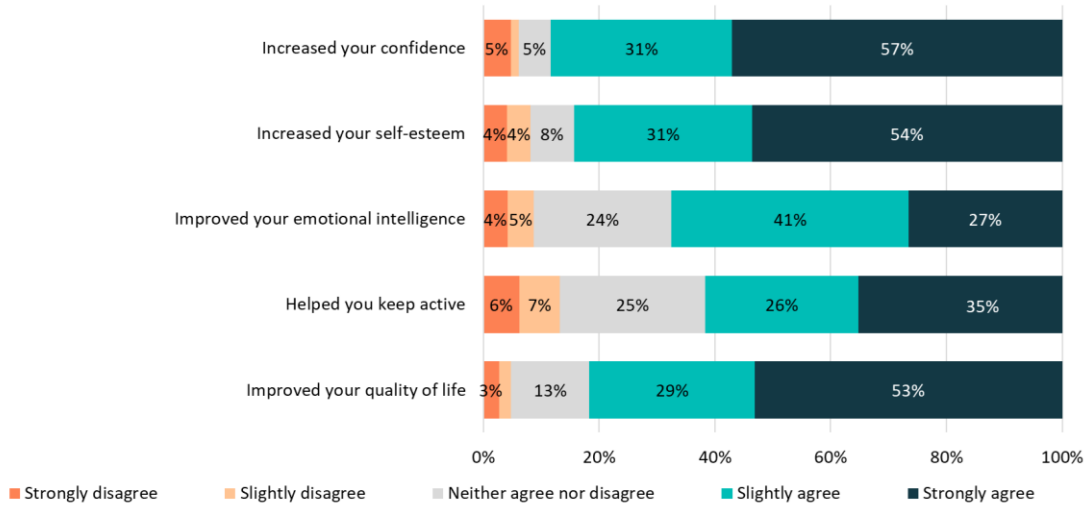
Figure 33 'In terms of your personal development, to what extent do you agree or disagree that your experience at the University of Cambridge…?' – Community cohesion and engagement



Note: Based on responses from 295 respondents. 'Don't know / Not applicable' responses have been excluded (3 to 30 respondents). Percentages may not sum exactly due to rounding.
Source: London Economics' analysis of University of Cambridge alumni survey data

Finally, in terms of measures of **well-being**, Figure 34 shows that **88%** of respondents agreed (either 'strongly' or 'slightly') that they had become **more confident** as a result of their degree; **85%** felt that their degree **helped increase their self-esteem**; **82%** agreed that their degree had **improved their quality of life**; **68%** believed that their emotional intelligence had increased as a result of their degree; and **61%** felt that their degree had helped them keep active.

Figure 34 'In terms of your well-being, to what extent do you agree or disagree that the degree which you completed at the University of Cambridge…?'



Note: Based on responses from 293 respondents. 'Don't know / Not applicable' responses have been excluded (0 to 7 respondents).
Source: London Economics' analysis of University of Cambridge alumni survey data

Gates Cambridge: a scholarship focused on global impact

Gates Cambridge is the University of Cambridge's **flagship international postgraduate scholarship programme**. Its mission is to build a **global network of future leaders** committed to improving the lives of others.

Established in 2000 through a **$210 million donation from the Bill and Melinda Gates Foundation** – the largest single donation to a UK university – the programme has awarded **2,081 scholarships to scholars from 111 countries** who represent **more than 600 universities globally** and join more than 80 academic departments and all 31 Colleges across the University of Cambridge.

"When someone once asked my dad if anything ever made him speechless, he said "my trips to Cambridge to meet Gates Cambridge scholars"… this scholarship programme is the embodiment of his most cherished beliefs – that, given the opportunity, people will come together, solve the biggest challenges we face, and make the world a better and more humane place for everyone."

Bill Gates, Philanthropist and founder of the Bill and Melinda Gates Foundation

Scholars come from all disciplines and there is no age barrier, meaning the scholarship benefits from a large breadth of experience. What unites them is their **academic brilliance, leadership potential and their commitment to improving the lives of others**, however they seek to do this.

Each year, around 80 to 90 new scholars are selected through a **rigorous and highly competitive interview for the scholarship**. The Gates Cambridge Scholars Council runs a **highly valued professional development programme** and an orientation week for the new cohort, introducing them to the Gates Cambridge community. Scholars forge enduring friendships and often note how conversations with someone from a different discipline – a chemist with a philosopher, for instance – can have a profound impact on them personally and on their work.

From one astronaut to another

Although the programme is still young, many of its alumni are already making an **impressive impact in many different ways across the globe**.

They include **Kayla Barron**, who did her MPhil in Engineering and is now a **NASA astronaut** (pictured, left), having just completed six months at the International Space Station; **Tara Westover** who did her PhD in History and is the **best-selling author** of *Educated*, a memoir about growing up in rural Idaho with Mormon survivalist parents and coming to Cambridge; **Claudia Sanhueza Riveros** who did her PhD in Economics and was appointed **Subsecretary of Home Affairs in the Chilean government**; and **Kate Brandt**, who did her MPhil in International Relations and is now **Chief Sustainability Officer at Google**.

The **entrepreneurial spirit** of fellow Gates Cambridge Scholars often inspires others – like **Christian Boehm** during his PhD in Plant Science. He **founded the European Synthetic Biology Society** in his first year: *"I never expected that a PhD student could from scratch build a community of hundreds of young researchers across 15 countries in one year and that it would keep growing to this day."* After leaving Cambridge, he joined Germany's **Federal Ministry of Education and Research** to help build a **sustainable bioeconomy**.

Alumni often mention how the **Gates Cambridge network** has helped them at Cambridge and the Gates Cambridge Alumni Association provides continuity between life at and after Cambridge. For some, that network has extended to **important collaborative work** after they leave – such as US biotech entrepreneur **Chandler Robinson**, who did his MBA at Cambridge. He is now collaborating with Singapore-based Gates Scholar **Anand Jeyasekharan** on an **anti-cancer drug candidate**.

Many scholars are driven by both their **intellectual curiosity** and their **personal experiences**. **Alice Musabende**, the first scholar from Rwanda, did her PhD on post-conflict peacebuilding and has gone on to present a Radio 4 series on how to tell children about genocide. Alice is now **Senior Political Advisor at the United Nations Security Council**. She said of her research: *"I feel I have to keep going for everyone else who did not get the chance to be here, for my family and siblings, for all the people whose lives were cut so short by the genocide. I am doing this to honour them. That is my inspiration and the force behind everything I do."*

Mona Jebril (pictured, right) became the first Gates Cambridge Scholar from the Gaza Strip. Her personal experiences fuelled her PhD on academic life under occupation and she faced challenging situations while completing it, such as being unable to travel to Gaza due to escalation of the conflict there. Today she is working on **health in conflict situations at the Centre for Business Research**. She describes leaving Gaza as being like an astronaut who realises they might never return to space again: *"I see myself as an astronaut, a **Gaza Cambridge astronaut**."*

5 The impact of the University of Cambridge's expenditures

Much of the existing literature on the economic impact of higher education institutions focuses (almost exclusively) on the **direct, indirect, and induced impact** of universities. Analyses of these impacts consider universities as economic units creating output within their local economies by purchasing products and services from their suppliers and hiring employees. Similar to the impact of the University of Cambridge's educational exports (see Section 4), the **direct, indirect, and induced economic** impacts of a university's expenditures are defined as follows:

- **Direct effect:** This considers the economic output generated by the University of Cambridge and its Colleges itself, by purchasing goods and services (including labour) from the economy in which it operates.
- **Indirect effect:** The University of Cambridge and its Colleges make purchases which generate income for the supplying industries. In turn, these industries spend on their own purchases from suppliers to meet the University's demands. This again results in a chain reaction of subsequent rounds of spending across industries, i.e. a 'ripple effect'.
- **Induced effect**: The employees of the University, its Colleges and businesses operating in the University of Cambridge's supply chain use their wages to buy consumer goods and services within the economy. This in turn generates wage income for employees within the industries producing these goods and services, who then spend their own income on goods and services – leading to a further 'ripple effect' throughout the economy as a whole.

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 Cambridge itself**, as well as the expenditures incurred by the University's **31 Colleges**. In accordance with the other strands of impact, the analysis focuses on the 2020-21 academic year. Again, these impacts can be measured in terms of **economic output, gross value added, and (full-time equivalent) employment**.

5.1 Direct impact of the University's and its Colleges' expenditures

To measure the direct economic impact of the purchases of goods, services, and labour by the University of Cambridge and its Colleges, we used information on the University's operational expenditures (including total staff and non-staff spending), capital expenditures, as well as the number of staff employed (in terms of full-time equivalent employees), for the 2020-21 academic year[113]. The consolidated financial statements used in this analysis provide an overview of the finances and operations of the University 'Group', covering:

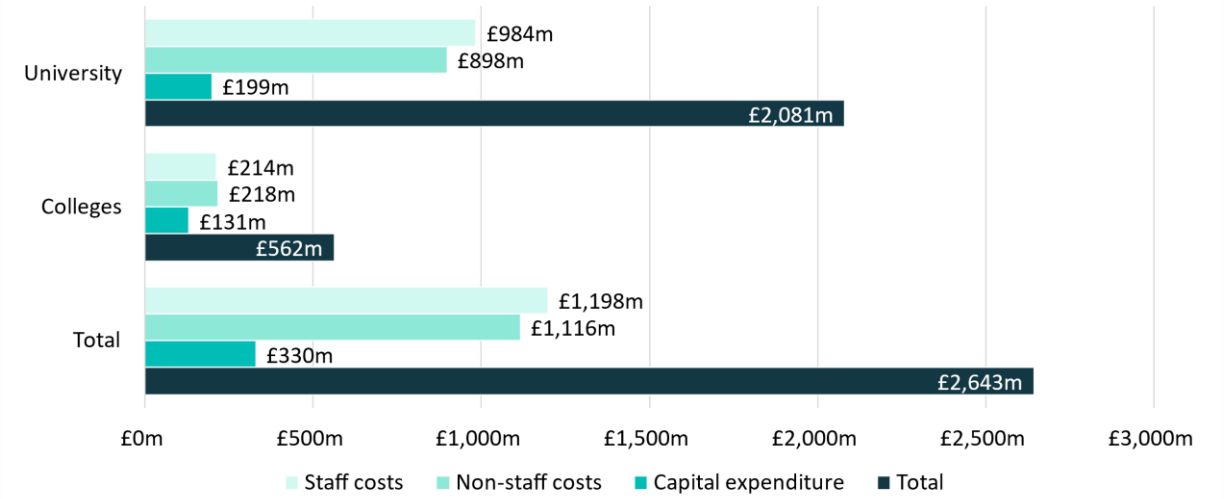
- the teaching and research activities of the University and its subsidiary companies that undertake activities which, for legal or commercial reasons, are more appropriately carried out by limited companies;
- Cambridge Assessment and its subsidiary companies, joint ventures and associates;
- Cambridge University Press and its subsidiary companies, joint ventures and associates[114]; and,
- the Gates Cambridge Trust and certain other Trusts.

[113] Based on the 2020-21 financial statements of the University of Cambridge and each of the University's Colleges.
[114] Please note, in 2021, Cambridge Assessment and Cambridge University Press merged to form Cambridge University Press & Assessment, (see the end of this chapter, for a case study on Cambridge University Press & Assessment).

This was combined with separate financial and staff data for the University's Colleges[115].

Based on this, in terms of monetary economic **output** (measured in terms of expenditure), **the direct economic impact** associated with the expenditures of the University of Cambridge itself stood at approximately **£2,081 million** in 2020-21. This includes **£984 million** of expenditure on staff costs, **£898 million** of expenditure on other (non-staff) operating expenses[116], and **£199 million** of capital expenditure incurred in that academic year. The corresponding direct impact associated with colleges' expenditures stood at **£562 million**, comprised of **£214 million** of staff expenditure, **£218 million** of other operating expenses[117], and **£131 million** of capital expenditure. Hence, the total direct impact of the expenditures of the University and its colleges was estimated at **£2,643 million**.

Figure 35 Direct economic impact (in terms of output) of the University's and its Colleges' expenditure in 2020-21, by type of expenditure



Note: From the University of Cambridge's and Colleges' total operating expenditure (excluding capital spending) in 2020-21 (£2.543 billion), we excluded £158 million in depreciation costs and -£9 million in movement in pension cost as it is assumed that these are not relevant from a procurement perspective (i.e. these 'non-cash' costs are not accounted for as income by other organisations). Transfers to Colleges from the University (£80 million) were also excluded on the University accounts to ensure no double counting. All estimates are presented in 2020-21 prices, and rounded to the nearest £1m.

Source: London Economics' analysis based on the 2020-21 financial statements of the University of Cambridge and each of the Colleges

[115] The information on Colleges' operational and capital expenditures, and staff numbers (including College staff and fellows) was extracted from each of the Colleges' published financial accounts. In this respect, note that for some Colleges, the number of staff was only available in *headcount* terms (rather than FTE employees). In all of these instances, the number of FTE staff was *estimated* by multiplying the corresponding headcount number by the ratio of FTE to headcount staff among the University of Cambridge's own employees (0.92, excluding atypical staff employed by the University).

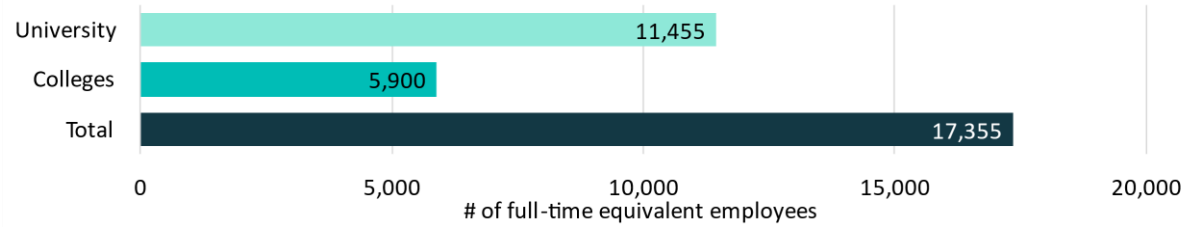
[116] The total operational expenditure (excluding capital expenditure) of the University of Cambridge in 2020-21 stood at £2.073 billion. From this, for the purposes of the analysis, we excluded £104 million in depreciation costs and £6 million in movements in pension provisions, as it is assumed that these are not relevant from a procurement perspective (i.e. these costs are not accounted for as income by other organisations). In addition, to avoid double-counting, we excluded £80 million in payments to the University's Colleges, as this would be accrued as income (and subsequently spent on goods and services) by the Colleges. In total, the analysis thus excludes £191 million of operational expenditure of the University of Cambridge.

[117] Again, from the total operational expenditures of the University's Colleges (£470 million), we excluded £54 million in depreciation costs and -£16 million in movements in pension provisions. Hence, we excluded a total of £38 million of operational expenditure incurred by the University's Colleges.

In terms of **employment**, the University of Cambridge directly employed **11,455 FTE staff** in 2020-21, while the number of staff employed by its Colleges stood at **5,900** FTE staff (see Figure 36). In total, there were **17,355** FTE staff employed by the University and its Colleges in 2020-21.

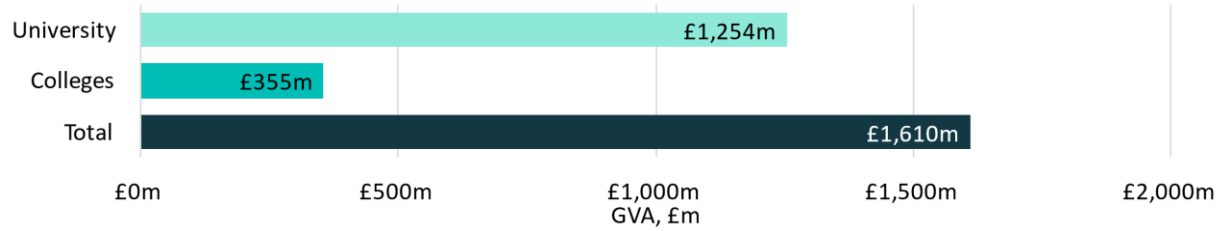
In terms of **gross value added** (see Figure 37), the University's operations direct contribution to GVA stood at **£1,254 million** in 2020-21, with a further **£355 million** generated by its colleges[118]. In aggregate, the University and its Colleges directly contributed **£1,610 million** of gross value added to the UK economy in 2020-21.

Figure 36 Direct employment (in FTE) of the University and its Colleges in 2020-21



Note: Figures are rounded to the nearest 5.
Source: London Economics' analysis based on HESA (2022c) and Colleges' financial statements

Figure 37 Direct GVA generated by the University's and its Colleges' expenditure in 2020-21



Note: All estimates are presented in 2020-21 prices, and rounded to the nearest £1m. Totals may not sum due to this rounding.
Source: London Economics' analysis based on the 2020-21 financial statements of the University of Cambridge and each of the Colleges

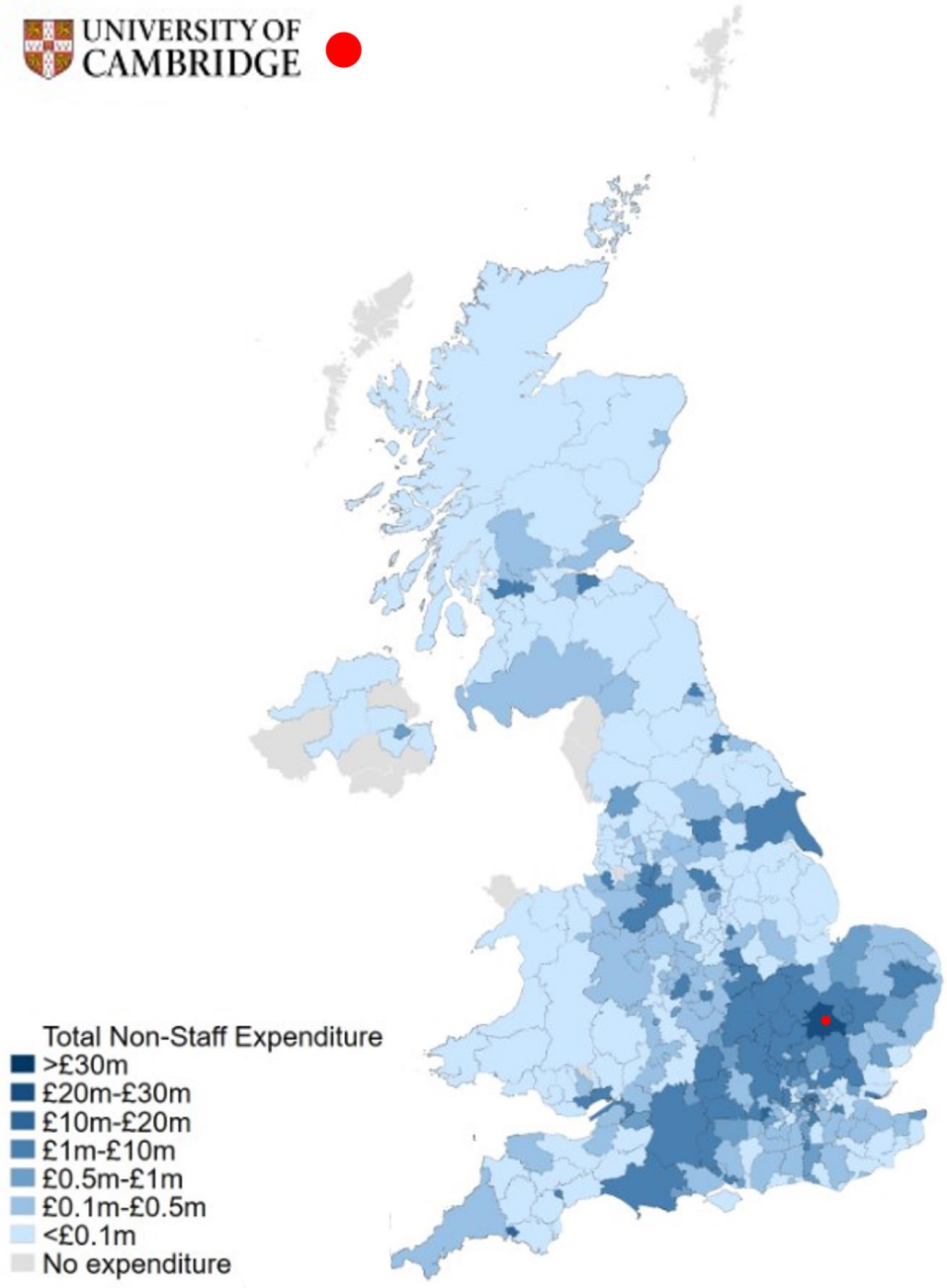
In addition to the above total expenditures, it is useful to investigate the geographical breakdown of the University's procurement expenditures and staff numbers, to demonstrate the breadth of the institution's impact across the UK.

Figure 38 presents the distribution of the University's procurement expenditures (based on invoice data for 2020-21) by Local Authority. The map illustrates a clear concentration of procurement expenditure in the **East of England** and **London**[119]. Despite the concentration of expenditure in and around the East of England, this illustrates the wider geographical reach of the University's activities, with significant levels of expenditure occurring throughout the rest of the UK. In addition to the analysis of the University's procurement expenditure, Figure 39 and Figure 40 illustrate the distribution of the University's staff and staff salary expenditure[120] (in the 2021 calendar year) by Local Authority (based on employees' home

[118] The level of direct GVA generated by the University and its Colleges was calculated as the sum of staff costs, surplus on operations, interest and other finance costs, and depreciation.
[119] It is likely that the data overestimates the level of procurement expenditure occurring in London as compared to other regions, since the invoice data would reflect suppliers' head office locations, rather than necessarily reflecting the location where these activities took place.
[120] We received data from the University on staff headcount and total remuneration (gross pay excluding temporary payments such as overtime) provided as of 31 July 2021 by local authority. Headcount of the University staff was rounded to the nearest 5 and total pay of the University staff was rounded to the nearest £5,000. Addresses used as home addresses are also those held in the University of Cambridge's HR system as of 31 July 2021. There were 215 records where no local authority was provided because no postcode or a non-recognisable UK postcode was provided by the employee, or an overseas address was provided. Note that this data will exclude College information on staff.

address). The map shows that while the University's staff are concentrated in areas surrounding the University, there are staff based across all regions of the UK.

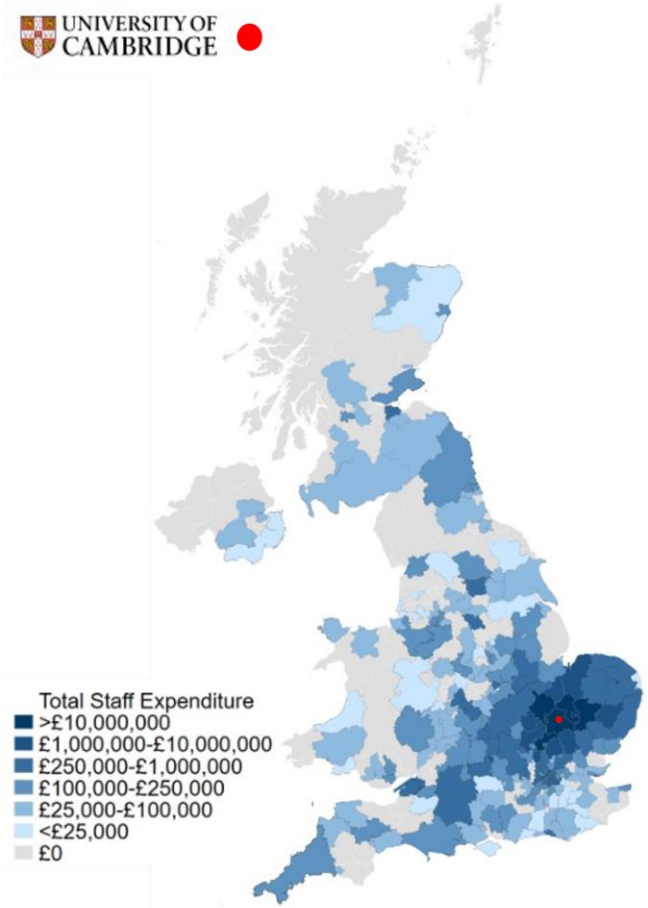
Figure 38 Distribution of the University of Cambridge's non-staff expenditure in 2020-21, by Local Authority (of invoice address)



Note: We received data on the invoice postcodes associated with £585 million of non-staff expenditure by the University of Cambridge in 2020-21 (excluding spending by Colleges which are each a separate entity). This constitutes a subset of the University's total non-staff spend, as it excludes a range of expenditure on different activities and suppliers such as banking, insurance, taxes, and utilities. Of this total, we excluded expenditure records with invalid postcodes (325 records) and records with negative expenditure (1 record). As a result of these exclusions, the figure is based on a total of £555 million of non-staff expenditure. We used the February 2022 ONS Postcode Directory to determine the Local Authority for each postcode included in the dataset. The data was then matched with the ONS digital vector boundaries for Local Authorities as of April 2019 to generate the map.

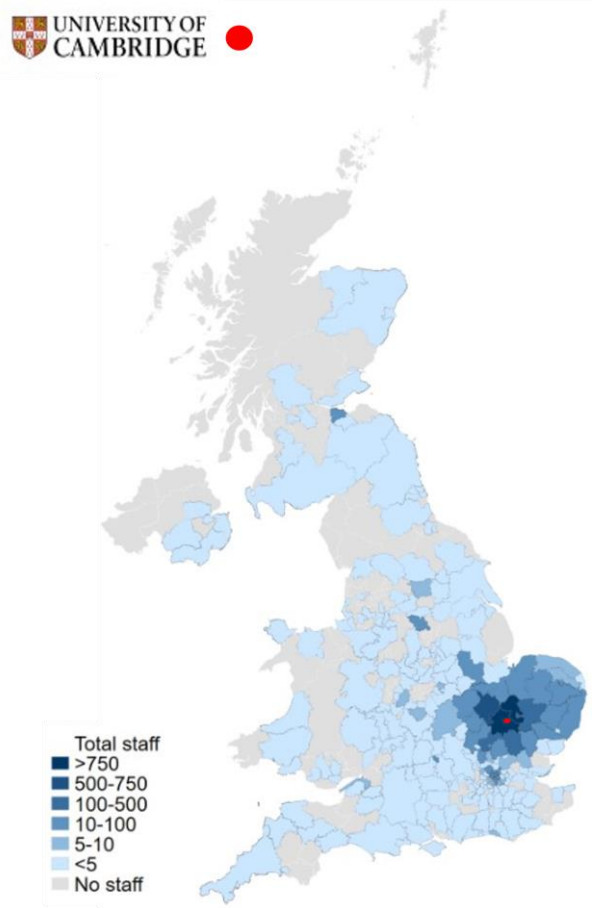
Source: London Economics' analysis based on University of Cambridge data and Office for National Statistics data. Contains National Statistics data, OS data, Royal Mail, Gridlink, LPS (Northern Ireland), ONS, NISRA data, NRS data and Ordnance Survey data © Crown copyright and database right 2023.

Figure 39 Distribution of the University of Cambridge's staff expenditure in 2020-21, by Local Authority (of invoice address)



Note: We received data on the invoice postcodes associated with £519 million of staff expenditure by the University of Cambridge in 2020-21 (excluding spending by Colleges which are each a separate entity). Of this total, we excluded expenditure records with no postcodes (215 records). As a result of these exclusions, the figure is based on a total of £509 million of non-staff expenditure. We used the February 2022 ONS Postcode Directory to determine the Local Authority for each postcode included in the dataset. The data was then matched with the ONS digital vector boundaries for Local Authorities as of April 2019 to generate the map.
Source: London Economics' analysis based on University of Cambridge data and Office for National Statistics data. Contains National Statistics data, OS data, Royal Mail, Gridlink, LPS (Northern Ireland), ONS, NISRA data, NRS data and Ordnance Survey data © Crown copyright and database right 2023.

Figure 40 Distribution of the University of Cambridge's staff in 2020-2021, by Local Authority (of home address)



Note: We received data on home address postcode districts for a total of 12,470 staff (in headcount) from the University of Cambridge (excluding Colleges) for the 2021 calendar year. Of this total, we excluded staff records with missing postcode districts (619 records) and invalid postcode districts (11 records). The figure is thus based on the home addresses of 12,255 staff. We used the February 2022 ONS Postcode Directory to determine the Local Authority for each postcode district included in the dataset. Staff associated with postcode districts that are spread across multiple Local Authorities have been apportioned equally across them, and the data by Local Authority was then matched with the ONS digital vector boundaries for Local Authority Districts as of April 2019 to generate the map.
Source: London Economics' analysis based on University of Cambridge data and Office for National Statistics data. Contains National Statistics data, OS data, Royal Mail, Gridlink, LPS (Northern Ireland), ONS, NISRA data, NRS data and Ordnance Survey data © Crown copyright and database right 2023.

Eddington: supporting growth through affordable housing in a sustainable destination

Eddington is the first phase of the **North West Cambridge Development**, a new district created by the University of Cambridge that helps to support its **long-term growth** in a **sustainable destination** close to the City.

Significant growth in Cambridge has resulted in pressures on housing availability and local congestion. The University's investment in Eddington provides **homes and community infrastructure** which supports staff recruitment and retention, helping the University to compete for the best talent globally. Specifically, many post-doctoral researchers are housed as key workers in affordable housing at Eddington, creating a **community of bright minds** working on research that changes our world.

Eddington's first residents arrived in 2017 and today there are over **700 homes dedicated for University staff** who come from more than 80 countries: this is complemented by student accommodation and private sale homes, the latter providing capital to support development of the neighbourhood.

The community enjoys a host of **social facilities**, including the Storey's Field Centre, the OFSTED outstanding-rated University of Cambridge Primary School, a nursery, retail, parklands and sports pitches. Social and networking opportunities are supported through a range of pastoral and community activities including the dedicated Post-Doc Centre.

Carefully planned **sustainable transport infrastructure and active travel initiatives** support cycling and walking while removing the need for car ownership. As a result, **93% of residents' trips**, both work and non-work travel, are made using **sustainable modes of transport**[121].

Across Eddington, high specification buildings and generous open spaces contribute to creating a long-lasting part of Cambridge city. Active ecological management, a Sustainable Urban Drainage System, an Underground Recycling System and solar panels all support **environmental sustainability**.

Future phases will create more homes for students, staff and the wider community, as well as space for the University's academic endeavours while **supporting employment and growth opportunities with business and enterprise**.

The North West Cambridge Development outline planning consent 2013 includes permission for:

[121] Figures from the NWCD Annual Traffic Monitoring Survey, October 2021.

5.2 Indirect and induced impacts of the University's and its Colleges' expenditures

As with the impact of the University's knowledge exchange activities (Section 2.2) and the impact of the expenditures of its international students (Section 4), the assessment of the indirect and induced economic impacts associated with the operational and capital expenditures of the University of Cambridge and its Colleges is again based on economic multipliers derived from the multi-regional Input-Output model[122]. In particular, we applied the estimated average economic multipliers associated with organisations in the East of England's government, health, and education sector. This mirrors the approach used to assess the impact of the University's other knowledge exchange activities, e.g. IP income (Section 2.2.3) and international fee income (Section 4.3.1), since these types of income were accrued (and subsequently spent) by the University itself. Again, this approach asserts that the spending patterns of the University of Cambridge – as well as its Colleges – reflect the average spending patterns across organisations operating in the East of England's government, health, and education sector.

These multipliers (for the East of England and the UK as a whole[123]) are presented in Table 20, indicating that every £1 million of operational or capital expenditure incurred by the University of Cambridge or its Colleges generates an *additional* **£1.41 million** of impact throughout the UK economy, of which **£0.52 million** is generated in the East of England[124]. In terms of employment, we assume that, for every **1,000** (FTE) staff employed directly by the University or its colleges, an additional **790** staff are supported throughout the UK, of which **310** are located in the East of England.

Table 20 Economic multipliers associated with the expenditures of the University and its Colleges

Location of impact	Output	GVA	FTE employment
East of England	1.52	1.45	1.31
Total UK	2.41	2.15	1.79

Note: All multipliers constitute Type II multipliers, defined as [Direct + indirect + induced impact]/[Direct impact]. The figures match the assumed multipliers associated with the University's international tuition fee income (see Table 19 in Section 4.4) as well as the multipliers applied to the University's IP income (see Table 8 in Section 2.2.3).
Source: London Economics' analysis

5.3 Adjustments for double-counting and transfers

Before arriving at the total direct, indirect, and induced impact associated with the University of Cambridge's institutional expenditure and the spending of its Colleges, it is necessary to deduct a number of income and expenditure items. The purpose of these deductions are to take into account the 'netting out' of costs and benefits associated with the University between different agents and the UK economy, as well as to avoid double counting. Specifically, we deducted:

- The total research income received by the University in 2020-21 (**£734 million**), to avoid double-counting with the estimated impact of the University's research activities (Section 2.1);
- The direct, indirect, and induced impacts associated with the University's knowledge exchange activities (**£505 million** in economic output terms), to avoid double-counting with the impact of the University's other knowledge exchange activities (Section 2.2);

[122] See Section 2.2 for more information.
[123] Again, in addition to the impacts on the East of England and the UK as whole, the analysis estimates a full breakdown across all regions, as well as by sector. These detailed results are presented in Figure 41 in Section 5.4.
[124] This exactly matches the assumed multipliers associated with the University's international tuition fee (see Table 19 in Section 4.4) as well as the multipliers applied to the University's other knowledge exchange activities (see Table 8 in Section 2.2.3).

- **£21 million** in bursary spending for UK domiciled students[125], as this was included (as a benefit) in the analysis of the University's teaching and learning activities (Section 3.6); and
- The direct, indirect, and induced impacts generated by the University's (gross) international fee income associated with the 2020-21 cohort of non-UK students (**£425 million**[126]), to avoid double-counting with the impact of the University's educational exports (Section 4).

5.4 Aggregate impact of the University of Cambridge and its Colleges' spending

Figure 41 presents the estimated total direct, indirect, and induced impacts associated with expenditures incurred by the University of Cambridge and its Colleges in 2020-21 (after the above-described adjustments have been made). The aggregate impact of these expenditures was estimated at approximately **£4,686 million** in economic output terms (see top panel of Figure 41):

The impact of the University of Cambridge's expenditure on the UK economy in 2020-21 stood at £4.686 billion.

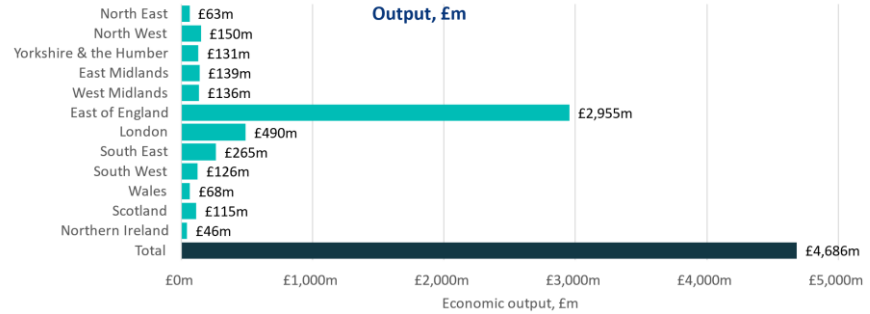
- In terms of region, the majority of this impact (**£2,955 million**, **63%**) was generated in the **East of England**, with **£1,731 million** (**37%**) occurring in **other regions** across the UK.
- In terms of sector, in addition to the impacts occurring in the **government, health, and education sector** itself (**£2,196 million**, **47%**[127]), there are also large impacts felt within other sectors, including the **distribution, transport, hotel, and restaurant sector** (**£602 million**, **13%**), the **production sector** (**£526 million**, **11%**), and **the real estate sector** (**£405 million**, **9%**)[128].

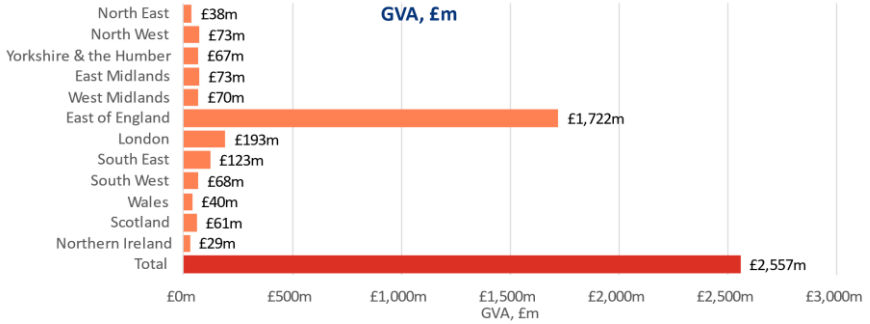
In terms of the number of jobs supported (in FTE), the results indicate that the University of Cambridge's spending supported a total of **24,185** FTE jobs across the UK economy in 2020-21 (of which **17,730** were located in the East of England). In addition, the impact in terms of gross value added was estimated at **£2,557 million** across the UK economy as a whole (with **£1,722 million** generated within the East of England).

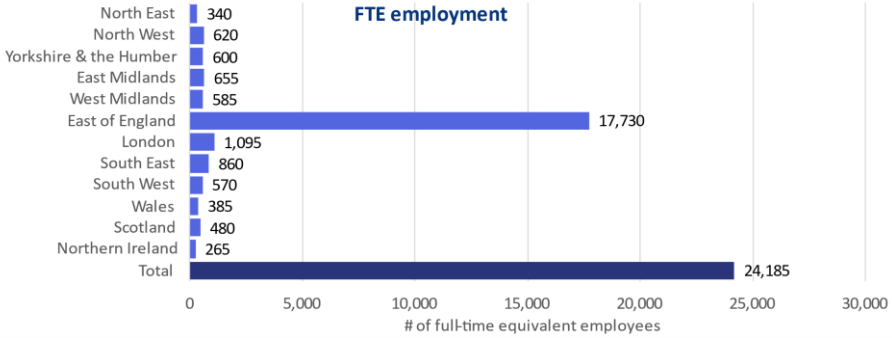
[125] The University's bursary support to UK domiciled students is considered as a benefit to the student in the analysis of the impact of teaching and learning activities (see Section 3). It was therefore necessary to deduct these bursaries from the direct impact of the University's spending to correctly 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.
[126] This is slightly larger than the above impact of the *net* tuition fee income associated with international students in the 2020-21 cohort (£406 million; see Section 4.4), as the value deducted here relates to the impact of the University's *gross* international fee income *before* the deduction of the Exchequer/University funding costs associated with these students (since these costs are already deducted when estimating the impact of the University's educational exports).
[127] The size of this impact is driven by the fact that, along with the indirect and induced impacts, it includes the *direct* level of expenditure of University of Cambridge and its Colleges (net of the above adjustments to avoid any double-counting).
[128] Again, for more detail on what industries are included in this high-level sector classification, please refer to Table 27 in Annex A2.1.

Figure 41 Estimated total economic impact associated with the University of Cambridge and its Colleges expenditure in 2020-21, by region and sector

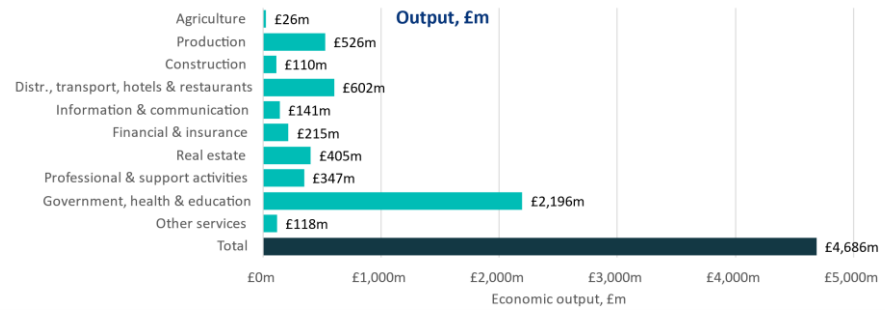
By region

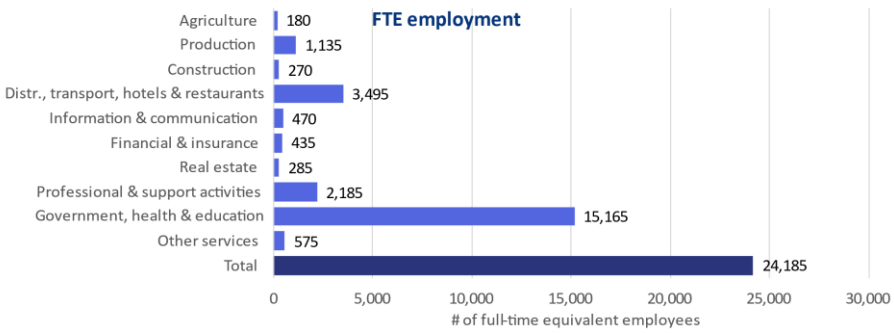






By sector





Note: Monetary estimates are presented in 2020-21 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***

Cambridge University Press & Assessment: reaching further

"Cambridge University Press & Assessment is the only organisation in the world that provides assessment, learning and academic publishing – backed by world-leading teaching and research departments – and supports learning from early years to higher education, academic research and beyond."

Peter Phillips, Chief Executive, Cambridge University Press & Assessment

Cambridge University Press & Assessment is a **world-leader in assessment, education, research and academic publishing**.

Being part of the University of Cambridge means a shared mission 'to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence'. **This connection gives the Press & Assessment an unrivalled depth of experience in research, national education systems, international education and English language learning**.

Building on a long heritage and ethos of excellence, Cambridge University Press & Cambridge Assessment came together to form a single organisation in 2021.

The Cambridge University Press & Assessment team is now one connected, global community helping people across the world to realise their potential, benefiting society and the planet. **Through its products and services, it informs action around some of the world's most pressing challenges**, including climate change, and it is committed to reducing its environmental impact.

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- Millions of grades are issued globally by their exam boards.
- The Cambridge Partnership for Education works with ministries of education and international development organisations to improve the quality of education systems around the world.

- How the English language is used and learned is a world-leading area of research, based on a multi-billion-word database called the Cambridge English Corpus.
- The organisation is the world's largest provider of international education programmes and qualifications for 5–19-year-olds.

Advancing learning and research, worldwide

- More than 180 Nobel Laureates have been published in books, journals and in the journals of partners.
- Cambridge Core, the central destination for academic research, **hosts 1.6 million journal articles and 36,000 ebooks.**
- The world's oldest Bible publisher now offers more than a hundred styles in a variety of modern translations, as well as an **Alexa version of the Book of Common Prayer.**

Fulfilling potential

- Virtual work experience days have been delivered to more than **500 school students** and the organisation aspires to reach more young people internationally.
- During 2020 and 2021, **15 people took part in paid internships – eight in the UK and seven in South Africa**. Three employees who started as interns in South Africa are now on permanent contracts, and three are on fixed-term contracts.
- In the UK, the organisation works with **Creative Access**, a not-for-profit social enterprise that **helps people from underrepresented communities get into the creative industries**. This has resulted in **12 paid internships** giving young people experience of publishing.
- In the past year, **nearly 170 employees gave nearly 1,600 hours** to fundraise, support and volunteer with educational charities from Cambridge to Cape Town.

"I have always wanted to get into publishing, but never had the connections. I found this internship on Creative Access, and I had to go for it! It has been mainly remote, which is ideal as I live in the North of England. I have not only gained a wealth of knowledge and experience within a prestigious publishing organisation, but I have also gained my confidence back. It is possible to work at a place that genuinely cares about you and values your work!"

Yemaya Marsden, qualified teacher and intern in Cambridge Learning for Schools team

6 The University of Cambridge's contribution to tourism

As a final strand of economic contribution, the University attracts a range of visitors to Cambridge, including tourists visiting the University's unique cultural and heritage sites (such as the Fitzwilliam Museum, the large number of historic Colleges of the University, or the Cambridge University Botanic Garden), business visitors, friends and family visiting the University's staff and students, or visitors participating in study trips to the University. The analysis (for the 2020-21 *academic year*) is based on visits to Cambridge in the 2019 *calendar year* (i.e. we adopt the most recently available pre-pandemic data to give an indication of the "typical" impact of tourism associated with the University of Cambridge).

To understand the economic impact associated with the University's contribution to tourism through the attraction of these visitors, we combine information on the number of visitors to Cambridge that are associated with the University's presence with information on the average trip expenditure per visitor. As with the University's knowledge exchange activities (Section 2.2), the expenditures of its international students (Section 4), and the spending of the University (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 2020-21.

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

Data from the International Passenger Survey (IPS), by the Office for National Statistics[129] estimated that, in 2019, there were a total of approximately **462,000** overseas staying visits to Cambridge. Domestic visits are not considered in the analysis as they do not contribute additionally to the UK economy. More specifically, it is likely that any domestic (day or overnight) visits to Cambridge 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. As a result, the remainder of this analysis focuses only on the **462,000** trips to Cambridge 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. Using information from the IPS (2019), of the total of **462,000** overnight trips to Cambridge by overseas visitors, approximately **41%** (**187,000**) were holiday visits, **30%** (**140,000**) were for the purposes of visiting friends and family, **16%** (**74,000**) were for business trips, **9%** (**41,000**) were study trips to Cambridge, and the remaining **4%** (**19,000**) were trips for other purposes. Using this breakdown by purpose of visit, to estimate the impact of the University of Cambridge's contribution to tourism in a typical academic year, we made the following assumptions in relation to the **number of overseas overnight visits to Cambridge that resulted from the University's presence**:

- We assumed that **all** the visits for the purposes of **holidays** (**187,000**) were directly as a result of the University, i.e. that all visitors on holiday were attracted by the University's campus and its heritage and cultural assets such as the Fitzwilliam Museum, the large number of historic

[129] Number of visits is based on the city's visitors' reported spending on at least one night during their trip.

Colleges of the University, or the Cambridge University Botanic Garden. King's College and Fitzwilliam Museum Enterprises are actively involved in the ownership and management of Visit Cambridge, which champions tourism in the city[130];

- With respect to **trips to visit family and friends**, data from the University of Cambridge (and its Colleges) and HESA indicates that there were approximately **6,620** non-UK nationals employed by the University and its Colleges[131] (representing **5%** of the resident population of Cambridge), as well as **7,270** non-UK-domiciled students attending the University[132] (representing **6%** of the resident population). Based on previous LE analysis assessing the economic impact of international students on the UK economy[133], we assumed that, on average, there were **1.6** visits from overseas per non-EU-domiciled student or non-EU member of staff and **3.0** visits from overseas per EU-domiciled student or EU member of staff in 2020-21[134]. Based on a 2019 population estimate for the city of Cambridge of **125,100**[135], we assumed that approximately **18%** of all overseas visits to Cambridge to visit family or friends were visits to the University's students and staff (equivalent to approximately **25,000** trips in 2020-21).
- A similar approach was adopted in relation to **business trips**. The University and its Colleges employed approximately **18,765** staff in 2020-21 (in terms of headcount, which is equal to **17,355** FTE employees (see Section 5.1))[136], accounting for approximately **27%** of the total employed population of Cambridge in 2020-21[137]. Based on this, we assumed that **27%** of business trips to Cambridge in 2020-21 were related to the University (corresponding to approximately **20,000** visits/trips). These include business trips facilitated by **MeetCambridge**, the conference and events bureau owned by the Cambridge Colleges. MeetCambridge offers free venue-findings services and a single point of contact with venues in and around the city, linking business and other visitors with event spaces across the University and Colleges.[138]
- In terms of the **study trips** to Cambridge, we assumed that all trips were as a result of either the University of Cambridge or Anglia Ruskin University (Cambridge campus). According to data from HESA there were **7,270** non-UK-domiciled students[139] enrolled at the University of Cambridge in 2020-21 accounting for **66%** of the total non-UK-domiciled student population in Cambridge in 2020-21[140]. Therefore, we assume that approximately **66%** of study trips to

[130] For more information, see Visit Cambridge at https://www.visitcambridge.org/
[131] This was estimated based on the distribution of the University of Cambridge's staff in 2020-21 by nationality (see HESA, 2020c), the number of total FTE staff employed across the University in 2020-21, and the number of FTE employees as a proportion of headcount employees (92%) at the University of Cambridge.
[132] Note that this includes *all* students enrolled with the University in 2020-21, i.e. including both first-year and continuing students.
[133] See London Economics (2018b).
[134] The previous analysis (London Economics, 2018b) estimated that there are 3.0 visits from overseas per EU student per year, and 0.9 visits per non-EU student per year. Here, we calculated a weighted average across EU and non-EU students (weighted by the number of total (first-year and continuing) EU and non-EU students enrolled at the University of Cambridge in 2020-21). We then used the same method to calculate this figure for non-UK staff employed by the University in 2020-21.
[135] See Nomis (2022).
[136] HESA data indicates that in 2020-21, there were 12,385 staff employed by the University of Cambridge in headcount terms, 11,455 in FTE terms. In addition, LE analysis of each of the Colleges' financial statements indicates that there were 5,900 FTE staff employed by the Colleges. Assuming that the ratio of headcount to FTE staff at the colleges is the same as the ratio of headcount to FTE employees at the University (92%), we thus estimate that there were approximately 6,380 staff employed by the Colleges in headcount terms. Total University and College combined staff total is therefore calculated as 18,765 in headcount terms and 17,355 in FTE terms.
[137] Using official labour market statistics data (Nomis, 2022), there were approximately 68,600 individuals employed (or self-employed) in Cambridge between October 2020 and September 2021.
[138] For more information, see MeetCambridge at https://www.meet-cambridge.com/
[139] Note that this includes *all* students enrolled with the University in 2020-21, i.e. including both first-year and continuing students.
[140] HESA data indicates that there were approximately 6,350 non-UK-domiciled students studying at Anglia Ruskin University in the 2020-21 academic year. Based on a freedom of information (FOI) response by Anglia Ruskin University, 60% of students studying at the University are based at the Cambridge campus. LE have used this proportion to attribute the total number of non-UK students studying at the Anglia Ruskin Cambridge campus as 3,805. This implies that the 7,270 non-UK-domiciled students studying at the University of Cambridge in 2020-21 made up approximately 66% of the 10,155 total non-UK-domiciled students studying in Cambridge in the 2020-21 academic year.

Cambridge in 2020-21 are related to the University (corresponding to approximately **27,000** visits/trips).

- Finally, we assumed that none of the remaining **trips to Cambridge for other purposes (19,000)** were as a result of the University.

Table 21 presents the resulting estimated number of trips to Cambridge by overseas visitors in 2020-21 that were due to the University of Cambridge's activities, estimated at a total of **260,000** (or **56%** of total overseas trips to Cambridge).

Table 21 Total number of visits to Cambridge and University-related visits by overseas overnight visitors in 2020-21

Type of trip	Total visits	Visits associated with the University	% associated with the University
Holidays	187,000	187,000	100%
Study trips	41,000	27,000	66%
Business trips	74,000	20,000	27%
Trips to visit friends and family	140,000	25,000	18%
Other trips	19,000	-	0%
Total visits	**462,000**	**260,000**	**56%**

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

Box 5 Social, community and cultural engagement at the University of Cambridge

Despite the COVID-19 pandemic and the associated restrictions, the University of Cambridge was still actively involved in the social, community and cultural life of the city and the country. A rapid move to online engagement and the growth of podcasts, video formats, digital libraries and online educational materials extended this reach globally. Mindful of the digital divide, the University also developed physical resource packs for families which were distributed through local food hubs and City Council community development schemes.

In total, visits to, and views of, free and chargeable activity in 2020-2021 amounted to more than **34 million**, placing the University second out of all higher education institutions in its engagement with the public, behind only the Open University.[141]

[141] Based on HE Provider Data: Business and Community Interaction from HESA. See https://www.hesa.ac.uk/data-and-analysis/providers/business-community/table-5

SIX the Musical: two students and a musical sensation

Toby Marlow and Lucy Moss (Photo credit: Radio 1 Newsbeat)

Described as 'the **global sensation** that everyone is losing their head over', **SIX the Musical** remixes the 500-year-old story of Henry VIII's six wives into a euphoric celebration of pop-icon girl power – and it was **written by two Cambridge undergraduates** in the final year of their studies.

Toby Marlow, studying English, had the seed of an idea in his poetry lecture and jotted it down with the words "need Lucy", who was studying History. Together they reimagined Henry's wives as a girl band, each competing with the others to be lead singer based on whose life had been more miserable married to the monarch.

The musical was set on the road to success when it was selected by the student-run Cambridge University Musical Theatre Society to be performed at the **Edinburgh Festival Fringe** in 2017.

SIX has been running in the **West End** and on **a tour of the UK** since 2019. The musical has garnered a **string of international premiers** (including Broadway), five Olivier Award nominations and eight Tony Award® nominations (winning Best Original Score and Best Costume Design of a Musical). It has also become a pop phenomenon with over **500 million** audio streams worldwide, **three billion** TikTok views on #SIXtheMusical and a studio album reaching number four in the UK Soundtracks chart. Lucy Moss became the **youngest woman to direct a musical on Broadway at the age of 26**.

> *"I hope that Six can show that people who haven't done anything before are worth taking a chance on. It's about investing in those younger, less likely, less experienced people in those spaces like the Edinburgh Fringe... and spending money and investing time and finding people who have the passion and the voice."*
>
> **Lucy Moss, interviewed by the New York Theatre Guide**

6.2 Direct impact associated with visitor expenditure

The **spend per trip** by purpose is calculated using information from Visit Britain (2019) on the value of tourism in England. The spend per trip was calculated using information on the total spend by purpose in 2019 and the number of visits by purpose in the same year, by dividing total spend by visits. Table 22 shows the spend per overseas staying visit in 2019 and these same values inflated to 2020-21 prices in the third column.[142] Using the figures for spend per trip, the **direct impact** associated with the University's contribution to tourism in 2020-21 stood at approximately **£233 million**.

Table 22 Spend per overseas staying trip by purpose in 2019 and in 2020-21

Type of trip	Overseas staying visits (2019)	Overseas staying visits (2020-21)
Holidays	£751	£757
Study trips	£2,315	£2,334
Business trips	£721	£727
Trips to visit friends and family	£507	£511
Other trips	£645	£650
Total visits (weighted average spend)	**£888**	**£896**

Note: the weighted average spend includes all trips associated with the University of Cambridge, rather than the weighted average spend of all visits to the city of Cambridge.
Source: London Economics' analysis and data from Visit Britain (2019) 'England Tourism Factsheet for 2019'

In terms of the breakdown by purpose of trip, the analysis suggests that approximately **£142 million** (**61%**) of this total came through holiday spending, with **£63 million** (**27%**) coming from study trips. An estimated **£15 million** (**6%**) was associated with business trips, while the remaining **£13 million** (**6%**) was spent during visits to see friends and family associated with the University. In terms of the nature of this visitor expenditure, the analysis suggests that approximately **£78 million** (**33%**) of this total was spent on accommodation, an estimated **£62 million** (**27%**) was associated with general shopping activities, **£46 million** (**20%**) was spent on food and drink, **£27 million** (**11%**) was spent on attractions, with the remaining **£20 million** (**9%**) spent on travel[143]. In terms of sector, this suggests that approximately **£206 million** (**89%**) of visitor spending occurred in the **distribution, transport, hotels, and restaurants sector**, while the remaining **£27 million** (**11%**) was spent on '**other**' services (i.e. expenditure on attractions).

In addition to economic output (i.e. visitor expenditure), we converted the above estimates into gross value added and the number of full-time equivalent jobs supported by this direct expenditure[144]. We thus estimated that the visitor expenditure associated with the University's activities directly generated **£133 million** in direct GVA and supported **2,800 FTE jobs**.

[142] Using CPI data from the Office for National Statistics (ONS). The uprating is calculated based on the change in the CPI index from 2019Q3 to 2021Q1 (both quarters referring to the central quarter of their reference years).
[143] This breakdown was estimated using a breakdown of expenditure by type provided by Destination Research (2017). The breakdown is based on tourism in Oxford, similar data has not been identified for Cambridge and thus the Oxford data is used in this instance, as a comparable University city in England.
[144] To estimate the direct GVA and employment associated overseas visitor expenditure, we multiplied this expenditure by the average ratio of GVA to output and FTE employees to output within the South East's distribution, transport, hotels and restaurants sector and the 'other' services sector.

6.3 Indirect and induced impacts associated with visitor expenditure

As with the impacts of the University's knowledge exchange activities (Section 2.2), the expenditures of its international students (Section 4), and the expenditure of the University (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[145]. In particular, given the concentration of visitor expenditure in the distribution, transport, hotels, and restaurants sector and the 'other' services sector, we applied the estimated average economic multipliers associated with organisations in these sectors located in the East of England.

These multipliers (for the East of England and the UK as a whole; presented in Table 23) indicate that every £1 million of (overseas overnight) visitor expenditure associated with the University of Cambridge generates an *additional* **£1.52 million** of impact throughout the UK economy, of which **£0.58 million** is generated in the East of England. In terms of employment, for every 1,000 (FTE) staff directly supported by this visitor expenditure, an additional **1,030** staff are supported throughout the United Kingdom, of which **420** are located in the East of England.

Table 23 Economic multipliers associated with tourism expenditures related to the University

Location of impact	Output	GVA	FTE employment
East of England	1.58	1.58	1.42
Total UK	2.52	2.45	2.03

Note: All multipliers constitute Type II multipliers, defined as [Direct + indirect + induced impact]/[Direct impact]. The multipliers shown are weighted averages across the assumed spend in the distribution, transport, hotels, and restaurants sector and the 'other' services sector.
Source: London Economics' analysis

6.4 Total impact associated with visitor expenditure

Figure 42 presents the estimated total direct, indirect, and induced impacts associated with the above visitor expenditures generated by the University's activities in 2020-21. The analysis indicates that the aggregate impact of these expenditures stood at approximately **£587 million** in economic output terms (see top panel of Figure 42). In terms of region, the majority of this impact (**£368 million**, **63%**) was generated in the **East of England**, with **£220 million** (**37%**) occurring in other regions across the UK.

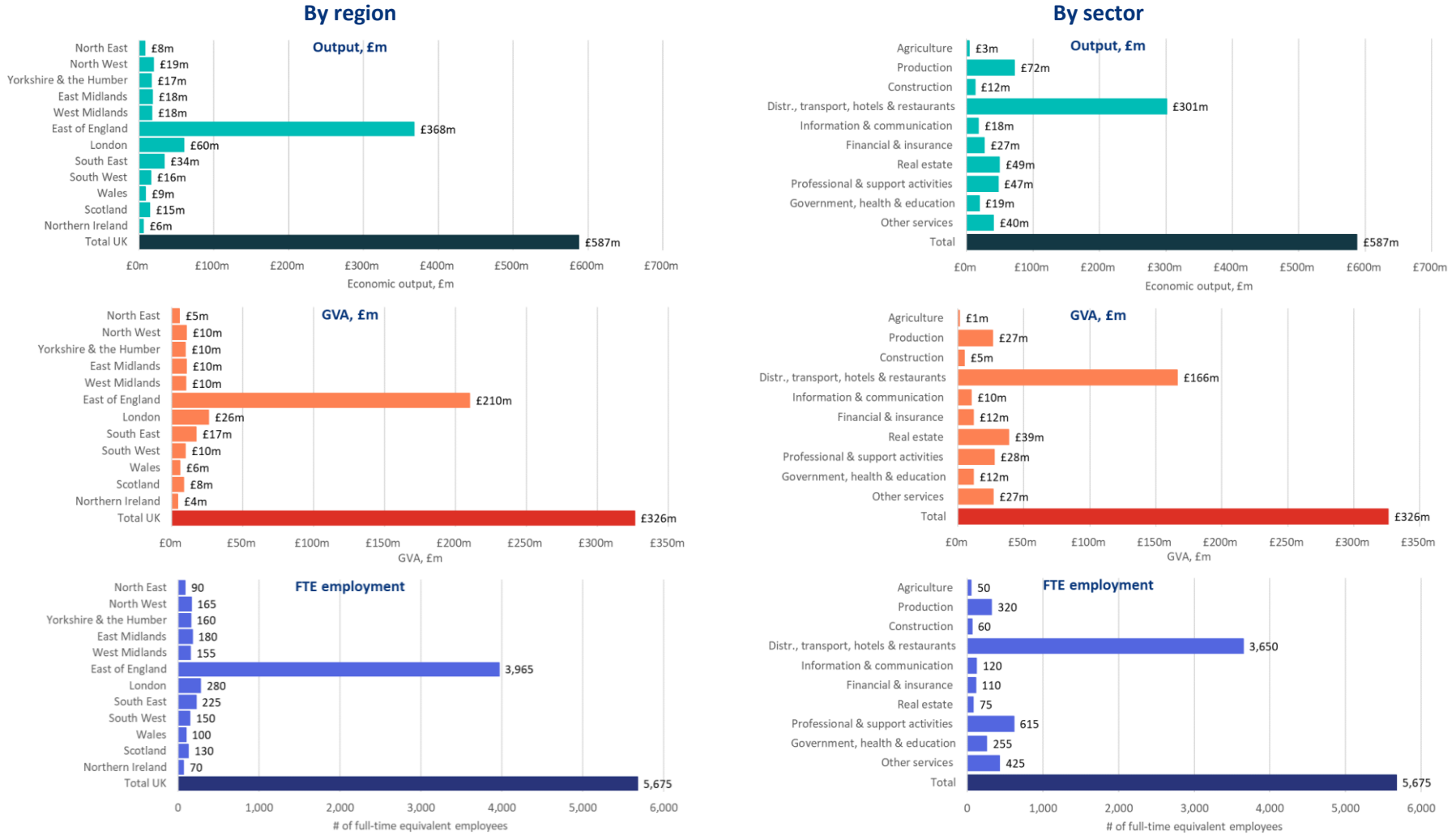
The impact of the University's contribution to tourism in 2020-21 stood at £587 million.

In terms of sector of impact, in addition to the impacts occurring in the **distribution, transport, hotels and restaurants sector** (**£301 million**, **51%**), there were also substantial impacts within other sectors, such as the **production sector** (**£72 million**, **12%**), the **real estate sector** (**£49 million**, **8%**), and the **professional and support activities sector** (**£47 million**, **8%**).[146]

In terms of the number of FTE jobs supported, the results indicate that the visitor spending generated by the University's activities supported a total of **5,675** FTE jobs across the UK economy in 2020-21, of which **3,965** are located in the East of England (presented in the bottom panel of Figure 42). In addition, the impact in terms of gross value added was estimated at **£326 million** across the UK economy as a whole, of which **£210 million** was generated within the East of England (see the middle panel of Figure 42).

[145] See Section 2.2 for more information.
[146] Again, for more detail on what industries are included in this high-level sector classification, please refer to Table 27 in Annex A2.1.

Figure 42 Total economic impact associated with the University's contribution to tourism in 2020-21, by region and sector



Note: Monetary estimates are presented in 2020-21 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***

Public Engagement & Museums: where the University meets the world

The eight University of Cambridge Museums and Botanic Garden represent the **UK's highest concentration of internationally important collections outside London**. With more than five million works of art, artefacts and specimens, the collections have supported nearly 300 years of investigation into the world around us, and resulted in over **one million visitors a year to the University** pre-COVID.

Public engagement through the Museums, collections and the University's annual **Cambridge Festival** are where the University meets the world, acting as a threshold to enable direct, two-way **connections** between academic research and the diversity of lived experience. The University's world-class scholarship and collections are active resources for inspiration, conversation and engagement with audiences and communities, from the **very local to the global**.

Professional staff in the University's Public Engagement Team and Museums are experts in helping the public engage with research and actively share their practice through **training for researchers**, **cross-sector partnerships** and playing a leadership role in the **regional and national cultural sector**. This enables them to act as routes to policy impact, as well as engaging the wider public with research.

"Making Cambridge research open to the public… creates awareness and recognition of vital issues that are being discussed, and/or need to be discussed, at an individual and community level, not just at the professional level."

Cambridge Festival attendee

Working with young people

A partnership with Cambridgeshire Virtual School, the dedicated team supporting the education of **young people in care**, has enabled the Museums to deliver a summer programme for unaccompanied young people seeking asylum.

Building on a pilot in 2021, the programme uses Museum collections as the focus for developing creativity, building spoken English through conversation, and making **cultural connections**. Cambridge Virtual School said: *"It helps the young people build up confidence in navigating a space they might not otherwise have experienced and that can sometimes be quite daunting, all while escaping their everyday realities and exploring the power of creative expression to communicate thoughts and process social encounters."*

Connecting local and global communities through collections

The Museums work to deepen understanding of our world. As well as having a reach of over **4 million visitors online annually**, they deliver **research-driven exhibitions and public programmes**.

For example, the Museum of Archaeology and Anthropology (MAA)'s *[Re:] Entanglements* exhibition (2021–22) was the culmination of the Museum Affordances project, involving **multiple partnerships in West Africa, the UK** and beyond, and funded by the Arts and Humanities Research Council. The project re-engaged with the ethnographic archive assembled by the Cambridge-educated colonial anthropologist, Northcote W. Thomas (1868–1936) in Southern Nigeria and Sierra Leone. The exhibition featured the work of **contemporary artists from Nigeria and Sierra Leone** alongside objects in the collection.

The collections also have long-standing partnerships across Cambridge and the region, for example with the **City Council's Independent Living Service** (working with elders in sheltered housing settings) and Children and Young People's Participation Service (ChYpPS, working with young people experiencing socio-economic disadvantage). These partnerships enable the University to continue to support some of Cambridge's most **vulnerable residents post-pandemic**, as well as lead research into how arts and cultural participation can enhance **health and wellbeing** outcomes.

Engaging globally through the Cambridge Festival

The annual research-led **Cambridge Festival** provides an opportunity for researchers and members of the public to come together to explore, discuss and debate the **big questions in society** today. Decades of experience running festivals, has shown the Public Engagement team the value of in-person engagement, the opportunities to exchange ideas, to listen, to share experiences and to have conversations in real time.

A move to digital engagement – driven by necessity during the pandemic – substantially increased the Festival's reach and democratised engagement, enabling the University to **share its research with new audiences globally**.

Over the past two years, the Festival's website has been accessed by people in over **170 countries**, with total viewing figures for online content standing at 160,000 and growing. One Festival attendee said: *"Please keep doing online events. People who are housebound due to disability or illness have suddenly found the world accessible to them… This also makes events accessible to parents with young children who cannot get babysitters, and people living in other parts of the country or world."*

Widening access to research

The **Engaged Researcher training** programme increases confidence, skills and competence to enable researchers and professional staff to engage effectively with stakeholders and communities. Training supports researchers to **share their expertise**, to listen and engage with different people's views, ideas and concerns beyond their lived experience, fostering an understanding of how this can be mutually beneficial both to their own research and to wider society.

Continuing to increase public access to the collections and stories they hold, new collections research centres are being created at MAA and the Sedgwick Museum, providing **greater physical access to collections** in store for researchers and wider communities than ever before. MAA, the Whipple Museum and the Botanic Garden have all delivered new online collections portals this year, while other University collections, including the University Library and Herbarium, are focusing on long-term digitisation projects. These dramatically enhance **global online access** to the collections, with a significant proportion of records available and fully searchable by the public for the first time.

7 The total economic impact of the University of Cambridge on the UK economy in 2020-21

The total economic impact on the UK economy associated with the University of Cambridge's activities in 2020-21 was estimated to be approximately **£29.8 billion** (Table 24). In terms of the components of this impact:

- The University of Cambridge's **research and knowledge exchange activities** accounted for **£23.12 billion** (**78%**) of this impact;
- The value of the University of Cambridge's teaching and learning activities stood at **£693 million** (**2%**);
- The impact of the University of Cambridge's **educational exports** was estimated at **£716 million** (**2%**);
- The impact generated by the **operating and capital spending of the University of Cambridge and its Colleges** stood at **£4.69 billion** (**16%**); and
- The impact generated with **tourism** spending associated with the University of Cambridge was estimated at **£587 million** (**2%**).

Table 24 Total economic impact of the University of Cambridge's activities in the UK in 2020-21 (£m and % of total)

Type of impact		£m
	Impact of research and knowledge exchange	**£23,119m**
	Research activities	£5,000m
	Knowledge exchange activities	£18,119m
	Impact of teaching and learning	**£693m**
	Students	£285m
	Exchequer	£408m
	Impact of educational exports	**£716m**
	Tuition fee income	£406m
	Non-tuition fee income	£311m
	Impact of University and College spending	**£4,686m**
	Direct impact	£2,643m
	Indirect and induced impact	£2,042m
	Impact of tourism	**£587m**
	Direct impact	£233m
	Indirect and induced impact	£354m
	Total economic impact	£29,801m

Note: All estimates are presented in 2020-21 prices, and rounded to the nearest £1m. Totals may not add up precisely due to rounding.
Source: London Economics' analysis

Compared to the University of Cambridge's total operational costs of approximately **£2.543 billion** in 2020-21[147], the total impact of the University of Cambridge's activities on the UK economy was

[147] From the University of Cambridge's and Colleges' total operating expenditure (excluding capital spending) in 2020-21 (£2,543 million), we excluded £158 million in depreciation costs and -£9 million in movement in pension cost as it is assumed that these are not relevant from a procurement perspective (i.e. these 'non-cash' costs are not accounted for as income by other organisations). Transfers to Colleges from the University (£80 million) were also excluded on the University accounts to ensure no double counting. All estimates are presented in 2020-21 prices, and rounded to the nearest £1m.

estimated at **£29.801 billion**, which corresponds to a **benefit to cost ratio of 11.7**. This compares to an average benefit-to-cost ratio among Russell Group institutions of approximately **5.5:1**.

In addition to the total impact on the UK economy as a whole it was possible to disaggregate *some* strands of the University of Cambridge's economic impact by sector and region and estimate the impacts in terms of economic output *as well as* GVA and FTE employment, including:

- The **£18.119 billion (61%)** impact of the University of Cambridge's **knowledge exchange activities;**
- The **£716 million (2%)** impact of the University of Cambridge's **educational exports**;
- The **£4.686 billion (16%)** impact generated by the **operating and capital spending of the University of Cambridge** and its Colleges;
- The **£587 million (2%)** impact generated by **tourism** spending associated with the University of Cambridge

Hence, approximately **£24,108 million (81%)** of the University of Cambridge's total impact of **£29,801 million** can be disaggregated in this way.[148] In terms of the breakdown by region, the analysis indicates that of this total of **£24,108 million, £13,620 million (56%)** was generated in the **East of England**, with **£10,488 million (44%)** occurring in **other regions** across the UK, including **£4,101 million** in **London**. In terms of sector, the University of Cambridge's activities resulted in particularly large impacts within the professional & support activities sector (**£8,937 million, 37%),** the government, health, and education sector (**£3,321 million**, **14%**), the distribution, transport, hotel, and restaurant sector **(£3,315 million, 14%**), and the production sector (**£3,116 million, 13%).**

The GVA and employment figures are presented in Table 25 and also Figure 43 below.

Table 25 Total GVA and employment impact of the University of Cambridge's activities in the UK in 2020-21 (£m and FTE)

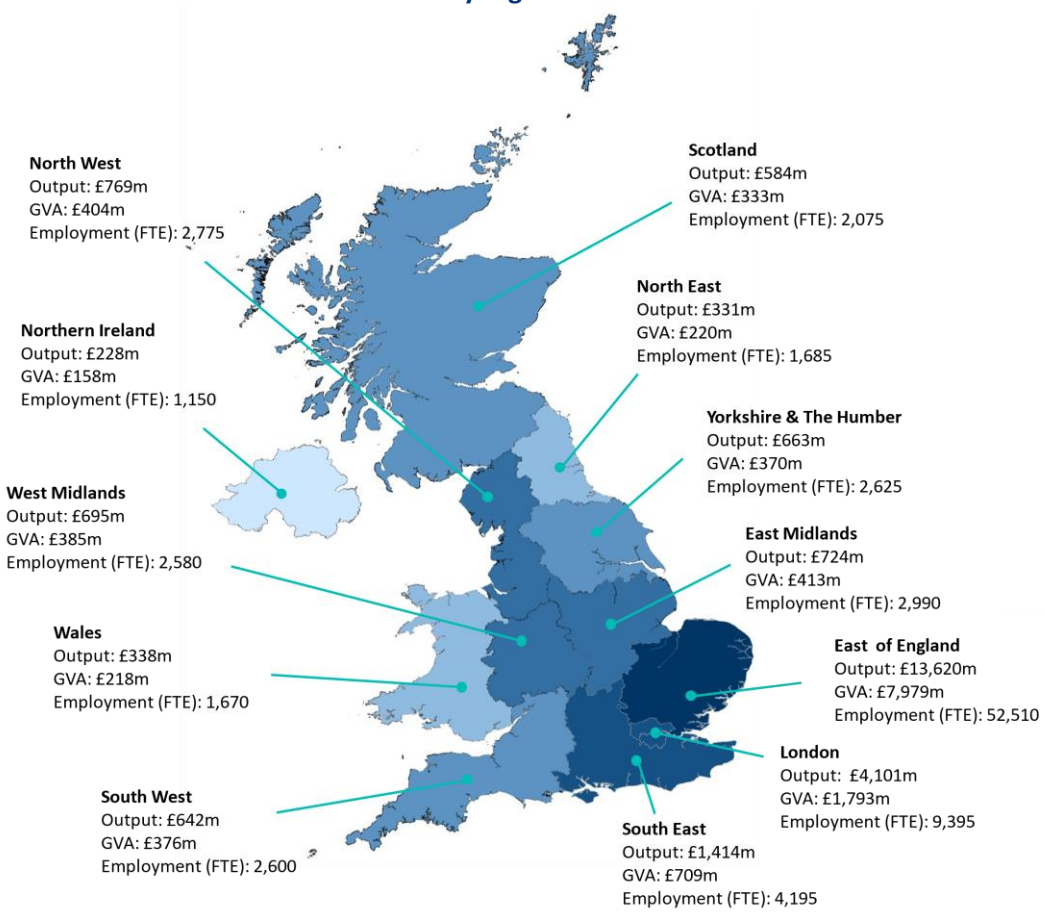
Type of impact		GVA (£m)	Employment (FTE)
	Impact of knowledge exchange only	**£10,048m**	**49,760**
	Direct impact of knowledge exchange activities	£4,151m	20,435
	Indirect and induced impact	£5,898m	29,325
	Impact of educational exports	**£426m**	**6,635**
	Tuition fee income	£243m	4,255
	Non-tuition fee income	£184m	2,380
	Impact of University and College spending	**£2,557m**	**24,185**
	Direct impact of spending	£1,610m	17,355
	Indirect and induced impacts	£947m	6,830
	Impact of tourism	**£326m**	**5,675**
	Direct impact	£133m	2,800
	Indirect and induced impact	£193m	2,875
	Total	**£13,358m**	**86,250**

Note: Presented in 2020-21 prices (rounded to nearest £1m for GVA or 5 for employment). Totals may not add up due to rounding.
Source: London Economics.

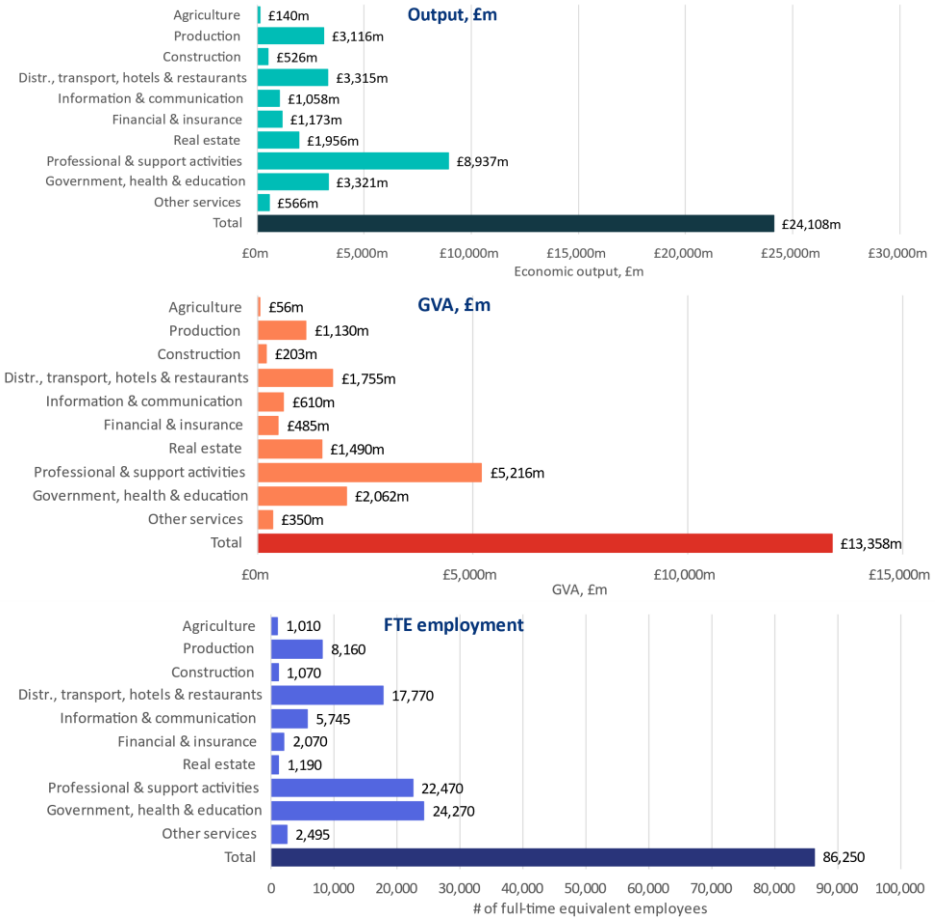
[148] The remaining £5,693 million of impact includes the impact of the University's research activities (£5.000 billion, where a breakdown by region or sector is not available as it was not possible to assign the geographic location or sectors of businesses benefiting from productivity spillovers generated by University research); and the impact of teaching and learning activities (£693 million, 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 graduates end up in).

Figure 43 Total economic impact of the University of Cambridge's activities in 2020-21, by region and sector (where possible)

By region



By sector



Note: Monetary estimates are presented in 2020-21 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.

Source: London Economics' analysis

7.1 Understanding the counterfactual

Within any economic analysis, it is important to identify an appropriate **counterfactual**. Given the significant extent of public funding that is accrued by the University of Cambridge to deliver world class teaching and research activities, in this case, the counterfactual refers to the potential economic impact that might be achieved with alternative uses of public funding. To understand the relative economic contribution of the University of Cambridge, we undertook an analysis of the costs and benefits associated with **almost six hundred government regulatory impact assessments**. This was undertaken in order to compare the return on investment (measured using the benefit-to-cost ratio (BCR)) associated with these alternative publicly funded government interventions, with that of the University.

To build a dataset of the BCRs of alternative public investment options, estimates of the total economic benefit and total economic costs were scraped from the individual regulatory impact assessments published by a number of UK government departments and public sector agencies.[149] In total, 579 regulatory impact assessments published on the government's website[150] between 2010 and 2022 were identified as being machine readable, but also containing non-missing best estimates for total costs and total benefits (thereby allowing for the calculation of a benefit-to-cost ratio).

Table 26 depicts the summary results for the benefit-cost ratio (BCR) and total benefit across the scraped impact assessments. The median BCR and benefit are **1.83** and **£64.9 million** respectively.

Table 26 Summary statistics for all impact assessments

	N	Minimum	Median	Maximum
Benefit-to-cost ratio	579	0	1.83	1772.73
Total benefit	579	£0.01m	£64.9m	£528,122m

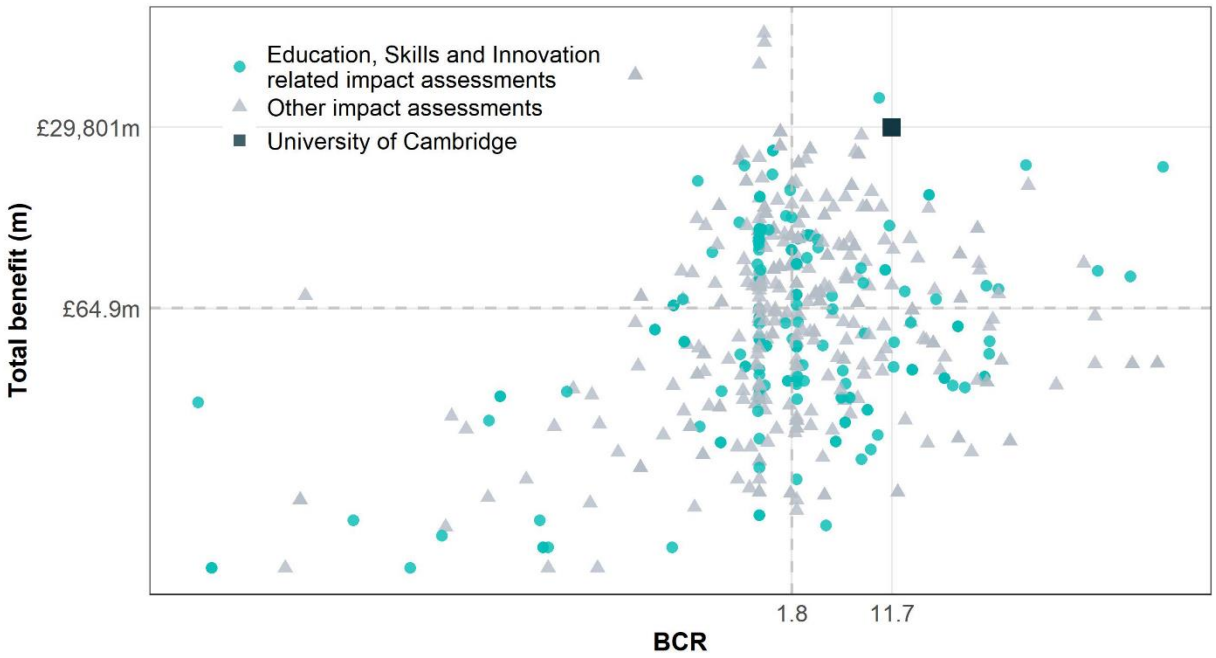
Source: London Economics analysis of UK government impact assessments between 2010 and 2022

Figure 44 plots the BCR and total benefit (in millions) for each of 579 impact assessments, alongside the equivalent metrics for the University of Cambridge (**11.7 and £29.8 billion**, respectively). Relative to other government interventions, the University of Cambridge clearly sits 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**. Notably, there is no intervention in the sample that brings higher economic benefit than the University, at a higher benefit-cost ratio.

[149] Departments included: Cabinet Office; Department for Business, Energy & Industrial Strategy; Department for Business, Innovation and Skills; Department for Digital, Culture, Media & Sport; Department for Education; Department for International Trade; Department for Transport; Department of Energy and Climate Change; Department of Health & Social Care; Education Funding Agency; Highways Agency; HM Revenue and Customs; HM Treasury; Ministry of Defense; Office of Communications.

[150] See: https://www.legislation.gov.uk/ukia?stage=Final

Figure 44 Total benefit and benefit-cost ratio (BCR) for all impact assessments



Note: 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 = £64.9m.
Source: London Economics analysis of UK government impact assessments between 2010 and 2022

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Annex 1 References

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Annex 2 Technical Annex

A2.1 Industry classifications for multi-regional Input-Output analysis

Table 27 provides an overview of the high-level industry classifications used throughout the multi-regional Input-Output analysis.

Table 27 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	
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	

Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	Information and communication [58-63]
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 (2020a) and UK SIC Codes (see Office for National Statistics, 2016)

A2.2 Impact of the University of Cambridge's teaching and learning activities

A2.2.1 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 A2.2.2) considered **five different higher education qualification groups** (i.e. five **'treatment' groups**) within the National Qualifications Framework: three at postgraduate level (higher degree (research), higher degree (taught) and 'other' postgraduate qualifications[151]) and two at undergraduate level (first degrees and 'other' undergraduate qualifications[152]).

[151] This relates to Labour Force Survey variables a) HIQUAL11 and HIQUAL15 value labels 'Level 7 Certificate' and b) HIQUAL4, HIQUAL5, HIQUAL8, HIQUAL11 and HIQUAL15 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).

[152] This relates to Labour Force Survey variables HIQUAL4, HIQUAL5, HIQUAL8, HIQUAL11 and HIQUAL15 value label 'other higher education below degree'. Additionally, Diplomas of Higher Education, Level 4 Certificates, and Level 6 Diplomas are included. 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

Table 28 presents these different postgraduate and undergraduate level 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 in Section 3.4.1, we compare the earnings of the group of individuals in possession of the 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 for the removal of other personal, regional, or socioeconomic characteristics that might influence *both* the determinants of qualification attainment as well as earnings/employment.

For the analysis of marginal returns, postgraduate degree 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 2 or more GCE 'A' Levels as their highest qualification. For the purposes of estimating the returns to all higher education qualifications, the highest level of professional or vocational qualification that an individual may be in possession of is Level 3 (for both those in possession of higher education qualifications (the treatment group) and those individuals not in possession of higher education qualifications (the control group)).

Table 28 Treatment and comparison groups used to assess the marginal earnings and employment returns to higher education qualifications

Treatment group – highest academic qualification	Comparison group - highest academic qualification	Treatment and comparison groups – highest possible vocational/professional qualification
Higher degree (research)	First degree	Level 3 vocational
Higher degree (taught)	First degree	Level 3 vocational
Other postgraduate	First degree	Level 3 vocational
First degree	2 or more GCE 'A' Levels	Level 3 vocational
Other undergraduate	2 or more GCE 'A' Levels	Level 3 vocational
2 or more GCE 'A' Levels	5 or more GCSEs at A*-C	Level 3 vocational

Source: London Economics

In addition to the analysis of higher education qualifications, we also included a separate specification comparing the earnings associated with GCE 'A' Levels to possession of 5 or more GCSEs at grades A*-C. This additional analysis was undertaken to provide an indication of the fact that the academic 'distance travelled' by a (small) proportion of students in the 2020-21 University of Cambridge cohort is **greater** than might be the case compared to those in possession of levels of prior attainment 'traditionally' associated with higher education entry. 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 intending to undertake a first degree 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 Cambridge was higher or lower than the 'traditional' counterfactual qualifications outlined in Table 28, 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 Cambridge**, we *deducted* the returns to undertaking an 'other

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.

undergraduate' qualification (relative to the possession of 2 or more GCE 'A' Levels) from the returns to undertaking a first degree (again relative to the possession of 2 or more GCE 'A' Levels). Similarly, to calculate the returns for a student **in possession of 5 or more GCSEs at grades A*-C undertaking a first degree at the University of Cambridge**, we *added* the returns to achieving 2 or more GCE 'A' Levels (relative to the possession of 5 or more GCSEs at grades A*-C) to the returns to undertaking a first degree (relative to the possession of 2 or more GCE 'A' Levels)[153].

A2.2.2 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, 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:

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

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:

- Gender;
- Age;
- Age squared;
- Ethnic origin;
- Region of usual residence;
- Qualifications held;
- 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;
- Interaction terms; and
- Yearly Dummies.

[153] In some instances, this stepwise calculation would 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 higher education qualification attainment, irrespective of the level of prior education attainment).

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. 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.

To estimate the impact of higher education qualifications on labour market outcomes using this methodology, we used information from **pooled Quarterly UK Labour Force Surveys between 2004 and 2022**. The selection of information over this period is the longest time for which information on education and earnings is available on a relatively consistent basis.

The resulting estimates of the marginal wage returns to higher education qualifications are presented in Table 29. In the earnings regressions, the coefficients relating to the different higher education qualifications provide an indication of the additional effect on hourly earnings associated with possession of the respective higher education qualification relative to the counterfactual level of qualification. To take an example, the analysis suggests that men aged between 31 and 35 in possession of a first degree achieve a **22.5%** hourly earnings premium compared to comparable men holding only 2 or more GCE 'A' levels as their highest level of attainment. The comparable estimate for women aged between 31 and 35 stands at **25.6%**.

In addition to estimating marginal earnings returns on average across *all subjects* of study, we repeated the econometric analysis to estimate these returns *separately by subject*[154]. Combining these subject-level returns with the number of students in the 2020-21 cohort of University of Cambridge students by subject, we then calculated **subject mix adjustment factors** (separately by gender and qualification level). These adjustment factors were then applied to the above average marginal wage returns (across all subjects) to **adjust for the specific subject composition of the University of Cambridge's student cohort**.

[154] The HESA Joint Academic Coding System (JACS) was used to classify subject areas. The following subject groups were distinguished: (1) Medicine & dentistry, (2) Subjects allied to medicine, (3) Biological sciences, (4) Veterinary science, (5) Agriculture & related subjects, (6) Physical sciences, (7) Mathematical sciences, (8) Computer science, (9) Engineering & technology, (A) Architecture, building & planning, (B) Social studies, (C) Law, (D) Business & administrative studies, (E) Mass communications & documentation, (F) Languages, (G) Historical & philosophical studies, (H) Creative arts & design, (I) Education, and (J) Combined.

Table 29 Marginal earnings returns to higher education qualifications (in all subjects), in % (following exponentiation), by gender and age band

Qualification level	Age band									
	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Men										
2 or more GCE A-levels[1]	8.9%	5.1%	9.9%	17.4%	24.1%	17.8%	24.9%	16.2%	19.2%	14.5%
Other undergraduate[2]			-3.8%	4.4%	7.5%	11.9%	16.6%	8.7%	7.5%	
First degree[2]		9.9%	16.0%	22.5%	20.9%	26.4%	18.4%	24.2%	22.9%	22.9%
Other postgraduate[3]		10.2%	12.1%	9.3%	4.4%	4.9%				
Higher degree (taught)[3]		9.6%	11.3%	8.1%	9.4%	11.7%	13.2%	13.3%	13.8%	14.8%
Higher degree (research)[3]			17.8%	17.7%	21.0%	20.9%	25.6%	28.8%	27.9%	47.1%
Women										
2 or more GCE A-levels[1]	8.3%	5.1%	10.3%	13.0%	17.8%	19.0%	13.8%	14.9%	13.8%	8.3%
Other undergraduate[2]			5.3%	10.6%	12.2%	14.3%	17.4%	22.9%	19.0%	
First degree[2]		9.9%	17.2%	25.6%	32.3%	30.2%	31.8%	31.9%	25.7%	
Other postgraduate[3]		8.7%	8.3%	11.5%	9.9%	9.5%	10.3%	13.4%	11.4%	
Higher degree (taught)[3]		8.0%	5.8%	9.4%	12.2%	16.5%	20.3%	15.5%	28.4%	
Higher degree (research)[3]		15.5%	19.2%	20.7%	31.3%	27.6%	39.1%	39.8%	38.3%	

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 2 or more GCE 'A' levels compared to 5 or more GCSEs at A*-C.

[2] Returns to first degrees and 'other' undergraduate qualifications are estimated relative to individuals holding 2 or more GCE 'A' levels as their highest qualification.

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

Source: London Economics' analysis of pooled Quarterly Labour Force Survey data for 2004-2022Q1

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:

$$Probit(EMPNOT_i) = \alpha + \gamma Z_i + \epsilon_i \qquad \text{for } i = 1 \text{ to n, where i is an individual LFS respondent}$$

The dependent variable adopted represents the binary variable $EMPNOT_i$, which is coded 1 if the individual is in employment and 0 otherwise[155]. 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:

- Gender;
- Age;
- Age squared;
- Ethnic origin;
- Region of usual residence;

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

- Qualifications held;
- 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 2020-21 cohort of UK domiciled students attending the University of Cambridge. Further, and again similar to the analysis of earnings returns, employment returns were estimated at the national (i.e. UK-wide) level.

The resulting estimated marginal employment returns to higher education qualifications (again on average across *all subjects* of study (i.e. before adjusting for the University of Cambridge's specific subject mix)) are presented in Table 30. In the employment regressions, the relevant coefficients provide estimates of the impact of the qualification on the probability of being in employment (expressed in percentage points). Again, to take an example, the analysis estimates that a man aged between 31 and 35 in possession of a first degree is **2.3 percentage points** more likely to be in employment than a man of similar age holding only 2 or more GCE 'A' levels as his highest level of education. The corresponding estimate for women stands at **4.4 percentage points**.

Table 30 Marginal employment returns to higher education qualifications (in all subjects), in percentage points, by gender and age band

Qualification level	Age band									
	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Men										
2 or more GCE A-levels[1]	-2.3		2.8	1.5	1.7	1.4	1.5			
Other undergraduate[2]			-2.7							
First degree[2]		-1.6	1.4	2.3	2.2	1.9	1.5	3.7	2.4	
Other postgraduate[3]		5.5		1.9		1.6	1.8	3.0		-5.8
Higher degree (taught)[3]			-1.1						2.4	2.8
Higher degree (research)[3]						2.1		4.3	7.9	8.9
Women										
2 or more GCE A-levels[1]		3.4	3.5	2.5		2.1	3.3	3.6		
Other undergraduate[2]				2.5	4.0					
First degree[2]		2.6	3.6	4.4	6.3	4.8	4.0	3.0	2.8	
Other postgraduate[3]		5.3	1.3	3.0	2.5	5.6	4.7	3.6	3.4	
Higher degree (taught)[3]			-1.8			3.7	2.1	3.3	5.7	4.1
Higher degree (research)[3]			-2.8	3.5		4.9	6.9	6.9	10.3	12.5

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 2 or more GCE 'A' levels compared to 5 or more GCSEs at A*-C.

[2] Returns to first degrees and 'other' undergraduate qualifications are estimated relative to individuals holding 2 or more GCE 'A' levels as their highest qualification.

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

Source: London Economics' analysis of pooled Quarterly Labour Force Survey data for 2004-2022Q1

A2.2.3 'Age-decay' function

Many existing economic analyses considering the lifetime benefits associated with higher education qualifications to date (e.g. Walker and Zhu, 2013) have 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 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 undergraduate (e.g. the estimated average age at enrolment among students in the 2020-21 cohort completing postgraduate taught degrees with the University of Cambridge on a part-time basis is **38**, compared to **24** 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 31 presents the assumed average age at enrolment, study duration, and age at completion for students in the 2020-21 University of Cambridge cohort[156].

Table 31 Average age at enrolment, study duration, and age at completion for students in the 2020-21 University of Cambridge 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	46	1	47
First degree	18	4	22			
Other postgraduate	25	2	27	37	2	39
Higher degree (taught)	24	1	25	38	2	40
Higher degree (research)	26	5	31	33	3	36

Note: All values have been rounded to the nearest integer. There were no students in the 2020-21 cohort of University of Cambridge students undertaking first degrees on a part-time basis.

Source: London Economics' analysis based on University of Cambridge HESA data

Given these characteristics, we adjust the methodology when estimating the returns to part-time (and later full-time) education attainment at the University of Cambridge, namely 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).

[156] 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 of Cambridge (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 Section 3.2 for more information)). In particular, the age at enrolment per qualification (based on the HESA data provided by the University of Cambridge) is calculated as the weighted average age at enrolment across students in the 2020-21 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 duration of study for both full-time and part-time students (by qualification level) is based on separate information provided by the University of Cambridge.

However, as the age of attainment increases, it is expected that a declining proportion of the potential value of the estimated earnings and employment benefit accrues to the individual[157]. 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 (potentially reflecting the investment nature of qualification acquisition).

Table 32 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 at the University of Cambridge in the 2020-21 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 a part-time postgraduate taught degree student, we assume that because of the late attainment (at age **40** (on average)), these students recoup only **66%** of the corresponding full-time earnings and employment premiums from that age (of attainment).

[157] 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 32 Assumed age decay adjustment factors for students in the 2020-21 University of Cambridge 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 Cambridge:

Full-time students Part-time students

Source: London Economics' analysis based on University of Cambridge HESA data

Note that the application of the 'age-decay' function implies that, for *all* qualification levels at the University of Cambridge, the estimated employment and earnings returns for part-time students are lower than the returns for comparable full-time students. These differences reflect the (relatively limited) wider economic literature on the returns to part-time study[158].

A2.2.4 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 above; see Annex A2.2.2) by undertaking the following elements of analysis (separately by qualification level, gender, and study mode):

1. We estimated the employment-adjusted **annual earnings** achieved by individuals in the counterfactual groups (i.e. 2 or more GCE 'A' Levels or a first degree).
2. We inflated these baseline or counterfactual earnings using the marginal earnings premiums and employment premiums (presented in Table 29 and Table 30 in Annex A2.2.2), adjusted to reflect late attainment (as outlined in Annex A2.2.3), to produce **annual age-earnings** profiles associated with the possession of each particular qualification.
3. We adjusted these age-earnings profiles to account for the fact that earnings would be expected to increase in real terms over time (at an assumed rate of **1.6%** per annum (based on average earnings growth rate forecasts estimated by the Office for Budget Responsibility (2022)[159]).
4. Based on the earnings profiles generated by qualification holders, and income tax and National Insurance rates and allowances for the relevant academic year[160], we computed the future stream of net earnings (i.e. post-tax)[161]. Using similar assumptions, we further calculated the stream of (employment-adjusted) foregone earnings (based on earnings in the relevant counterfactual group[162]) during the period of study, again net of tax, for full-time students only.

[158] In general, these studies suggest that the economic returns to studying part-time are lower than the economic returns associated with studying full-time. This is in part because part-time students are often already employed when undertaking their studies, so the marginal (or additional) impact of the higher education qualification is lower. For instance, six months after graduation, graduates undertaking part-time study were three percentage points more likely to be employed than graduates undertaking full-time study, and less than half as likely (3% compared to 7%) to be unemployed. See Callender et al. (2011).
According to the same study, the salaries of graduates from part-time study grow at a slower pace compared with their full-time peers. Part-time graduates are less likely to see their salaries increase and are more likely to see their salaries stagnate between 6 months and 42 months after graduation: specifically, during this period, 78% of part-time graduates and 88% of full-time graduates saw their salaries rise, while 16% of part-time and 8% of full-time graduates experienced no change in salaries, and 6% of part-time and only 2% of former full-time students saw a drop in their salaries.

[159] Specifically, we make use of the Office for Budget Responsibility's most recent long-term forecasts of nominal average earnings growth (for 2021-22 to 2071-72); see Office for Budget Responsibility (2022). The assumed 1.6% rate captures the compound annual growth rate in real earnings over the total period (adjusted from nominal to real terms based on projected Consumer Price Index (CPI) inflation over the same period (and based on the same source).

[160] i.e. 2020-21. Note that the analysis assumes fiscal neutrality, i.e. it is asserted that, in subsequent years, the earnings tax and National Insurance income bands grow at the same rate of annual earnings growth of 1.6%.

[161] The tax adjustment also takes account of increased VAT revenues for HMG, by assuming that individuals consume 91.5% of their annual income, and that 50% 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 (2022), while the proportion of consumption subject to VAT is based on VAT estimates provided by the Office for Budget Responsibility (no date).

[162] The foregone earnings calculations are based on the baseline or counterfactual earnings associated with either 2 or more GCE 'A' Levels or first degrees. Specifically, as outlined in Annex A2.2.1, some students in the 2020-21 University of Cambridge 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 2 or more GCE 'A' Levels as the highest qualification (adjusted for the age at enrolment and completion associated with the relevant qualification obtained). In addition,

5. We calculated the **discounted** stream of additional (employment-adjusted) future earnings compared to the relevant counterfactual group (using a standard discount rate of **3.5%** as presented in HM Treasury Green Book (HM Treasury, 2022)), and the discounted stream of foregone earnings during qualification attainment (for full-time students), to generate a present value figure. We thus arrive at the **gross graduate premium** (or equivalent for other qualifications).
6. The **discounted** stream of enhanced taxation revenues minus the tax income foregone during students' qualification attainment (where relevant) derived in element 4 provides an estimate of the **gross public benefit** associated with higher education qualification attainment.

Note that the gross graduate premium and gross public benefit for students undertaking qualifications at a level equivalent to or lower than the highest qualification that they are already in possession of was assumed to be zero. For example, it is assumed that a student in possession of a taught postgraduate degree undertaking an additional postgraduate qualification at the University of Cambridge 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.

The resulting gross graduate premiums and gross public purse benefits per student (by study mode, level of study, gender, and prior attainment) are presented in Table 33.

A2.2.5 Net graduate premium and net public benefit

Table 34 and Table 35 provide detailed information on the net graduate premiums and net public benefits for students associated with all higher education qualifications offered by the University of Cambridge (respectively), based on the 2020-21 cohort. Each table provides detailed information on the net graduate premiums/net Exchequer benefits by student domicile, study mode, study level, prior attainment, and gender[163]

the estimated foregone earnings for students previously in possession of postgraduate qualifications are based on the level of earnings associated with first degrees.

[163] In terms of gender, it is important to note that the economic benefits associated with higher education qualifications - expressed in *monetary terms* - are generally lower for women than men, predominantly as a result of the increased likelihood of spending time out of the active labour force. However, as with the majority of the wider economic literature, the *marginal benefits* associated with higher education qualifications - expressed as either the *percentage increase* in hourly earnings or enhanced probability of employment - are often greater for women than for men (see Annex A2.2.2).

Table 33 Gross graduate premiums and Exchequer benefits per student associated with HE qualification attainment at the University of Cambridge, by study mode, level, gender, and prior attainment

Level of study	Previous qualification and gender													
	GCSE		A-level		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			-£8,000	£33,000			-£11,000	-£8,000			-£11,000		-£11,000	
First degree	£211,000	£130,000	£124,000	£89,000	£140,000	£49,000	-£29,000	-£25,000	-£29,000	-£25,000	-£29,000	-£25,000		-£25,000
Other postgraduate							-£0,000	£18,000	-£41,000	-£36,000	-£41,000	-£36,000	-£41,000	-£36,000
Higher degree (taught)					£221,000	£125,000	£41,000	£41,000	-£4,000	-£14,000	-£17,000	-£16,000	-£17,000	-£16,000
Higher degree (research)							£37,000	£52,000	£8,000	£6,000	-£12,000	-£2,000	-£115,000	
Part-time students														
Other undergraduate	£22,000	£22,000	£1,000	£13,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
First degree														
Other postgraduate			£96,000		£93,000	£66,000	£11,000	£30,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)	£158,000	£116,000			£110,000	£74,000	£35,000	£42,000	£25,000	£13,000	£0	£0	£0	£0
Higher degree (research)					£227,000	£169,000	£129,000	£125,000	£114,000	£89,000	£87,000	£76,000	£0	£0
Gross Exchequer benefits														
Full-time students														
Other undergraduate			-£1,000	£34,000			-£2,000	-£1,000			-£2,000		-£2,000	
First degree	£233,000	£139,000	£153,000	£102,000	£166,000	£68,000	-£5,000	-£3,000	-£5,000	-£3,000	-£5,000	-£3,000		-£3,000
Other postgraduate							£23,000	£31,000	-£21,000	-£17,000	-£21,000	-£17,000	-£21,000	-£17,000
Higher degree (taught)					£232,000	£118,000	£56,000	£44,000	£8,000	-£6,000	-£8,000	-£7,000	-£8,000	-£7,000
Higher degree (research)							£107,000	£82,000	£74,000	£41,000	£52,000	£34,000	-£66,000	
Part-time students														
Other undergraduate	£20,000	£18,000	£1,000	£10,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
First degree														
Other postgraduate			£98,000		£94,000	£58,000	£15,000	£27,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)	£156,000	£100,000			£113,000	£65,000	£39,000	£36,000	£26,000	£11,000	£0	£0	£0	£0
Higher degree (research)					£244,000	£149,000	£148,000	£110,000	£129,000	£78,000	£100,000	£67,000	£0	£0

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2020-21 University of Cambridge cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at the University of Cambridge 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 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 34 Net graduate premiums per student associated with HE qualification attainment at the University of Cambridge, by study mode, level, gender, prior attainment, and domicile

Level of study	Previous qualification and gender													
	GCSE		A-level		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
Students from England														
Full-time students														
Other undergraduate			-£11,000	£29,000			-£14,000	-£11,000			-£14,000		-£14,000	
First degree	£198,000	£117,000	£111,000	£75,000	£127,000	£36,000	-£42,000	-£38,000	-£42,000	-£38,000	-£42,000	-£38,000		-£38,000
Other postgraduate							-£23,000	-£4,000	-£64,000	-£59,000	-£64,000	-£59,000	-£64,000	-£59,000
Higher degree (taught)					£209,000	£114,000	£30,000	£30,000	-£15,000	-£26,000	-£29,000	-£28,000	-£29,000	-£28,000
Higher degree (research)							£9,000	£25,000	-£19,000	-£21,000	-£39,000	-£30,000	-£143,000	
Part-time students														
Other undergraduate	£21,000	£21,000	-£1,000	£11,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000
First degree														
Other postgraduate			£70,000		£67,000	£40,000	-£15,000	£4,000	-£26,000	-£26,000	-£26,000	-£26,000	-£26,000	-£26,000
Higher degree (taught)	£132,000	£91,000			£84,000	£49,000	£9,000	£16,000	-£1,000	-£12,000	-£26,000	-£26,000	-£26,000	-£26,000
Higher degree (research)					£212,000	£155,000	£114,000	£110,000	£99,000	£74,000	£72,000	£61,000	-£15,000	-£15,000
Students from Wales														
Full-time students														
Other undergraduate			-£9,000	£32,000										
First degree			£123,000	£87,000			-£30,000					-£26,000		
Other postgraduate							-£23,000	-£4,000			-£64,000	-£59,000		
Higher degree (taught)							£33,000	£33,000			-£26,000			
Higher degree (research)							£10,000	£25,000						
Part-time students														
Other undergraduate	£22,000	£22,000		£12,000		-£0,000		-£0,000			-£0,000	-£0,000		
First degree														
Other postgraduate											-£26,000	-£26,000		
Higher degree (taught)								£20,000						
Higher degree (research)										£74,000				

Level of study	Previous qualification and gender													
	GCSE		A-level		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
Students from Scotland														
Full-time students														
Other undergraduate														
First degree			£116,000	£80,000	£132,000		-£38,000							
Other postgraduate							-£23,000	-£4,000			-£64,000	-£59,000		
Higher degree (taught)							£30,000	£30,000	-£16,000	-£26,000	-£29,000	-£28,000	-£29,000	
Higher degree (research)							£8,000	£24,000			-£40,000	-£31,000		
Part-time students														
Other undergraduate						-£4,000	-£4,000	-£4,000			-£4,000	-£4,000		
First degree														
Other postgraduate						£39,000	-£15,000	£4,000						
Higher degree (taught)												-£25,000	-£25,000	
Higher degree (research)								£109,000			£71,000	£60,000		
Students from Northern Ireland														
Full-time students														
Other undergraduate							-£14,000							
First degree			£111,000	£75,000										
Other postgraduate							-£23,000	-£5,000			-£64,000			
Higher degree (taught)								£30,000	-£16,000					
Higher degree (research)							£9,000				-£40,000	-£30,000		
Part-time students														
Other undergraduate					-£3,000		-£3,000				-£3,000			
First degree														
Other postgraduate							-£15,000	£4,000			-£26,000	-£26,000		
Higher degree (taught)														
Higher degree (research)							£113,000			£73,000				

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2020-21 University of Cambridge cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at the University of Cambridge 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 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***

Table 35 Net Exchequer benefits per student associated with HE qualification attainment at the University of Cambridge, by study mode, level, gender, prior attainment, and domicile

Level of study	Previous qualification and gender													
	GCSE		A-level		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
Students from England														
Full-time students														
Other undergraduate			-£7,000	£29,000			-£8,000	-£7,000			-£8,000		-£8,000	
First degree	£212,000	£118,000	£131,000	£81,000	£144,000	£46,000	-£26,000	-£24,000	-£26,000	-£24,000	-£26,000	-£24,000		-£24,000
Other postgraduate							£21,000	£29,000	-£24,000	-£20,000	-£24,000	-£20,000	-£24,000	-£20,000
Higher degree (taught)					£231,000	£117,000	£55,000	£42,000	£6,000	-£7,000	-£9,000	-£8,000	-£9,000	-£8,000
Higher degree (research)							£106,000	£81,000	£73,000	£40,000	£51,000	£33,000	-£67,000	
Part-time students														
Other undergraduate	£17,000	£15,000	-£2,000	£7,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000	-£3,000
First degree														
Other postgraduate			£97,000		£93,000	£57,000	£14,000	£26,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000
Higher degree (taught)	£155,000	£99,000			£112,000	£63,000	£38,000	£35,000	£25,000	£10,000	-£1,000	-£1,000	-£1,000	-£1,000
Higher degree (research)					£243,000	£148,000	£146,000	£108,000	£128,000	£77,000	£99,000	£66,000	-£1,000	-£1,000
Students from Wales														
Full-time students														
Other undergraduate			-£10,000	£25,000										
First degree			£119,000	£69,000			-£38,000					-£36,000		
Other postgraduate							£21,000	£29,000			-£24,000	-£20,000		
Higher degree (taught)							£52,000	£39,000			-£12,000			
Higher degree (research)							£106,000	£81,000						
Part-time students														
Other undergraduate	£16,000	£14,000		£6,000		-£4,000		-£4,000			-£4,000	-£4,000		
First degree														
Other postgraduate											-£1,000	-£1,000		
Higher degree (taught)								£32,000						
Higher degree (research)										£77,000				

Level of study	Previous qualification and gender													
	GCSE		A-level		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
Students from Scotland														
Full-time students														
Other undergraduate														
First degree			£126,000	£76,000	£140,000		-£31,000							
Other postgraduate							£21,000	£29,000			-£24,000	-£20,000		
Higher degree (taught)							£55,000	£42,000	£6,000	-£7,000	-£9,000	-£8,000	-£9,000	
Higher degree (research)							£107,000	£82,000			£52,000	£34,000		
Part-time students														
Other undergraduate						-£1,000	-£1,000	-£1,000			-£1,000	-£1,000		
First degree														
Other postgraduate						£57,000	£14,000	£26,000						
Higher degree (taught)												-£1,000	-£1,000	
Higher degree (research)								£110,000			£100,000	£67,000		
Students from Northern Ireland														
Full-time students														
Other undergraduate							-£8,000							
First degree			£131,000	£81,000										
Other postgraduate							£21,000	£29,000			-£24,000			
Higher degree (taught)								£42,000	£6,000					
Higher degree (research)							£107,000				£52,000	£34,000		
Part-time students														
Other undergraduate					-£2,000		-£2,000				-£2,000			
First degree														
Other postgraduate							£14,000	£26,000			-£1,000	-£1,000		
Higher degree (taught)														
Higher degree (research)							£148,000			£78,000				

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2020-21 University of Cambridge cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at the University of Cambridge 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 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***

A2.3 Impact on educational exports

A2.3.1 Additional information on the 2020-21 cohort of non-UK domiciled students studying at the University of Cambridge

Table 36 presents a detailed breakdown of the 2020-21 non-UK domiciled University of Cambridge cohort, by domicile, level, and mode of study.

Table 36 Non-UK domiciled students in the 2020-21 cohort of University of Cambridge students, by level of study, mode of study and domicile

Level and mode of study	Domicile		
	EU	Non-EU	Total
Full-time			
Other undergraduate	5	25	**30**
First degree	245	550	**795**
Other postgraduate	10	10	**20**
Higher degree (taught)	435	1,195	**1,630**
Higher degree (research)	315	585	**900**
Total	**1,010**	**2,365**	**3,375**
Part-time			
Other undergraduate	0	5	**5**
First degree	0	0	**0**
Other postgraduate	0	0	**0**
Higher degree (taught)	0	0	**0**
Higher degree (research)	0	5	**5**
Total	**0**	**10**	**10**
Total			
Other undergraduate	5	30	**35**
First degree	245	550	**795**
Other postgraduate	10	10	**20**
Higher degree (taught)	435	1,195	**1,630**
Higher degree (research)	315	590	**905**
Total	**1,010**	**2,375**	**3,385**

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

A2.3.2 Net tuition fee income per international student

Table 37 presents estimates of the net tuition fee income per international student in the 2020-21 University of Cambridge cohort (over the entire study duration), by domicile, level of study, and mode of study.

Table 37 Net tuition fee income per international student in the 2020-21 cohort of University of Cambridge students, by level of study, mode, and domicile

Level	EU domiciled students		Non-EU domiciled students	
	Full-time	Part-time	Full-time	Part-time
Other undergraduate	£5,000	£2,000	£25,000	£12,000
First degree	£17,000		£91,000	
Other postgraduate	£20,000	£25,000	£56,000	£53,000
Higher degree (taught)	£10,000		£29,000	£52,000
Higher degree (research)	£23,000	£12,000	£99,000	£28,000

Note: Gaps may arise where there are no students in the 2020-21 University of Cambridge cohort expected to complete the given qualification (of the given characteristics). All estimates are presented in 2020-21, discounted to reflect net present values, and rounded to the nearest £1,000.
Source: London Economics' analysis

A2.3.3 Assumed average stay durations among international students

As outlined in Section 4.3.2, to estimate the non-tuition fee income associated with non-UK students in the 2020-21 University of Cambridge 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.

In particular, 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[164]. 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 38.

Table 38 Assumed average stay durations (in weeks) for non-UK domiciled students, by study level and study mode

Level of study	Domicile	
	EU (outside UK)	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)

[164] There may be significant variation around these assumed average stay durations depending on individual students' circumstances, such as country of origin, parental income etc. Further note that we have made separate adjustments to the non-tuition fee expenditures of international students in the cohort during the 2020-21 academic year to account for the increased likelihood of students returning to their home countries during the Covid-19 pandemic (see Section 4.3.2).

A2.3.4 Non-fee income per international student

Table 39 presents estimates of the non-tuition fee income per international student in the 2020-21 University of Cambridge cohort (over the entire study duration), by domicile, level of study, and mode of study.

Table 39 Non-fee income per international student in the 2020-21 cohort of University of Cambridge students, by level of study, mode, and domicile

Level	EU domiciled students		Non-EU domiciled students	
	Full-time	Part-time	Full-time	Part-time
Other undergraduate	£9,000	£14,000	£10,000	£15,000
First degree	£43,000		£47,000	
Other postgraduate	£28,000	£38,000	£28,000	£38,000
Higher degree (taught)	£13,000		£13,000	£38,000
Higher degree (research)	£72,000	£56,000	£72,000	£56,000

Note: Gaps may arise where there are no students in the 2020-21 University of Cambridge cohort expected to complete the given qualification (of the given characteristics). All estimates are presented in 2020-21 prices, discounted to reflect net present values, and rounded to the nearest £1,000.

Source: London Economics' analysis

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