The Economic and Social impact of Queen Mary University of London

Final Report

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About London Economics

London Economics is one of Europe's leading specialist economics and policy consultancies and has its head office in London.

We advise clients in both the public and private sectors on economic and financial analysis, policy development and evaluation, business strategy, and regulatory and competition policy. Our consultants are highly qualified economists with experience in applying a wide variety of analytical techniques to assist our work, including cost-benefit analysis, multi-criteria analysis, policy simulation, scenario building, statistical analysis and mathematical modelling. We are also experienced in using a wide range of data collection techniques including literature reviews, survey questionnaires, interviews and focus groups.

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

w: londoneconomics.co.uk   e: info@londoneconomics.co.uk   🐦: @LE_Education
t: +44 (0)20 3701 7700   f: +44 (0)20 3701 7701   @LondonEconomics

Authors

Jack Booth, Economic Consultant, jbooth@londoneconomics.co.uk

Calum Kennedy, Economic Analyst, ckennedy@londoneconomics.co.uk

Katharina Knuth, Economic Analyst, kknuth@londoneconomics.co.uk

Ella Lingard, Economic Analyst, elingard@londoneconomics.co.uk

Maike Halterbeck, Divisional Director, mhalterbeck@londoneconomics.co.uk

Dr Gavan Conlon, Partner, gconlon@londoneconomics.co.uk

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Foreword

Queen Mary University of London is a leading research-intensive university with a difference – one that opens the doors of opportunity to anyone with the potential to succeed. It's therefore important that we understand our impact not just in terms of social mobility, at which we excel, but also our wider economic impact.

To do this, we have commissioned London Economics to conduct an independent analysis of the economic impact of our work. I am proud to share the findings of this analysis, and I would like to thank and congratulate the community of Queen Mary staff, students, alumni and partners, whose collective work has led to this significant impact.

In 2021/22, Queen Mary delivered a total economic benefit to the UK economy of £4.4 billion. I would like to draw out here two aspects of these findings that demonstrate Queen Mary's distinctive contribution as one of the UK's leading global universities.

First, value for money. This report has found that we generate economic impact more efficiently than many of our peers. For every £1 we spent in 2021/22, we generated £7 of economic benefit. This ratio is higher than many other universities; the average for all Russell Group universities is £5.50 of benefit for every £1 spent. In times of economic challenge, it is particularly important that we generate the greatest return on investment, and I am pleased that this report confirms just that.

Second, Queen Mary is unique in the way in which we generate economic benefit. The report has considered the impact of all our activities including research and innovation, teaching and learning, Queen Mary's expenditure and international education. What it finds is that Queen Mary is distinctive for balancing the generation of that impact across all four areas. Our 2030 Strategy sets out our aims to deliver excellence in research and education, underpinned by local and global engagement. I am pleased to see in these findings evidence of our strengths in all these areas.

The report identifies many further significant economic impacts which are created by the University. I am particularly proud of the distribution of the economic benefit of Queen Mary's expenditure. While we are a global University, our roots are in East London and it is this sense of place and belonging that defines us. We are truly embedded here; our close working with partners helps deliver this significant benefit and is brought to life through some of the case studies included in the report. It is therefore absolutely right that the greatest direct benefit of Queen Mary's £610 million of expenditure on goods, services and as an employer is felt in the London boroughs of Tower Hamlets, Newham, Redbridge, Waltham Forest, Barking and Dagenham, Hackney and Havering.

In other respects, our economic impact is distributed more evenly across the UK. In 2021/22, the economic impact generated by Queen Mary's activities supported a total of 13,865 FTE jobs across the UK economy, of which 7,930 were located in London and the remaining 5,935 were located outside of London.

Finally, I would like to highlight the economic value of a Queen Mary degree. This report has found that a typical Queen Mary full-time undergraduate degree generates an additional £94,000 in earnings, and a full-time postgraduate taught or research degree between £97,000 and £148,000 in additional earnings, respectively. This finding evidences our commitment as a University to not only opening the doors of opportunity but supporting the aspiration of our students, with many of our London students the first in their family to go to university. The additional net benefit to the Exchequer and therefore the wider economy is £90,000 and £108,000-£150,000, respectively.

We are living through a period in which the value of universities in the UK is being questioned. Of course, challenge is necessary and important; it is vital for the future of the UK that its university sector remains a leader across the world. It is also important that there is a place in this debate for clear, objective evidence. This report contributes to that evidence base, demonstrating the value of this great university.

Professor Colin Bailey CBE, President and Principal

Executive Summary

£ The aggregate economic impact of Queen Mary

The total economic impact on the UK economy associated with Queen Mary's activities in the 2021-22 academic year was estimated at approximately **£4,401 million** (see Table 1)[1]. In terms of the components of this impact, the value of the University's **research and knowledge exchange activities** stood at **£1,438 million** (**33%** of total), while the impact of the University's **teaching and learning activities** accounted for **£1,253 million** (**28%**). The impact associated with the University's international students stood at **£1,099 million** (**25%**), while the impact generated by the **operating and capital expenditures of the University** accounted for **£610 million** (**14%**). In terms of the sources of core economic impact, unlike many other higher education institutions that have undertaken comparable analyses, there is a particularly even balance across the four major strands of activity at Queen Mary.

In terms of the number of FTE jobs supported, the results indicate that the total impact generated by the Queen Mary's activities supported a total of **13,865** FTE jobs across the UK economy in the 2021-22 academic year, of which **7,930** were located in **London** and the remaining **5,935** were located outside of **London**.

Table 1   **Total economic impact of Queen Mary's activities in the UK in the 2021-22 academic year (£m and % of total)**

Type of impact		£m	%
	Impact of research and knowledge exchange	**£1,438m**	**33%**
	Research activities	£1,152m	26%
	Knowledge exchange activities	£286m	7%
	Impact of teaching and learning	**£1,253m**	**28%**
	Students	£626m	14%
	Exchequer	£627m	14%
	Impact of international students	**£1,099m**	**25%**
	Tuition fee income	£724m	16%
	Non-tuition fee income	£376m	9%
	Impact of the University's spending	**£610m**	**14%**
	Direct impact	£565m	13%
	Indirect and induced impact	£45m	1%
	Total economic impact	**£4,401m**	**100%**

Note: All estimates are presented in 2021-22 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

Compared to the University's total operational costs of approximately **£631 million** in the 2021-22 academic year[2], the total impact of Queen Mary's activities on the UK economy was estimated at

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

[2] This relates to the University's total operating expenditure (including depreciation costs and movements in pension provisions), excluding capital expenditure.

£4,401 million, which corresponds to a **benefit to cost ratio of approximately 7.0:1**. This compares to an average benefit-to-cost ratio among Russell Group institutions of approximately **5.5:1**[3].

London Economics have undertaken a number of economic and social impact analyses for a range of UK higher education institutions. Using a comparable methodological approach as the one presented here, compared to the benefit to operating expenditure ratio of QMUL of **7.0:1** (associated with the 2021-22 academic year), the benefit to operating expenditure ratio posted by UCL (2018-19), the University of Edinburgh (2021-22), Warwick University (2019-20) and the University of Southampton (2020-21) were **5.9**, **6.9**, **5.8**, and **7.4** respectively.

In addition to the total impact of **£4,401 million** on the UK economy as a whole, it is also possible to estimate the economic impact of a number of strands of analysis on a regional basis, including the economic impact of the University in London. Specifically, we estimated the regional-level economic impacts associated with the University's knowledge exchange activities, of the University's international students, and the University's operating and capital expenditure. Given the difficulties in tracking graduate mobility over the working life and the location where productivity spillovers from the University's research activities may have occurred, it is not possible to allocate the economic impact associated with the University's teaching and learning activity or research activities to different geographical areas.

Following this approach, approximately **£1,996 million** (**45%**) of Queen Mary's total impact of **£4,401 million** can be disaggregated geographically (see Section 6.1 for more information), of which approximately **£1,325 million** (**66%**) occurred in London, with the remaining **£671 million** (**34%**) of occurring outside of London.

The impact of Queen Mary's research and knowledge exchange activities

To estimate the **direct** economic impact associated with Queen Mary's research, we used information on the total research-related income accrued by the University in the 2021-22 academic year, which stood at **£167 million**. 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 **£103 million** in the 2021-22 academic year, resulting in a **net direct research impact** of **£64 million**.

Existing academic literature[4] indicates that there is strong evidence of **productivity spillovers** from public investment in university research. Applying estimates from the literature, our analysis implies that **every £1 million invested in research at Queen Mary results in an additional economic output of £6.51 million across the UK economy**.

Combining the **net direct impact** of Queen Mary's research activities **(£64 million)** with the resulting **productivity spillovers** accrued by other organisations across the UK (**£1,088 million**), the total impact associated with Queen Mary's research activities in the 2021-22 academic year was estimated at **£1,152 million** (see Figure 1).

In addition to Queen Mary's research, the analysis estimated the impact associated with **knowledge exchange activities** at the University, including the activities of the University's **spinout** and **start-up** companies; **contract research** services; **consultancy services**; **business and community courses**;

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[3] See London Economics (2017). The analysis of the economic impact of all Russell Group institutions (including Queen Mary) was based on the 2015-16 academic year.
[4] See Haskel and Wallis (2010), and Haskel et al. (2014).

facilities and equipment hire; and **licensing of the 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 University's active spinout and start-up companies, as well as income received by the University for its wider knowledge exchange activities. The **total direct, indirect, and induced impact** 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 Queen Mary's knowledge exchange activities generated a total of **£286 million** of impact across the UK economy in the 2021-22 academic year. Although driven in part by the success of its **spinout** companies, there is a balanced contribution across all of Queen Mary's consultancy, contract research, IP Licensing, facilities and equipment hire, and business and community course activities.

The total economic impact associated with Queen Mary's research and knowledge exchange activities in the 2021-22 academic year was therefore estimated at **£1,438 million** (see Figure 1).

Figure 1   Total impact of Queen Mary's research and knowledge exchange activities in the 2021-22 academic year, £m
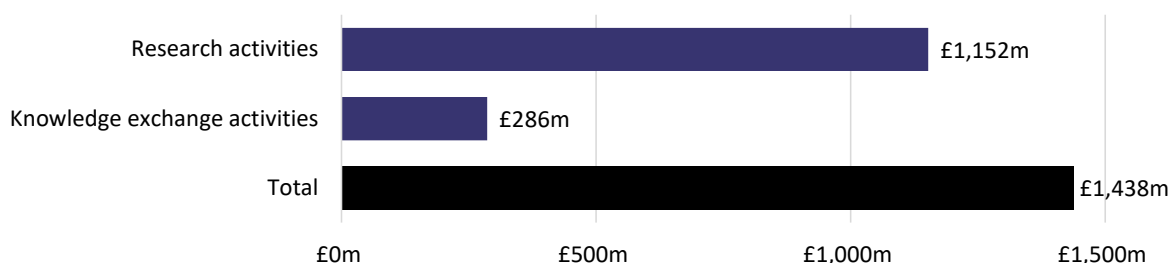
Note: All values are presented in 2021-22 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

The impact of Queen Mary's teaching and learning activities

The analysis of the impact of Queen Mary's teaching and learning activities estimates the **enhanced employment and earnings benefits to graduates**, and, separately, the **additional taxation receipts to the public purse** associated with higher education qualification attainment at the University[5]. The analysis is adjusted for the characteristics of the **7,440** UK domiciled students who started a qualification at Queen Mary in the 2021-22 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 UK domiciled students in the 2021-22 cohort completing a **full-time first degree** (with a Level 3[6] qualification as their highest level of prior attainment) stands at approximately **£94,000** (in 2021-22 money terms). Separately, taking account of the benefits and costs to the public purse, the analysis indicates that the corresponding **net Exchequer benefit** associated with these students stands at **£90,000**.[7]

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[5] The estimation of the net graduate premiums and net Exchequer benefits is based on a detailed econometric analysis of the Labour Force Survey. The analysis considers the impact of higher education qualification attainment on earnings and employment outcomes; however, as no information is specifically available on the particular HEI attended, the analysis is not specific to Queen Mary alumni. Rather, the findings from the analysis are adjusted to reflect the characteristics of the 2021-22 cohort of Queen Mary 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).

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

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

The net graduate premiums and net Exchequer benefits were combined with information on the number of students starting qualifications at Queen Mary in the 2021-22 academic year and expected completion rates. The aggregate economic impact generated by the teaching and learning activities associated with the 2021-22 cohort stood at approximately **£1,253 million** (see Table 2). This is split evenly between the Exchequer and students/graduates: **£626 million** (**50%**) of the total economic benefit generated is accrued by students/graduates undertaking qualifications at Queen Mary, while the remaining **£627 million** (**50%**) is accrued by the Exchequer.

Table 2 **Aggregate impact of Queen Mary's teaching and learning activities associated with the 2021-22 cohort (£m), by type of impact, domicile, and level of study**

Beneficiary and study level	Domicile				
	England	**Wales**	**Scotland**	**Northern Ireland**	**Total**
Students	**£613m**	**£9m**	**£2m**	**£2m**	**£626m**
Undergraduate	£425m	£6m	£0m	£0m	**£432m**
Postgraduate	£188m	£3m	£2m	£1m	**£194m**
Exchequer	**£615m**	**£8m**	**£3m**	**£2m**	**£627m**
Undergraduate	£412m	£4m	£0m	£0m	**£417m**
Postgraduate	£203m	£3m	£2m	£1m	**£210m**
Total	**£1,228m**	**£17m**	**£5m**	**£3m**	**£1,253m**
Undergraduate	£838m	£10m	£1m	£0m	**£849m**
Postgraduate	£391m	£7m	£4m	£3m	**£404m**

Note: All estimates are presented in 2021-22 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 Queen Mary's educational exports

With Queen Mary being an attractive destination for 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 Queen Mary'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'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 **5,745** non-UK domiciled students who started qualifications at Queen Mary in the 2021-22 academic year. Of these students, **610** (**11%**) were EU-domiciled, and **5,135** (**89%**) were from non-EU jurisdictions.

Combining the estimates of tuition fee income (net of Queen Mary's cost of fee waivers and bursaries for international students) and non-tuition fee income associated with international students in the 2021-22 cohort, the **total export income** (**i.e. direct impact**) generated by this cohort stood at **£364 million**. Almost two-thirds of this income (**£231 million**) was generated from international students' (net) tuition fee expenditure accrued by Queen Mary, while just over a third (**£133 million**) was generated from international students' non-tuition fee expenditure (e.g. including costs related to accommodation, subsistence, course-related purchases, and travel).

> **The impact of the export income generated by the 2021-22 Queen Mary cohort of international student starters stood at £1.10 billion.**

The total (direct, indirect, and induced) economic impact associated with this income was again estimated using relevant economic multipliers, identifying the extent to which the 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 2021-22 the Queen Mary cohort amounts to **£1,099 million**. Of this total, **£724 million** was associated with international students' (net) **tuition fees**, and **£376 million** was associated with these students' non-tuition fee expenditures over the duration of their studies at Queen Mary (see Figure 2).

The University's activities in respect of **educational exports** supported an estimated **7,135 full-time equivalent jobs** across the UK as a whole, of which **4,185 jobs** were located in London. This is in addition to the number of jobs supported as a result of the impact associated with Queen Mary's institutional expenditures or the impact associated with Queen Mary's knowledge exchange activities.

Figure 2 **Impact of Queen Mary's educational exports associated with international students in the 2021-22 cohort (£m), by domicile and type of income**
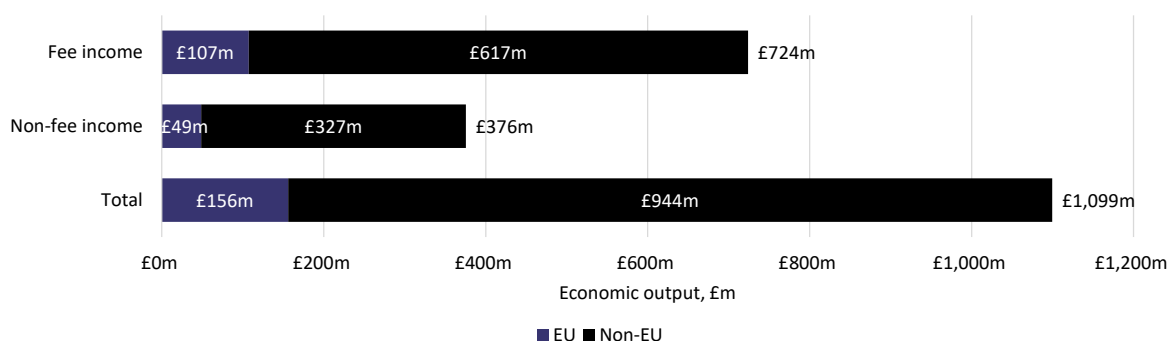
Note: All estimates are presented in 2021-22 prices, discounted to reflect net present values, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

The impact of Queen Mary's institutional expenditure

Queen Mary'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 Queen Mary's physical footprint was based on the operating and capital expenditures of the University. In the 2021-22 academic year, Queen Mary incurred a total of **£565 million** of expenditure (including **£509 million** of

> **The impact of Queen Mary's expenditure on the UK economy in the 2021-22 academic year stood at £610 million.**

operating expenditure and **£56 million** of capital expenditure)[8].

Again, the direct increase in economic activity resulting from the expenditures of Queen Mary 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 Queen Mary's expenditures in the 2021-22 academic year was estimated at **£610 million** (see Section 5).

In terms of **region**, almost three-quarters of this impact (**£410 million, 67%**) occurred in **London**, while the remainder (**£201 million**, **33%**) was accrued across the rest of the UK.

In relation to the **sector of impact**, in addition to the impacts occurring in the government, health, and education sector itself (**£245 million**, **40%**), there are also large impacts felt within other sectors, including the **distribution, transport, hotel, and restaurant sector** (**£86 million**, **14%**), the **professional and support activities sector** (**£64 million**, **11%**), and the **production sector** (**£60 million**, **10%**).

Figure 3   Impact associated with Queen Mary's expenditure in the 2021-22 academic year (£m)
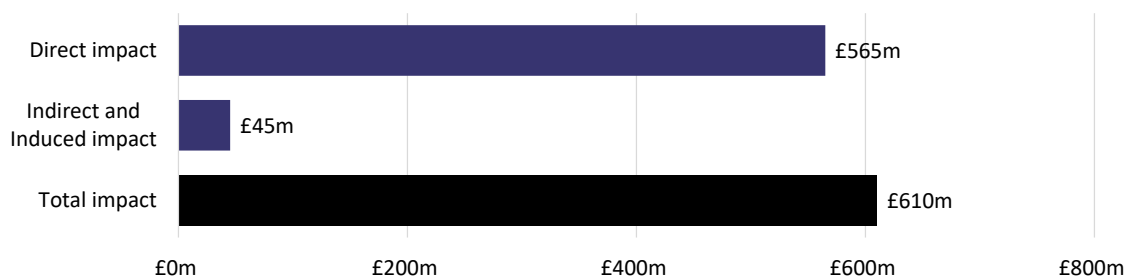
Note: All estimates are presented in 2021-22 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

In terms of the number of FTE jobs supported, Queen Mary's expenditure supported a total of **4,275** FTE jobs across the UK economy in the 2021-22 academic year of which **2,570** (**60%**) were based in London. The remaining **1,715** jobs supported by the activities of Queen Mary are located across the rest of the UK[9].

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[8] The total operational expenditure (excluding capital expenditure) of Queen Mary in 2021-22 stood at **£1,389 million**. From this, for the purpose of the analysis, we excluded **£61 million** in depreciation costs and **£242 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).
[9] Totals may not add up precisely due to rounding.

1   Introduction

London Economics were commissioned to assess the **economic impact of Queen Mary to the United Kingdom**, focusing on the 2021-22 academic year. Queen Mary contributes to the UK's national prosperity through a range of activities and channels, and the analysis is split into:

- ■   The impact of Queen Mary's **research and knowledge exchange activities**;
- ■   The economic contribution of Queen Mary's provision of **teaching and learning**;
- ■   The impact of Queen Mary's contribution to **educational exports**; and
- ■   The impact of Queen Mary's **operating and capital expenditures**.

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 Queen Mary's research and knowledge exchange activities. To estimate the impact of the research undertaken at Queen Mary, we combine information on the research-related income accrued by the University in the 2021-22 academic year with estimates from the wider economic literature on the extent to which public investment in research activity results in additional private sector productivity (i.e. positive 'productivity spillovers'). In addition, the analysis estimates the direct, indirect, and induced impact associated with the University's knowledge exchange activities, 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; facility and equipment hire; and licensing of the University's intellectual property (IP) to other organisations.

In **Section 3**, we assess the improved labour market earnings and employment outcomes associated with higher education attainment at Queen Mary. Through an assessment of the expected lifetime benefits and costs associated with educational attainment, we estimate the net economic benefits of the University's teaching and learning activity to its graduates and the public purse (through enhanced taxation receipts), focusing on the cohort of **7,440** UK domiciled students who started higher education qualifications at Queen Mary in the 2021-22 academic year.

In addition to these UK domiciled students, there were a further **5,745** international students commencing their studies in the 2021-22 cohort of Queen Mary students. These students contribute to the value of UK educational exports through their tuition fees as well as their non-fee (i.e. living cost) expenditures during their studies. **Section 4** assesses the direct, indirect, and induced economic impacts generated by this fee and non-fee income associated with the University's 2021-22 cohort of international students.

Given that Queen Mary is a major employer and supports its core activities through significant expenditures, the University's substantial physical footprint supports jobs and promotes economic growth throughout London and the wider UK economy. **Section 5** presents our estimates of the direct, indirect, and induced economic impacts associated with the operating and capital expenditures incurred by Queen Mary in the 2021-22 academic year.

Finally, **Section 6** of this report **summarises** our main findings.

2 The impact of Queen Mary's research and knowledge exchange activities

2.1 Economic impact of Queen Mary's research

In this section, we outline our analysis of the **economic impact of Queen Mary's research activities**. 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 to the rest of the UK economy.

2.1.1 Direct research impact

To estimate the **direct impact** generated by Queen Mary's research activities, we used information on the total research-related income accrued by the University in the 2021-22 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 by the Research England.

Aggregating across these sources, the total research-related income accrued by the University in the 2021-22 academic year stood at **£167 million** (see 0). Approximately **26%** (**£44 million**) of this income was received through recurrent research grant funding from Research England, with an additional **25%** (**£41 million**) received from the UK Research Councils, **26%** (**£44 million**) from UK charities, and **16%** (**£27 million)** from other UK sources[10]. In addition, in terms of funding from international sources, **5%** (**£9 million**) of the University's research-related income was derived from EU research grants and contracts, whilst the remaining **2%** (**£4 million**) was from non-EU sources.

To arrive at the net direct impact of Queen Mary's research activities on the UK economy, we deducted the **costs to the public purse** of funding Queen Mary's research activities from the above total research income in the 2021-22 academic year. These public costs include the funding provided by the UK Research Councils (**£41 million**), recurrent research grants provided by Research England (**£44 million**), and other research income from UK central government bodies, Local Authorities, and health and hospital authorities (**£19 million**). Deducting these total public purse costs (**£103 million**) from the above total research-related income (**£167 million**), we estimated that the **net direct impact** associated with Queen Mary's research activity in the 2021-22 academic year stood at **£64 million**.

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[10] This income from 'other UK sources' includes **£19 million** from UK central government bodies, Local Authorities, and health and hospital authorities; **£7 million** from UK industry and commerce; and **£1 million** from other sources (numbers may not add up precisely due to rounding).

The East London Genes and Health Project

Queen Mary has had a longstanding collaboration with Barts Health Trust going back before the founding of the NHS with pioneering clinical and medical research.

This unique collaboration with Barts Health Trust has made genomic medicine a reality across the NHS. One in four UK patients with a rare disease have received a diagnosis thanks to their world-leading genomics expertise. With BAME people under-represented and marginalised in medical research, however, genotype testing needs targeted research to benefit everyone. Queen Mary's East London Genes and Health Project, a longitudinal study of 100,000 people of Bangladeshi and Pakistani ethnicity within the East London community, is paving the way in the identification of genetic determinants for specific illnesses affecting this community. A group of life sciences companies (Bristol Myers Squibb, GSK, Maze Therapeutics, MSD, Novo Nordisk, Pfizer, Takeda) have collectively committed £25 million of new investment to the generation of genetic data and analyses of samples donated by 50,000 volunteers.

Alongside these companies, Queen Mary runs several of the UK's national tissue banks, which enable life-saving clinical trials to develop treatments for cancer and autoimmune disease among many other conditions. Using machine learning and AI to combine tissue samples with large lifestyle and health datasets, Queen Mary can enable precision care for patients, especially those with hard-to-treat conditions or from underserved groups. This breakthrough bioinformatics research underpins SNPnexus, an online genomics sequencing platform that can analyse 100,000 genome variants to allow researchers and clinicians to pinpoint promising treatments for people based on their genotype. A free-to-use Covid-19 edition of SNPnexus was launched in December 2020 to help manage and treat Covid-19 in different populations.

Through partnership, Queen Mary has the proven ability to unlock potential and foster growth and prosperity where it is needed most. This collaboration is at the heart of Whitechapel's transformation into a global innovation hub, spreading the impact of Queen Mary's research excellence across the UK and around the world. The Whitechapel Life Sciences cluster brings medical practice, research, product development and local communities closer together. Co-location will break down silos in expertise, streamline innovation across clinics, community and commerce and provide interdisciplinary teams with new routes to implementation and commercialisation. The project will benefit the NHS nationally and locally, reducing costs to public and private providers and speeding up new treatments for patients.

Figure 4   Research income received by Queen Mary in the 2021-22 academic year, £m by source of income
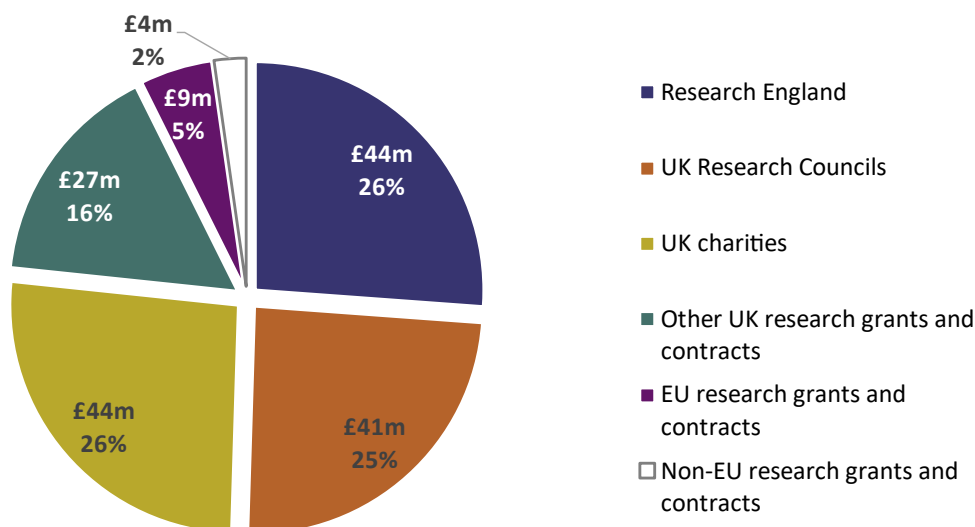
Note: All values are presented in 2021-22 prices and rounded to the nearest £1 million.
Source: London Economics' analysis based on data provided by the Higher Education Statistics Agency (HESA, 2023a)

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 induce (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[11]. For example, spillovers are enabled through direct R&D collaborations between universities and firms (such as Knowledge Exchange Partnerships), 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)[12] 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[13, 14], and the relative effectiveness of these channels of public spending in terms of their impact on the

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[11] 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.

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

[13] 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.

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

'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[15]. 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[16]. 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)[17], interacted with measures of industry research activity, and total factor productivity within the different market sectors[18]. 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 (2014a) replicates the Haskel and Wallis (2010) approach, using a different (publicly available) dataset and a slightly different methodology to explore variation in types of Research Council R&D investments in terms of their impact on private sector productivity. Despite the difference in data and approach, they find qualitatively similar findings: Research Council R&D investments yield large returns through their impact on private sector productivity.[19] 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

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[15] 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.

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

[17] 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.

[18] 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.

[19] 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.

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multiplier of 9.76, which may be expected given the different country under consideration (Elnasri and Fox, 2017)[20].

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, 2014b).[21] 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 Queen Mary'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 in the 2021-22 academic year (again see 0). Specifically, assigning the multiplier of **12.7** to the research funding that Queen Mary received from **UK Research Councils and UK charities**[22] in the 2021-22 academic year (amounting to **£84 million**), and assigning the multiplier of **0.2** to **all other research funding** received by Queen Mary in that academic year (amounting to **£83 million**)[23], we estimate that the research conducted by Queen Mary in the 2021-22 academic year resulted in **total market sector productivity spillovers of £1,088 million**.

In other words, we infer a weighted average spillover multiplier associated with Queen Mary's research activities of approximately **6.51** – i.e. **every £1 invested in the University's research activities generates additional annual economic output of £6.51 across the UK economy**. This captures the impact of the research undertaken by the University in the 2021-22 academic year within that same academic year (but excludes any additional (and likely substantial) impacts in subsequent years).[24]

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[20] Also see London Economics (2018). The authors find an elasticity of 0.175, which converted to a research spillover, equals 9.76.

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

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

[23] 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.

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

New synthesis methods for exact Polyethylene Glycol Polymers

Exactmer is a fast-growing, ambitious SME that manufactures polymers used in medicine. Polymers are used in therapeutic drugs to regulate transportation and retention in the body. Exactmer has developed a breakthrough technology – Nanostar Sieving – to help improve the accuracy of making polymers. Now, it needs the latest in small-molecule synthesis to improve manufacture of a bespoke suite of polymers known as polyethylene glycol polymers (PEGs), and deliver commercial opportunities.

Nanostar Sieving is a cutting-edge technology for making polymers. Polymers are difficult to make accurately, because the standard chemical techniques are not accurate enough for exact replication. Just a few more or less monomers added to the polymer chain can make a big difference to the way a drug behaves in the body. While Nanostar Sieving has been developed to synthesise sequence-defined polymers with an exact molecular weight known as 'oligonucleotides', the current technology needs enhancing to be able to consistently produce PEG polymers to the same standard, in a commercially viable setting.

A Knowledge Transfer Partnership (KTP) programme between Queen Mary and Exactmer will develop the chemistry needed to overcome the issues facing Nanostar Sieving for bespoke PEG polymers. It will bring Queen Mary's expertise in small-molecule synthesis to the methods currently used to form PEGs and develop new, unimolecular Nanostar-hub molecules. Exactmer will also benefit from a small library of completely new PEG monomers, with side-arms for attaching cargo including drugs, cell-penetrating agents, and targeting ligands. These sequence-defined 'hetero-PEGs' will help to drive Exactmer's expansion into the Antibody Drug Conjugates market.

The KTP will give Exactmer access to specific areas of small-molecule expertise and will allow it to continue to develop its commercial proposition and explore new markets.

"Exactmer is thrilled to be part of the Knowledge Transfer Partnership, working with Queen Mary to develop and strengthen new research activities in East London. We are looking forward to integrating the knowledge developed from the partnership into Exactmer's processes and are excited to see the commercial and business potential this will bring."

— Dr Dara O'Brien, Exactmer

2.1.3   Aggregate impact of Queen Mary's research

Combining the direct economic impact of the University's research (**£64 million**) with the estimated productivity spillovers associated with this research (**£1,088 million**), we estimate that the total economic impact associated with the University's research activities in the 2021-22 academic year stands at approximately **£1,152 million** (see Figure 5).

Comparing the **£103 million** of publicly funded research income received by Queen Mary in the 2021-22 academic year to the **£1,152 million** impact from research activities, this suggests that **for each £1 million of** *publicly* **funded research income, Queen Mary's research activities generated an estimated total of £11.19 million in economic impact across the UK.**

Figure 5   Total impact of Queen Mary's research activities in the 2021-22 academic year, £m
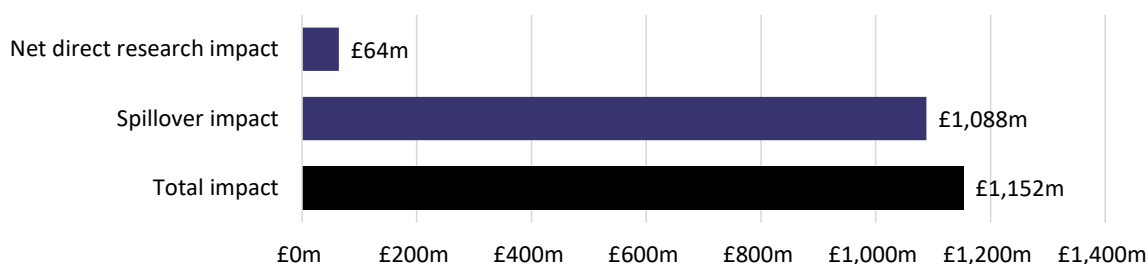
Note: All values are presented in 2021-22 prices, rounded to the nearest £1 million, and may not add up precisely to the total indicated
Source: London Economics' analysis

2.2   Economic impact of Queen Mary's knowledge exchange activities

In addition to its research activities, the University generates significant economic impacts through a range of knowledge exchange activities, including:

- The activities of **spinout and start-up companies that are based on the University's IP**;
- **Licensing of the University's IP** to other organisations;
- **Consultancy services** provided by the University;
- **Contract research** provided by the University;
- **Facilities and equipment hire**, and related activities; and
- **Business and community courses** provided by the University.

Specifically, the analysis captures the direct, indirect, and induced economic impacts associated with 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 Queen Mary's spinout and start-up companies; and the **income received** by Queen Mary from its contract research, consultancy services, business and community courses, facilities and equipment hire, and IP licensing.

- **Indirect effect ('supply chain impacts'):** Queen Mary, 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 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 salaries to purchase consumer goods and services within the economy. This in turn generates wage income for employees within the industries producing these goods and services, again leading to subsequent rounds of spending, i.e. a further 'ripple effect' throughout the economy as a whole.

The total of the direct, indirect, and induced effects constitutes the *gross* economic impact of Queen Mary'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[25].

The direct, indirect, and induced impacts are measured in terms of monetary economic output[26], gross value added (GVA)[27], 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 Queen Mary'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[28]. In other words, these tables capture the degree to which different sectors within the UK economy are connected, i.e. the extent to which changes in the demand for the output of any one sector impact all other sectors of the economy. To be able to achieve a breakdown of the analysis by region, we then developed a **multi-regional Input-Output**

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[25] 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 Queen Mary 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 Queen Mary's knowledge exchange activities in *gross* terms.

[26] Here, economic output is equivalent to income/turnover (e.g. the direct economic output associated with the University's spinout and start-up companies is captured by the organisations' turnover).

[27] 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).

[28] Specifically, the analysis makes use of *Type II* multipliers, defined as [Direct + indirect + induced impact]/[Direct impact].

model, combining UK-level Input-Output tables (for 2019[29]) with a range of regional-level data (again for 2019)[30] to achieve a granular breakdown by sector[31] *and* region[32].

In addition to the impacts associated with Queen Mary's knowledge exchange activities described in the following sections, a similar methodology is applied to estimate the direct, indirect, and induced economic effects associated with the University's export income (see Section 4) and the operational and capital expenditures of Queen Mary (see Section 5).

2.2.1   Economic impact of Queen Mary's spinout and start-up companies

To assess the **direct impact** associated with Queen Mary's UK-based spinout and start-up companies, we made use of information on **turnover** data (as a measure of economic output) and **FTE employment** associated with a total of **25** Queen Mary spinout companies and **75** start-ups that were active and based in the UK in the 2021-22 academic year (where available)[33]. The information on each company's turnover and employment was based on data provided by Queen Mary, supplemented with information from Bureau van Dijk's FAME database (based on Companies House information) to validate and fill any gaps where possible[34]. The direct **gross value added** generated

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[29] See Office for National Statistics (2023a).

[30] 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, 2023b); employment by sector and region (Office for National Statistics, 2022a); gross disposable household income by region (Office for National Statistics, 2022b); population by region (Office for National Statistics, 2022c); mean weekly total paid hours worked by industry, for full-time vs. part-time employees (Office for National Statistics, 2022d); employed residents by region of usual residence and region of workplace (Office for National Statistics, 2014); and UK imports into each region and exports by each region, by commodity (Office for National Statistics, 2021).

[31] In terms of sector breakdown, the original UK Input-Output tables are broken down into 105 relatively granular sectors. However, the wide range of regional-level data required to generate the multi-regional Input-Output model is not available for such a granular sector breakdown. Instead, the multi-regional Input-Output model is therefore broken down into 10 more high-level sector groups (see Annex A2.1 for more information).

[32] 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) 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.

[33] The analysis includes spinouts with some Queen Mary ownership, and excludes 2 spinouts based on the University's IP that were active in 2021-22 but were non-UK based. In terms of the start-ups analysis, 8 companies were excluded that were founded after 2021-22 or dissolved prior to 2021-22. Note also that the information is based on each company's 2021-22 academic year, which does not necessarily coincide with the 2021-22 academic year, and varies across companies.

[34] In spite of using FAME data to fill gaps, the combined Queen Mary/FAME data still provide an incomplete estimate of the total turnover, GVA, or employment of Queen Mary'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). Information provided by Queen Mary contained data for the turnover of 11 of the 25 UK-based active spinouts, and data for the employment of 14 of the 25 UK-based active spinouts. Information from FAME added no further turnover data, but contained employment data for an additional 2 spinouts. Whilst the list of Queen Mary's active start-up companies was provided by the University, those companies' turnover and employment data were collected solely from FAME, which contained turnover data for 5 start-ups and employment data for 34 start-ups.

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[35,36].

Using this approach, for the academic year 2021-22, the **total direct impact** of Queen Mary's spinout companies was estimated at **£53 million** in economic output (i.e. turnover) terms, **360 FTE staff**, and **£22 million** of GVA. In a similar manner, the direct impact associated with the activities of Queen Mary's start-up companies in the 2021-22 academic year was estimated at **£16 million** in economic output terms, **225 FTE staff**, and **£7 million** of GVA. The **total direct impact** of spinout and start-up companies associated with Queen Mary is therefore **£69 million** in economic output (i.e. turnover) terms, **585 FTE staff**, and **£29 million** of gross value added[37].

We then 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 Queen Mary. Specifically, we assigned relevant economic multipliers to each active spinout and start-up company in the 2021-22 academic year based on each firm's industry classification and the region of its main registered office address. Table 3 presents the resulting average multipliers across all spinout companies and Table 4 presents the corresponding figures for start-ups (weighted by the underlying (direct) turnover, employment, and GVA associated with each firm)[38]. Note that the difference between the average economic multipliers associated with the University's spinout vs start-up companies reflects the differing regional and sectoral make-up of these companies.

Based on these estimates, in terms of economic output, we assume that every **£1 million** of turnover directly accrued by Queen Mary's **spinout** companies generates a *total* of **£2.64 million** impact throughout the UK economy, *of which* **£1.41 million** is generated in London. In terms of employment, we assume that, for every **1,000** (FTE) staff employed by these spinout companies, a *total* of **2,840** staff are supported throughout the UK, of which **1,100** are supported in London. For **start-ups**, we assume that every **£1 million** of turnover directly accrued by Queen Mary's start-up companies generates a *total* of **£2.91 million** impact throughout the UK economy, *of which* **£2.00 million** is generated in London. In terms of employment, we assume that, for every **1,000** (FTE) staff employed by these start-up companies, a *total* of **3,430** staff are supported throughout the UK, of which **1,700** are supported in London.

Table 3   Economic multipliers associated with the activities of Queen Mary's spinout companies

Location of impact	Output	GVA	FTE employment
London	1.41	1.41	1.10
Total UK	2.64	2.93	2.84

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

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[35] 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 Queen Mary, 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.

[36] 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 11 spinout firms (out of the 25 active UK-based companies) for which turnover information was available, and 16 spinout firms for which employment information was available. Of the 75 start-ups considered in the analysis, we were able to obtain turnover data for 5 and employment data for 34.

[37] Note that totals may not sum due to rounding.

[38] The tables provide multipliers for the impact on London and the UK economy as a whole. A full breakdown of impacts by regions (as well as sector) - across all of Queen Mary's knowledge exchange activities – is provided in Section 2.2.4.

Next generation companion diagnostics

This pioneering precision medicine research and diagnostics company specialising in cell signalling with patented, interdisciplinary phosphoproteomics platform, KScan®.

Incorporated in 2016 and was cofounded by Professor Pedro Cutillas, Dr David Britton and Professor John Gribben, after developing a new approach of cell signalling at the proteomic level. The Kinomica KScan® platform can monitor drug efficiency and response, elucidate mode of action and mechanisms of resistance to drugs, and allow predictive patient population biomarker stratification in clinical trials. This means that instead matching the drug to the right patients, the KScan® phosphoproteomic diagnostic platform that helps clinicians to prescribe the right drug, for the right patient, at the right time.

"I started Kinomica because I thought we had the potential to help treat cancer patients with the most appropriate anti-cancer drug out of the several different treatments now available. My research team and I had been developing this technology over the last 15 years, but without further development this was just academic. We needed a vehicle to develop these approaches into tests that can actually bring benefit to patients. Kinomica is now developing these tests in a way that one day, in the not-so-distant future, will enable clinicians to make a more informed decision on the best-suited treatment for a given patient." Professor Pedro Cutillas.

In 2018 the secured support from the Bio-City Accelerator programme, now known as Pioneer. Kinomica was successful in securing seed fund investment with match funding from the Innovate UK Precision Medicene Investment Accelerator of close to £1million.

Since then the company has gone from strength to strength with 2 further innovate UK grants and further investment totalling around £7.5 million.

They are currently developing diagnostic tests that predict how a patient will respond to front-line therapies for Hepatocellular Carcinoma and Acute Myloid Leukaemia.

Table 4   Economic multipliers associated with the activities of Queen Mary's start-up companies

Location of impact	Output	GVA	FTE employment
London	2.00	1.94	1.70
Total UK	2.91	3.09	3.43

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 2021-22 academic year was estimated to be **£141 million** across the UK economy, of which **£75 million** (**54%**) occurred in London (see Table 5). The estimated total number of FTE jobs supported stood at **1,015** (of which **395** (**39%**) were located in London). The corresponding estimate in terms of GVA stood at **£65 million** (of which **£31 million** (**48%**) occurred in London)[39].

Table 5   Economic impact associated with Queen Mary's spinouts in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£75m	£31m	395
Total UK	£141m	£65m	1,015

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

In addition, the total economic impact associated with the activities of the University's start-ups was estimated to be **£45 million** across the UK economy, of which **£31 million** (**69%**) was generated in London (see Table 6). The estimated total number of FTE jobs supported stood at **770** (of which **380** or **49%** were located in London). The corresponding estimate in terms of GVA stood at **£21 million** (of which **£13 million** or **63%** occurred in London)[40].

Table 6   Economic impact associated with Queen Mary's start-ups in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£31m	£13m	380
Total UK	£45m	£21m	770

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Combining these estimates, the **total direct, indirect and induced economic impact** of the University's active spinouts and start-ups in the 2021-22 academic year was estimated at **£186 million** across the UK economy, of which **£106 million** (**57%**) was generated in London. The estimated total number of FTE jobs supported stood at **1,785** (of which **775** or **43%** were located in

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[39] A full breakdown of the total impact of all of Queen Mary's knowledge exchange activities is provided in Section 2.2.4.
[40] Again, a full breakdown of the total impact of all of Queen Mary's knowledge exchange activities is provided in Section 2.2.4.

London)[41]. The corresponding estimate in terms of GVA stood at **£86 million** (of which **£45 million** or **52%** occurred in London)[42].

Ro-EX

Thanks to Instagram-style filters, millions of ordinary people enjoy producing artwork that was once expensive and exclusive. What if we could do the same for music?

RoEx, the third Queen Mary spinout from Professor Josh Reiss's laboratory, is redefining music production through AI-powered mixing.

Today's musicians want professional-quality sound without the daunting technicalities of compressors, EQ settings, or the need for expensive studios and complex plugins. RoEx is making that high-level production quality accessible and efficient.

Based on innovative research by David Ronan during his PhD, RoEx is the first company to bring a fully-fledged AI mixing system to market. Their flagship product, Automix, lets musicians produce professional-level mixes in minutes. By removing barriers, this pioneering technology can democratise professional music creation, making it accessible and intuitive for all.

roex®

2.2.2   Economic impact of Queen Mary's other knowledge exchange activities

In this section, we estimate the economic impact of Queen Mary's wider knowledge exchange activities (i.e. other than its spinout and start-up activities). Amounting to approximately **£34 million** of income accrued by the University in the 2021-22 academic year, 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; and
- **Business and community courses** provided by the University.

IP licensing

To measure the direct impact associated with the University's IP licensing activities, we made use of data from the Higher Education Business and Community Interaction Survey (HE-BCI)[43] on the total

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[41] Note that totals may not sum due to rounding.
[42] Again, a full breakdown of the total impact of all of Queen Mary's knowledge exchange activities is provided in Section 2.2.4.
[43] See Higher Education Statistics Agency (2023d).

IP licensing income received by Queen Mary in the 2021-22 academic year (including income from the sale of shares in spinoffs). This stood at **£2.8 million** (including **£0.8 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 ratio (of GVA to output and of FTE employees to output) among organisations within the government, health, and education sector located in London.[44] Applying these assumptions, we estimate that the University's IP income in the 2021-22 academic year *directly* generates **£1.5 million** in GVA and supports **20** full-time equivalent jobs.[45]

To estimate the total direct, indirect, and induced impacts associated with Queen Mary'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 London[46]. These multipliers (for the impact on London and the UK economy as a whole) are presented in Table 7[47]. Based on these estimates, in terms of economic output, we assume that every **£1 million** of IP income accrued by Queen Mary generates an *additional* **£1.92 million** of impact throughout the UK economy, of which **£0.96 million** is generated in London. In terms of employment, we assume that, for every **1,000** (FTE) staff employed directly by Queen Mary (supported by its IP income), an additional **1,560** staff are supported throughout the UK, of which **540** are supported within London.

Table 7   Economic multipliers associated with Queen Mary's IP licensing activities

Location of impact	Output	GVA	FTE employment
London	1.96	1.80	1.54
Total UK	2.92	2.86	2.56

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 Queen Mary's IP licensing activities in the 2021-22 academic year stood at approximately **£8.3 million** across the UK economy, of which **£5.6 million** (**67%**) was generated in London (see Table 8)[48]. The estimated total number of jobs supported (in FTE) stood at **55** (of which **35** or **64%** were located in London), while the corresponding estimate in terms of GVA stood at **£4.1 million** (of which **£2.6 million** or **63%** occurred in London)[49].

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[44] This approach is based on the fact that the IP income is generated by Queen Mary itself. In other words, we assume that the income accrued by Queen Mary supports the same levels of GVA and employment (in relative/proportionate terms) as the income accrued by other institutions operating in London'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.

[45] All employment estimates have been rounded to the nearest 5.

[46] i.e. we assume that the expenditure patterns of Queen Mary are the same as for other institutions operating in London's government, health and education sector.

[47] Again, a full breakdown of impacts by regions (as well as sector) - across all Queen Mary's knowledge exchange activities – is provided in Section 2.2.4.

[48] 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.

[49] Again, a full breakdown of the estimated total impact of Queen Mary's knowledge exchange activities is provided in Section 2.2.4.

Table 8   Economic impact associated with Queen Mary's IP licensing in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£5.6m	£2.6m	35
Total UK	£8.3m	£4.1m	55

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Consultancy services

In the 2021-22 academic year, Queen Mary received approximately **£16.5 million** in revenues associated with consultancy services, of which approximately **£2.2 million** was received for services provided to (non-SME) commercial businesses, and **£14.3 million** was received for services provided to non-commercial organisations.

Adopting the same approach as for the impact of the University's IP income (using the same multipliers as presented in Table 7), the analysis indicates that the estimated total economic impact associated with Queen Mary's provision of consultancy services in the 2021-22 academic year stood at approximately **£48.1 million** across the UK economy, of which **£32.3 million** (**67%**) was generated in London (see Table 9). The estimated total number of jobs supported (in FTE) stood at **320** (of which **190** or **59%** were located in London), while the corresponding estimate in terms of GVA stood at **£24.0 million** (of which **£15.1 million** or **63%** occurred in London).

Table 9   Economic impact associated with the University's consultancy services income in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£32.3m	£15.1m	190
Total UK	£48.1m	£24.0m	320

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Contribution to smoking cessation in East London

Queen Mary has seen significant growth in consultancy income over the past 5 years, in part due to the expansion of its tobacco cessation services in East London. This expansion is underpinned by pioneering research, led by Professor Peter Hajek at the Health and Lifestyle Research Unit, and the transformative work of the BME Stop Tobacco Project from the Dental Institute at Queen Mary.

Professor Peter Hajek, renowned for pioneering smoking cessation treatment with behavioural support using the 'Maudsley Model', has been instrumental in the innovative nicotine delivery device research at Queen Mary. His leadership not only advanced public health outcomes but also attracted substantial research funding. The research has informed the establishment of the national Stop Smoking Service, the development of NICE guidelines and clinical practices worldwide.

In parallel, the BME Stop Tobacco Project, founded in 1999 by Professor Ray Croucher using MRC Funding in response to the high prevalence of smoking among Bangladeshi men and similar prevalence of smokeless tobacco use among Bangladeshi women, has been a transformative initiative. This service provided culturally sensitive support to those who faced language and cultural barriers when accessing mainstream stop-smoking services. By focusing on evaluating interventions that are both effective and can be disseminated economically and at scale, Queen Mary has played a pivotal role in reshaping the tobacco cessation service. It has evolved from a productive research programme into a culturally sensitive service targeting all members of the community, particularly in Tower Hamlets, and in recent years, in Newham and Waltham Forest.

The impact from this work combined with the growth in service is reflected in the size of the team, which has gone from four dedicated research assistants to a team of twenty staff. Delivering 23 years of tobacco cessation services has made a profound impact on public health across Northeast London, with 16,650 people supported and 12,250 people quitting by October 2023.

The treatment programme provides 8–12 weeks of behavioural support with stop-smoking medications, nicotine replacement therapy and electronic cigarettes and works with 'priority groups' to tackle health inequalities. Their expertise in delivering high-quality treatment and collaborative partnership efforts have not only elevated the university's reputation but have also attracted substantial funding and repetitive grants.

Andrew Shaw, Business Development Manager for Consultancy at Queen Mary, aptly notes: "Responding to e-procurement tenders in areas where we have relevant transformative research makes sense and is mutually reinforcing, creating a virtuous circle. This service also provides us with up-to-date patient data to continue our research."

The service's growth, including the securing of an ongoing 5-year contract in Tower Hamlets and other contracts in Newham and Waltham Forest, has amounted to over £1 million in consultancy income. The initiative underscores QMUL's commitment to improving public health outcomes through research and culturally sensitive evidence-based services.

Contract research

Reflecting the depth, breadth and impact of the research routinely undertaken by Queen Mary, in addition to the research income identified in 0, the University received approximately **£11.1 million** in research contract income in the 2021-22 academic year. Of this, approximately **£0.9 million** related to income generated from research contracts delivered to SMEs, **£8.3 million** related to income generated from research contracts delivered to other (non-SME) commercial businesses, and **£1.8 million** of income was associated with research contracts delivered to non-commercial organisations.

Again using the same multipliers as presented in Table 7, the analysis indicates that the estimated total economic impact associated with Queen Mary's provision of research contract services in the 2021-22 academic year stood at approximately **£32.3 million** across the UK economy, of which **£21.7 million** (**67%**) was generated in London (see Table 10). The estimated total number of jobs supported (in FTE) stood at **215** (of which **130** or **60%** were located in London), while the corresponding estimate in terms of GVA stood at **£16.1 million** (of which **£10.1 million** or **63%** occurred in London).

Table 10   Economic impact associated with Queen Mary's contract research income in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£21.7m	£10.1m	130
Total UK	£32.3m	£16.1m	215

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Facilities and equipment hire

In addition to delivering research, Queen Mary received approximately **£3.1 million** in income in the 2021-22 academic year 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 **£0.2 million** related to income generated from facilities and equipment provided to SMEs, approximately **£2.6 million** related to income generated from facilities and equipment hire to other (non-SME) commercial businesses, and **£0.3 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.

Again applying the same multipliers presented in Table 7, the estimated total economic impact associated with Queen Mary's facilities and equipment hire services in the 2021-22 academic year stood at approximately **£9.1 million** across the UK economy, of which **£6.1 million** (**67%**) was generated in London (see Table 11). The estimated total number of jobs supported (in FTE) stood at **60** (of which **35** or **58%** were located in London), while the corresponding estimate in terms of GVA stood at **£4.5 million** (of which **£2.9 million** or **63%** occurred in London).

Table 11   Economic impact associated with Queen Mary's facilities and equipment hire income in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£6.1m	£2.9m	35
Total UK	£9.1m	£4.5m	60

Note: All monetary values are presented in 2021-22 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, Queen Mary also received approximately **£0.7 million** in income in the 2021-22 academic year associated with its delivery of business and community courses. Of this total, approximately **£0.1 million** related to income generated from business and community courses provided to (non-SME) commercial businesses, and **£0.5 million** was associated with business and community courses provided to non-commercial organisations. In contrast to the other research income sources, approximately **£0.2 million** related to business and community courses provided to individuals[50].

Again applying the above-described economic multipliers (see Table 7), the analysis indicates that the estimated total economic impact associated with Queen Mary's business and community courses in the 2021-22 academic year stood at approximately **£2.1 million** across the UK economy, of which **£1.4 million** (**67%**) was generated in London (see Table 12). The estimated total number of jobs supported (in FTE) stood at **15** (of which **10** or **67%** were located in London), while the corresponding estimate in terms of GVA stood at **£1.1 million** (of which **£0.7 million** or **63%** occurred in London).

Table 12   Economic impact associated with Queen Mary's business and community course income in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£1.4m	£0.7m	10
Total UK	£2.1m	£1.1m	15

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

2.2.3   Total impact of Queen Mary's knowledge exchange activities

Adding the above impacts, in aggregate, Queen Mary's knowledge exchange activities generated an estimated **£286 million** of impact across the UK economy in the 2021-22 academic year, of which **£173 million** (**61%**) was generated in London (see Table 13 and Figure 6). The estimated total number of jobs supported (in FTE) stood at **2,450** (of which **1,175** or **48%** were located in London), while the corresponding estimate in terms of GVA stood at **£136 million** (of which **£76 million** or **56%** occurred in London).
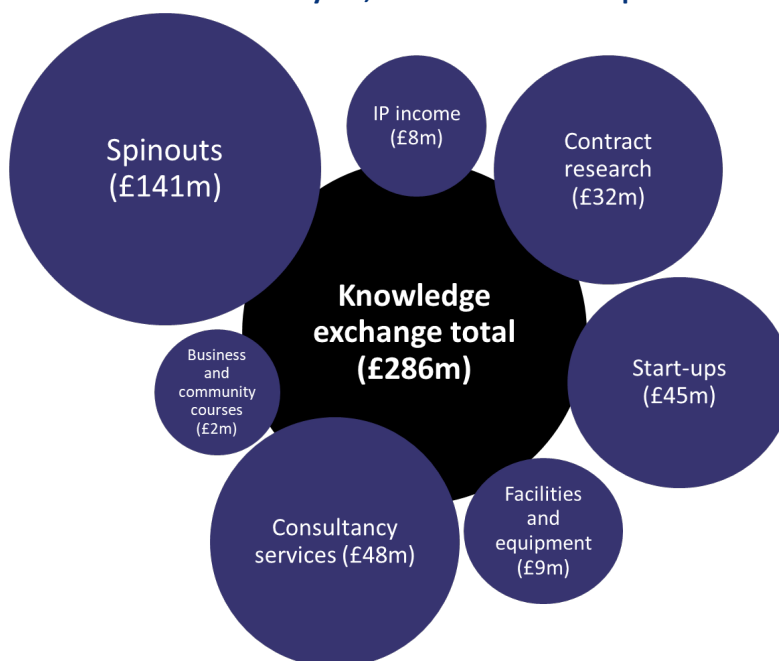
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[50] Note that all values are presented in 2021-22 prices, rounded to the nearest £1 million, and may not add up precisely to the total indicated due to this rounding.

Table 13   Economic impact associated with Queen Mary's knowledge exchange activities in the 2021-22 academic year

Location of impact	Output, £m	GVA, £m	# of FTE employees
London	£173m	£76m	1,175
Total UK	£286m	£136m	2,450

Note: All monetary values are presented in 2021-22 prices and rounded to the nearest £1 million. The employment figures are rounded to the nearest 5.
Source: London Economics' analysis

Figure 6   Estimated total economic impact associated with Queen Mary's knowledge exchange activity in the 2021-22 academic year, £m of economic output

Note: All values are presented in economic output in 2021-22 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

2.2.4   Regional and sectoral impact of Queen Mary's knowledge exchange activities

Figure 7 presents the aggregate impact associated with the University's knowledge exchange impacts in the 2021-22 academic year by region and sector.

In terms of **economic output** (top panel), of the total of **£286 million** of economic output across the UK economy generated by the University's knowledge exchange activities:

■ Considering the breakdown by region, while the majority of this impact (**£173 million**, **61%**) was generated in **London**, there were also significant impacts occurring in other regions across the UK, particularly in the **East of England** (**£33 million, 11%**) and the **South East** (**£20 million, 7%**). The total combined impact on the Greater South East (GSE), which comprises London, the South East and the East of England, was estimated to be **£226 million** (**79%**) with **£60 million** of impact occurring outside of the Greater South East (**21%**).

■ In terms of sector, the University's knowledge exchange activities resulted in particularly large impacts within the **professional and support activities sector** (**£72 million, 25%**), the **government, health, and education sector** (**£46 million, 16%**), the **production sector** (**£43 million, 15%**) and the **distribution, transport, hotels, and restaurants sector** (**£37 million, 13%**).

Figure 7   Estimated total economic impact associated with the University's knowledge exchange activities in the 2021-22 academic year, by region and sector

By region

Output, £m

Region	Value
North East	£3m
North West	£9m
Yorkshire & the Humber	£7m
East Midlands	£8m
West Midlands	£8m
East of England	£33m
London	£173m
South East	£20m
South West	£10m
Wales	£4m
Scotland	£6m
Northern Ireland	£3m
Total UK	£286m

Economic output, £m

GVA, £m

Region	Value
North East	£2m
North West	£5m
Yorkshire & the Humber	£4m
East Midlands	£4m
West Midlands	£5m
East of England	£16m
London	£76m
South East	£10m
South West	£6m
Wales	£3m
Scotland	£4m
Northern Ireland	£2m
Total UK	£136m

GVA, £m

FTE employment

Region	Value
North East	55
North West	120
Yorkshire & the Humber	90
East Midlands	100
West Midlands	115
East of England	220
London	1,175
South East	185
South West	195
Wales	70
Scotland	75
Northern Ireland	45
Total UK	2,450

# of full-time equivalent employees

By sector

Output, £m

Sector	Value
Agriculture	£2m
Production	£43m
Construction	£6m
Distribution, transport, hotels & restaurants	£37m
Information and communication	£16m
Financial and insurance	£20m
Real estate	£21m
Professional and support activities	£72m
Government, health & education	£46m
Other services	£22m
Total	£286m

Economic output, £m

GVA, £m

Sector	Value
Agriculture	£1m
Production	£16m
Construction	£2m
Distribution, transport, hotels & restaurants	£19m
Information and communication	£8m
Financial and insurance	£7m
Real estate	£15m
Professional and support activities	£33m
Government, health & education	£25m
Other services	£11m
Total	£136m

GVA, £m

FTE employment

Sector	Value
Agriculture	30
Production	230
Construction	40
Distribution, transport, hotels & restaurants	515
Information and communication	225
Financial and insurance	65
Real estate	45
Professional and support activities	645
Government, health & education	435
Other services	225
Total	2,450

# of full-time equivalent employees

Note: Monetary estimates are presented in 2021-22 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*

A wilder future for Walthamstow

A core team of environmental scientists and urban geographers at Queen Mary, that are interested in rewilding and how their research in these areas can be translated to complex urban environments, have been working with the community and stakeholders in Walthamstow, East London. Using a mixture of research and public engagement funds to explore visions for wilder, greener urban futures, they have successfully built momentum behind urban greening and sustainability schemes at multiple scales in the area.

The team are working successfully with Waltham Forest Borough Council, London Wildlife Trust, City of London Corporation, Thames21, Thames Water, Lee Valley Regional Park Authority, local artists, community groups and action groups. Urban wilding efforts necessitate new forms of stewardship, while negotiating the diverse and sometimes conflicting needs of urban residents. Public engagement and participation in the research underpins everything the team do, resulting in a rich set of assets informed by the community for the community, and highlighting ideas for potential 'wilder' futures for Walthamstow.

Professor Gemma Harvey comments: "Making more space for nature in cities through green space (vegetation) and blue space (water environment) can improve residents' physical and mental health, reduce air and noise pollution, increase biodiversity and improve the resilience of urban environments to future changes in climate including warmer temperatures, flood risk and water scarcity."

Connectivity of green space in cities can be achieved through structurally connected green 'corridors' or spatially discrete but functionally connected 'stepping stone' habitats, combined with larger 'core' areas such as woodlands and wetlands that are more difficult to accommodate in cities. Corridors and stepping stones can help animals to move between habitat patches, supporting biodiversity and increasing the connection between people and nature in cities.

Recently, the team held a free public exhibition which attracted 700 visitors, as well as two workshops with 26 stakeholders in attendance. The exhibition featured photographs submitted by residents, exploring the diversity of ways in which people connect with nature, maps of connectivity for urban wildlife, research with local stakeholders, global and local examples of radical blue-green urban futures, local examples of environmental 'emergencies' (floods, fires) and an arch decorated by local school children with their wishes for nature in 2050.

Stakeholders commented in follow-up surveys that the exhibition and workshops had "widened the possibilities", made them feel "more optimistic about the potential for change to be achieved" and "made me more determined than ever to make it happen". Another wrote that it "made me feel more positive about applying for larger research funds on community led projects with slower more radical perspectives on the local and its reach to the global around empowerment in relation to climate change".

2.3   Total impact of Queen Mary's research and knowledge exchange activities

The impact of Queen Mary's research and knowledge exchange activities in 2021-22 stood at £1.44 billion.

Combining the impact of Queen Mary's research activities (**£1,152 million**) with the estimated impact associated with the University's knowledge exchange activities (**£286 million**), we estimate that the total economic impact associated with Queen Mary's research and knowledge exchange activities in the 2021-22 academic year stands at approximately **£1,438 million** (see Figure 8).

Comparing the **£167 million** of research income received by Queen Mary in 2021-22 to the **£1,438 million** impact from research and knowledge exchange activities, this suggests that **for each £1 million of research income, Queen Mary's research and knowledge exchange activities generated a total of £8.61 million in economic impact across the UK.**

Figure 8   Total impact of Queen Mary's research and knowledge exchange activities in the 2021-22 academic year, £m
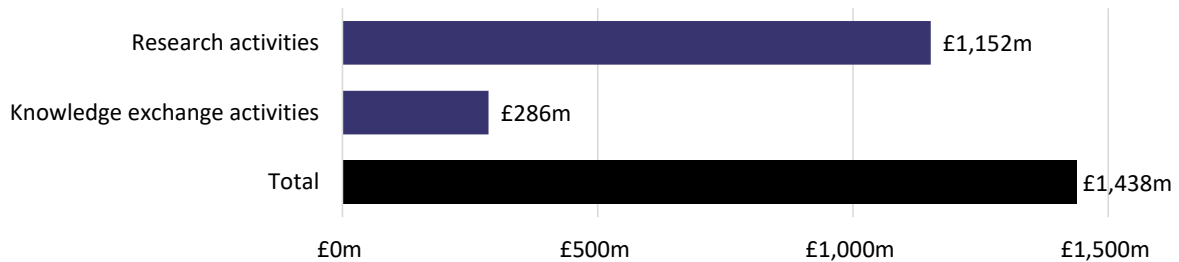
Note: All values are presented in 2021-22 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

3   The impact of Queen Mary'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 (generated as a result of an institution's extensive supply chains and expenditure on employing staff), as well as the economic impacts associated with the expenditures of students attending the institution. However, given that one of universities' 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 Queen Mary, 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 2021-22 cohort of UK domiciled Queen Mary students

The analysis of the economic impact of the teaching and learning activities of Queen Mary is based on the **2021-22 cohort of UK domiciled students**. In other words, instead of the University's entire student body of **26,045** students in the 2021-22 academic year (*irrespective* of when these individuals may have started their studies), the analysis in this section focuses on the **7,440** UK domiciled[51] students **starting higher education qualifications (or standalone modules/credits) in the 2021-22 academic year**[52].

In terms of **level of study** (Figure 9), **69%** (**5,120** students) in this cohort of UK domiciled students were undertaking **first degrees**, with a further **1,770** students (**24%**) undertaking **postgraduate taught degrees**, and **205** students (**3%**) enrolled in **postgraduate research degrees**. The remaining **345** (**4%**) were enrolled in **other postgraduate qualifications**[53].

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[51] A proportion of EU and non-EU domiciled students undertaking their studies at Queen Mary will remain in the UK to work following completion of their studies; similarly, a proportion of UK domiciled students will leave the UK to pursue their careers in other countries. Given the uncertainty in predicting the extent to which this is the case, and the difficulty in assessing the net labour market returns for students not resident in the UK post-graduation, the analysis of teaching and learning focuses on UK domiciled students only. In other words, for the purposes of this analysis, we assume that all UK domiciled students will enter the UK labour market upon graduation, and that non-UK students will leave the UK upon completing their qualifications at Queen Mary.

[52] We received HESA data on a total of 13,240 first-year students from Queen Mary. Of these, we excluded 50 students who did not have a stated gender, and 5,745 non-UK domiciled students (who are instead considered as part of the analysis of educational exports (see Section 4)). Figures may not add up precisely due to rounding to the nearest five students.

[53] 'Other postgraduate' learning includes postgraduate-level diplomas and other qualifications, as well as taught work for credit at postgraduate level.
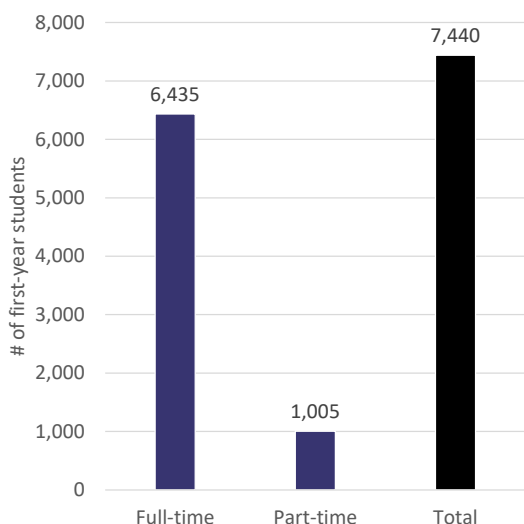
Figure 9   UK domiciled students in the 2021-22 cohort of Queen Mary students, by level of study
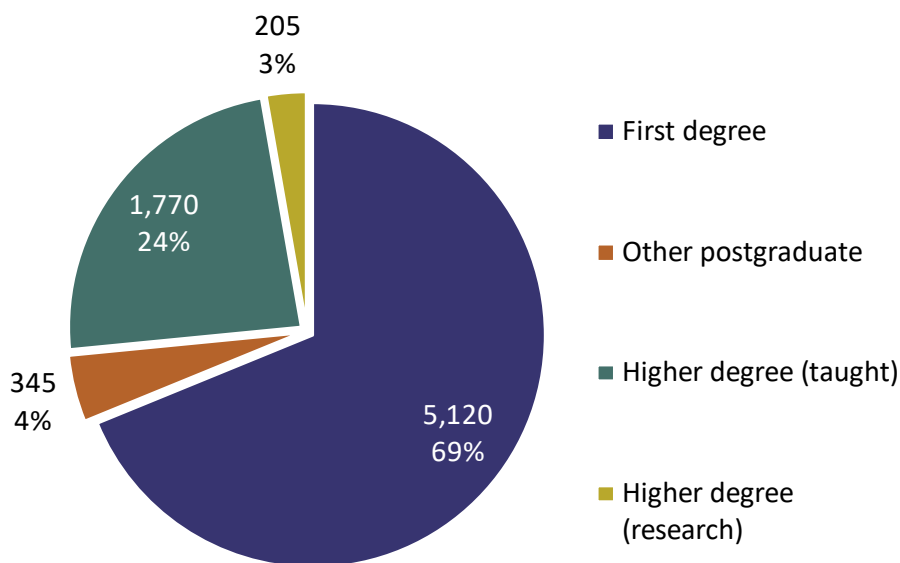
Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding. 'Other postgraduate' learning includes postgraduate-level diplomas and other qualifications, as well as taught work for credit at postgraduate level.
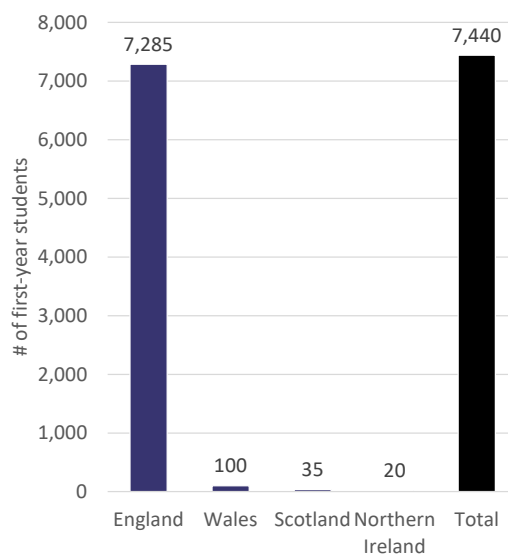*Source: London Economics' analysis based on Queen Mary Higher Education Statistics Agency (HESA) data*

In relation to **mode of study** (Figure 10), **6,435** (**86%**) students in the cohort were undertaking their studies with Queen Mary on a full-time basis, while the remaining **1,005** (**14%**) were enrolled on a part-time basis. As shown in Table 14, most full-time students were undertaking first degrees (**79%** of full-time students), while part-time students in the cohort were predominantly enrolled in higher degree (taught) qualifications (**63%** of part-time students) or other postgraduate qualifications (**34%** of part-time students).

Figure 10   UK domiciled students in the 2021-22 cohort of Queen Mary 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 Queen Mary HESA data

Figure 11   UK domiciled students in the 2021-22 cohort of Queen Mary 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 Queen Mary HESA data

In terms of **domicile** (Figure 11), almost all students (**7,285**, **98%**) in the cohort were domiciled in England. A further **100** (**2%**) students were domiciled in Wales, and the remainder were domiciled in Scotland (**35**) and Northern Ireland (**20**).

Table 14   UK domiciled students in the 2021-22 cohort of Queen Mary students, by level of study, mode, and domicile

Level and mode of study	Domicile				
	England	**Scotland**	**Wales**	**Northern Ireland**	**Total**
Full-time					
Other undergraduate	0	0	0	0	**0**
First degree	5,030	60	10	5	**5,110**
Other postgraduate	10	0	0	0	**10**
Higher degree (taught)	1,105	15	10	0	**1,135**
Higher degree (research)	180	5	0	0	**185**
Total	**6,320**	**80**	**25**	**10**	**6,435**
Part-time					
Other undergraduate	0	0	0	0	**0**
First degree	10	0	0	0	**10**
Other postgraduate	325	5	5	5	**340**
Higher degree (taught)	615	10	5	5	**635**
Higher degree (research)	20	0	0	0	**20**
Total	**965**	**20**	**10**	**10**	**1,005**
Total					
Other undergraduate	0	0	0	0	**0**
First degree	5,040	60	10	5	**5,120**
Other postgraduate	330	5	5	5	**345**
Higher degree (taught)	1,715	30	15	10	**1,770**
Higher degree (research)	195	5	0	0	**205**
Total	**7,285**	**100**	**35**	**20**	**7,440**

Note: All numbers are rounded to the nearest 5, and the total values may not add up due to this rounding. 'Other postgraduate' learning includes postgraduate-level diplomas and other qualifications, as well as taught work for credit at postgraduate level.
Source: London Economics' analysis based on Queen Mary HESA data

Figure 12 and Figure 13 present the distribution of the 2021-22 cohort studying undergraduate and postgraduate qualifications (respectively) by domicile at the Local Authority level. These maps illustrate Queen Mary's geographical draw of students from across the UK, among both the undergraduate and postgraduate cohorts. However, as expected, the maps also show a greater concentration of students from London.

Figure 12   UK domiciled undergraduate first-year students in the 2021-22 cohort, by Local Authority of domicile
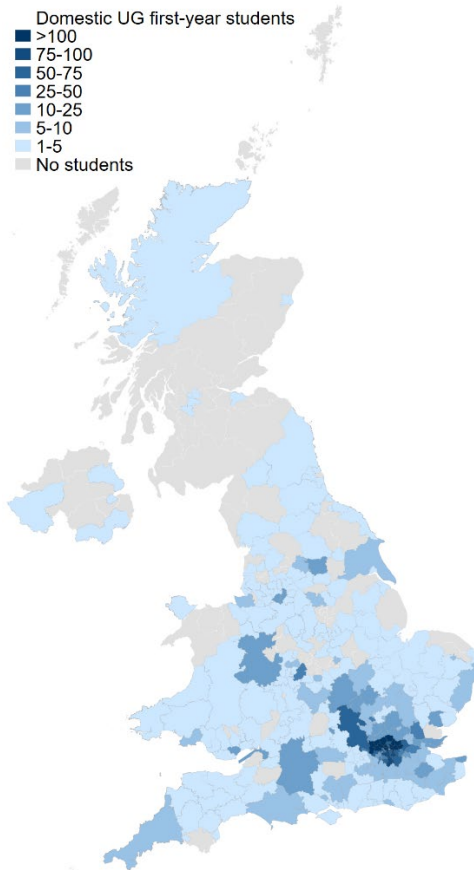
Note: Based on HESA data on 5,144 first-year undergraduate UK domiciled students from Queen Mary. Students from Guernsey, Jersey, and the Isle of Man or those with an unspecified unknown domicile in the UK (fewer than 5 students in total) were excluded.
Source: London Economics' analysis based on data from Queen Mary 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 13   UK domiciled postgraduate first-year students in the 2021-22 cohort, by Local Authority of domicile
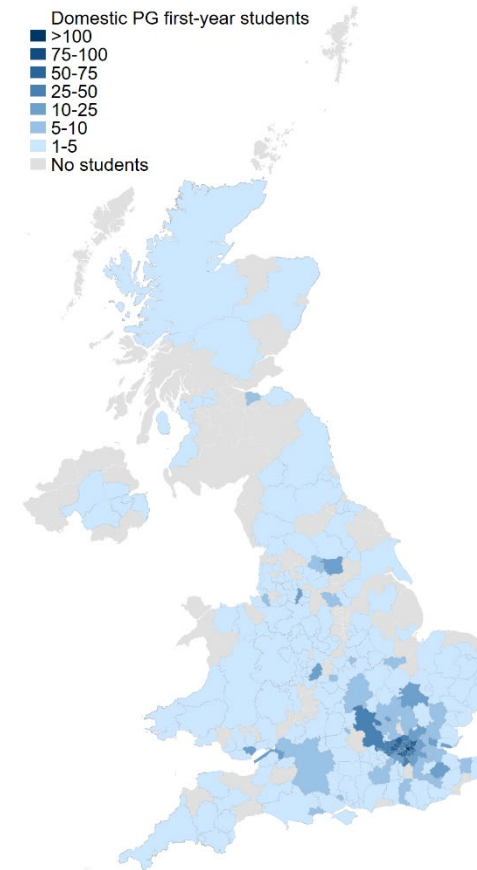
Note: Based on HESA data on 2,316 first-year UK domiciled postgraduate students from Queen Mary. Students from Guernsey, Jersey, and the Isle of Man or those with an unspecified unknown domicile in the UK (fewer than 5 students in total) were excluded.
Source: London Economics' analysis based on data from Queen Mary 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.

Widening participation at Queen Mary

Queen Mary vision is to open the doors of opportunity and the University has been recognised as leading the Russell Group for social mobility by the Higher Education Policy Institute. The University brings this to life across a series of programmes and engagements offered to its local community and beyond. Queen Mary's core work involves sponsorship of two Multi-Academy Trusts (Drapers' Multi Academy Trust and University Schools Trust), where being a sponsor means that the University is actively involved in all aspects of the Trusts' work, from nominating staff to act as Trustees and governors through to delivering outreach activities to pupils across primary, secondary, and sixth form cohorts.

The University also offers an active programme of outreach activities across the UK, and, in 2022-23, approximately 24,000 individuals were engaged in such activity. **Queen Mary Futures** provides a key example of such programmes.

Queen Mary Futures is an outreach programme aimed at supporting students from underrepresented backgrounds to build the knowledge and skills needed for higher education, including a chance to gain insight into their future field of study. The programme offers the opportunity to attend subject lectures, interact with current students and alumni, gain career insights, and develop academic skills associated with success at university.

The programme covers a multitude of study for skills in preparation for university, including identifying reliable sources, critical thinking, academic discussion, revision and time management, and using a university library. Participants are also inducted to QMPLUS, an online learning environment that simulates the university experience.

The programme runs for four weeks, twice yearly. In the 2021-22 academic year, 30% of the participants in Queen Mary Futures subsequently enrolled at Queen Mary.

Participants reported having an increased insight into their preferred subject area and developing a better understanding of what to expect from a university environment.

"I *would like to thank QM for the amazing opportunity as I learnt many skills … needed as a student at university, and got a better idea of the courses I would like to study in the near future… Overall, a wonderful experience full of useful information.*" – Participant in Queen Mary Futures

3.2 Adjusting for completion rates

The previous section provided an overview of the number of UK domiciled students *starting* qualifications or modules at Queen Mary in the 2021-22 academic year. However, to aggregate individual-level impacts of Queen Mary '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 Queen Mary on the historical completion outcomes of students from the University[54] – broken down by study mode, study intention, and study completion. 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))[55].

Table 15 presents the resulting completion rates applied throughout the analysis. We assume that, of those students starting a full-time first degree at Queen Mary in the 2021-22 academic year, **87%** complete the first degree as intended, while the remaining **13%** undertake one or more of the credits/modules associated with their degree before discontinuing their studies (modelled as completion at 'other undergraduate' level). Similarly, at postgraduate level, we assume that of those individuals starting a full-time postgraduate taught or postgraduate research degree, **93%** complete the qualification as intended, while the remaining **7%** undertake one or more of the credits/modules associated with the intended degree before dropping out (in this case, modelled as completion at 'other postgraduate' level). In all these cases, **the analysis of the impact of teaching and learning calculates the estimated returns associated with the *completed* qualification/standalone module(s)**.

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[54] Data is based on the 2015-16 cohort of Queen Mary students for all study levels except higher degree (research), where the data was based on students in the 2014-15 cohort instead.

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

Table 15   Assumed completion rates of Queen Mary student entrants

Completion outcome	Study intention				
	Other undergraduate	First degree	Other postgraduate	Higher degree (taught)	Higher degree (research)
Full-time students					
Other undergraduate	100%	13%	-	-	-
First degree	-	87%	-	-	-
Other postgraduate	-	-	100%	7%	7%
Higher degree (taught)	-	-	-	93%	-
Higher degree (research)	-	-	-	-	93%
Total	**100%**	**100%**	**100%**	**100%**	**100%**
Part-time students					
Other undergraduate	100%	13%	-	-	-
First degree	-	87%	-	-	-
Other postgraduate	-	-	100%	25%	28%
Higher degree (taught)	-	-	-	75%	-
Higher degree (research)	-	-	-	-	72%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Totals may not sum due to rounding. Data is based on the 2015-16 cohort of Queen Mary students for all study intentions except higher degree (research), for which the 2014-15 cohort is used.
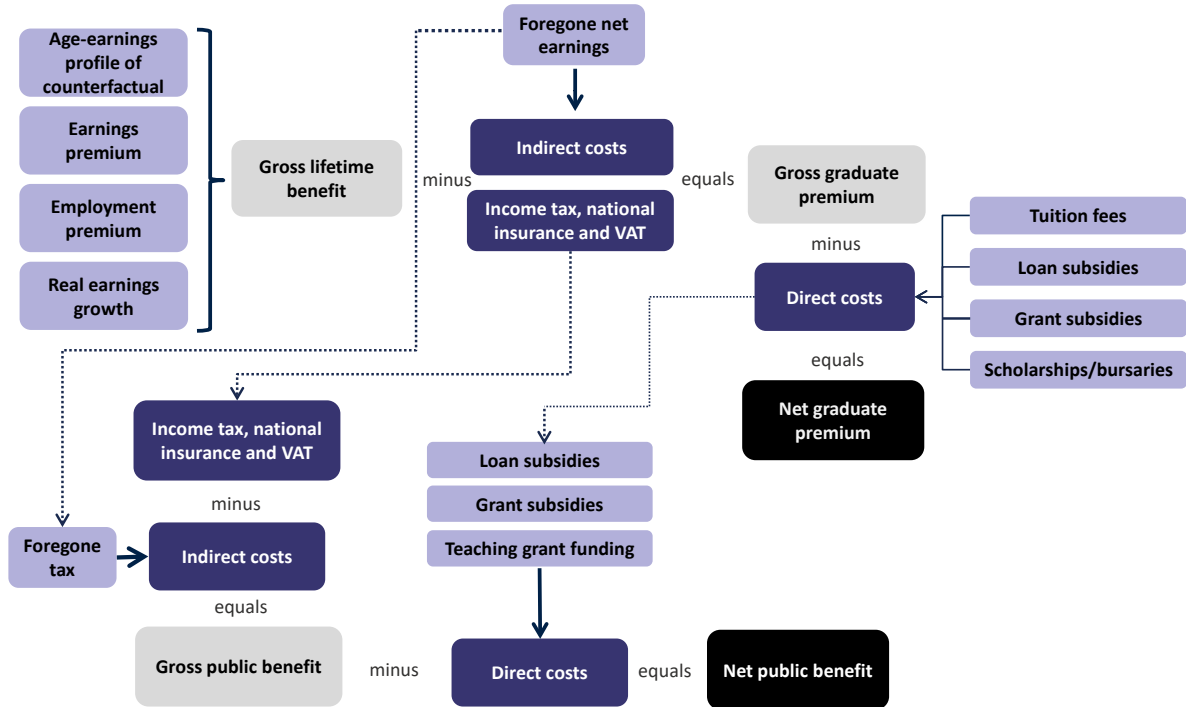*Source: London Economics' analysis based on information provided by Queen Mary*

3.3   Defining the returns to higher education qualifications

The fundamental objective of the analysis of the impact of Queen Mary'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 14):

- 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 14   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)

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' (to the greatest extent possible with the relevant data) those other personal and socioeconomic characteristics that might affect labour market earnings and employment (such as gender, age, or sector of employment), leaving just the labour market gains attributable to the qualification itself (see Figure 15 for an illustration of this, for full-time first degrees). 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 15   Estimating the gross graduate premium and gross Exchequer benefit
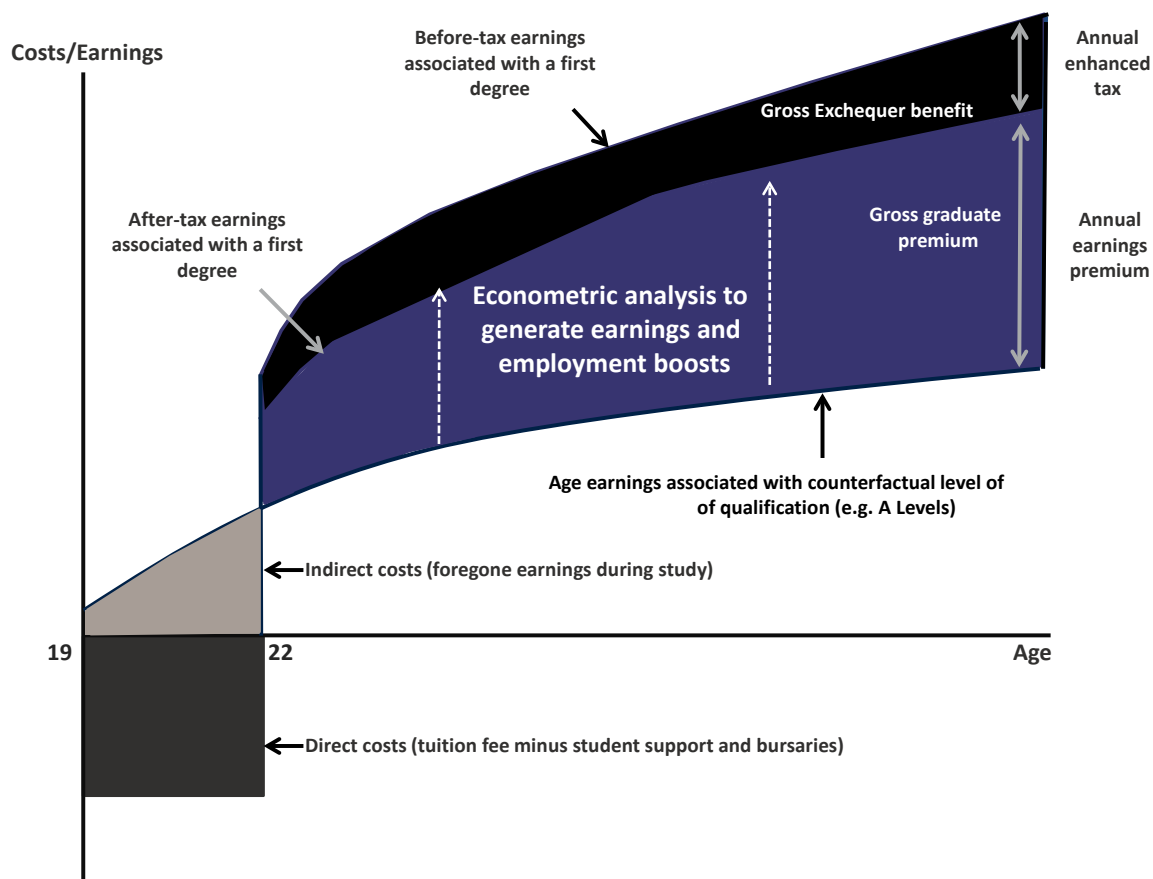
Note: The analysis assumes that the opportunity costs of foregone earnings associated with higher qualification attainment are applicable to full-time students only. For part-time students, we have assumed that these students are able to combine work with their academic studies and as such, do not incur any opportunity costs in the form of foregone earnings. This illustration is based on an analysis of Queen Mary's student cohort data for 2021-22, where the mean age at enrolment for full-time first degree students stands at 19, and we have assumed that a full-time first degree requires 3 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 adjusted for the specific **subject composition** of students studying at Queen Mary, to reflect the fact that there is significant variation in post-graduation labour market outcomes depending on the subject of study. In addition, given the fact that part-time students generally undertake and complete higher education qualifications later in life than full-time students, the analysis for part-time students applies a **'decay function'** to the returns associated with qualification attainment, to reflect the shorter period of time in the labour market[56].

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).

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[56] See Annex A2.2.3 for more information.

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[57]. These direct costs refer to the **proportion of the tuition fee paid by the student**[58] 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 (SAAS, for students from Scotland)[59], minus any **fee waivers or bursaries** provided by Queen Mary[60]. In this respect, the student benefit associated with tuition fee loan or maintenance loan support equals the **Resource Accounting and Budgeting charge** (RAB charge)[61], capturing the

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[57] 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.

[58] We made use of information provided by Queen Mary on the tuition fee income (net of fee waivers) received by the University in the 2021-22 academic year associated with *full-time* students, separately by domicile and study level. To arrive at the net fees per *full-time* student, we then divided the total relevant fee income by the underlying number of (first-year and continuing) full-time students in 2021-22 (again by study level). To arrive at the net fees per *part-time* student (ensuring that the estimated fees for part-time students accurately reflect the average study intensity amongst part-time students in the 2021-22 cohort), we adjusted the respective full-time rates for the average study intensity amongst part-time students in the cohort. In turn, the average study intensity 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 Queen Mary). To arrive at the total tuition fee income per student, the estimated average fee waivers per student were added to the net tuition fee income per student (separately by domicile, study level, and mode). More information on the derivation of the average fee waiver per student is provided in Footnote 60.

[59] 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 2021-22 (see Student Loans Company 2022a, 2022b and 2022c, 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, 2022). 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. In addition, the assumed average fee loans or fee grants per student (where applicable) have been capped at the average tuition fees charged per Queen Mary student in 2021-22.

[60] Average fee waivers per student were calculated based on information provided by Queen Mary on the total funding through fee waivers provided by the University in 2021-22, by domicile, mode, and level of study. Average non-fee waivers (i.e. other bursaries and scholarships) per student were calculated based on information provided by Queen Mary on total funding through non-fee waivers by scholarship or bursary scheme, which were applied to the specific domiciles, modes, and levels of study which each scheme applies to. To arrive at the average level of funding per student (per year), we then divided the relevant total funding (by domicile, mode, and level) by the total number of (first-year and continuing) students studying at Queen Mary in 2021-22 (again, by domicile, mode, and level).

[61] 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 (2022a)), 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)); and 26% for Northern Irish students (assumed to be the same as the RAB charge for Welsh domiciled students given the similar loan balance). 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 (2022a); 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; and 0% for Northern Irish domiciled students (given that these students have a very small loan

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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[62].

The **direct costs**[63] **to the public purse** include the **teaching grant funding** administered by the Office for Students[64], the **student support** provided in the form of fee and maintenance loans/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 2021-22 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.

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balance). 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, we have assumed a RAB charge of 0% for both full-time and part-time students (based on the Department for Education's (2022a) student RAB charge estimates for postgraduate Master's loans for English students (again see Annex B of Department for Education (2022a)). For Scottish students at postgraduate taught level, we again assumed a RAB charge of 31% (again based on Audit Scotland (2020); unfortunately, the estimates here did not provide a breakdown of the RAB charge by study level).

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 and Wales, we assumed a RAB charge of 19% (again based on based on Department for Education (2022a)).

[62] 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 Queen Mary tuition fees – i.e. the net graduate premium *exceeds* the gross graduate premium per student (see the results presented in Table 27 and Table 28 in Annex A2.2.5).

[63] 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.

[64] This is based on published HESA financial information on the total OfS recurrent teaching grant received by Queen Mary in 2021-22 (see HESA, 2023c), divided by the total number of UK domiciled and *continuing* EU students enrolled with Queen Mary in 2021-22 (excluding any first-year EU students, as well as 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)). The inclusion of *continuing* EU students in the calculations was based on the fact that EU domiciled *first-year* students starting HE qualifications in the UK in 2021-22 were subject to the new post-Brexit rules – and, therefore, were generally no longer eligible for public teaching grant funding. In contrast, EU domiciled *continuing* students in 2021-22 were, in general, still eligible for this funding. We again adjusted for the average assumed study intensity among full-time and part-time students, to arrive at separate rates of teaching grant funding by study mode.

3.5   Estimated net graduate premium and net Exchequer benefit

Table 16 presents the net graduate premiums and net Exchequer benefits achieved by UK domiciled students[65] starting qualifications at Queen Mary in the 2021-22 academic year (by study mode, on average across men and women[66], and on average across students from all domiciles).

The statistical and econometric analysis indicates that the estimated **net graduate premium** achieved by a representative[67] student in the 2021-22 cohort completing a **full-time first degree** at Queen Mary (with a RQF Level 3 qualification as their highest level of prior attainment[68]) is approximately **£94,000** in today's money terms. At postgraduate level, the net (post)graduate premiums for a representative[69] student completing a full-time postgraduate taught or postgraduate research degree at Queen Mary (relative to a first degree) stand at approximately **£97,000** and **£148,000**, respectively. The returns associated with postgraduate taught degrees are particularly robust given the fact that postgraduate taught degrees are typically 12 months in duration, but also relative to individuals in possession of first degrees (where a strong economic return has already been identified).

> **The net graduate premium for a representative full-time first degree student stands at £94,000.**

Table 16   Net graduate premium and net Exchequer benefit per UK domiciled student at Queen Mary, 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]	£58,000		£54,000	
First degree[1]	£94,000	£78,000	£90,000	£51,000
Other postgraduate[2]	£95,000	£101,000	£109,000	£99,000
Higher degree (taught)[2]	£97,000	£100,000	£108,000	£102,000
Higher degree (research)[2]	£148,000	£60,000	£150,000	£57,000

Note: All estimates constitute weighted averages across men and women (weighted by the estimated number of student completers in the 2021-22 cohort) and are presented in 2021-22 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 (while the costs of qualification attainment would still be incurred). Gaps may arise where there are no students in the 2021-22 Queen Mary cohort expected to complete the given qualification (with the given characteristics). [1] Net graduate premiums and net public purse benefits associated with qualifications at 'other undergraduate' and first degree level are estimated relative to possession of Level 3 qualifications (see Annex A2.2.1 for further detail). [2] Net graduate premiums and net public purse benefits associated with qualifications at 'other postgraduate', higher degree (taught) and higher degree (research) level are estimated relative to the possession of first degrees.
Source: London Economics' analysis

There are also substantial **net graduate premiums** for **part-time** students. For instance, for representative part-time student in the cohort completing a first degree, the estimated net graduate

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[65] The full set of net graduate premiums and net Exchequer benefits (for all study levels, study modes, and prior attainment levels) is presented in Annex A2.2.5.

[66] For a breakdown of the results by gender, again see Annex A2.2.5.

[67] The analysis is based on an average age at graduation of 22 for students undertaking full-time first degrees at Queen Mary in the 2021-22 cohort (also see Annex A2.2.3 for further information).

[68] As further outlined in Annex A2.2.1, this predominantly includes 2 or more GCE 'A' levels (or equivalent qualifications). RQF refers to the Regulated Qualifications Framework used in England, Wales, and Northern Ireland.

[69] This is based on an average age at graduation in the 2021-22 cohort of 25 for full-time higher degree (taught) students and 31 for full-time higher degree (research) students.

premium stands at approximately **£78,000**. The fact that part-time students tend to complete their studies later in life[70] (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. In the case of first degrees[71], part-time net graduate premiums tend to be lower than (or equal to) the corresponding premiums for full-time students, suggesting that the former effect likely dominates the latter in this case.

> **The net public purse benefit associated with a representative full-time first degree student stands at £90,000.**

In terms of the benefits to the public purse, the **net Exchequer benefit** for a representative **full-time** first degree student (again with a Level 3 qualification as their highest level of prior attainment) stands at approximately **£90,000** in 2021-22 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 **£108,000** and **£150,000**, respectively. The substantial net Exchequer benefit associated with postgraduate taught degrees reflects both the strong earnings and employment outcomes associated with these qualifications, but also the relatively moderate public costs incurred to provide these qualifications.

Again, there are also substantial net Exchequer benefits associated with **part-time students**. For instance, the net Exchequer benefit for a representative part-time student undertaking a first degree was approximately **£51,000**, while the net benefits for postgraduate taught degrees or postgraduate research degrees (relative to a first degree) stand at approximately **£102,000** and **£57,000** (respectively).

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

Combining the information on the number of UK domiciled students in the 2021-22 Queen Mary 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 Queen Mary's teaching and learning activities** associated with the 2021-22 cohort amounts to approximately **£1,253 million** (see Table 17).

This total impact is split evenly between the Exchequer and students, with **£627 million** of the economic benefit accrued by the Exchequer, and the remaining **£626 million** accrued by students. In terms of study level, **68%** (**£849 million**) of the estimated economic impact is generated by Queen Mary's undergraduate students, with the remaining **32%** (**£404 million**) generated by the University's postgraduate students. In terms of domicile, **98%** (**£1,228 million**) of the

> **The total economic impact of teaching and learning generated by the 2021-22 cohort of Queen Mary students stands at £1.25 billion.**

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[70] Again, see Annex A2.2.3 for more information.
[71] As well as for higher degree (research) qualifications.

estimated economic impact is associated with students from England.

Table 17   Aggregate impact of Queen Mary's teaching and learning activities associated with the 2021-22 cohort (£m), by type of impact, domicile, and level of study

Beneficiary and study level	Domicile				
	England	**Wales**	**Scotland**	**Northern Ireland**	**Total**
Students	**£613m**	**£9m**	**£2m**	**£2m**	**£626m**
Undergraduate	£425m	£6m	£0m	£0m	**£432m**
Postgraduate	£188m	£3m	£2m	£1m	**£194m**
Exchequer	**£615m**	**£8m**	**£3m**	**£2m**	**£627m**
Undergraduate	£412m	£4m	£0m	£0m	**£417m**
Postgraduate	£203m	£3m	£2m	£1m	**£210m**
Total	**£1,228m**	**£17m**	**£5m**	**£3m**	**£1,253m**
Undergraduate	£838m	£10m	£1m	£0m	**£849m**
Postgraduate	£391m	£7m	£4m	£3m	**£404m**

Note: All estimates are presented in 2021-22 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 2021-22 cohort of students only. Depending on the size and composition of subsequent cohorts of Queen Mary 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).

4   The impact of Queen Mary's educational exports

With the United Kingdom, and Queen Mary 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 Queen Mary.** Specifically, we analyse overseas income in the form of tuition fee spending (net of any fee waivers and other bursaries provided by the University) and non-tuition fee (off-campus) expenditures by international (EU and non-EU domiciled) students in the 2021-22 cohort of Queen Mary students, over the entire course of their studies[72]. 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 Queen Mary itself) and non-fee income (accrued by other organisations providing goods and services to international students) associated with non-UK students in the 2021-22 cohort.

- **Indirect effect ('supply chain impacts'):** Queen Mary 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 Queen Mary (supported by its tuition fee income) and of companies providing good and services to the University'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 further 'ripple effect' throughout the economy as a whole[73].

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

4.1   The 2021-22 cohort of international Queen Mary students

Figure 16, Figure 17, and Figure 18 present information on the number of non-UK domiciled students in the 2021-22 cohort of Queen Mary students (by domicile, mode of study, and level of study, respectively).

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[72] Note that other types of export income accrued directly by Queen Mary (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 Queen Mary's research activity (Section 2.1) and the impact of the expenditures of Queen Mary (Section 5) , and are thus excluded from the analysis of exports to avoid double-counting.

[73] 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 Queen Mary). The economic impact associated with UK students' tuition fee expenditures is instead (implicitly) included in the estimated direct, indirect, and induced impacts associated with Queen Mary's own expenditures (see Section 5).

In terms of domicile (Figure 16), of the total of **5,745** international students starting higher education qualifications at Queen Mary in 2021-2022, **610** (**11%**) were domiciled within the European Union, while **5,135** (**89%**) were from non-EU countries. In terms of study mode (Figure 17), the majority of international students in the cohort (**5,620** , **98%**) were undertaking their qualifications on a full-time basis, with the remaining **125** (**2%**) studying on a part-time basis.

In terms of study level (Figure 18), in contrast to UK domiciled students (see Section 3.1), the majority of non-UK domiciled students in the cohort were undertaking postgraduate qualifications (**4,330, 75%**), including **4,085** students (**71%**) enrolled in postgraduate taught degrees, **175** (**3%**) undertaking postgraduate research degrees, and **70** (**1%**) undertaking other postgraduate qualifications. At undergraduate level, there were **1,330** (**23%**) students undertaking first degrees, while the remaining **85** (**2%**) students were enrolled in other undergraduate learning[74].

Figure 19 presents more detailed information on the country of domicile of international students in the 2021-22 cohort.
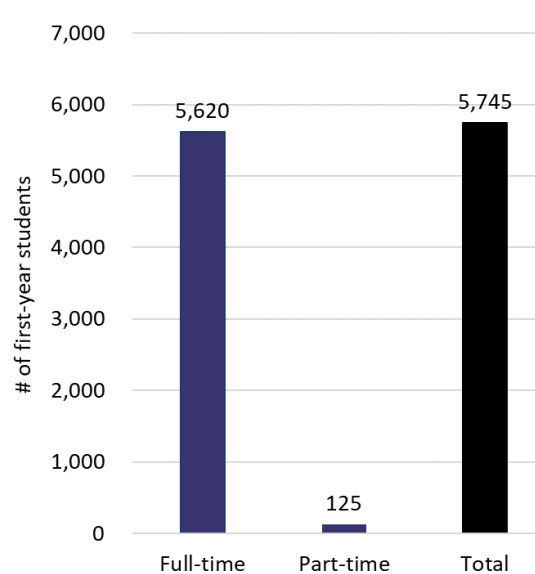
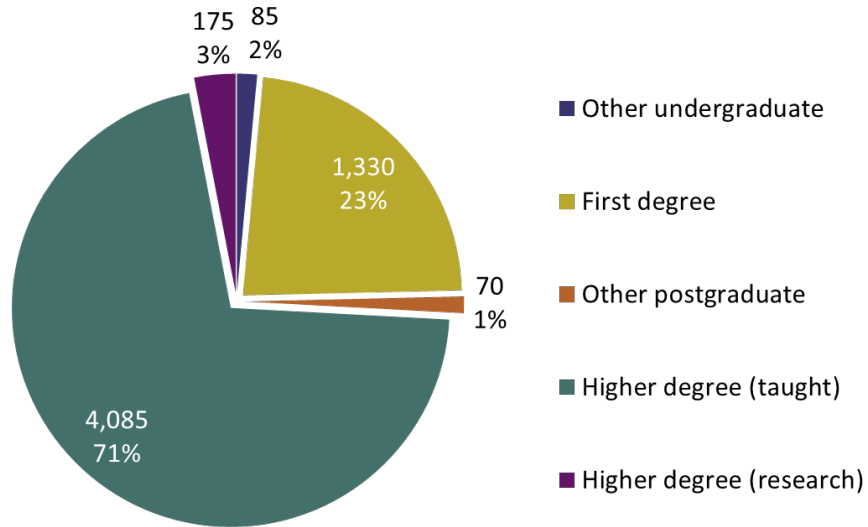**Figure 16   Non-UK domiciled students in the 2021-22 cohort of Queen Mary students, by domicile**
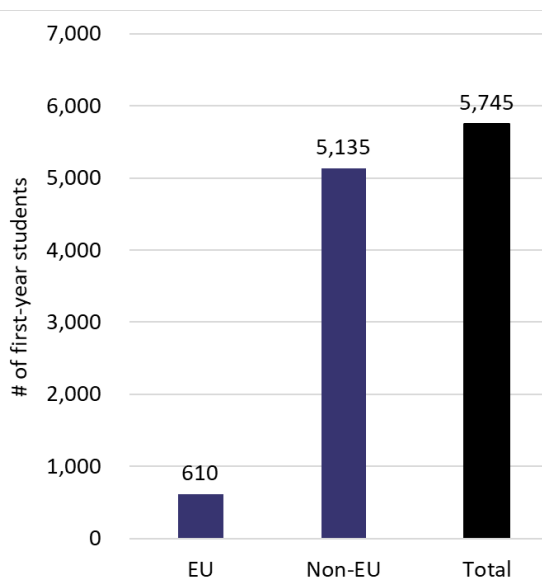
Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
Source: London Economics' analysis based on Queen Mary HESA data

Figure 17   Non-UK domiciled students in the 2021-22 cohort of Queen Mary 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 Queen Mary HESA data

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[74] For more detailed information on Queen Mary's 2021-22 cohort of non-UK domiciled students, please refer to Annex A2.3.1.
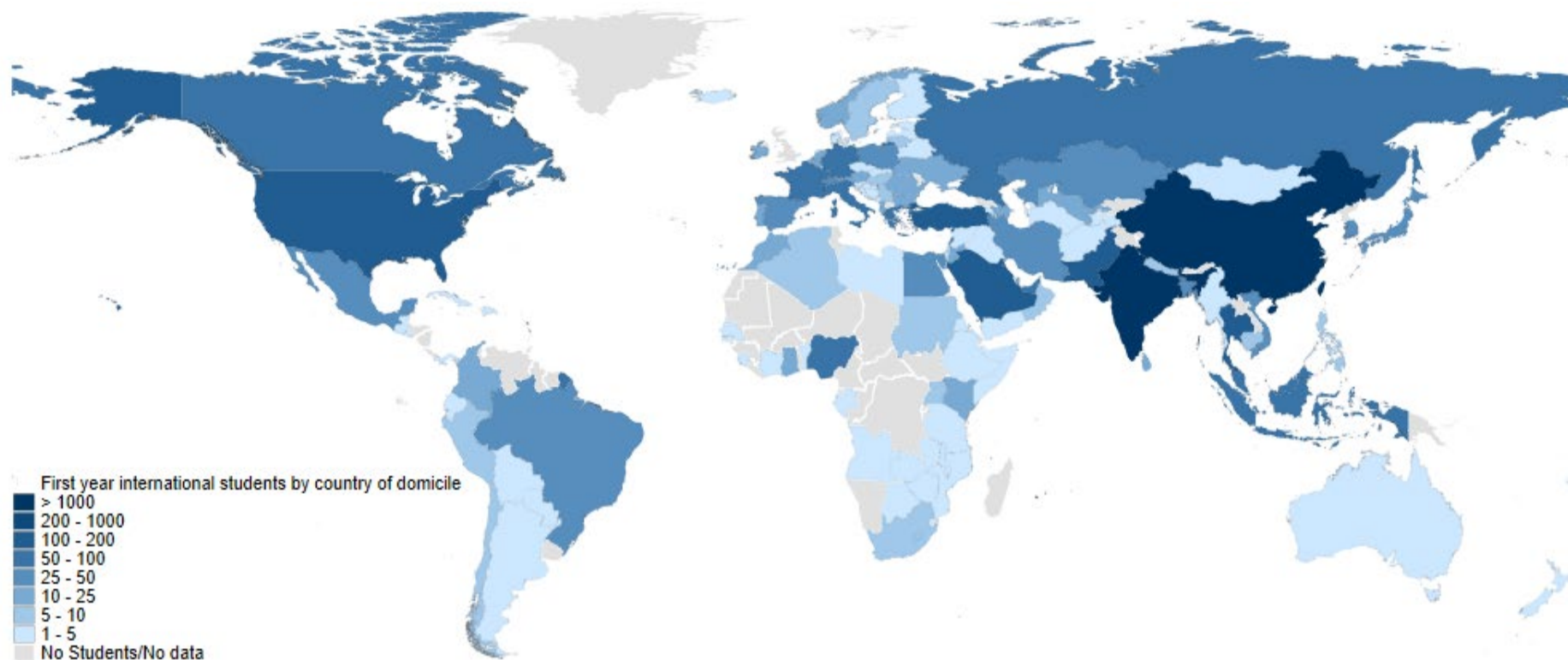
Figure 18   Non-UK domiciled students in the 2021-22 cohort of Queen Mary students, by level of study

Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding. 'Other undergraduate' learning relates to undergraduate-level diplomas and certificates. 'Other postgraduate' learning includes postgraduate-level diplomas and other qualifications, as well as taught work for credit at postgraduate level.
Source: London Economics' analysis based on Queen Mary HESA data

Figure 19   Non-UK domiciled students in the 2021-22 cohort of Queen Mary students, by country of domicile

First year international students by country of domicile
- > 1000
- 200 - 1000
- 100 - 200
- 50 - 100
- 25 - 50
- 10 - 25
- 5 - 10
- 1 - 5
- No Students/No data

Note: Based on HESA data on **5,765** first year overseas domiciled students from Queen Mary.
Source: London Economics' analysis based on Queen Mary HESA data. © EuroGeographics for the administrative boundaries and © 2009 Bjørn Sandvik

4.2 Changes in the number of international students at Queen Mary

Alongside the analysis of the 2021-22 cohort of non-UK domiciled *first-year* students, we have also examined the trends in Queen Mary's *entire* non-UK student body over the past twelve years (i.e. academic years 2010-11 to 2021-22).

With Queen Mary being an increasingly popular destination for international students, there has been a significant increase in the number of non-UK domiciled students enrolled at Queen Mary over the last decade, increasing from **4,035** students in 2010-11 to **8,940** students in the 2021-22 academic year (a **122%** increase). With the number of UK domiciled students having increased at a slower rate across the period (by **59%**), the proportion of Queen Mary's students that are from non-UK domiciles has increased from **27%** in 2010-11 to **34%** in the 2021-22 academic year (see Figure 20).
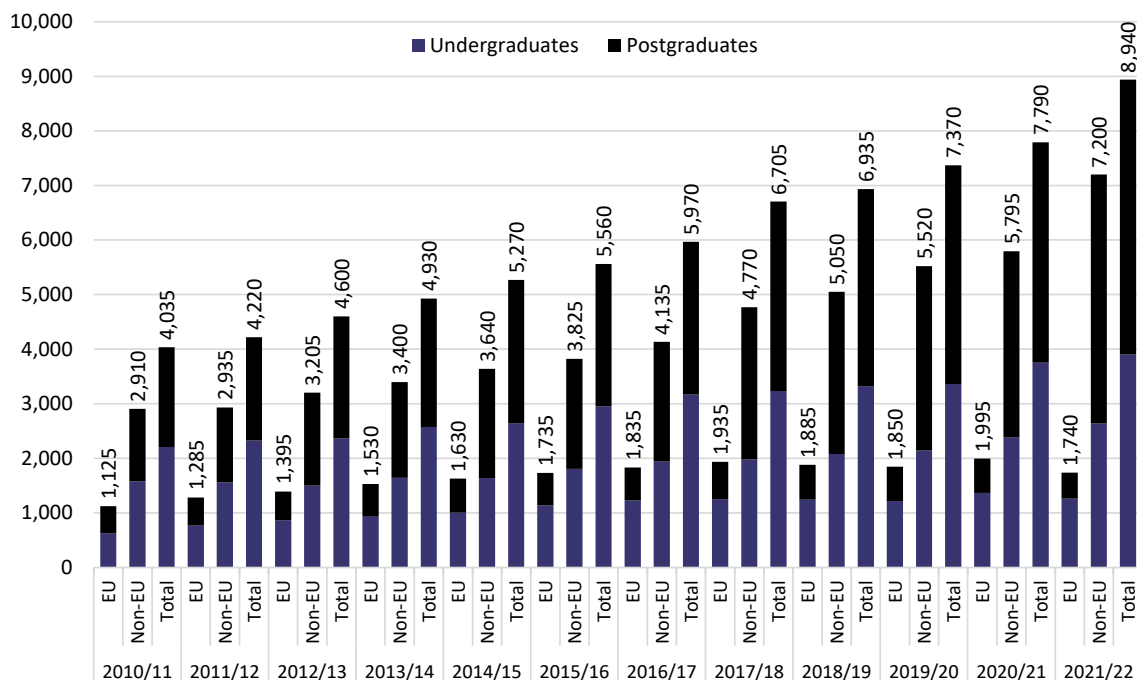
Figure 20   Total number of students at Queen Mary, 2010-11 to 2021-22, by domicile
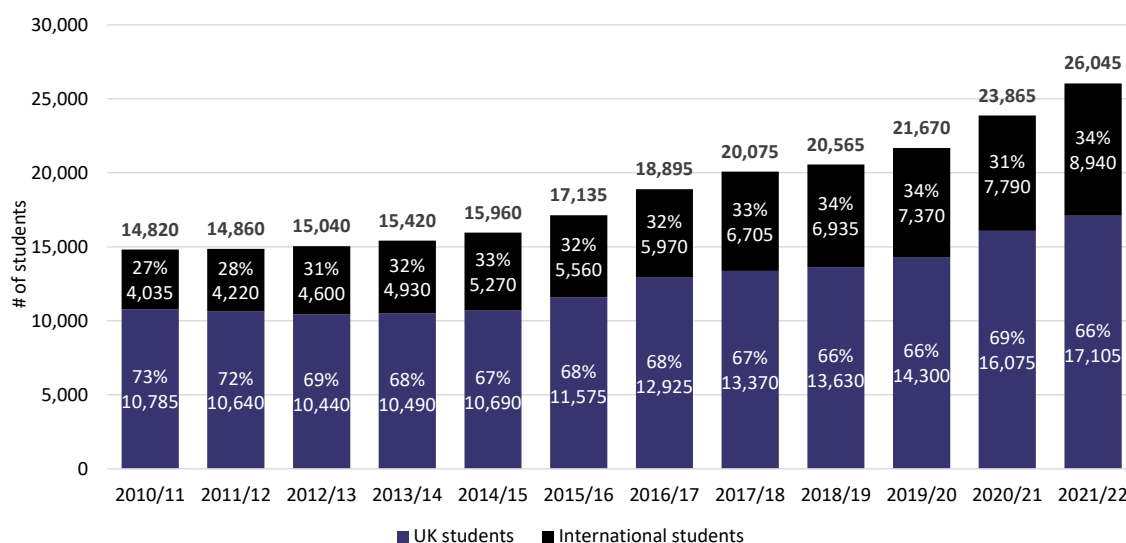
Note: All numbers are rounded to the nearest 5, and the total values may not add up precisely due to this rounding.
Source: London Economics' analysis based on HESA (2011, 2012, 2013, 2014, 2015, and 2023e)

Regarding the breakdown of the University's non-UK students by domicile (Figure 21), the overall increase in international students was predominantly driven by an increase in students from non-EU domiciles (from **2,910** in 2010-11 to **7,200** in the 2021-22 academic year) with a much smaller increase in students from EU domiciles (from **1,125** in 2010-11 to **1,740** in the 2021-22 academic year). 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 **72%** in 2010-11 to **81%** in the 2021-22 academic year. Also note the decline in the number of EU domiciled students enrolled at Queen Mary between 2020-21 and 2021-22. This decrease was mostly driven by the significant changes to the fees and funding rules for EU domiciled first-year students commencing HE qualifications in the UK from 2021-22 onwards, following the UK's departure from the European Union (more detail on these changes is provided in Section 4.3). However, the **13%** decline in the number of EU domiciled students commencing their studies at Queen Mary was less severe than the **52%** decline that was experienced across the entire UK higher education sector.

Figure 21   Number of non-UK domiciled students at Queen Mary, 2010-11 to 2021-22, by level of study and 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 HESA (2011, 2012, 2013, 2014, 2015, and 2023e)

In terms of level of study (again see Figure 21), the increase in the number of international students studying at Queen Mary occurred across both undergraduate and postgraduate students, with the number of non-UK undergraduate students increasing from **2,210** in 2010-11 to **3,905** in the 2021-22 academic year, and the number of non-UK postgraduate students rising from **1,825** in 2010-11 to **5,035** in the 2021-22 academic year. The higher growth amongst postgraduate students compared to undergraduate students has resulted in an increase in the proportion of non-UK students that are studying at postgraduate level, from **45%** in 2010-11 to **56%** in the 2021-22 academic year.

4.3   The impact of Brexit on fees and funding for EU students

The UK's exit from the European Union has had several significant impacts on the fees and funding rules for EU domiciled students studying in the UK, with 2021-22 being the first academic year in which post-Brexit rules applied to these students.

In relation to **tuition fees**, pre-Brexit, EU students were eligible for 'home' fee status (i.e., they were charged the same level of tuition fees as UK domiciled students studying in the UK[75]). However, following the end of the Brexit transition period, EU domiciled students starting HE qualifications in the UK from 2021-22 onwards are typically no longer eligible to pay 'home' fees – since, in general, only EU nationals with pre-settled or settled status (under certain residency conditions) in the UK

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[75] Specifically, institutions were obliged to charge the same tuition fees to EU domiciled students studying in England, Wales, Scotland, or Northern Ireland as for English students studying in England, Welsh students studying in Wales, Scottish students studying in Scotland, and Northern Irish students studying in Northern Ireland (respectively).

are eligible for these (lower) fees[76]. We expect that the vast majority of first-year EU domiciled students starting HE qualifications in the UK in the 2021-22 academic year do *not* have settled or pre-settled status, and therefore assume that all EU domiciled students in the 2021-22 Queen Mary cohort are charged the same fees as non-EU students (which are typically much higher than the tuition fees charged to 'home' students)[77].

In relation to the **funding costs** associated with international students, in addition to any potential fee waivers and bursaries provided to international students by Queen Mary itself, prior to 2021-22, our analysis of the impact of educational exports would also have deducted the cost of public **teaching grants** to fund the University's provision of teaching and learning activities for EU domiciled students, as well as the costs associated with public **tuition fee support** provided to EU domiciled students studying in England. However, following the end of the Brexit transition period, only EU nationals with pre-settled or settled status in the UK are generally eligible for this funding. Again, we expect that most EU domiciled students in the 2021-22 cohort did not hold pre-settled or settled status, and we therefore assume that there are no public teaching grant or student support costs applicable to the cohort[78]. Given these simplifying assumptions, note that our analysis is likely to *overestimate* the tuition fees and *underestimate* the funding costs associated with EU domiciled students in the 2021-22 cohort.

4.4 Direct impact

4.4.1 Net tuition fee income

To assess the level of *gross* **tuition fee income** associated with international students in the 2021-22 cohort, we made use of data on the average tuition fees per student charged by Queen Mary in the 2021-22 academic year (by study level, mode, and domicile[79]). Assuming the same average study

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[76] The eligibility rules for home fee status and student finance from the 2021-22 academic year following the UK's exit from the EU (Department for Education, 2022b) indicate that EU nationals with settled status can be awarded home fee status and fee and maintenance support if they have been resident in the UK (and Islands) for at least 3 years. For EU nationals with pre-settled status, the rules state that 'in practice, the Student Loans Company (SLC) will accept pre-settled status, together with ID documentation, as evidence for the purposes of awarding student support to EU, other EEA and Swiss nationals and their family members. We anticipate that providers will take the same approach when awarding home fee status where the student has 3 years' residence in the UK, Gibraltar, EEA, Switzerland or the British/EU overseas territories'.

[77] HESA does not collect data on the number of EU domiciled students that hold settled or pre-settled status in the UK. In the absence of this information, we have assumed that no EU domiciled students in the 2021-22 cohort have settled or pre-settled status, i.e., that all of these students pay the same fees that are charged to non-EU students. Note that HESA's definition of domicile states that a student's domicile is the 'country the student lived in for non-educational purposes before starting their course' (HESA, 2023b), but does *not* capture students' nationality (i.e., HESA's definition does not align exactly with the definition of EU students in the Department for Education's eligibility rules for home fee status and student finance (see Department for Education, 2022b)).

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

[79] As in the analysis of Queen Mary's teaching and learning activities (see Section 3), we made use of information provided by Queen Mary on the tuition fee income (net of fee waivers) received by the University in the 2021-22 academic year associated with *full-time* students, separately by domicile and study level. To arrive at the net fees per *full-time* student, we then divided the total relevant fee income by the underlying number of (first-year and continuing) full-time students in 2021-22 (again by study level). To arrive at the net fees per *part-time* student (ensuring that the estimated fees for part-time students accurately reflect the average study intensity amongst part-time students in the 2021-22 cohort), we adjusted the respective full-time rates for the average study intensity amongst part-time students in the cohort. To arrive at the total tuition fee income per student, the estimated average fee waivers per student were added to the net tuition fee income per student (separately by domicile, study level, and mode). More information on the derivation of the average fee waiver per student is provided in Section 3.4.2.

This approach was used to derive the estimated tuition fees per non-EU student (by study level and mode); as outlined in further detail in Section 4.3, following the UK's exit from the European Union, we assume that all EU students in the 2021-22 cohort were charged the same tuition fees as non-EU students (as EU students were generally no longer eligible for 'home' fee status). As a result, we apply the

durations as in the analysis of the impact of Queen Mary's teaching and learning activities provided to UK-domiciled students (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 2021-22 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 any **fee waivers and bursaries** paid to international students by Queen Mary[80]. These costs were again calculated over students' total study duration and estimated in present value terms[81].

Combining the estimates per student with information on the number of non-UK students in the 2021-22 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 2021-22 cohort of Queen Mary students. As presented in Figure 22, the **total net tuition fee income** generated by international students in the cohort was estimated at **£231 million**, of which **£36 million (16%)** was generated by **EU students**, and **£195 million (84%)** was generated by **non-EU students**.

Figure 22   Aggregate net tuition fee income associated with international student entrants in the 2021-22 cohort, by domicile (£m)
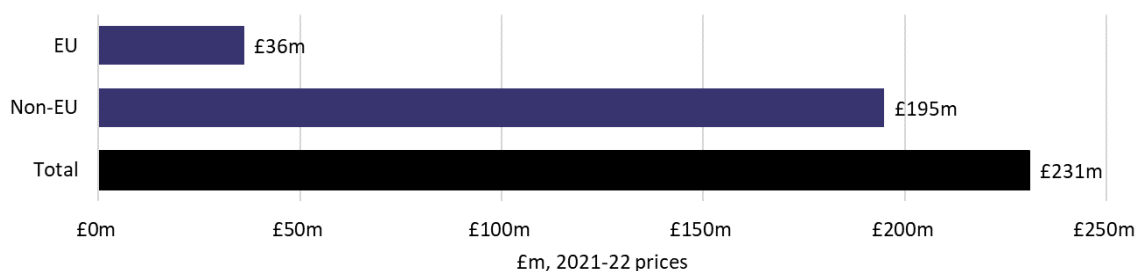
Note: All estimates are presented in 2021-22 prices, discounted to reflect net present values, and rounded to the nearest £1m. Values may not add up precisely to the totals due to rounding.
Source: London Economics' analysis

4.4.2   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 Queen Mary. 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

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average non-EU fee rates to both non-EU *and* EU students (i.e. we assume the same fees per student per year for EU students as for non-EU students).
[80] See Section 3.4.2 for more information on our assumptions in relation to fee waivers and bursaries.
[81] For information on the estimated levels of net fee income per student, please refer to Annex A2.3.2.

■ **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[82], 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 2021-22 cohort of international students studying at Queen Mary, we used estimates from the **2014-15 Student Income and Expenditure Survey** (SIES)[83]. The survey provides estimates of the average expenditures of English domiciled undergraduate students (studying in England or Wales) on living costs, housing costs, participation costs (including tuition fees) and spending on children, separately for full-time and part-time students. For 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 4.4.1).

■ We deducted any **on-campus expenditure** that students might incur (to avoid double-counting with the analysis of the impacts of the expenditure of Queen Mary itself (see Section 5))[84].

■ 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[85].

■ Finally, we **inflated** the estimates to 2021-22 prices[86].

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 2021-22 prices, by level of study, mode, and domicile[87].

Again combining the estimated non-tuition fee income per student with the number of international students in the 2021-22 cohort expected to complete qualifications (or credits/modules) at Queen Mary, the **total (off-campus) non-tuition fee expenditure** associated with international students in the 2021-22 cohort was estimated at **£133 million** (Figure 23). Of this total, **£17 million** (**13%**) was associated with **EU students**, whereas **£116 million** (**87%**) was generated by **non-EU students** in the cohort.

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[82] See Department for Business, Innovation and Skills (2011b).

[83] 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.

[84] 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 Queen Mary itself).

[85] 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.

[86] Inflation estimates are based on Consumer Price Index inflation estimates provided by the Office for National Statistics (2023c).

[87] For information on the estimated levels of non-tuition fee income per student, please refer to Annex A2.3.4.

Figure 23 **Aggregate non-fee income associated with international student entrants in the 2021-22 cohort, by domicile (£m)**

Note: All estimates are presented in 2021-22 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

4.4.3 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 2021-22 Queen Mary cohort (in economic output terms) was estimated at **£364 million** (Figure 24). Almost two-thirds of this total (**£231 million, 63%**) was generated from international students' tuition fees accrued by Queen Mary (net of any fee waivers or bursaries provided by the University), while the remaining **£133 million** (**37%**) was generated from international students' non-tuition fee spending. In terms of student domicile, most of this impact (**£311 million**, **85%**) was generated by non-EU domiciled students, while **£53 million** (**15%**) was associated with EU students (not presented graphically here).

In addition to economic output (i.e. export income), it was possible to convert the above estimates into gross value added and the number of full-time equivalent jobs supported[88]. We thus estimate that the export income generated by international students in the 2021-22 Queen Mary cohort directly generates **£187 million in GVA** (**£118 million** from international (net) fee income and **£69 million** from non-fee income) and supports **2,510 FTE jobs** (**1,750** from (net) tuition fee income and **760** from non-tuition fee income).

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

Figure 24   Total direct impact associated with non-UK students in the 2021-22 Queen Mary entrant cohort, by type of impact
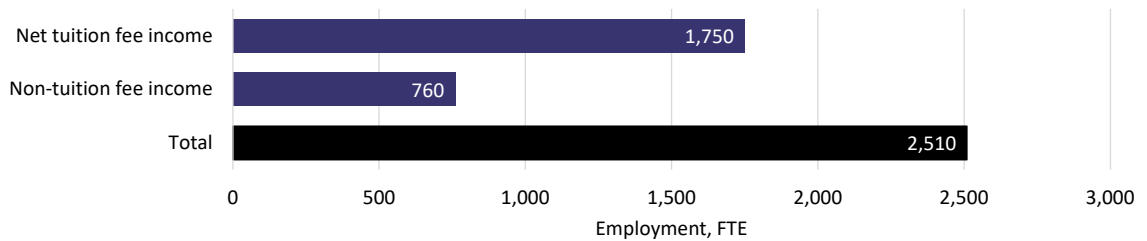
Output, £m

Economic output, £m in 2021-22 prices

GVA, £m

GVA, £m in 2021-22 prices
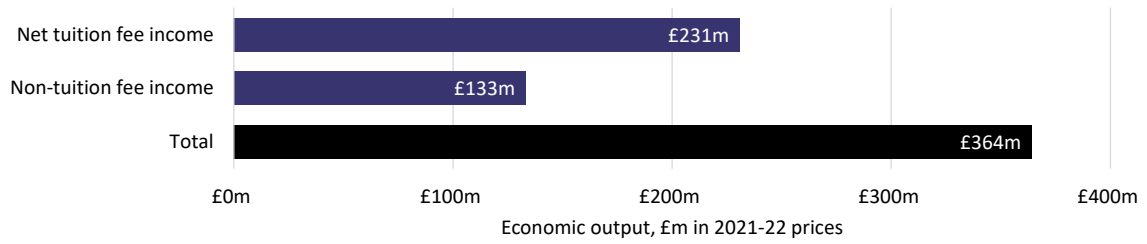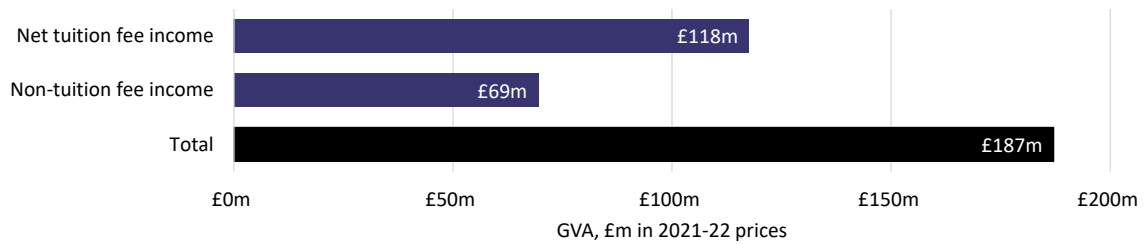
Employment, FTE

Employment, FTE

Note: All monetary estimates are presented in 2021-22 prices, discounted to reflect net present values, and rounded to the nearest £1m. The employment figures are rounded to the nearest 5. Values may not add up precisely to the totals due to rounding.
Source: London Economics' analysis

4.5   Total economic impact associated with Queen Mary's educational exports

To estimate the total (direct, indirect, and induced) economic impact associated with the export income generated by international students studying at Queen Mary, we used economic multipliers derived from the above-described multi-regional Input-Output model (see Section 2.2), 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 2021-22 cohort, including:

■ **Multipliers relating to international tuition fee income (accrued by Queen Mary itself):** The multipliers used to estimate the impact of Queen Mary's international tuition fee

income were calculated based on the inter- and intra-industry flows of goods and services for London's government, health, and education sector as a whole[89].

■ **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 London[90], and subsequently applied to the estimated off-campus non-tuition fee expenditures of overseas students in the 2021-22 cohort of Queen Mary 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 18 presents the economic multipliers applied to the income generated by international students at Queen Mary (in terms of the impact on London and the UK economy as a whole)[91]. In terms of economic output, the analysis assumes that every £1 million of **tuition fee expenditure** incurred by international students generates an *additional* **£1.92 million** of impact throughout the UK economy, of which **£0.96 million** is generated in London. In addition, we assume that every £1 million of non-fee expenditure incurred by international students generates an *additional* **£1.82 million** of impact throughout the UK, of which **£0.92 million** is located in London.

Table 18   Economic multipliers associated with the income from international student entrants in the 2021-22 cohort of Queen Mary students

Location of impact and type of income	Output	GVA	FTE employment
Tuition fee income			
London	1.96	1.80	1.54
Total UK	2.92	2.86	2.56
Non-fee income			
London	1.92	1.79	1.73
Total UK	2.82	2.77	3.08

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[92], 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 2021-22 Queen Mary cohort amounts to **£1,099 million** of **economic output** (see top panel of Figure 25):

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[89] This approach is based on the fact that the tuition fee income from international students is accrued by Queen Mary itself. In other words, we assume that the expenditure patterns of the University are the same as for other institutions operating in London's government, health, and education sector. Specifically, we apply these multipliers to the gross tuition fee income generated by international students in the 2021-22 Queen Mary cohort, and then deduct Queen Mary 's cost of provision (i.e. Queen Mary fee waivers and bursaries) to arrive at the net direct, indirect and induced impact associated with this income.

[90] In other words, for the purpose of applying relevant economic multipliers, we assume that international students studying at Queen Mary have similar expenditure patterns as households in London 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.

[91] While the table presents the multipliers for the impacts on London 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 25.

[92] 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 2021-22 Queen Mary cohort, and then deduct Queen Mary's cost of provision (i.e. Queen Mary's fee waivers and bursaries) to arrive at the net direct, indirect and induced impact associated with this income.

- In terms of the breakdown by type of income from international sources, **£724 million** of this impact was associated with international students' (net) **tuition fees**, and **£376 million** was associated with these students' **non-tuition fee expenditures** over the duration of their studies at Queen Mary.

- In terms of the breakdown by region, most of this impact (**£742 million**, **67%**) was generated in **London**, with the remaining **£358 million** (**33%**) occurring in **other regions** across the UK.

- In terms of sector, the tuition fee and non-tuition fee income generated from Queen Mary's international students generated particularly large impacts within the **government, health, and education sector** (**£318 million** (**29%**), given that the cohort's tuition fee income is accrued as income by Queen Mary itself). In addition, there are relatively large impacts felt within the **distribution, transport, hotel, and restaurant sector** (**£187 million**, **17%**), and the **real estate industry** (**£130 million, 12%**)[93].
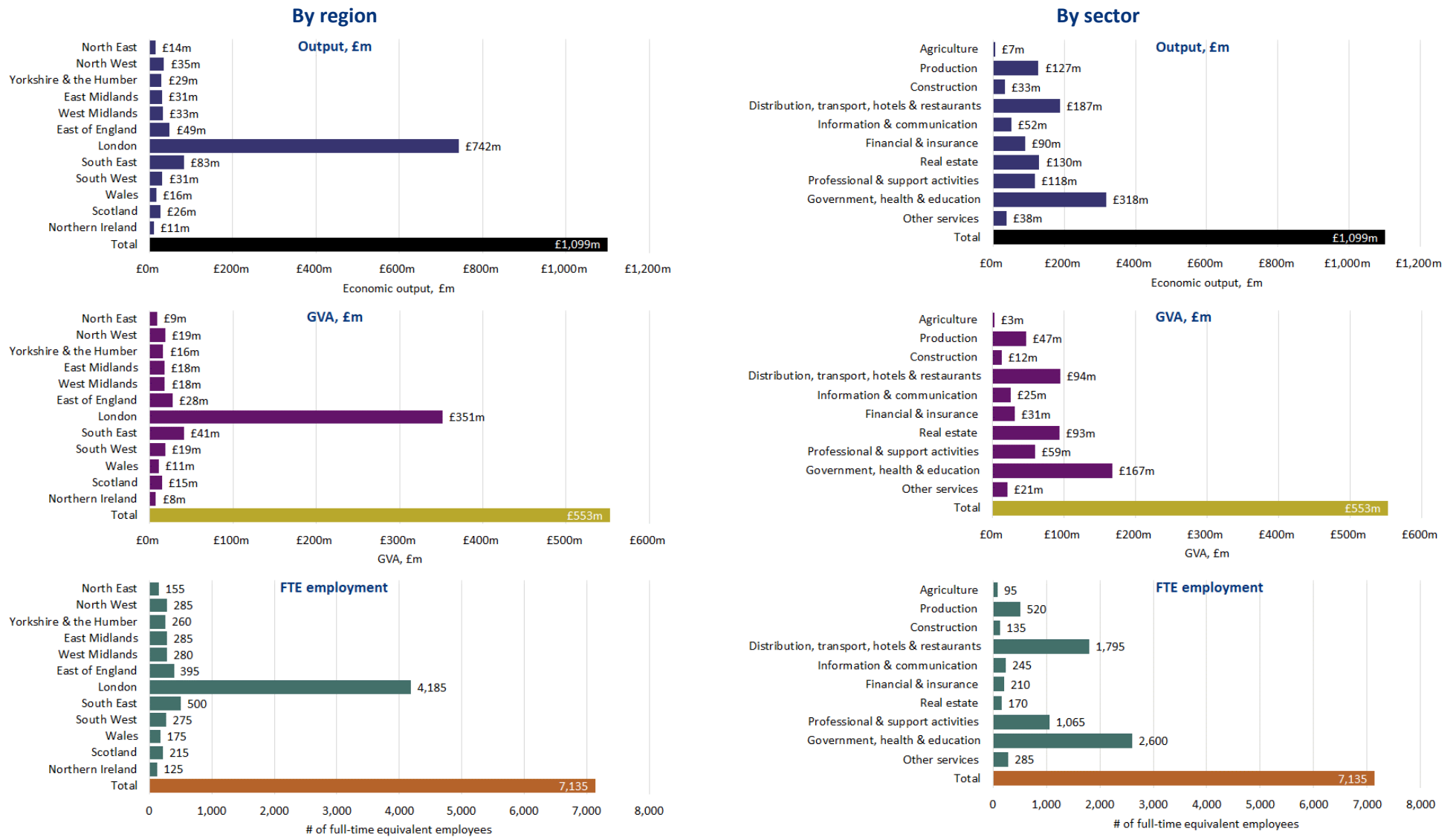
> **The impact of the export income generated by the 2021-22 Queen Mary student cohort stood at £1.10 billion.**

The impact in terms of gross value added was estimated at **£553 million** across the UK economy as a whole (with **£351 million** generated within London), while the corresponding estimates in terms of employment stood at **7,135 full-time equivalent jobs** across the UK as a whole, with **4,185** jobs supported across London.

To place these estimates in context, the University attracts **1.5%** of all international students coming to the UK, and **5.8%** of all international students coming to London. Analysis undertaken by London Economics (2023) on behalf of the Higher Education Policy Institute and Universities UK International on the economic costs and benefits associated with international students, identified the total gross economic benefit to the UK economy associated with international students commencing their studies in the 2021-22 academic year to be approximately **£41.9 billion**. Although a slightly different methodology is adopted compared to the one presented here, this suggests that Queen Mary contributes approximately **2.6%** of the gross economic benefit to the UK economy associated with international students.

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[93] Again, for more detail on what industries are included in this high-level sector classification, please refer to Table 21 in Annex A2.1.

Figure 25 Total economic impact associated with international students in the 2021-22 Queen Mary cohort, by region and sector

By region

Output, £m

Region	
North East	£14m
North West	£35m
Yorkshire & the Humber	£29m
East Midlands	£31m
West Midlands	£33m
East of England	£49m
London	£742m
South East	£83m
South West	£31m
Wales	£16m
Scotland	£26m
Northern Ireland	£11m
Total	£1,099m

Economic output, £m

GVA, £m

Region	
North East	£9m
North West	£19m
Yorkshire & the Humber	£16m
East Midlands	£18m
West Midlands	£18m
East of England	£28m
London	£351m
South East	£41m
South West	£19m
Wales	£11m
Scotland	£15m
Northern Ireland	£8m
Total	£553m

GVA, £m

FTE employment

Region	
North East	155
North West	285
Yorkshire & the Humber	260
East Midlands	285
West Midlands	280
East of England	395
London	4,185
South East	500
South West	275
Wales	175
Scotland	215
Northern Ireland	125
Total	7,135

# of full-time equivalent employees

By sector

Output, £m

Sector	
Agriculture	£7m
Production	£127m
Construction	£33m
Distribution, transport, hotels & restaurants	£187m
Information & communication	£52m
Financial & insurance	£90m
Real estate	£130m
Professional & support activities	£118m
Government, health & education	£318m
Other services	£38m
Total	£1,099m

Economic output, £m

GVA, £m

Sector	
Agriculture	£3m
Production	£47m
Construction	£12m
Distribution, transport, hotels & restaurants	£94m
Information & communication	£25m
Financial & insurance	£31m
Real estate	£93m
Professional & support activities	£59m
Government, health & education	£167m
Other services	£21m
Total	£553m

GVA, £m

FTE employment

Sector	
Agriculture	95
Production	520
Construction	135
Distribution, transport, hotels & restaurants	1,795
Information & communication	245
Financial & insurance	210
Real estate	170
Professional & support activities	1,065
Government, health & education	2,600
Other services	285
Total	7,135

# of full-time equivalent employees

Note: Monetary estimates are presented in 2021-22 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 precisely to the totals indicated. *Source: London Economics' analysis*

5   The impact of Queen Mary's expenditures

In this section, we outline our estimates of the **direct, indirect, and induced impacts** associated with the operational and capital expenditures of Queen Mary. 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's knowledge exchange activities (see Section 2.2) and the impact of Queen Mary'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 Queen Mary itself, by purchasing goods and services (including labour) from the economy in which it operates.
- **Indirect effect:** Queen Mary's purchases generate income for the supplying industries, which they in turn 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, also referred to as a 'ripple effect'.
- **Induced effect**: The employees of Queen Mary and of businesses operating in Queen Mary'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 line with the other strands of impact, the analysis focuses on the 2021-22 academic year. As with the impact of the University's knowledge exchange activities and the impact of Queen Mary's educational exports, these impacts can be measured in terms of economic output, gross value added, and FTE employment.

5.1   Direct impact of the University's expenditures

To measure the direct economic impact of the purchases of goods, services, and labour by Queen Mary, we used information on the University's operational expenditures (including staff and non-staff spending), capital expenditures, as well as the number of staff employed (in terms of full-time equivalent employees), for the 2021-22 academic year[94].

Based on this, in terms of monetary economic **output** (measured in terms of expenditure), **the direct economic impact** associated with Queen Mary's expenditures stood at approximately **£565 million** in the 2021-22 academic year (see Figure 26). This includes **£306 million** of operating expenditure on staff related costs, **£203 million** of expenditure on other (non-staff) operating expenses[95], as well as **£56 million** of capital expenditure incurred in that academic year.

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[94] Based on staff and financial data published by HESA and Queen Mary's financial statements.

[95] The total operational expenditure (excluding capital expenditure) of Queen Mary in 2021-22 stood at **£631 million**. From this, for the purpose of the analysis, we excluded **£27 million** in depreciation costs (from non-staff expenditure) and **£95 million** in movements in pension provisions (from staff expenditure), 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). This results in total operational expenditure of **£509 million** in 2021-22 included here. Totals may not add up precisely due to rounding.

Collaboration in the community

Dennis Johns Service Group is an SME which has been based in the east of London since 1972. An electrical contractor and East End family firm, they have been working with Queen Mary since 2018 on building and maintaining their estates and research facilities in Mile End, Whitechapel and Charterhouse Square. This partnership with Queen Mary University has provided a consistent stream of business opportunities over the years, and in 2021 the university spent £5.5million with Dennis Johns. This commitment has helped our contractors to expand their operations, invest in new technologies, and explore new markets, going from a small business to a major local employer with a turnover of £8 million.

Their partnership is more than transactional: it reflects their shared commitment to our community, our people, and excellence in what we do. Dennis Johns have actively engaged in apprenticeship programs supported by Queen Mary. These initiatives have allowed the company to train and mentor young talent, equipping them with valuable skills and kickstarting their careers. This reflects Queen Mary and Dennis Johns' shared commitment to fostering local talent and addressing skills gaps in industry. Dennis Johns staff have also participated in community outreach and CSR initiatives led by Queen Mary. These efforts have strengthened the University's ties with the local community and enhanced their corporate social responsibility efforts.

Working with Queen Mary University has exposed Dennis Johns and its staff to cutting-edge research and innovation in various fields. This knowledge-sharing has been instrumental in improving Dennis Johns products and services and has led to the development of innovative products and systems. These have not only improved the company's competitiveness but also generated additional revenue streams for the company. This has also enhanced their own supply chain, adding greater resilience to the services purchased by the University.

"Our collaboration with Queen Mary University of London has been nothing short of transformative. Queen Mary University of London's partnership with Dennis Johns Service Group has been a mutually beneficial endeavour that has had a substantial impact on our growth, employment opportunities, apprenticeships, social value, and overall sustainability. We look forward to continuing this fruitful partnership and further contributing to the economic development of the London area."

Kris Adams, Managing Director

Figure 26   Direct economic impact (in terms of output) of Queen Mary's expenditure in the 2021-22 academic year, by type of expenditure
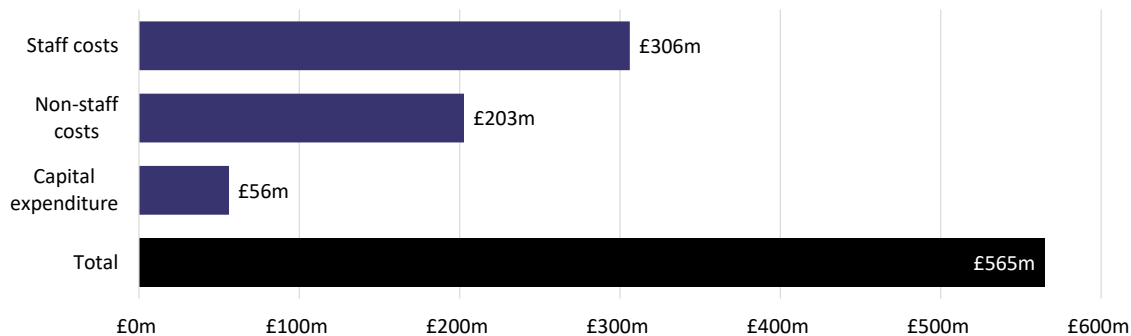
Note: We exclude a total of **£27 million** of non-staff costs associated with depreciation, and **£95 million** of staff costs associated with movements in pension provisions, as it is assumed that these are not relevant from a procurement perspective (i.e. these costs are not accounted for as income by other organisations). All estimates are presented in 2021-22 prices and rounded to the nearest £1m.
Source: London Economics' analysis based on HESA (2023f), HESA (2023g) and Queen Mary's financial statements

In addition to these total expenditures, we investigated the **geographical breakdown** of Queen Mary's procurement expenditures, the number of staff, and staff expenditures, to demonstrate the breadth of Queen Mary's impact across London and the rest of the UK.

Figure 27 presents the distribution of Queen Mary's procurement expenditures (based on invoice data for 2021-22) by Local Authority. The map illustrates a concentration of procurement expenditure in **London** (approximately **33% of expenditure**), but also in the **East of England** (approximately **22% of expenditure**) and the **South East** (approximately **20% of expenditure**)[96]. Although these three regions account for around three-quarters of Queen Mary's procurement expenditure, the University also spends significant amounts on goods and services from suppliers in other regions, including the **South West** (**7%**) and the **North West** (**5%**). Within its core local area within London – and East London in particular - Queen Mary spends significant amounts in both **Tower Hamlets** (**£5 million**) and **Waltham Forest** (**£5 million**). In total, approximately **8.1%** of all of Queen Mary's expenditure occurred in East London (equivalent to approximately **£11 million**).

In addition, Figure 28 and Figure 29 illustrate the distribution of the University's staff headcount and staff expenditure (respectively) by Local Authority (based on the outward postcode area of employees' home addresses). As expected, the maps show a particularly strong concentration of staff and staff expenditure in the area immediately surrounding the University (approximately **77% of staff are based in London**), but also dispersion around the **East of England** (**10%**) and the **South East** (**8%**). Within London, the Local Authorities of Tower Hamlets, Newham, Redbridge, Waltham Forest, Barking and Dagenham, Hackney, and Havering account for over a third of all staff employed by the University (**37%**), which corresponds to staff expenditures of **£102 million**. Within this, Tower Hamlets (**£40 million**) and Newham (**£16 million**) together make up **18%** and **22%** of the University's total staff expenditure and headcount, respectively.

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

Figure 27   Distribution of Queen Mary's procurement expenditure in the 2021-22 academic year by Local Authority (of invoice address)
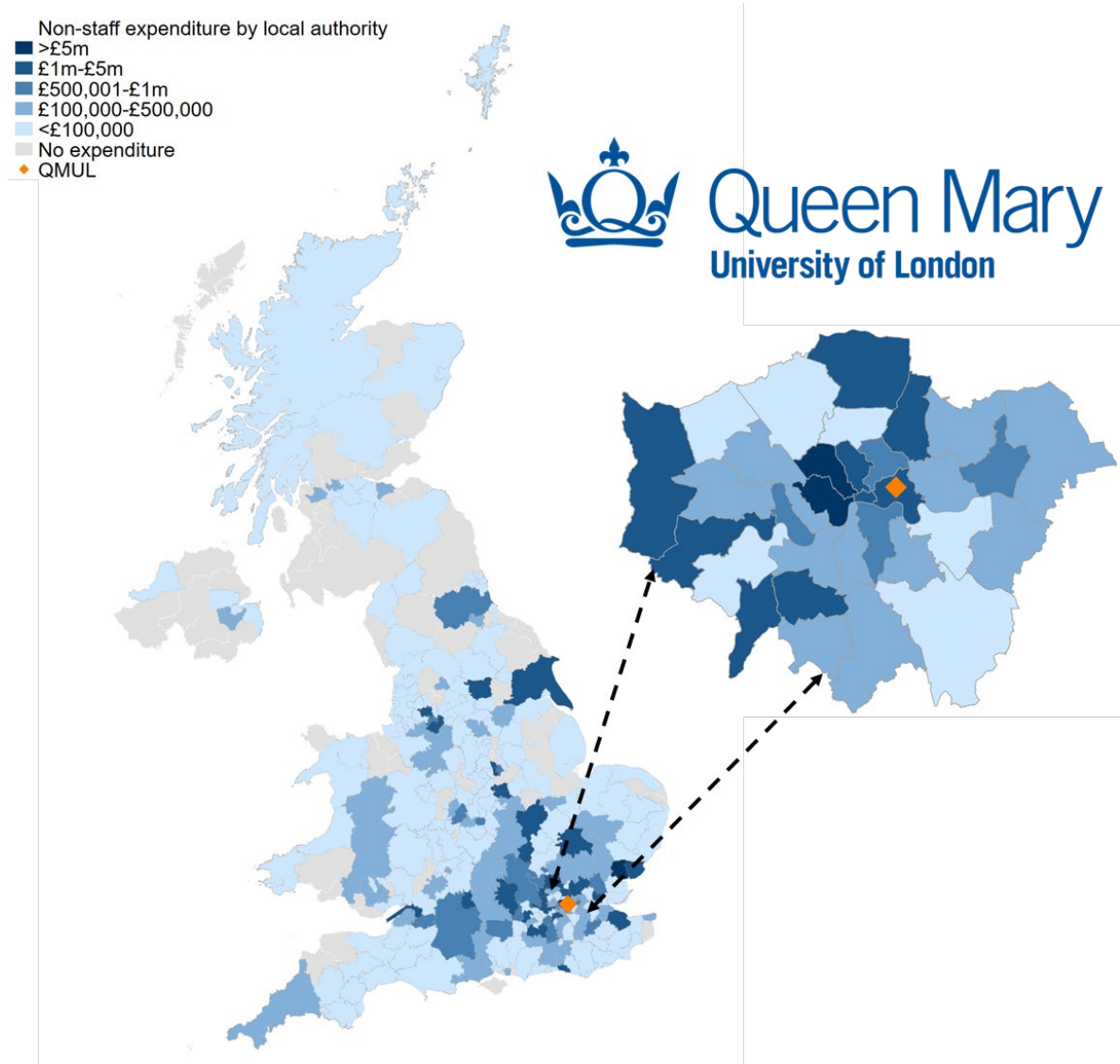
Note: We received data on the invoice outward postcodes associated with £135 million of procurement expenditure by Queen Mary in the 2021-22 academic year. We used the February 2022 ONS Postcode Directory to determine the Local Authority for each outward postcode included in the dataset. The data was then matched with the ONS digital vector boundaries for Local Authorities as of May 2021 to generate the map.
Source: London Economics' analysis based on data from Queen Mary 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 28   Distribution of Queen Mary's staff (in headcount) by Local Authority (of home address)
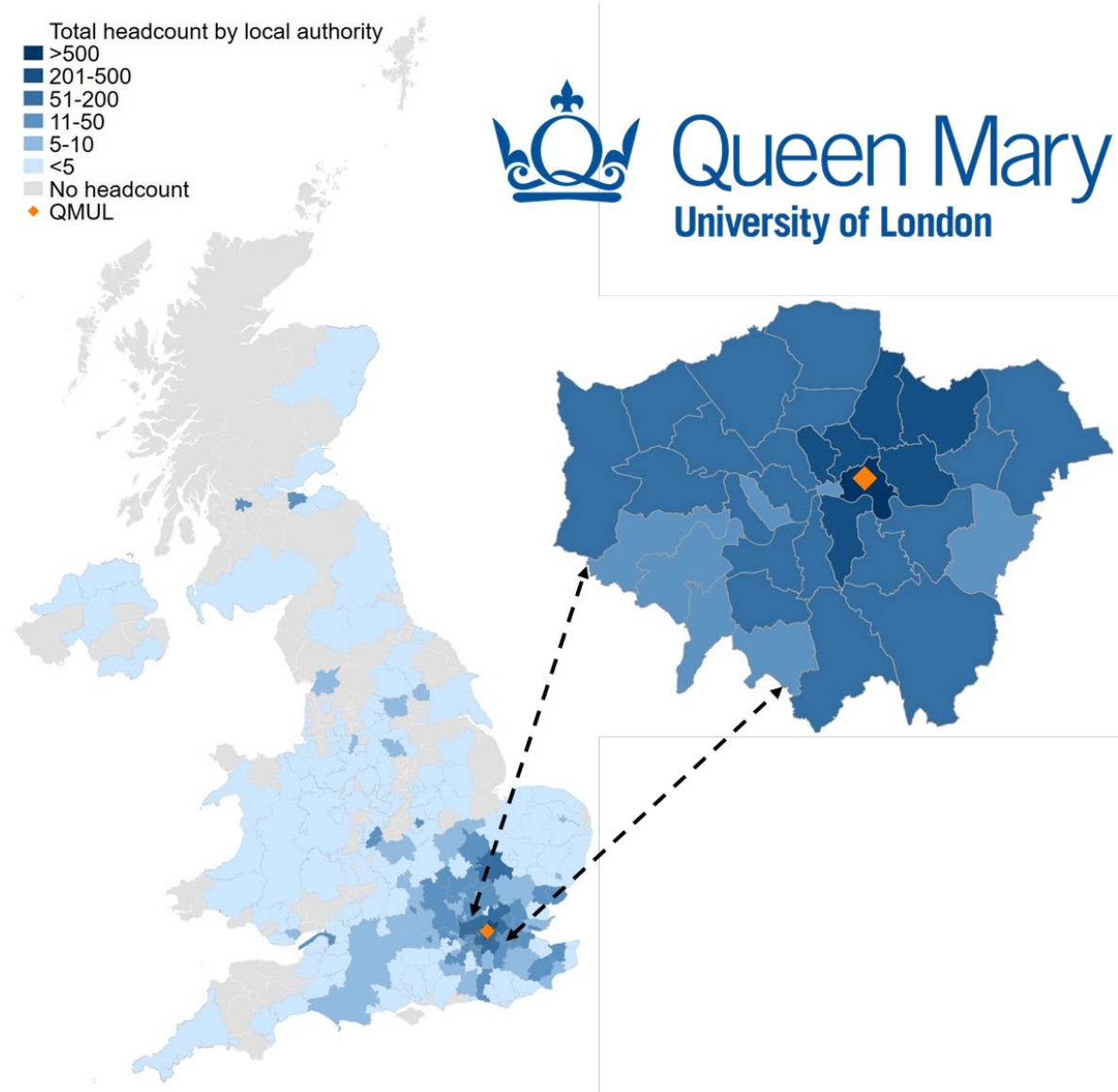
Note: We received data on the home address outward postcode and the first character of the inward postcode for a total of 6,714 staff (in headcount) from Queen Mary. We exclude 25 staff with outward postcodes that did not originally match with the ONS database. The figure is thus based on the home addresses of 6,689 staff. 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 May 2021 to generate the map.
Source: London Economics' analysis based on Queen Mary's data and Office for National Statistics data. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data © Crown copyright and database right 2023

Figure 29   Distribution of Queen Mary's expenditure on staff by Local Authority (of home address)
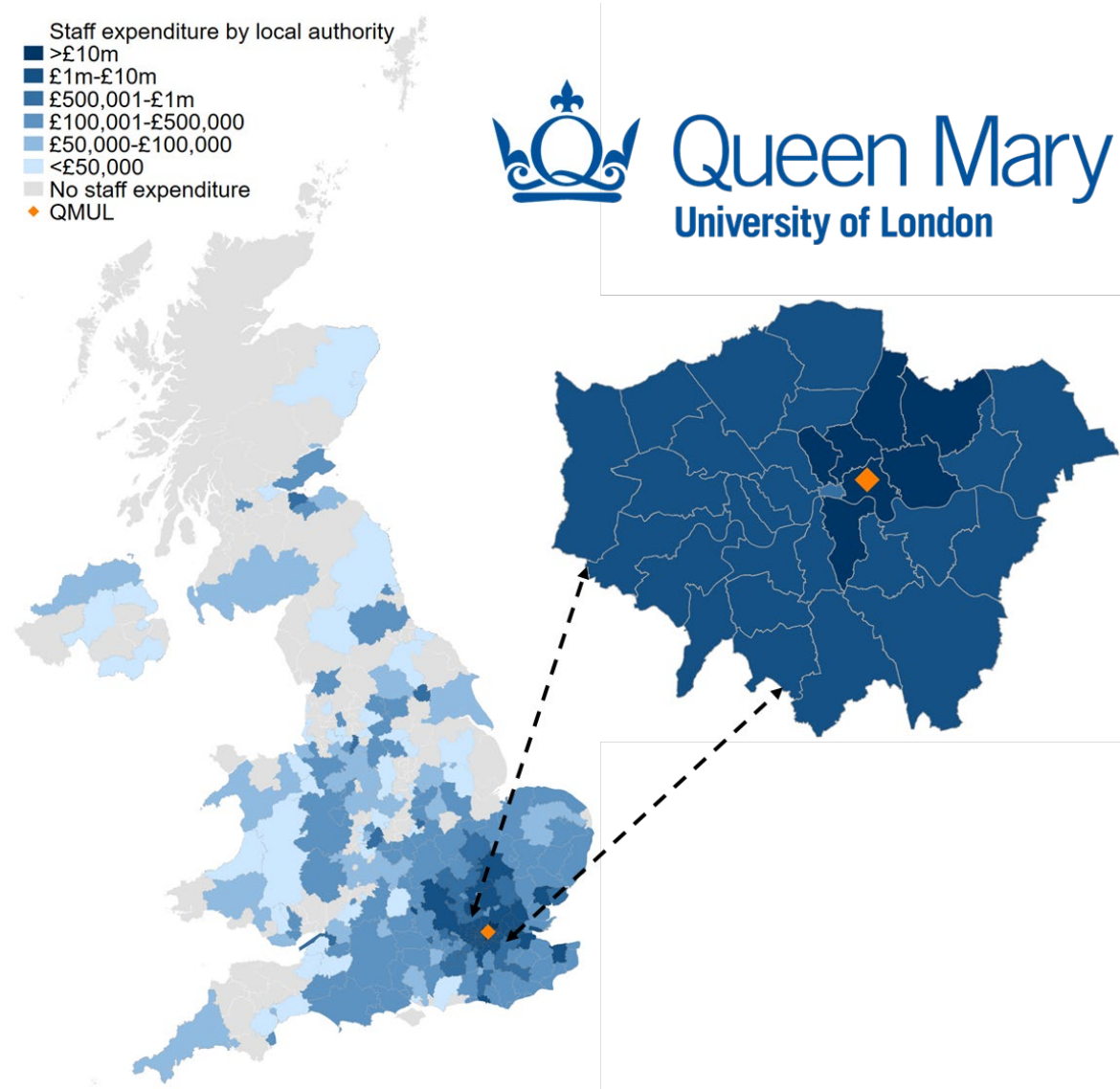
Note: The same data, as for the staff headcount map was used to map staff expenditure. The data represented a total of £315 million of staff expenditure. The 29 missing postcodes represented £1.3 million of staff spend. The figure is thus based on £314 million of staff expenditure (rounded to the nearest million, totals may not add up due to rounding). 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 May 2021 to generate the map.
Source: London Economics' analysis based on Queen Mary's data and Office for National Statistics data. Contains National Statistics, OS, Royal Mail, Gridlink, ONS, NISRA, NRS and Ordnance Survey data © Crown copyright and database right 2023

The Festival of Communities

The annual Festival of Communities is a collaborative event led by Queen Mary with Tower Hamlets stakeholders, aiming to bring together Queen Mary and its local communities to share skills, experiences, knowledge, and opportunities for a more collaborative future.

The Festival of Communities was created in 2016 for everyone in Tower Hamlets to come together to explore living and learning in the University's borough, make new connections, to try something different, and learn something new.

Over two days, local residents take part in hundreds of hands-on activities showcasing the breadth of Queen Mary's research, teaching, and other initiatives which are designed and delivered by the University's academics, support staff, and students. These varied activities include hands-on experiments, sharing stories and views, and interacting with demonstrations. Together with charities and community organisations, food stalls, performances and games, there are many opportunities to share ideas and experiences, find out about local opportunities, and celebrate the best of Tower Hamlets.

The Festival takes place in Stepney Green Park and the Queen Mary Mile End campus to introduce local spaces in a different way, with more than 7,000 local visitors attending over the two days.

5.2 Indirect and induced impacts of the University's expenditures

As with the economic impact of Queen Mary's educational exports (see Section 4) and knowledge exchange activities (see Section 2.2), the assessment of the indirect and induced economic impacts associated with the expenditures of the University is again based on economic multipliers derived from the above-discussed multi-regional Input-Output model[97]. In particular, we applied the estimated average economic multipliers associated with organisations in London's government, health, and education sector. This mirrors the approach used to assess the impact of Queen Mary's international tuition fee income and the income derived from its wider knowledge exchange activities (such as the University's contract research services), since this income was accrued (and subsequently spent) by Queen Mary itself. Again, this approach asserts that the spending patterns of the University reflect the average spending patterns across organisations operating in London's government, health, and education sector.

These multipliers (for London and the UK as a whole[98]) are presented in Table 19, indicating that every £1 million of operational or capital expenditure incurred by Queen Mary generates an *additional* **£1.92 million** of impact throughout the UK economy, of which **£0.96 million** is generated in London[99]. In terms of employment, we assume that, for every **1,000** (FTE) staff employed directly by Queen Mary, an additional **1,560** staff are supported throughout the UK, of which **540** are in London.

Table 19   Economic multipliers associated with the expenditures of Queen Mary

Location of impact	Output	GVA	FTE employment
London	1.96	1.80	1.54
Total UK	2.92	2.86	2.56

Note: All multipliers constitute Type II multipliers, defined as [Direct + indirect + induced impact]/[Direct impact]. The figures match the assumed multipliers associated with Queen Mary's wider knowledge exchange activities (see Table 7) and international tuition fee income (see Table 18).
Source: London Economics' analysis

5.3 Adjustments for double-counting and transfers

Before arriving at the total direct, indirect, and induced impact associated with Queen Mary's institutional expenditure, it is necessary to deduct a number of income and expenditure items to avoid double-counting, and to take account of the 'netting out' of the costs and benefits associated with Queen Mary between different agents in the UK economy. Specifically, we deducted:

■ The total research income received by the University in the 2021-22 academic year (**£167 million**), to avoid double-counting with the estimated impact of the University's research activities (Section 2.1.1);

■ The direct, indirect, and induced impacts associated with the University's knowledge exchange activities (**£100 million** in economic output terms), to avoid double-counting with the impact of the University's wider knowledge exchange activities (Section 2.2);

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[97] See Section 2.2 for more information.
[98] Again, in addition to the impacts on London 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 Section 5.4.
[99] This exactly matches the assumed multipliers associated with Queen Mary 's wider knowledge exchange activities (see Table 7 in Section 2.2.2) and international tuition fee income (see Table 18 in Section 4.5).

■ **£22 million** in bursary spending for UK domiciled students[100], as this was included (as a benefit) in the analysis of the University's teaching and learning activities (Section 3); and

■ The direct, indirect, and induced impacts generated by the University's (gross) international fee income associated with the 2021-22 cohort of non-UK students (**£750 million**[101]), to avoid double-counting with the impact of the University's educational exports (Section 4).

5.4   Aggregate impact of Queen Mary's spending

Figure 30 presents the estimated total direct, indirect, and induced impacts associated with the expenditures incurred by Queen Mary in the 2021-22 academic year (after the above-described adjustments have been made). The aggregate impact of these expenditures was estimated at approximately **£610 million** in economic output terms (see top panel of Figure 30):

> **The impact of Queen Mary's expenditure on the UK economy in 2021-22 stood at £610 million.**

■ In terms of region, the majority of this impact (**£410 million, 67%**) was generated in **London**, with the remaining **£201 million (33%)** 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 (**£245 million, 40%**[102]), there are also large impacts felt within other sectors, including the **distribution, transport, hotel, and restaurant sector** (**£86 million, 14%**), the **professional and support activities sector** (**£64 million, 11%**), and the **production sector** (**£60 million, 10%**)[103].

In terms of the number of jobs supported (in FTE), the results indicate that Queen Mary's spending supported a total of **4,275** FTE jobs across the UK economy in the 2021-22 academic year (of which **2,570** were located in London). In addition, the impact in terms of gross value added was estimated at **£465 million** across the UK economy as a whole (with **£293 million** generated within London).
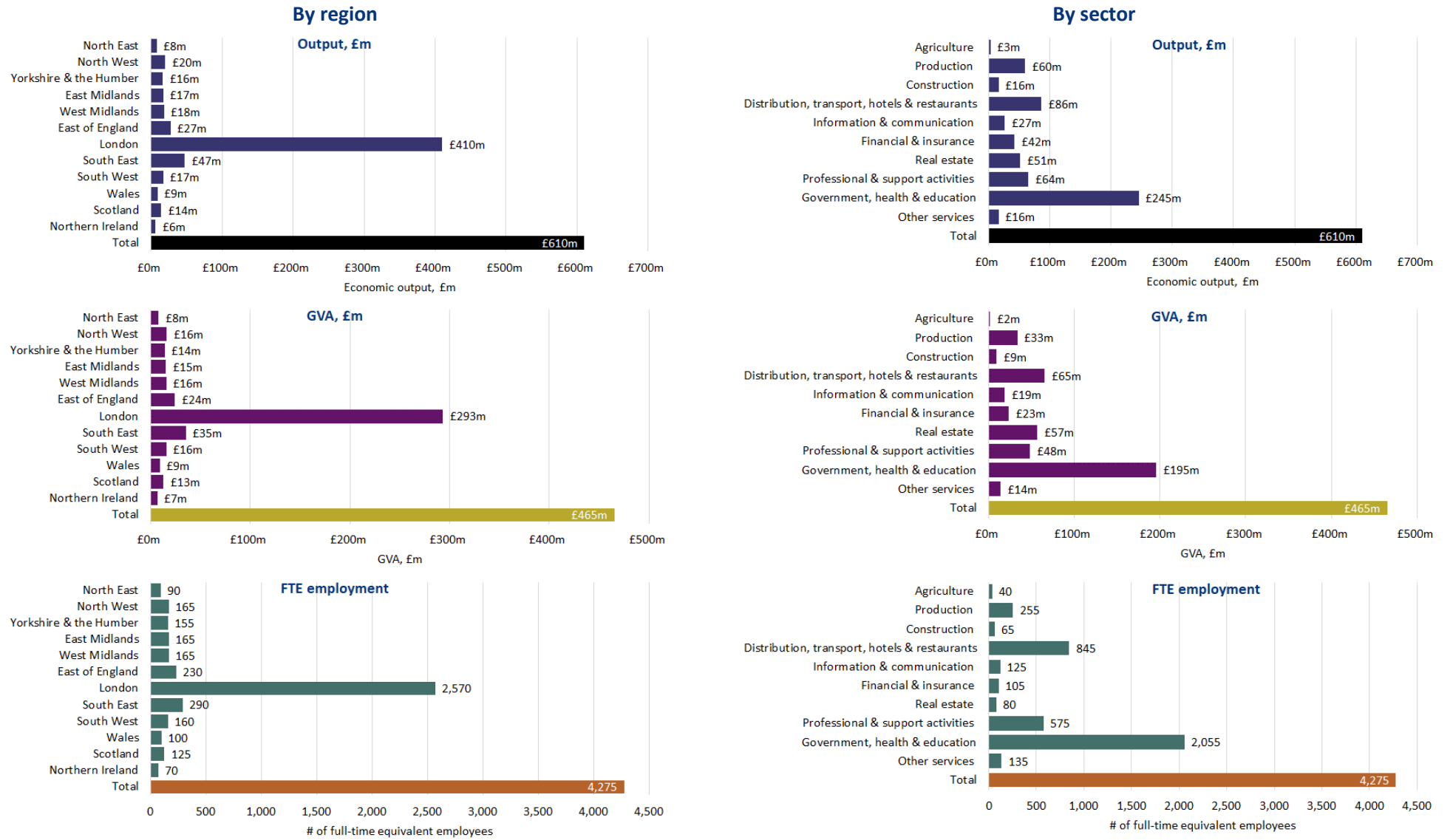
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[100] The University's bursary support to UK domiciled students is considered as a benefit to the student in the analysis of the impact of teaching and learning activities (see Section 3). It was therefore necessary to deduct these bursaries from the 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.

[101] This is slightly larger than the above impact of the *net* tuition fee income associated with international students in the 2021-22 cohort (£724 million; see Section 4.5), as the value deducted here relates to the impact of the University's *gross* international fee income *before* the deduction of the University fee waiver/bursary costs associated with these students (since these costs are already deducted when estimating the impact of the University's educational exports).

[102] 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 Queen Mary (net of the above adjustments to avoid any double-counting).

[103] Again, for more detail on what industries are included in this high-level sector classification, please refer to Table 21 in Annex A2.1.

Figure 30   Estimated total economic impact associated with Queen Mary and its Colleges expenditure in the 2021-22 academic year , by region and sector

By region

Output, £m

Region	Economic output, £m
North East	£8m
North West	£20m
Yorkshire & the Humber	£16m
East Midlands	£17m
West Midlands	£18m
East of England	£27m
London	£410m
South East	£47m
South West	£17m
Wales	£9m
Scotland	£14m
Northern Ireland	£6m
Total	£610m

GVA, £m

Region	GVA, £m
North East	£8m
North West	£16m
Yorkshire & the Humber	£14m
East Midlands	£15m
West Midlands	£16m
East of England	£24m
London	£293m
South East	£35m
South West	£16m
Wales	£9m
Scotland	£13m
Northern Ireland	£7m
Total	£465m

FTE employment

Region	# of full-time equivalent employees
North East	90
North West	165
Yorkshire & the Humber	155
East Midlands	165
West Midlands	165
East of England	230
London	2,570
South East	290
South West	160
Wales	100
Scotland	125
Northern Ireland	70
Total	4,275

By sector

Output, £m

Sector	Economic output, £m
Agriculture	£3m
Production	£60m
Construction	£16m
Distribution, transport, hotels & restaurants	£86m
Information & communication	£27m
Financial & insurance	£42m
Real estate	£51m
Professional & support activities	£64m
Government, health & education	£245m
Other services	£16m
Total	£610m

GVA, £m

Sector	GVA, £m
Agriculture	£2m
Production	£33m
Construction	£9m
Distribution, transport, hotels & restaurants	£65m
Information & communication	£19m
Financial & insurance	£23m
Real estate	£57m
Professional & support activities	£48m
Government, health & education	£195m
Other services	£14m
Total	£465m

FTE employment

Sector	# of full-time equivalent employees
Agriculture	40
Production	255
Construction	65
Distribution, transport, hotels & restaurants	845
Information & communication	125
Financial & insurance	105
Real estate	80
Professional & support activities	575
Government, health & education	2,055
Other services	135
Total	4,275

Note: Monetary estimates are presented in 2021-22 prices, rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. *Source: London Economics' analysis*

6 The total economic impact of Queen Mary on the UK economy in the 2021-22 academic year

The total economic impact on the UK economy associated with Queen Mary's activities in the 2021-22 academic year was estimated at approximately **£4,401 million** (see Table 20). In terms of the components of this impact:

> **The total economic impact associated with Queen Mary's activities in 2021-22 stood at £4.40 billion.**

■ Queen Mary's **research and knowledge exchange activities** accounted for **£1,438 million** (**33%**) of this impact;

■ The value of Queen Mary's **teaching and learning activities** stood at **£1,253 million** (**28%**);

■ The impact associated with Queen Mary's international students was estimated at **£1,099 million** (**25%**); and

■ The impact generated by the **operating and capital expenditures of the University** stood at **£610 million** (**14%**).

Table 20   Total economic impact of Queen Mary's activities in the UK in the 2021-22 academic year (£m and % of total)

Type of impact		£m	%
	Impact of research and knowledge exchange	**£1,438m**	**33%**
	Research activities	£1,152m	26%
	Knowledge exchange activities	£286m	7%
	Impact of teaching and learning	**£1,253m**	**28%**
	Students	£626m	14%
	Exchequer	£627m	14%
	Impact of international students	**£1,099m**	**25%**
	Tuition fee income	£724m	16%
	Non-tuition fee income	£376m	9%
	Impact of the University's spending	**£610m**	**14%**
	Direct impact	£565m	13%
	Indirect and induced impact	£45m	1%
	Total economic impact	**£4,401m**	**100%**

Note: All estimates are presented in 2021-22 prices, rounded to the nearest £1m, and may not add up precisely to the totals indicated.
Source: London Economics' analysis

Compared to the University's total operational costs of approximately **£631 million** in the 2021-22 academic year[104], the total impact of Queen Mary's activities on the UK economy was estimated at **£4,401 million**, which corresponds to a **benefit to cost ratio of approximately 7.0:1**. This compares to an average benefit-to-cost ratio among Russell Group institutions of approximately **5.5:1**[105].

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[104] This relates to the University's total operating expenditure (including depreciation costs and movements in pension provisions), excluding capital expenditure.
[105] See London Economics (2017). The analysis of the economic impact of all Russell Group institutions (including Queen Mary) was based on the 2015-16 academic year.

London Economics have undertaken a number of economic and social impact analyses for a range of UK higher education institutions. Using a comparable methodological approach as the one presented here, compared to the benefit to operating expenditure ratio of QMUL of **7.0:1** (associated with the 2021-22 academic year), the benefit to operating expenditure ratio posted by UCL (2018-19), the University of Edinburgh (2021-22), Warwick University (2019-20) and the University of Southampton (2020-21) were **5.9**, **6.9**, **5.8**, and **7.4** respectively.

6.1 Total impact by region and sector (where available)

In addition to the total impact on the UK economy as a whole, it was possible to disaggregate *some* strands of the University's economic impact by sector and region (and estimate the impacts in terms of economic output *as well as* GVA and FTE employment). The strands of impact for which this disaggregation was achievable include:

- The impact of the University's **knowledge exchange activities** (estimated at **£286 million**, see Section 2.2);
- The impact of the University's **educational exports** (**£1,099 million**, see Section 4); and
- The impact associated with the **operating and capital expenditure of the University** (**£610 million**, see Section 5).

Hence, approximately **£1,996 million** (**45%**) of Queen Mary's total impact of **£4,401 million** can be disaggregated in this way[106] (see Figure 31).

In terms of the breakdown by region, the analysis indicates that of this total of **£1,996 million**, **£1,325 million** (**66%**) occurred in **London**, with **£671 million** (**34%**) occurring in **other regions** across the UK.

In terms of sector, the University's activities resulted in particularly large impacts within the **government, health, and education sector** (**£609 million**, **31%**), the **distribution, transport, hotel, and restaurant sector** (**£310 million**, **16%**), the **professional and support activities sector** (**£254 million**, **13%**), and the **production sector** (**£230 million**, **12%**).

In terms of the number of FTE jobs supported, the results indicate that the total impact generated by the University's activities supported a total of **13,865** FTE jobs across the UK economy in the 2021-22 academic year, of which **7,930** were located in **London** (presented in the bottom panel of Figure 31). In addition, the impact in terms of gross value added was estimated at **£1,155 million** across the UK economy as a whole, of which **£720 million** was generated within **London** (see the middle panel of Figure 31).

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[106] The remaining **£2,406 million** of impact includes the impacts associated with the University's **research activities** (**£1,152 million**, where a breakdown by region or sector is not available as it was not possible to assign the geographic location or sectors of businesses benefiting from productivity spillovers generated by the University's research); and the impact of **teaching and learning activities** (**£1,253 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 31   Total economic impact of Queen Mary's activities in the 2021-22 academic year, by region and sector (where possible)
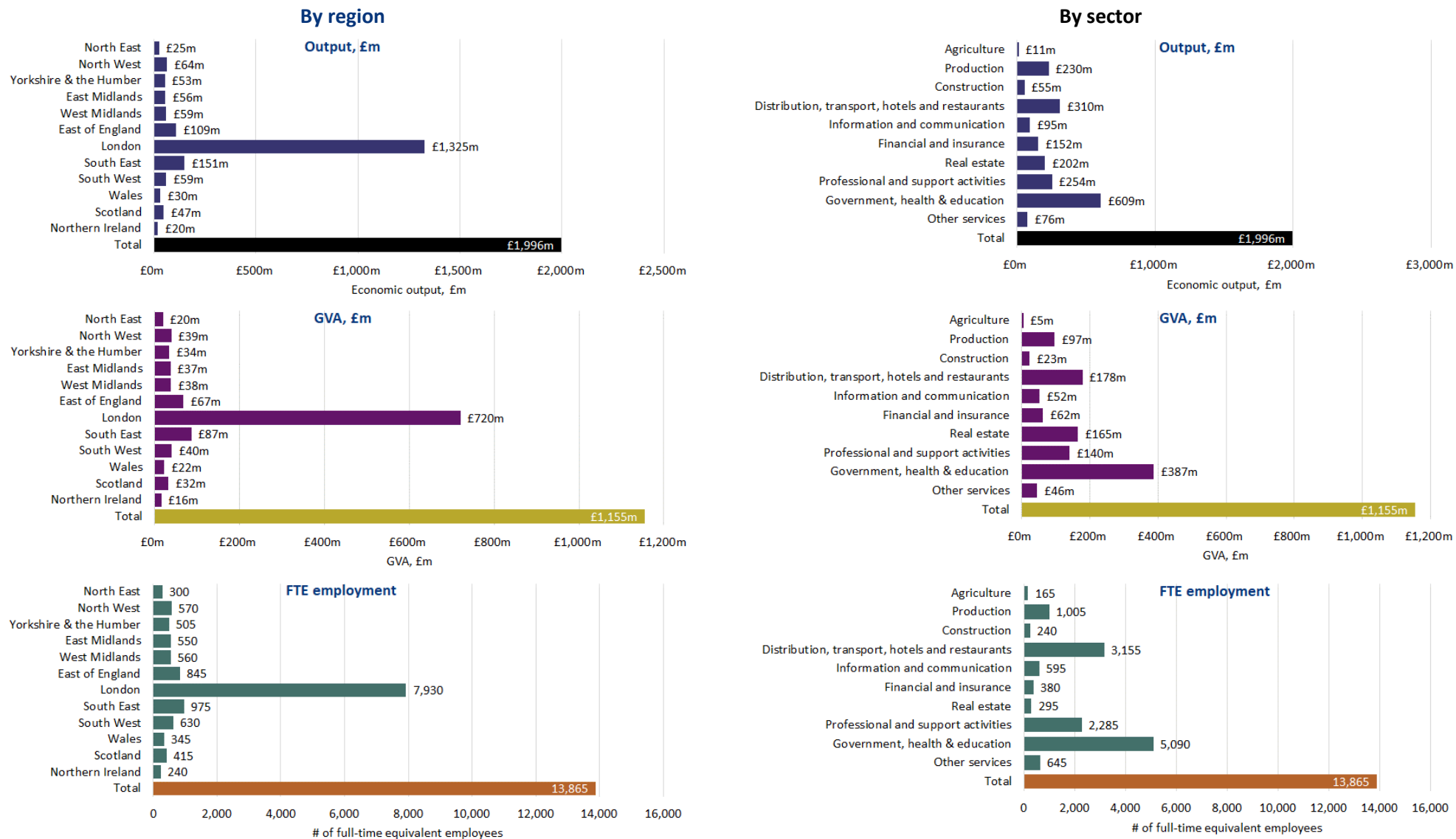
Note: Monetary estimates are presented in 2021-22 prices, discounted to reflect net present values (where applicable), rounded to the nearest £1 million, and may not add up precisely to the totals indicated. Employment estimates are rounded to the nearest 5, and again may not add up precisely to the totals indicated. *Source: London Economics' analysis*

Index of Tables, Figures and Boxes

Tables

Figures

ANNEXES

Annex 1   References

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Annex 2 Technical Annex

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

Table 21 provides an overview of the high-level industry classifications used throughout the multi-regional Input-Output analysis.

Table 21 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 Of Coal And Lignite	Production [5-39]
Extraction Of Crude Petroleum And Natural Gas & Mining Of Metal Ores	
Other Mining And Quarrying	
Mining Support Service Activities	
Processing and preserving of meat and production of meat products	
Processing and preserving of fish, crustaceans, molluscs, fruit and vegetables	
Manufacture of vegetable and animal oils and fats	
Manufacture of dairy products	
Manufacture of grain mill products, starches and starch products	
Manufacture of bakery and farinaceous products	
Manufacture of other food products	
Manufacture of prepared animal feeds	
Manufacture of alcoholic beverages & Tobacco Products	
Manufacture of soft drinks; production of mineral waters and other bottled waters	
Manufacture Of Textiles	
Manufacture Of Wearing Apparel	
Manufacture Of Leather And Related Products	
Manufacture Of Wood & Products Of Wood & Cork, Except Furniture; Manuf. Of Articles Of Straw	
Manufacture Of Paper And Paper Products	
Printing And Reproduction Of Recorded Media	
Manufacture Of Coke And Refined Petroleum Products	
Manufacture of paints, varnishes and similar coatings, printing ink and mastics	
Manufacture of soap & detergents, cleaning & polishing, perfumes & toilet preparations	
Manufacture of other chemical products	
Manufacture of industrial gases, inorganics and fertilisers (inorganic chemicals) - 20.11/13/15	
Manufacture of petrochemicals - 20.14/16/17/60	
Manufacture of dyestuffs, agro-chemicals - 20.12/20	
Manufacture Of Basic Pharmaceutical Products And Pharmaceutical Preparations	
Manufacture Of Rubber And Plastic Products	
Manufacture of cement, lime, plaster and articles of concrete, cement and plaster	
Manufacture of glass, refractory, clay, porcelain, ceramic, stone products - 23.1-4/7-9	
Manufacture of basic iron and steel	
Manufacture of other basic metals and casting	
Manufacture of weapons and ammunition	
Manufacture of fabricated metal products, excluding weapons & ammunition - 25.1-3/5-9	
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	
Building of ships and boats	
Manufacture of air and spacecraft and related machinery	
Manufacture of other transport equipment - 30.2/4/9	
Manufacture Of Furniture	
Other Manufacturing	

Industries included in original UK Input-Output table	High-level industry group [and UK SIC Codes]
Repair and maintenance of ships and boats	
Repair and maintenance of aircraft and spacecraft	
Rest of repair; Installation - 33.11-14/17/19/20	
Electric power generation, transmission and distribution	
Manufacture of gas; distribution of gaseous fuels through mains; steam and aircon 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	
Rail transport	
Land transport services and transport services via pipelines, excluding rail transport	
Water Transport	
Air Transport	
Warehousing And Support Activities For Transportation	
Postal And Courier Activities	
Accommodation	
Food And Beverage Service Activities	
Publishing Activities	Information and communication [58-63]
Motion Picture, Video & TV Programme Production, Sound Recording & Music Publishing Activities & Programming And Broadcasting Activities	
Telecommunications	
Computer Programming, Consultancy And Related Activities	
Information Service Activities	
Financial Service Activities, Except Insurance And Pension Funding	Financial and insurance [64-66]
Insurance, reinsurance and pension funding services, except compulsory social security	
Activities Auxiliary To Financial Services And Insurance Activities	
Real estate services on a fee or contract basis	Real estate [68.1-2-68.3]
Owner-Occupiers' Housing	
Buying and selling, renting and operating of own or leased real estate, excluding imputed rent	
Legal activities	Professional and support activities [69.1-82]
Accounting, bookkeeping and auditing activities; tax consultancy	
Activities Of Head Offices; Management Consultancy Activities	
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 And Other 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	
Residential Care & Social Work Activities	
Creative, Arts And Entertainment Activities	Other services [90-97]
Libraries, Archives, Museums And Other Cultural Activities	
Gambling And Betting Activities	
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 Of Domestic Personnel	

Note: 'N.E.C.' = not elsewhere classified. *Source: London Economics' analysis, based on Office for National Statistics (2023a) and UK SIC Codes (see Office for National Statistics, 2022e).*

A2.2   Impact of Queen Mary'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** for HE qualifications):

- **Three at postgraduate level** (higher degree (research), higher degree (taught) and 'other' postgraduate qualifications[107]); and
- **Two at undergraduate level** (first degrees and 'other' undergraduate qualifications[108]);

Table 22 presents these different undergraduate and postgraduate qualifications (i.e. treatment groups) considered in the analysis, along with the associated **counterfactual group** used for the marginal returns analysis in each case. As outlined in Section 3.4.1, we compare the earnings of the group of individuals in possession of each higher education qualification to the relevant counterfactual group, to ensure that we assess the economic benefit associated with the qualification itself (rather than the economic returns generated by the specific characteristics of the individual in possession of the qualification). This is a common approach in the literature and allows us to control for other personal, regional, or socioeconomic characteristics that might influence *both* the determinants of qualification attainment as well as earnings/employment.

For the analysis of marginal labour market returns, postgraduate qualification holders are compared to first degree holders, while for individuals holding first degrees or 'other undergraduate' level qualifications, the counterfactual group consists of individuals holding any (academic or vocational) qualification at Regulated Qualifications Framework (RQF) Level 3 as their highest qualification[109, 110].

In addition, we also included a separate specification comparing the earnings associated with RQF Level 3 qualifications to possession of 5 or more GCSEs at grades A*-C (or equivalent). This additional analysis was undertaken to provide an indication of the fact that the academic 'distance travelled' by a (very small) proportion of students in the 2021-22 Queen Mary 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

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[107] 'Other' postgraduate relates to Labour Force Survey variables HIQUAL8, HIQUAL11, HIQUAL15 and HIQUAL22 value labels 'Postgraduate Certificate in Education', 'Other postgraduate degree or professional qualification' and 'Don't know', for individuals who selected 'Higher degree' (other than Masters or Doctorate degree).

[108] 'Other' undergraduate relates to Labour Force Survey variables HIQUAL8, HIQUAL11, HIQUAL15 and HIQUAL22 value labels 'other degree', 'diploma in higher education', and 'other higher education below degree'. Interviewers are instructed to use 'other higher education below degree' only if the respondent states that they have 'something from higher education but they do not know what it is'. It is therefore not possible to provide examples of typical qualifications that would normally fall under this category. The response option serves the purpose of confirming that higher education qualifications have been achieved but that the respondent is unaware of the actual qualification title itself.

[109] Historically (and looking across all UK higher education institutions), students starting first degrees or other undergraduate qualifications are in possession of 2 or more GCE 'A' Levels as their highest level of prior attainment. However, as this is no longer the case for all HE institutions and subject areas, the analysis reflects the fact that a (small) proportion of first degree students in the 2021-22 Queen Mary cohort started their degrees with RQF Level 3 qualifications *other than* GCE 'A' Levels as their highest prior attainment.

[110] In terms of prior attainment for HE students, note that for **5** students in the 2021-22 cohort of UK domiciled students, previous attainment levels were specified as 'Other qualification level not known'. For these students, we imputed their prior attainment level using a group-wise imputation approach based on the most common prior attainment among students in the cohort undertaking qualifications at the same level, separately by study mode.

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intending to undertake a first degree had previously already completed a sub-degree level (i.e. 'other undergraduate') qualification).

Table 22   Treatment and comparison groups used to assess the marginal earnings and employment returns to higher education qualifications

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

Note: 1. The analysis for first degrees (only) is weighted to reflect the specific prior attainment levels among UK domiciled students in the 2021-22 Queen Mary cohort. In other words, the analysis is weighted to reflect the proportions of students in possession of 2 or more GCE 'A' Levels or other academic (or vocational) qualifications (at RQF Level 3) as their highest attainment prior to starting their learning at Queen Mary.
2. Similar to the counterfactual group for first degrees, the analysis for the treatment group here is weighted to reflect the proportions of students in possession of 2 or more GCE 'A' Levels or other equivalent (vocational or academic) qualifications (at RQF Level 3) as their highest attainment prior to starting their learning at Queen Mary.
Source: London Economics

In instances where the level of prior attainment for students at Queen Mary was higher or lower than the 'traditional' counterfactual qualifications outlined in Table 22, 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 Queen Mary**, we *deducted* the returns to undertaking an 'other undergraduate' qualification (relative to the possession of an RQF Level 3 qualification) from the returns to undertaking a first degree (again relative to the possession of an RQF Level 3 qualification). Similarly, to calculate the returns for a student **in possession of 5 GCSEs A*-C (or equivalent) undertaking a first degree at Queen Mary**, we *added* the returns to achieving an RQF Level 3 qualification (relative to the possession of 5 GCSEs A*-C) to the returns to undertaking a first degree (relative to the possession of an RQF Level 3 qualification)[111].

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 (LFS), we estimated a standard **Ordinary Least Squares** linear regression model, where the dependent variable is the natural logarithm of hourly earnings, and the independent variables include the full range of qualifications held alongside a range of personal, regional, and job-related characteristics that might be expected to influence earnings. In this model specification, we included individuals who were employed on either a full-time or a part-time basis. This approach has been used widely in the academic literature.

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[111] 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).

The basic specification of the model was as follows:

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

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

- Highest qualification held;
- Age;
- Age squared;
- Ethnic origin;
- Disability status;
- Region of work;
- Marital status;
- Number of dependent children under the age of 16;
- Full-time / part-time employment;
- Temporary or permanent contract;
- Public or private sector employment;
- Workplace size; and
- Yearly Dummies.

Using the above specification, we estimated earnings returns in aggregate and **for men and women separately**. Further, to analyse the benefits associated with different education qualifications over the lifetime of individuals holding these qualifications, the regressions were **estimated separately across a range of specific age bands** for the working age population, depending on the qualification considered. The estimated marginal earnings returns also take account of the specific subject mix of UK domiciled students in the 2021-22 Queen Mary cohort.[112] As a result, the estimated marginal wage returns **adjust for the specific subject composition of Queen Mary's student cohort**, where possible.[113] In addition, as outlined in Annex A2.2.1, the marginal wage returns for first degrees also reflect the specific prior level of attainment of students in the 2021-22 Queen Mary cohort (i.e. where the analysis is adjusted for the proportions of students in possession of GCE 'A' levels or other types of RQF Level 3 qualifications as their highest prior attainment on entry).

Further note that the analysis of earnings premiums was undertaken at a national (UK-wide) level. However, to adjust for differences across the Home Nations, these UK-wide earnings premiums

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

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

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 2010 and 2022**.

The resulting estimated marginal wage returns to the different qualifications of interest are presented in Table 23. In the earnings regressions, the coefficients provide an indication of the additional effect on hourly earnings associated with possession of the respective higher education qualification relative to the counterfactual level of qualification. To take an example, the analysis suggests that men aged between 31 and 35 in possession of a first degree achieve a **27.1%** hourly earnings premium compared to comparable men holding only an (academic or vocational) RQF Level 3 qualification as their highest level of attainment (weighted to reflect the specific prior attainment levels of first degree students in the 2021-22 Queen Mary cohort (i.e. predominantly GCE 'A' Levels or equivalent)). The comparable estimate for women aged between 31 and 35 stands at **29.3%**.

Table 23   Marginal earnings returns to higher education qualifications (weighted across subjects), in % (following exponentiation), by gender and age band

Qualification level (vs. counterfactual)	Age band									
	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Men										
Level 3 (vs. 5+GCSEs)[1]		7.3%	9.3%	15.3%	17.6%	13.5%	14.2%	12.3%	15.0%	10.8%
Other undergraduate (vs. Level 3)[2]				17.4%	20.3%	27.3%	25.2%	23.0%	28.4%	35.4%
First degree (vs. Level 3)[2]		10.6%	18.3%	27.1%	29.7%	36.2%	26.5%	29.0%	39.5%	32.0%
Other postgraduate (vs. first degrees)[3]			13.8%	19.0%	14.0%	16.0%	24.0%	10.6%		
Higher degree (taught) (vs. first degrees)[3]		7.5%	10.4%	11.5%	14.3%	19.2%	14.9%	19.2%	18.2%	26.9%
Higher degree (research) (vs. first degrees)[3]		18.2%	12.1%	20.8%	22.5%	28.1%	39.9%	35.5%	29.2%	57.3%
Women										
Level 3 (vs. 5+GCSEs)[1]		4.2%	7.0%	7.0%	13.1%	14.5%	8.4%	10.0%	9.3%	9.6%
Other undergraduate (vs. Level 3)[2]		3.7%	9.0%	13.7%	26.6%	25.5%	26.2%	25.5%	26.5%	28.5%
First degree (vs. Level 3)[2]	25.2%	8.7%	17.8%	29.3%	37.0%	36.8%	35.1%	37.0%	37.3%	25.6%
Other postgraduate (vs. first degrees)[3]		6.9%	18.6%	22.0%	31.1%	28.1%	24.2%	41.1%	23.0%	24.2%
Higher degree (taught) (vs. first degrees)[3]		5.7%	11.6%	21.3%	29.0%	35.0%	34.6%	25.6%	45.6%	29.8%
Higher degree (research) (vs. first degrees)[3]		10.7%	24.1%	44.3%	54.3%	38.5%	54.5%	52.5%	50.2%	76.8%

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

[1] Returns to holding RQF Level 3 qualifications are estimated relative to 5 or more GCSEs at A*-C (or equivalent) (weighted to reflect the proportion of first degree entrants in the 2021-22 Queen Mary cohort holding GCE 'A' levels or other RQF Level 3 qualifications as their highest prior qualification on entry).

[2] Returns to other undergraduate qualifications and first degrees are estimated relative to individuals holding a Level 3 (academic or vocational) qualification as their highest qualification. Returns to first degrees are estimated relative to individuals holding RQF Level 3 qualifications as their highest qualification (weighted by the proportion of first degree entrants in the 2021-22 Queen Mary cohort holding GCE 'A' levels s or other RQF Level 3 qualifications as their highest prior attainment).

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

Source: London Economics' analysis of pooled Quarterly Labour Force Survey data for 2010Q1-2022Q4

Marginal employment returns

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

$$Probit(EMPNOT_i) = \alpha + \gamma Z_i + \epsilon_i \quad \text{for } i = 1 \text{ to } n^{114}$$

The dependent variable adopted represents the binary variable $EMPNOT_i$, which is coded 1 if the individual is in employment and 0 otherwise.[115] We specified the model to contain a constant term (α) as well as a number of standard independent variables, including the qualifications held by an individual (represented by Z_i in the above equation), as follows:

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

Again, ϵ_i represents an error term. Similar to the methodology for estimating earnings returns, the described probit model was estimated in aggregate and **separately for men and women**, with the analysis further split by respective **age bands**, and adjusted for the specific **subject mix** of students in the 2021-22 cohort of UK domiciled students attending Queen Mary. Further, and again similar to the analysis of earnings returns, employment returns were estimated at the national (i.e. UK-wide) level. In addition, marginal employment returns for first degrees again reflect the specific prior level of attainment of first degree students in the 2021-22 Queen Mary cohort (i.e. the proportions of students in possession of GCE 'A' levels or other types of RQF Level 3 qualifications as their highest prior attainment on entry).

The resulting estimated marginal employment returns to HE qualifications are presented in Table 24. 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 **2.0 percentage points** more likely to be in employment than a man of similar age holding only a Level 3 qualification as his highest level of education (again, predominantly including GCE 'A' levels or equivalent). The corresponding estimate for women stands at **6.0 percentage points**.

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

Table 24   Marginal employment returns to higher education qualifications (weighted across 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										
Level 3 (vs. 5+GCSEs)[1]	-6.1	2.3	3.8	2.3		1.9	1.3			
Other undergraduate (vs. Level 3)[2]				1.8		2.0		1.8		
First degree (vs. Level 3)[2]		-3.8	2.8	2.0	3.2		2.1	2.4		-7.3
Other postgraduate (vs. first degrees)[3]			2.4	1.3	1.4	2.4	3.7	6.1	5.1	
Higher degree (taught) (vs. first degrees)[3]				1.3	1.2	2.1			5.0	
Higher degree (research) (vs. first degrees)[3]		10.8	3.1		2.4	3.4		3.2	9.1	10.7
Women										
Level 3 (vs. 5+GCSEs)[1]		4.4	3.9	2.5	3.3	2.3	3.9	3.0	2.1	2.3
Other undergraduate (vs. Level 3)[2]		3.0		3.8	4.4	2.9	3.1	2.6		
First degree (vs. Level 3)[2]	14.4		3.9	6.0	5.3	6.3	3.3			
Other postgraduate (vs. first degrees)[3]				5.7		5.5	3.0			
Higher degree (taught) (vs. first degrees)[3]						2.3	4.7	3.8	5.2	
Higher degree (research) (vs. first degrees)[3]		-11.4		6.1	4.5	3.6	7.6	6.2	10.3	9.7

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

[1] Returns to holding RQF Level 3 qualifications are estimated relative to 5 or more GCSEs at A*-C (or equivalent) (weighted to reflect the proportion of first degree entrants in the 2021-22 Queen Mary cohort holding GCE 'A' levels or other RQF Level 3 qualifications as their highest prior qualification on entry).

[2] Returns to other undergraduate qualifications and first degrees are estimated relative to individuals holding a Level 3 (academic or vocational) qualification as their highest qualification. Returns to first degrees are estimated relative to individuals holding RQF Level 3 qualifications as their highest qualification (weighted by the proportion of first degree entrants in the 2021-22 Queen Mary cohort holding GCE 'A' levels s or other RQF Level 3 qualifications as their highest prior attainment).

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

Source: London Economics' analysis of pooled Quarterly Labour Force Survey data for 2010Q1-2022Q4

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 2021-22 cohort completing postgraduate taught degrees with Queen Mary on a part-time basis is **30**, 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 25 presents the assumed average age at enrolment, study duration, and age at completion for students in the 2021-22 Queen Mary cohort[116].

Table 25   Average age at enrolment, study duration, and age at completion for students in the 2021-22 Queen Mary 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	2	21			
First degree	19	3	22	28	7	35
Other postgraduate	25	1	26	31	1	32
Higher degree (taught)	24	1	25	30	2	32
Higher degree (research)	27	4	31	42	6	48

Note: All values have been rounded to the nearest integer. Gaps may arise where there are no students in the 2021-22 Queen Mary cohort expected to complete the given qualification.
Source: London Economics' analysis based on Queen Mary HESA data

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

However, as the age of attainment increases, it is expected that a declining proportion of the potential value of the estimated earnings and employment benefit accrues to the individual[117]. 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 26 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 Queen Mary in the 2021-22 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 **32** (on average)), these students recoup only **89%** of the corresponding earnings and employment premiums from that age (of attainment).

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[116] The assumed average age at enrolment is based on the number of individuals in the cohort assumed to *complete* a given qualification at Queen Mary (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 Queen Mary) is calculated as the weighted average age at enrolment across students in the 2021-22 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 Queen Mary.

[117] 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 26   Assumed age decay adjustment factors for students in the 2021-22 Queen Mary 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 Queen Mary:
■ Full-time students ■ Part-time students
Source: London Economics' analysis based on Queen Mary HESA data

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 in 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 (e.g., RQF Level 3 qualifications or first degrees).
2. We inflated these baseline or counterfactual earnings using the marginal earnings premiums and employment premiums (presented in Table 23 and Table 24 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 and 2023)[118]).
4. Based on the earnings profiles generated by qualification holders, and income tax and National Insurance rates and allowances for the relevant academic year[119], we computed the future stream of net earnings (i.e. post-tax)[120]. Using similar assumptions, we further calculated the stream of (employment-adjusted) foregone earnings (based on earnings in the relevant counterfactual group[121]) during the period of study, again net of tax, for full-time students only.
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.

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[118] Specifically, we make use of the Office for Budget Responsibility's short-term forecasts (for 2021-22 to 2027-28; see Office for Budget Responsibility (2023)) and long-term forecasts (for 2028-29 to 2072-73; see Office for Budget Responsibility (2022)) of nominal average earnings growth. The assumed 1.6% rate captures the average 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 sources)).

[119] i.e. 2021-22. 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%.

[120] The tax adjustment also takes account of increased VAT revenues for HMG, by assuming that individuals consume 92.6% 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 (2023), while the proportion of consumption subject to VAT is based on VAT estimates provided by the Office for Budget Responsibility (no date).

[121] The foregone earnings calculations are based on the baseline or counterfactual earnings associated with either a Level 3 (academic or vocational) qualification or first degrees. Specifically, as outlined in Annex A2.2.1, some students in the 2021-22 Queen Mary cohort were in possession of other levels of prior attainment. To accommodate this, as a simplifying assumption, the foregone earnings for students previously in possession of other undergraduate qualifications (other than first degrees) are based on the earnings associated with possession of a Level 3 qualification as the highest qualification (adjusted for the age at enrolment and completion associated with the relevant qualification obtained). In addition, the estimated foregone earnings for students previously in possession of postgraduate qualifications are based on the level of earnings associated with first degrees.

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 Queen Mary 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 27.

A2.2.5   Net graduate premium and net public benefit

Table 28 provides detailed information on the net graduate premiums and net public benefits for UK domiciled students associated with higher education qualifications offered by Queen Mary, based on the 2021-22 cohort. The table provides detailed information on the net graduate premiums/net Exchequer benefits by study level, prior attainment, gender, and study mode.[122]

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

Table 27   Gross graduate premiums and Exchequer benefits per student associated with HE qualification attainment at Queen Mary, by study mode, level, gender, and prior attainment

Level of study	Previous qualification and gender													
	GCSE		Level 3		Other undergraduate		First degree		Other postgraduate		Higher degree (taught)		Higher degree (research)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Gross graduate premiums														
Full-time students														
Other undergraduate			£84,000	£48,000	-£18,000	-£18,000	-£15,000	-£20,000				-£20,000		
First degree	£197,000		£129,000	£80,000	£26,000	£15,000	-£25,000	-£29,000	-£25,000		-£25,000	-£29,000	-£25,000	
Other postgraduate				£227,000			£101,000	£116,000			-£19,000	-£17,000		
Higher degree (taught)			£265,000	£232,000			£101,000	£119,000	-£17,000	-£12,000	-£17,000	-£16,000		
Higher degree (research)			£250,000		£155,000		£104,000	£139,000	£5,000		£1,000	£18,000		
Part-time students														
Other undergraduate														
First degree			£101,000	£66,000			£0	£0						
Other postgraduate			£230,000		£135,000	£144,000	£99,000	£112,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)			£232,000		£138,000	£152,000	£103,000	£121,000	£6,000	£11,000	£0	£0	£0	£0
Higher degree (research)							£64,000	£57,000			£35,000	£27,000		
Gross Exchequer benefits														
Full-time students														
Other undergraduate			£83,000	£50,000	-£3,000	-£2,000	-£2,000	-£3,000				-£3,000		
First degree	£191,000		£132,000	£84,000	£46,000	£32,000	-£3,000	-£4,000	-£3,000		-£3,000	-£4,000	-£3,000	
Other postgraduate				£195,000			£118,000	£103,000			-£9,000	-£7,000		
Higher degree (taught)			£256,000	£199,000			£114,000	£106,000	-£7,000	-£3,000	-£7,000	-£6,000		
Higher degree (research)			£284,000		£204,000		£159,000	£142,000	£52,000		£52,000	£41,000		
Part-time students														
Other undergraduate														
First degree			£86,000	£54,000			£0	£0						
Other postgraduate			£220,000		£139,000	£120,000	£107,000	£93,000	£0	£0	£0	£0	£0	£0
Higher degree (taught)			£218,000		£139,000	£127,000	£107,000	£100,000	£2,000	£9,000	£0	£0	£0	£0
Higher degree (research)							£63,000	£44,000			£35,000	£19,000		

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2021-22 Queen Mary cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at Queen Mary is equal to or lower than the level of previous attainment. In these instances, the analysis implicitly assumes that all calculated gross returns (*before* the deduction of any foregone earnings or other costs) can only be larger than or equal to zero (i.e. there can be no wage or employment penalty associated with any higher education qualification attainment). Hence, each grey-shaded cell displays only the assumed underlying foregone earnings. *Source: London Economics' analysis*

Table 28   Net graduate premiums and Exchequer benefits per student associated with HE qualification attainment at Queen Mary, by study mode, level, gender, and prior attainment

Level of study	Previous qualification and gender													
	GCSE		Level 3		Other undergraduate		First degree		Other postgraduate		Higher degree (taught)		Higher degree (research)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Net graduate premiums														
Full-time students														
Other undergraduate			£78,000	£41,000	-£25,000	-£24,000	-£22,000	-£26,000				-£26,000		
First degree	£188,000		£119,000	£71,000	£18,000	£6,000	-£33,000	-£38,000	-£34,000		-£34,000	-£36,000	-£34,000	
Other postgraduate				£213,000			£87,000	£102,000			-£33,000	-£31,000		
Higher degree (taught)			£251,000	£219,000			£87,000	£106,000	-£30,000	-£26,000	-£30,000	-£30,000		
Higher degree (research)			£278,000		£183,000		£132,000	£167,000	£33,000		£29,000	£46,000		
Part-time students														
Other undergraduate														
First degree			£96,000	£61,000			-£6,000	-£6,000						
Other postgraduate			£225,000		£130,000	£139,000	£94,000	£107,000	-£5,000	-£5,000	-£5,000	-£5,000	-£5,000	-£5,000
Higher degree (taught)			£220,000		£126,000	£140,000	£90,000	£109,000	-£6,000	-£1,000	-£12,000	-£12,000	-£12,000	-£12,000
Higher degree (research)							£62,000	£55,000			£33,000	£25,000		
Net Exchequer benefits														
Full-time students														
Other undergraduate			£72,000	£39,000	-£14,000	-£13,000	-£13,000	-£14,000				-£14,000		
First degree	£175,000		£115,000	£68,000	£29,000	£16,000	-£19,000	-£21,000	-£19,000		-£19,000	-£23,000	-£19,000	
Other postgraduate				£193,000			£117,000	£102,000			-£10,000	-£8,000		
Higher degree (taught)			£254,000	£198,000			£113,000	£105,000	-£8,000	-£4,000	-£8,000	-£8,000		
Higher degree (research)			£283,000		£203,000		£158,000	£141,000	£51,000		£51,000	£40,000		
Part-time students														
Other undergraduate														
First degree			£67,000	£35,000			-£19,000	-£19,000						
Other postgraduate			£219,000		£139,000	£119,000	£107,000	£92,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000	-£1,000
Higher degree (taught)			£217,000		£138,000	£126,000	£106,000	£99,000	£1,000	£8,000	-£1,000	-£1,000	-£1,000	-£1,000
Higher degree (research)							£62,000	£42,000			£34,000	£18,000		

Note: All values are rounded to the nearest £1,000. Gaps may arise where there are no students in the 2021-22 Queen Mary cohort expected to complete the given qualification (with the given characteristics). Grey shading indicates instances where the level of study at Queen Mary is equal to or lower than the level of previous attainment. In these instances, the analysis implicitly assumes that all calculated net returns (*before* the deduction of any foregone earnings or other 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 2021-22 cohort of non-UK domiciled student students studying at Queen Mary

Table 29 presents a detailed breakdown of the 2021-22 non-UK domiciled Queen Mary cohort, by domicile, level, and mode of study.

Table 29 Non-UK domiciled students in the 2021-22 cohort of Queen Mary 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	80	**85**
First degree	295	1,035	**1,330**
Other postgraduate	0	10	**10**
Higher degree (taught)	250	3,770	**4,020**
Higher degree (research)	25	150	**175**
Total	**575**	**5,045**	**5,620**
Part-time			
Other undergraduate	0	0	**0**
First degree	0	0	**0**
Other postgraduate	15	45	**60**
Higher degree (taught)	20	45	**65**
Higher degree (research)	0	0	**0**
Total	**40**	**90**	**125**
Total			
Other undergraduate	0	80	**85**
First degree	295	1,035	**1,330**
Other postgraduate	15	55	**70**
Higher degree (taught)	270	3,815	**4,085**
Higher degree (research)	25	150	**175**
Total	**610**	**5,135**	**5,745**

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 relates to undergraduate-level diplomas and certificates. 'Other postgraduate' learning includes postgraduate-level diplomas and other qualifications, as well as taught work for credit at postgraduate level.
Source: London Economics' analysis based on Queen Mary HESA data

A2.3.2 Net tuition fee income per international student

Table 30 presents estimates of the net tuition fee income per international student in the 2021-22 Queen Mary cohort (over the entire study duration), by domicile, level of study, and mode of study. Note that, as we assume the same average tuition fees charged for non-EU and EU students (see Sections 4.3 and 4.4.1 for more information), any differences by domicile are driven entirely by differences in the average fee waivers and other bursaries provided by Queen Mary to non-EU vs. EU students.

Table 30   Net tuition fee income per international student in the 2021-22 cohort of Queen Mary students, by level of study, mode, and domicile

Level and mode of study	EU domiciled students		Non-EU domiciled students	
	Full-time	Part-time	Full-time	Part-time
Other undergraduate	£66,000	-	£65,000	-
First degree	£96,000	-	£95,000	-
Other postgraduate	£28,000	£12,000	£25,000	£9,000
Higher degree (taught)	£28,000	£27,000	£25,000	£22,000
Higher degree (research)	£40,000	£21,000	-£6,000	-

Note: Gaps may arise where there are no students in the 2021-22 Queen Mary cohort expected to complete the given qualification (of the given characteristics). All estimates are presented in 2021-22 prices, discounted to reflect net present values, and rounded to the nearest £1,000. Values may be negative in instances where the average value of fee waivers and bursaries is greater than the average gross tuition fee.
Source: London Economics' analysis

A2.3.3   Assumed average stay durations among international student entrants

As outlined in Section 4.4.2, to estimate the non-tuition fee income associated with non-UK students in the 2021-22 Queen Mary 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[123]. 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 on 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 31.

Table 31   Assumed average stay durations (in weeks per year) for non-UK domiciled students, by study level and study mode

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

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

A2.3.4   Non-fee income per international student

Table 32 presents estimates of the non-tuition fee income per international student in the 2021-22 Queen Mary cohort (over the entire study duration), by domicile, level of study, and mode of study.

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

Table 32   Non-fee income per international student in the 2021-22 cohort of Queen Mary students, be level of study, mode, and domicile

Level	EU domiciled students		Non-EU domiciled students	
	Full-time	**Part-time**	**Full-time**	**Part-time**
Oter undergraduate	£25,000	-	£27,000	-
First degree	£37,000	-	£40,000	-
Other postgraduate	£17,000	£20,000	£17,000	£20,000
Higher degree (taught)	£17,000	£40,000	£17,000	£40,000
Higher degree (research)	£65,000	£116,000	£65,000	-

Note: Gaps may arise where there are no students in the 2021-22 Queen Mary cohort expected to complete the given qualification (of the given characteristics). All estimates are presented in 2021-22 prices, discounted to reflect net present values, and rounded to the nearest £1,000.
Source: London Economics' analysis

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