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ECONOMIC BENEFITS QUANTUM COMPUTING CAN BRING TO SUSSEX AND GREATER BRIGHTON

A REPORT FOR MID SUSSEX DISTRICT COUNCIL

OCTOBER 2025

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EXECUTIVE SUMMARY

Quantum computing is a rapidly developing field in which Sussex and Greater Brighton are well placed to play a leading role in the UK. The region benefits from academic excellence in the field of quantum, specialist suppliers (notably in ultra-high vacuum and mu-metal manufacturing), as well as facilities to support businesses including Innovation Centres at the University of Sussex and in Crawley. Moreover, the region enjoys excellent transport connectivity and quality of life that attracts talent. The growth of high value sectors such as quantum would help to drive prosperity in the region by anchoring high value jobs locally.

Provided the sector is given appropriate support, we expect that quantum computing in Sussex and Greater Brighton could generate outsized regional and UK-wide economic benefits. Our forecasts suggest that by 2050, the quantum sector in Sussex and Greater Brighton could directly generate between £721 million and £1.2 billion of economic activity and support between 1,100–1,900 jobs in the region. When regional supply chain spending impacts and wage payments are considered, the industry could support a gross value added contribution of £1.2 billion–£1.9 billion to the South East region and support between 7,000–11,400 jobs. Moreover, our forecasts suggest that by 2050, the total UK wide contribution of the region's quantum computing sector will be between £2.5 billion–£4.1 billion. This economic impact is projected to support between 25,000–40,800 UK jobs.

Moreover, we expect that the development of a quantum ecosystem in Sussex and Greater Brighton would drive substantial productivity gains, leading to additional economic benefits. Firstly, quantum technologies have the potential to improve productivity in end user industries; our forecasts suggest that widespread adoption of quantum technologies could lift economy-wide productivity in Sussex and Greater Brighton by around 8% by 2050. In addition, the presence of a strong quantum ecosystem would enable synergies with other advanced technologies in the region such as Artificial Intelligence (AI). With the region already possessing strong AI foundations, stakeholders highlighted that quantum computing could strengthen AI's capabilities in areas such as pattern recognition, whilst AI could help solve complex computational problems within quantum systems.

The economic benefits outlined in the report are more likely to be realised if the quantum computing sector in Sussex and Greater Brighton is supported effectively. On a national level there are widespread concerns that a lack of domestic support for strategic technologies means the UK risks becoming an 'incubator economy', with innovative British companies shifting their centre gravity away from the UK because of more attractive financing options overseas. This is particularly true of the quantum computing sector; as quantum firms are currently struggling to find the necessary scale up funds in Britain, UK-founded companies are pivoting their focus abroad. With many UK quantum computing companies already having an overseas presence, it is relatively easy for companies to shift their centre of gravity towards countries with better funding opportunities.

We estimate that if the region's quantum computing sector does not receive sufficient funding, economic and employment impacts could be reduced by around 40% with losses likely to be higher in the long run.[1] If other locations provide companies with clearer paths to expansion, companies are likely to relocate core functions away from the region. This will cause corresponding reductions in local procurement and household spending. Economic losses are likely to accelerate over time as quantum capabilities become more established in other jurisdictions and the attractiveness of the Sussex cluster decreases.

Case studies illustrate how quantum ecosystems are fast developing around the world, supported in part by national and local government funding. For example, government funding has helped to support the creation of quantum campus' in both Chicago, Munich and Hanover. These examples offer a model for best practice. Each campus has strong links with local universities which have extensive quantum research capabilities. Quantum companies locating in these parks benefit from shared equipment and research spaces as well as training, mentorships, and technical expertise to scale their companies. Several of the world's leading quantum companies, supported by various incentives, have announced that they will headquarter at these locations. These campuses are expected to generate significant economic benefits; for example, the Chicago campus is projected to create thousands of jobs and generate up to $20 billion in economic impact. Moreover, it is likely that the clustering of these firms in the same geographical location will help to boost their growth and productivity; we find strong support for this in the academic literature.

Stakeholder interviews reveal that funding constraints are one of the most significant barriers affecting the development of a quantum computing ecosystem in Sussex and Greater Brighton. Stakeholders (across industry, academia and the wider innovation ecosystem) consistently noted that current funding models are too short term to support the long development cycles typical of quantum computing. Academics called for longer, more flexible grants, and for funding mechanisms that enable sustained collaboration. Moreover, with quantum research and commercialisation depending on access to specialised facilities, stakeholders highlighted the need for affordable laboratory and industrial space. Stakeholders also emphasised the role of public procurement in validating new technologies. Interviewees suggested that public sector pilot projects, for instance with the NHS, Ministry of Defence, or Department for Transport, could showcase practical use cases, generate case studies, and attract commercial co-investment.

Sussex and Greater Brighton's quantum success will rely on coordinated action between universities, councils, and industry to attract firms, develop skills, and strengthen innovation infrastructure. Establishing a "Quantum Sussex" cluster—supported by shared facilities and specialist training would give the region a clear identity and a single-entry point for investors and businesses.

[1] For example, in the instance no funding is allocated to the region via the quantum computing allocation from UK's Modern Industrial Strategy or other regional economic growth funding allocations such as UKRI's Local Innovation Partnerships Fund

1. INTRODUCTION

We begin the report by providing context on the economic profile of Sussex and Greater Brighton. This overview highlights the existing strengths they have in quantum computing. Moreover, outlining the local economic conditions demonstrates how the development of a quantum ecosystem could interact with, and enhance, the broader regional economy.

1.1 SUSSEX AND GREATER BRIGHTON'S STRENGTHS IN QUANTUM COMPUTING

Sussex and Greater Brighton possess strong quantum computing capabilities, supported by academic excellence, specialist suppliers, and strong regional, national and international transport connectivity.

The University of Sussex anchors the county's research base with its unique breadth across multiple quantum domains, allowing theorists and experimentalists to collaborate closely. The Sussex Innovation Centre provides affordable workspace and commercialisation support for early-stage ventures, while the Crawley Innovation Centre is specifically designed to "provide vital grow-on space which will enable hi-tech small businesses to scale up, prototype and demonstrate new technologies", including quantum.[2] These centres help connect researchers and businesses, supporting local spinouts and attracting new entrants to the region. (See Section 4 for more detail on these initiatives and how they support scale-up and innovation in Sussex.)

Sussex also hosts a uniquely concentrated cluster of vacuum technology firms specialising in ultra-high vacuum (UHV) and mu-metal chamber manufacturing. These capabilities are integral to quantum computing, and their co-location within the region creates valuable synergies across the supply chain.

With Gatwick Airport at its centre, Sussex benefits from international air links, proximity to London, and access to three major seaports (Shoreham, Newhaven, and Dover) as well as European rail connections. The combination of global accessibility and lower operational costs enhances the area's appeal to investors and technology companies.

Finally, Sussex's quality of life—from its coastal towns to its cultural and academic communities—continues to attract skilled professionals, students, and entrepreneurs who see the region as both an inspiring place to work and a desirable place to live.

1.2 OVERVIEW OF THE REGION

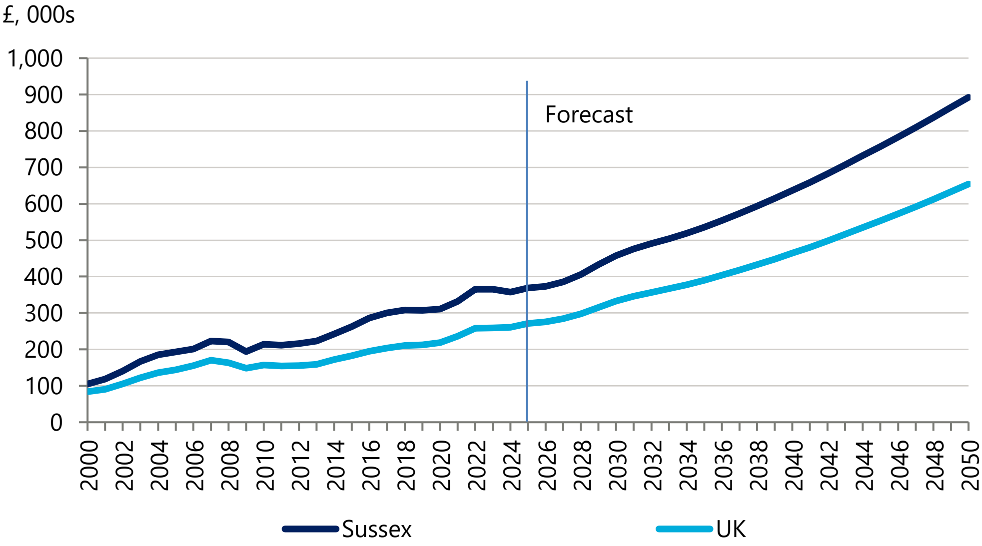
Sussex has long benefitted from a strong economy, high household incomes, and proximity to London, but faces a set of structural pressures that threaten its long-term competitiveness.

Average house prices in Sussex remain consistently higher than the UK average and have continued to rise in recent years (see Fig. 1), reflecting both the region's desirability and its strong transport connectivity to London. This accessibility has made Sussex an attractive location for those who work in London but prefer to live outside the capital, leading many to commute daily. However, this pattern

[2] Crawley Borough Council Crawley Borough Council takes possession of Crawley Innovation Centre, accessed October 2025.

has contributed to rising housing costs, sustained in part by London-level wages, and has widened the affordability gap for local workers. For early-career researchers and technical staff, this dynamic can make it difficult to live near their place of work, reinforcing patterns of commuting and mobility toward London. Several professors at the University of Sussex we interviewed noted the risk of this contributing to a regional brain drain. Strengthening high-value sectors in the region, such as quantum computing, can help counter this trend by anchoring better-paid, knowledge-based jobs locally.

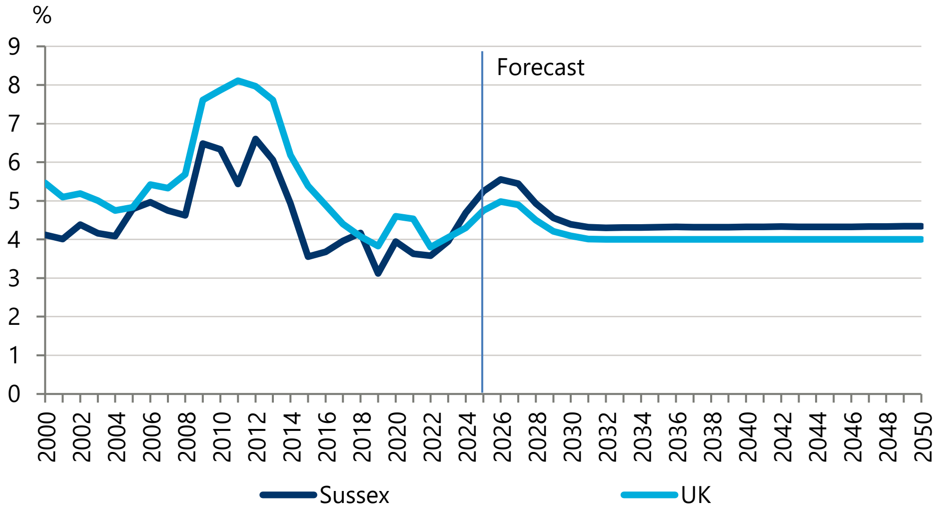
Fig. 1. Average house prices in Sussex and the UK (2000–2050)



Sources: Oxford Economics, ONS

Historically, Sussex's unemployment rate has been lower than the UK average, reflecting a relatively strong regional economy and diverse employment base (see Fig. 2). However, since 2024, unemployment in Sussex has edged above the national average and is projected to remain elevated in the near term before gradually declining. This indicates a local labour market in transition, which could benefit from new sources of resilient, future-facing employment. Investment in innovation-intensive industries like quantum computing can help generate high-skill job opportunities.

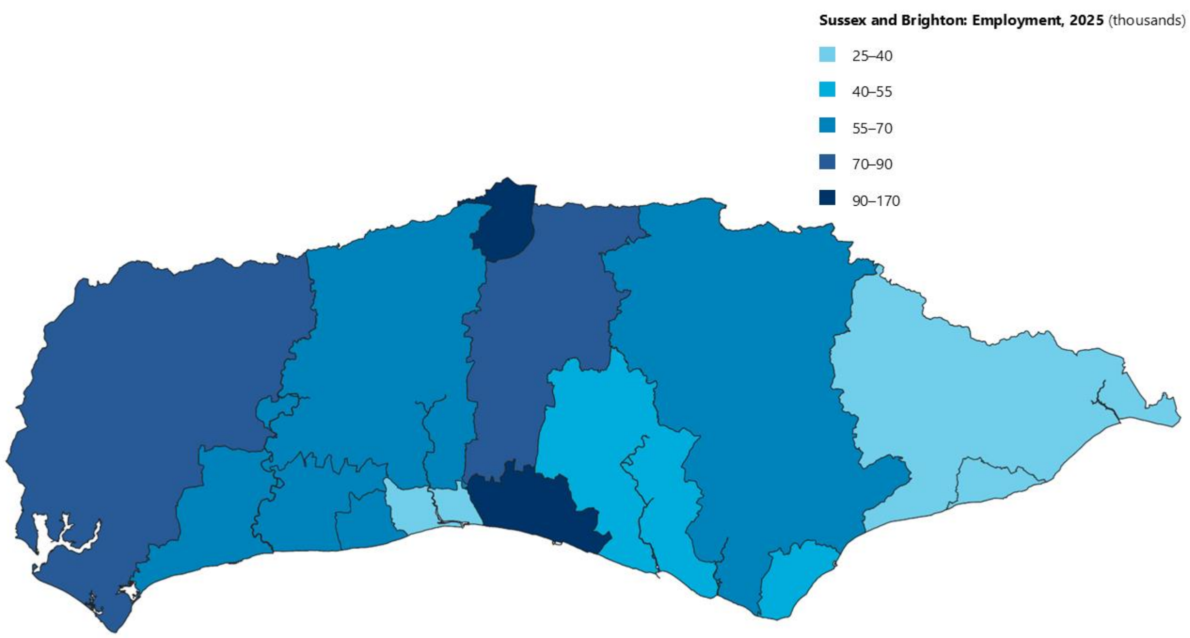
Fig. 2. Unemployment rate in Sussex and the UK (2000–2050)



Sources: Oxford Economics, ONS

The heat map presented in Fig. 3 illustrates employment levels across the region, highlighting areas of higher and lower workforce concentration. Employment is heavily concentrated in urban and economic hubs such as Brighton and Crawley (which hosts Gatwick Airport), where figures reach the highest range (90 thousand–170 thousand). In contrast, more rural and coastal areas across the region show lower employment levels, highlighting the urban–rural divide in job distribution.

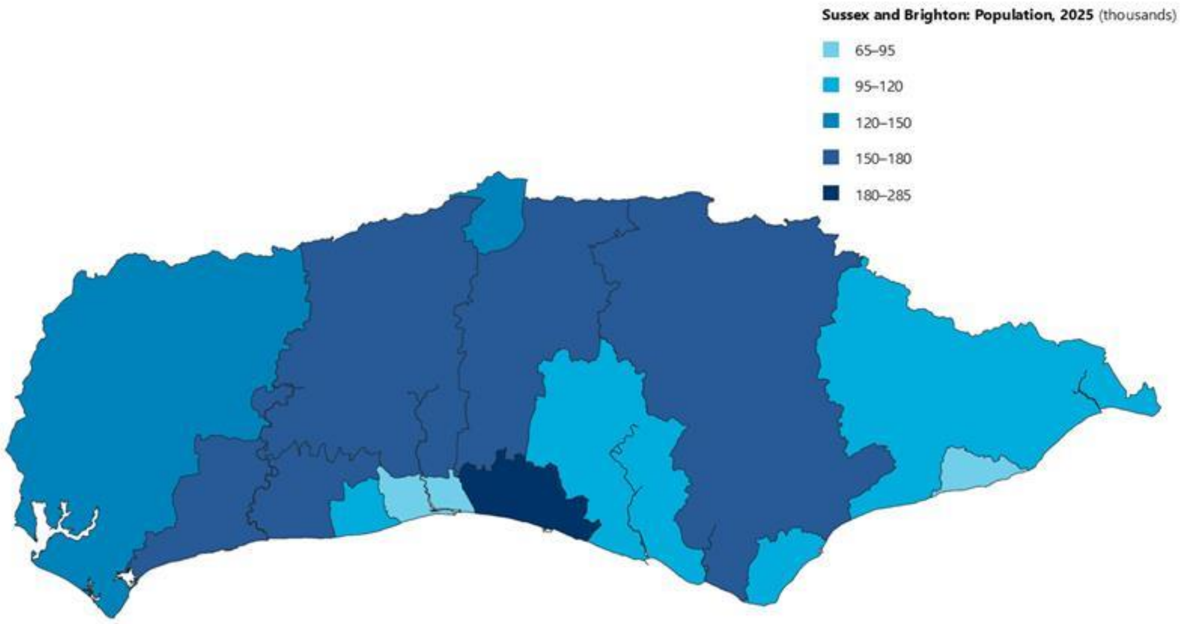
Fig. 3. Sussex and Greater Brighton employment in 2025



Source: Oxford Economics

The heat map presented in Fig. 4 displays population distribution across the region, the largest populations are concentrated in urban centres such as Brighton and Crawley, while the surrounding rural and coastal districts have smaller populations.

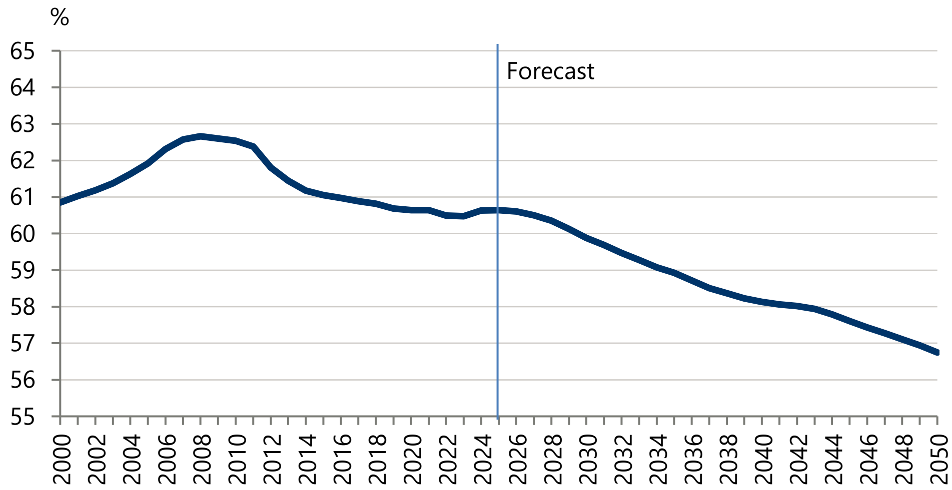
Fig. 4. Sussex and Greater Brighton population in 2025



Source: Oxford Economics

The proportion of Sussex's population aged 16–64 has been steadily declining since 2008 and is projected to continue falling through to 2050, even as the overall population grows. This indicates a stagnating working-age base and a growing share of retirees, increasing pressure on local services and employers. Hence, regional prosperity will depend on the ability to attract and retain high-skilled workers and to boost productivity through innovation. Supporting high-value sectors such as quantum computing offers a dual opportunity: sustaining Sussex's talent base by creating compelling local career paths and driving productivity growth in a demographically constrained economy.

Fig. 5. Proportion of Sussex's population aged 16–64 (2000–2050)



Sources: Oxford Economics, ONS

2. THE ECONOMIC IMPACT OF THE QUANTUM COMPUTING SECTOR IN SUSSEX AND GREATER BRIGHTON

This chapter analyses the economic contribution currently supported by the quantum computing industry itself in Sussex and Greater Brighton. To do so we use gross value added, a metric used to quantify the contribution to GDP, as well as employment. Estimates are shown for 2025 and a point in the future when quantum computing is fully developed and widely adopted across the rest of the economy. The latter point is conjectured to occur in line with the predictions for Universal Quantum specifically, but the modelling intuition remains the same no matter which year this takes place.

This chapter does not discuss the productivity benefits delivered to end user industries, which are presented in Chapter 3.

2.1 DEFINING THE INDUSTRY AND THE EXISTING REGIONAL OFFERING

We worked with the team at Mid Sussex District Council and Winfried Hensinger, Professor of Quantum Technologies at the University of Sussex and co-founder of Universal Quantum, to identify quantum firms currently working in Sussex. The existing registered companies working exclusively in quantum computing are: [3]

- Universal Quantum;
- CDO2 Ltd; and
- Bosonic;

The current definition of the quantum computing sector focuses primarily on active companies whose economic impact can already be modelled and measured. However, this approach overlooks a growing number of emerging companies that are nearing commercialisation and could potentially play a vital role in the industry. For example, Speqra is a spin-out company from the University of Sussex which was founded in 2025. As the company is in such early stages of development, we are not able to account for its economic impact in our modelling. These companies are developing innovations which are not yet fully captured in existing assessments but may become essential to the broader quantum ecosystem. As these technologies mature and enter the market, they are expected to significantly expand the scope, capability, and economic contribution of the sector.

Universal Quantum is the largest player in the quantum computing industry in Sussex, currently representing 95% of the employment of the industry. For this reason, the upcoming modelling framework is informed by engagement and interviews with Universal Quantum's staff on their operations to inform our modelling assumptions. Interviews were conducted with the relevant stakeholders on:

[3] This includes quantum hardware, software, and sensing.

- Current employment
- Future employment forecasts
- Future growth forecasts
- Overview of supply chain spending
- R&D strategy

2.1.1 Current employment

Data on the employment of the remaining firms were sourced from LinkedIn in August 2025. In total, we estimate that the industry currently employs 74 people in Sussex and Greater Brighton.

Although current employment levels in the quantum sector within Sussex and Greater Brighton remain modest due to the emergent nature of the industry, the region possesses an exceptional talent pipeline poised to support future growth, largely driven by the University of Sussex. The university has established one of the most comprehensive quantum computing training programmes in the world, helping to address the global shortage of skilled professionals in this emerging field. It was the first university in the UK to introduce a four-year undergraduate degree in quantum technology, where students engage in active research from the very start of their studies. Sussex also offers a Msc in Quantum Technologies and as a UK first, offers an Online Distance Learning Quantum Technology master's degree. Further strengthening this pipeline, the University of Sussex—together with the University of Bristol—operate a £24 million EPSRC Centre for Doctoral Training in Quantum Information Science and Technologies, supporting 18 new PhD students each year. Collectively, these initiatives ensure that Sussex is not only nurturing a highly skilled quantum workforce but also positioning the county as a critical contributor to the UK's growing quantum computing sector.

2.1.2 Current GDP contribution

Estimates of the quantum industry's contribution to the region's GDP are based on measures of labour productivity (gross value added per head) sourced from comparable industries using ONS data.[4]. Based on this approach we estimate the quantum computing industry generates a £9 million gross value added contribution to the county's GDP.[5] By comparing this result to our previous analysis of the UK quantum sector, we estimate that Sussex and Greater Brighton currently represent 11% of the UK's GDP contribution of the quantum computing hardware sector.[6] Given that Sussex and Greater Brighton contribute approximately 2% to total economy wide UK GDP, this demonstrates the strength of the quantum computing sector in the county.

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[4] ONS, "Non-financial business economy, UK: Sections A to S", April 2024.

[5] Gross value added is the contribution each firm or sector makes to UK GDP. It is easiest thought of as the difference between the value a sector's output is sold for minus the cost of bought in inputs of goods and services that are purchased and used up in the production of that output. Gross domestic product (GDP) is the main measure of a country's economic output. It is the indicator used to compare the relative sizes of different countries' economies and their rate of growth.

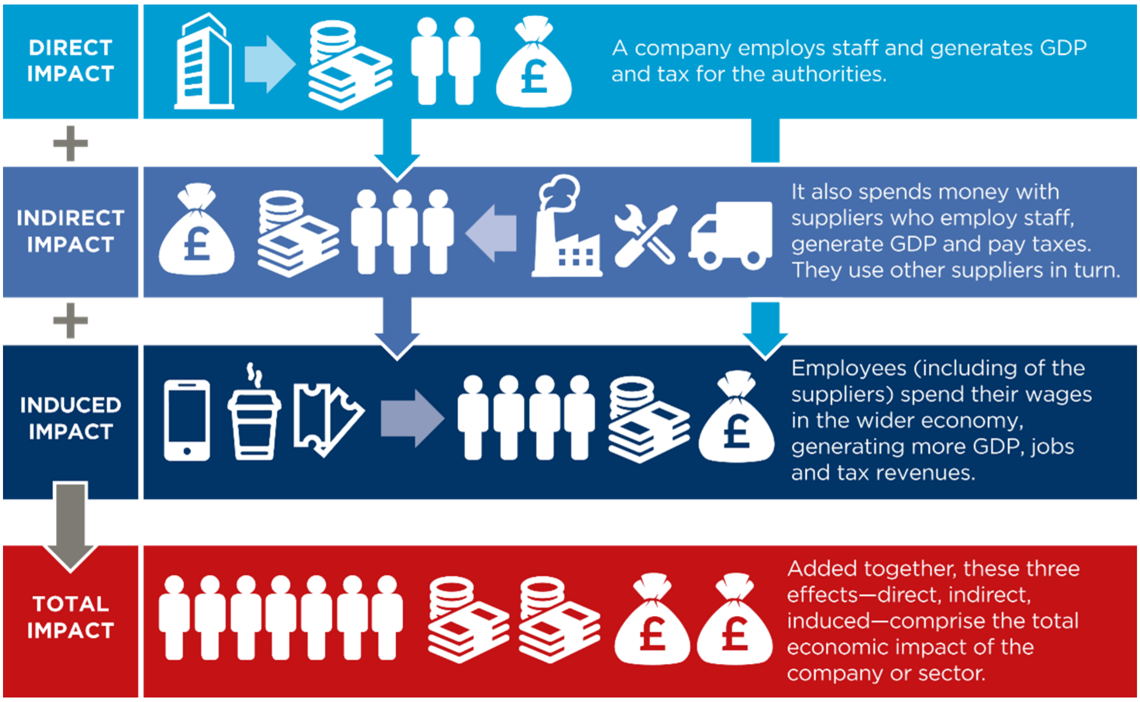
[6] Given that Universal Quantum (a quantum hardware company) is the largest player in the region, quantum computing in Sussex and Greater Brighton is currently concentrated in the hardware sector. Oxford Economics, February 2025. Ensuring that the UK can capture the benefits of quantum computing.

2.2 MULTIPLIER IMPACTS OF THE QUANTUM COMPUTING INDUSTRY

The impact of the quantum computing industry on the UK and Sussex and Greater Brighton economies is assessed using an economic impact assessment. This involves quantifying the company's economic contribution across three channels of expenditure (Fig. 6). The channels of impact are:

- **Direct impact** relates to the employment and economic activity generated by the industry itself and highlighted in Section 3.1.
- **Indirect impact** captures the economic benefit stimulated by the quantum computing industry's procurement of inputs of goods and services from its regional and UK supply chain.
- **Induced impact** comprises the wider economic benefits that arise from the payment of wages by the quantum computing industry and its supply chain.

Fig. 6. Schematic of the channels of economic impact



2.2.1 Indirect impacts

The impact of the industry in Sussex and Greater Brighton extends beyond the contribution of its operations alone. The industry procures a range of inputs of goods and services. Through this procurement spend on locally-made goods and services, the quantum computing industry stimulates further economic activity and employment at firms in the region. This contribution along the supply chain of the industry is known as the indirect channel.

We estimate the quantum computing sector's procurement supports a GDP contribution of £13.5 million and 183 jobs along its supply chain across the entire UK economy. The quantum computing sector supports a GDP contribution of £3.4 million and 39 jobs in the South East region itself. This is equivalent to 25% and 21% of the industry’s total contribution to the UK economy, respectively.

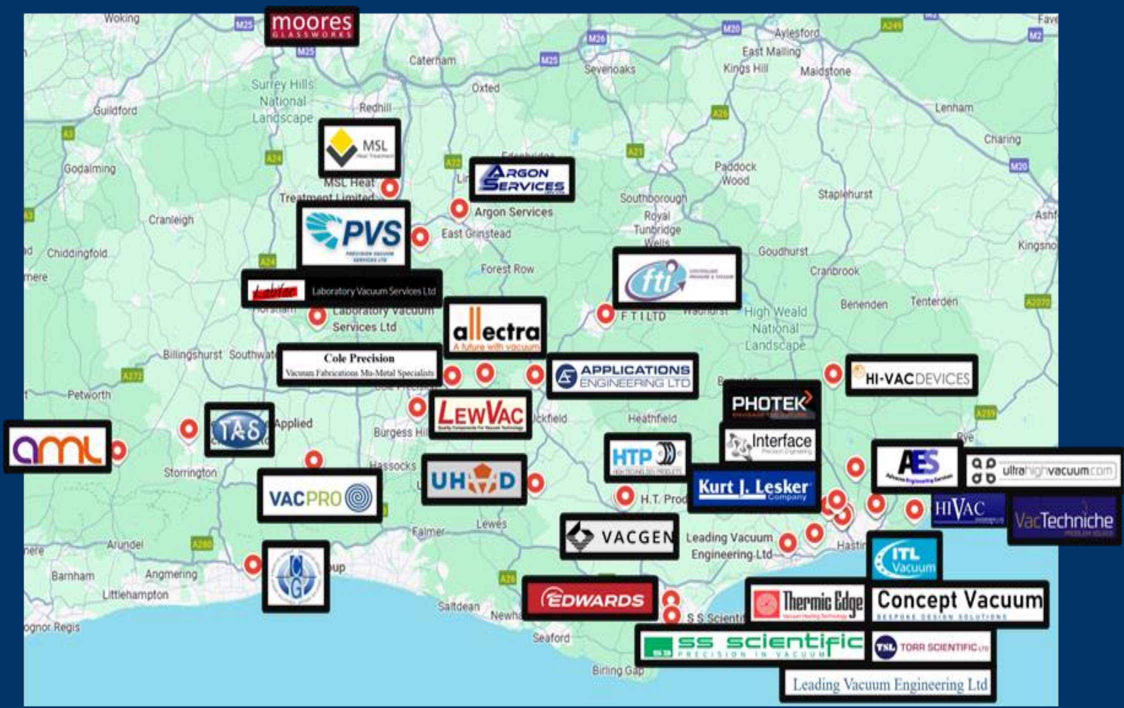
While this indirect impact is spread across various industries, the largest indirect gross value added contribution is estimated to be stimulated in the manufacture of machinery and the research and development sectors.

The reason that much of the supply chain impact is concentrated in the manufacture of machinery industry is because it encompasses vacuum technology companies (see Box 1). The strong presence of vacuum technology companies in the South East enables quantum computing firms to source key components locally, allowing Sussex and Greater Brighton to retain a greater share of the economic and innovation benefits generated by the quantum computing industry. We estimate that for this reason 30% of Universal Quantum’s procurement is sourced from companies in the South East.

Box 1. The Sussex and Greater Brighton Vacuum Cluster: a regional advantage

Sussex hosts one of Europe's largest and most uniquely concentrated clusters of vacuum technology firms, specialising in ultra-high vacuum (UHV) and mu-metal chamber manufacturing. This capability is critical for quantum computing, where magnetic shielding and environmental isolation are paramount. UHV systems provide the pristine, particle-free conditions necessary to maintain qubit coherence and operational stability.

This map illustrates the geographic concentration of vacuum technology firms across West and East Sussex.



Source: Kurt J. Lesker Company

Sussex's heritage in vacuum excellence stretches back to 1953, when Edwards Vacuum relocated its operations to Crawley, expanding across several sites in Sussex. Vacuum Generators, founded in East Grinstead in 1964, became another cornerstone of the local industry, helping to establish a deep ecosystem of expertise and suppliers that continues today.

The region's companies and engineers now support research and production facilities worldwide, including Stanford, MIT, NASA, Brookhaven, SpaceX, and Microsoft. Within the UK, Sussex-made equipment underpins activity at Strathclyde, Daresbury, Harwell, Diamond Light Source, SPTS, and Plessey Semiconductor, strengthening the nation's sovereign capability.

At the heart of this cluster is a workforce with unparalleled hands-on experience in creating UHV environments that match the vacuum of space. This concentration of skills and infrastructure gives Sussex a distinctive advantage as it builds its quantum sector.

The Sussex mu-metal cluster

Mu-metal, a nickel-iron alloy with high magnetic permeability, is essential for shielding quantum systems from low-frequency magnetic noise. Only a handful of mills worldwide produce this specialty alloy. Within a 50-mile radius in Sussex, five manufacturers (Kurt J. Lesker Company, Argon Services, VACGEN, Cole Precision, and TIG Fusion) have the capability to fabricate leak-tight, fully heat-treated mu-metal vacuum chambers. They are supported by a specialist stockholder and heat-treatment provider located in the South East.

This represents vital sovereign capacity in vacuum engineering. Sussex is one of only three regions globally—alongside clusters in Germany and the US—with multiple mu-metal chamber manufacturers operating at scale. These firms serve strategic markets including quantum computing, aerospace, defence, cyber security, and semiconductor foundries.

Sussex's concentration of UHV and mu-metal manufacturing expertise provides a critical foundation for the region's quantum computing sector. Having these advanced capabilities co-located in Sussex shortens supply chains, accelerates prototype development, and strengthens the region's position as a leading hub for quantum hardware innovation in the UK and Europe.

2.2.2 Induced impacts

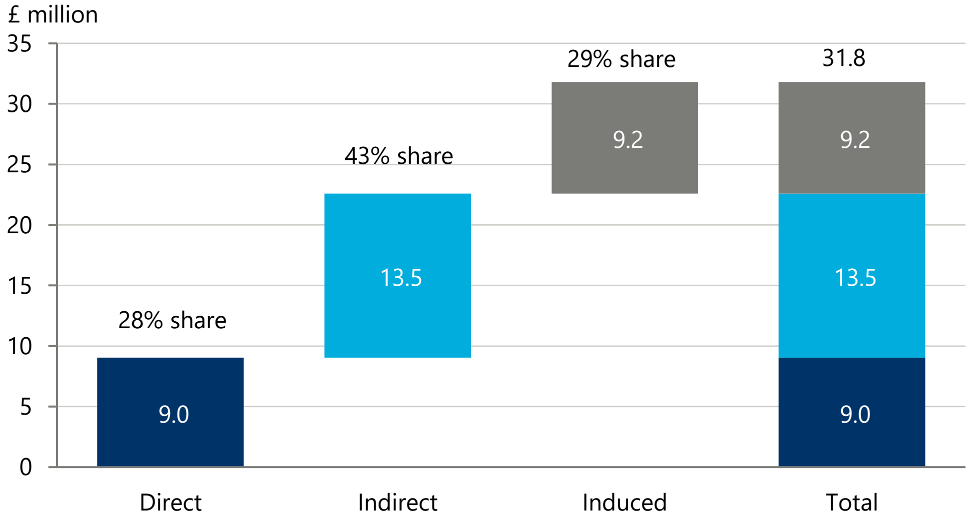
Another impact to be considered is the induced channel. Quantum computing firms and their suppliers pay their staff wages which they spend throughout the consumer economy. Retail, leisure and other outlets that benefit from the spend sell goods and services which they purchase from their own supply chain. The economic activity and employment stimulated as a result of the wage payments by both these firms and their suppliers are referred to as the induced channel. We estimate the induced contribution of the quantum computing sector to UK GDP is £9.2 million with 117 jobs supported across the nation. The quantum computing sector supports a GDP contribution of £2.7 million and 35 jobs in the South East. This is equivalent to 29% and 30% of the total contribution to the UK economy, respectively.

2.2.3 Total impacts

Combining these three channels—direct, indirect, and induced— we find that the quantum computing industry in the region supports a total gross value added contribution to GDP of £31.8 million across the UK economy (Fig. 7). The quantum computing sector supports a GDP contribution of £15.2 million in the South East itself. This is equivalent to 48% of the total contribution to the UK economy.

The sector's gross value added regional multiplier is 1.7. This means for every £10 million in gross value added generated by the sector itself, it supported a further £7 million around the rest of the South East economy through its expenditure.

Fig. 7. Gross value added contribution to UK GDP supported by the quantum computing industry[7]



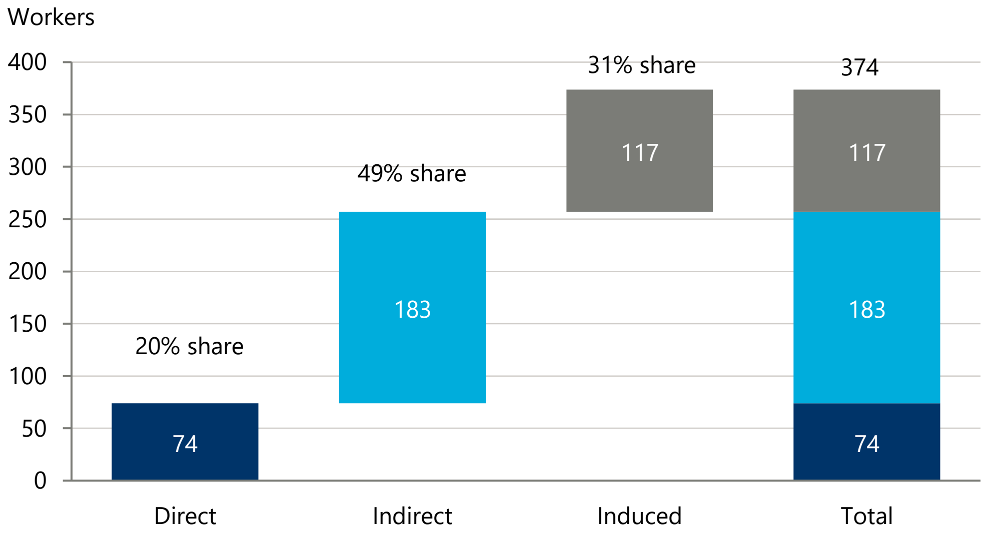
Source: Oxford Economics

The quantum computing sector supports 374 jobs in the whole UK economy (Fig. 8). Of these only 19.8% were in the sector itself, with the rest supported in its supply chain through wage and consumption impacts. The sector supports 148 jobs in the South East. This is equivalent to 40% of the total UK economy.

The sector has an employment multiplier of 2.0. This means that for every 10 people employed in the quantum computing sector itself, another 10 were employed round the rest of the South East.

[7] Values are rounded and may not add up to exactly 100%.

Fig. 8. Employment supported by the quantum computing industry



Source: Oxford Economics

2.3 FUTURE ECONOMIC CONTRIBUTION OF THE QUANTUM COMPUTING INDUSTRY

The current impact of the quantum computing sector in Sussex and Greater Brighton is relatively small, reflecting its early stage of development and limited commercial activity. As the technology matures, new companies will emerge, and existing firms will scale up, with the sector's economic and innovation value anticipated to grow significantly, positioning the region to capture substantial long-term benefits.

Accurately forecasting the growth of a new industry always presents challenges. How quickly breakthroughs occur, how much funding the industry attracts, and how effectively it can transition from research to end user commercially viable applications are all factors that make forecasting highly uncertain.

The transformative potential of quantum computing is widely recognised, both in the region and the world. However, the timeline for widespread adoption and tangible impacts across different end user industry sectors remains uncertain.

To manage both of these uncertainties, our proposed approach forecasts the growth of the industry under four different potential scenarios for growth.

Two scenarios use data on similar technology revolutions. We conducted extensive desk research to identify comparable technologies in comparable stages of evolution. Creating these parallels with other successful technologies also allows us to visualise the potential for the industry's growth following appropriate funding. A wider discussion about best practice funding is contained in Chapter 4.

The third scenario uses data on the Universal Quantum's employment projections provided from staff at the firm to reflect an example which is close and relevant to the region.

The fourth scenario models a potential case in which government funding and infrastructure development do not materialise in Sussex and Greater Brighton and the companies in the region are forced to consider relocation. This is informed by conversations with staff at Universal Quantum on what portion of employment and operations is expected to remain in the region if the wider company opted for relocation. The fourth scenario is presented separately due to its different assumption about the availability of government funding.

All four scenarios are aligned in terms of the productivity data used to ensure comparability.

Fig. 9. Forecasting scenarios for the future growth of the quantum computing industry

Scenario 1: Parallel technology—semiconductor industry
To model the potential growth of the quantum computing industry, we begin by drawing parallels with the historical development of the semiconductor industry. We use data from Oxford Economics' Global Industry Service, which includes data for the semiconductor industry from 1980.[8] To mitigate for country-specific effects, we analyse data across multiple countries and calculate an average growth trajectory. We identify key phases in the semiconductor sector's development, including scoping and R&D, the build-up of commercial capacity, and full market adoption. These phases provide a framework to understand how a technology-intensive sector evolves and offer insights into potential timelines and growth patterns for quantum computing by drawing parallels with an appropriately funded industry such as semiconductors.
Scenario 2: Parallel technology—telecommunications industry
This scenario relies on the same methodology as Scenario 1 but uses historical data from the telecommunications industry in China starting from the year 1980 (the first year available in Oxford Economics' Global Industry Service). This scenario represents the lower bound of our projections.
Scenario 3: Universal Quantum's expected growth trajectory
To create a region-specific projection, we include a scenario aligned with the expected growth trajectory of Universal Quantum's staff. Unlike the broader industry parallels in Scenarios 1 and 2, this projection is grounded in the local context, capturing both the specific capabilities of Universal Quantum and the anticipated expansion of the regional quantum ecosystem. This scenario uses data on the forecast headcount and the revenue of the firm to proxy the potential growth of the entire industry. The revenue figure is obtained from 'The Sussex Quantum Silicon Valley' vision document [to be published in 2025].[9] This is deflated to reflect the portion of

[8] Oxford Economics' Global Industry Service

[9] This document proposes to leverage significant private investment using a government seed funding contribution. Government could make such seed funding contribution available making use of the quantum

this revenue that would be based exclusively in Sussex and Greater Brighton and the growth is then backloaded to reflect the fact that while sales could potentially take place as soon as 2026, the majority of the growth and associated income will take place in later years.

This scenario represents the upper bound of our projections and corresponds with a predicted inflection point where quantum computing either achieves its first industrial application, or when the demonstrated performance of the technology becomes sufficient for customers to begin placing orders for utility-scale quantum computers.[10]

Scenario 4: Growth trajectory without government support for the region

All of the scenarios outlined above assume that the growth of the quantum computing sector continues to be underpinned by government funding and strategic support. However, without sustained investment and a clear commitment to developing the necessary infrastructure and skills, companies such as Universal Quantum are likely to consider relocating to regions offering stronger incentives and better opportunities for scaling. In the absence of sufficient support, there is a real risk that the region's quantum capabilities will drift to countries where government backing is more substantial. Under this scenario, both Sussex and Greater Brighton—and the wider UK economy—would miss out on the long-term economic, technological, and employment benefits associated with retaining a strong quantum industry base.

The aim of this scenario is to visualise the reduced benefits to the region.

2.3.1 The future direct economic contribution of the quantum computing industry

In the previous section, we estimated that in 2025 the direct contribution to GDP of the quantum computing industry in Sussex and Greater Brighton was £9 million. This is projected to increase to between £721 million and £1.2 billion across the UK economy by 2050 (Fig. 10). This is equivalent to 20% and 32% of the predicted gross value added of the entire quantum computing hardware industry in the UK, according to Oxford Economics forecasts. [11]

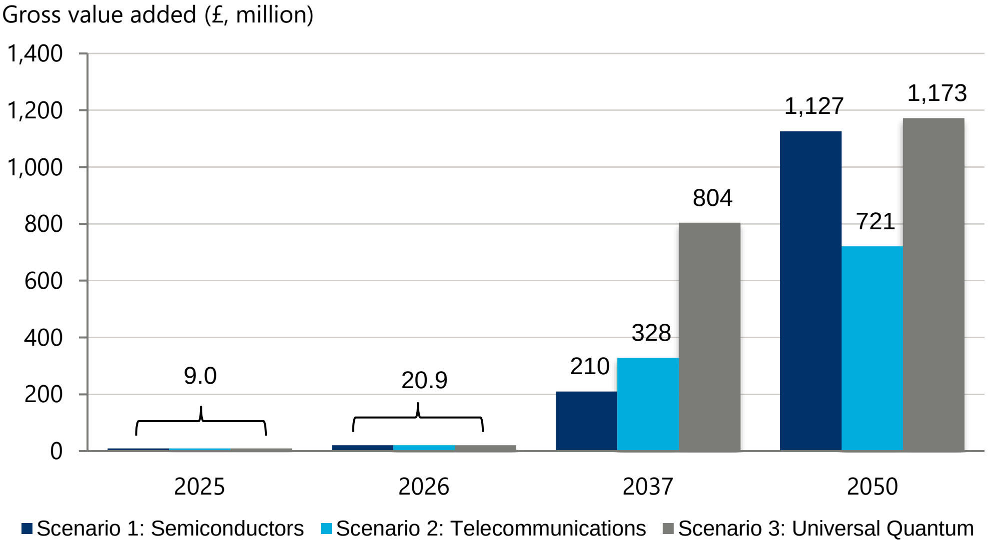
This is equivalent to an average annual growth between 19% and 21% between 2025 and 2050 for the quantum computing industry. In comparison, the GVA of the manufacturing of computers industry in Sussex and Greater Brighton is expected to grow at an annual average of 1.0% in the same time period.

computing allocation within UK Government's Modern Industrial Strategy and other regional economic growth funding allocations such as UKRI's Local Innovation Partnerships Fund.

[10] The Sussex Quantum Silicon Valley Vision document, [2025, to be published] provides a strategy in which the industry's inflection point can be reached through making use of the UK government as an early customer.

[11] Oxford Economics, 'Ensuring that the UK can capture the benefits of quantum computing', February 2025.

Fig. 10. Forecast direct contribution of the quantum computing industry to UK GDP 2025–2050

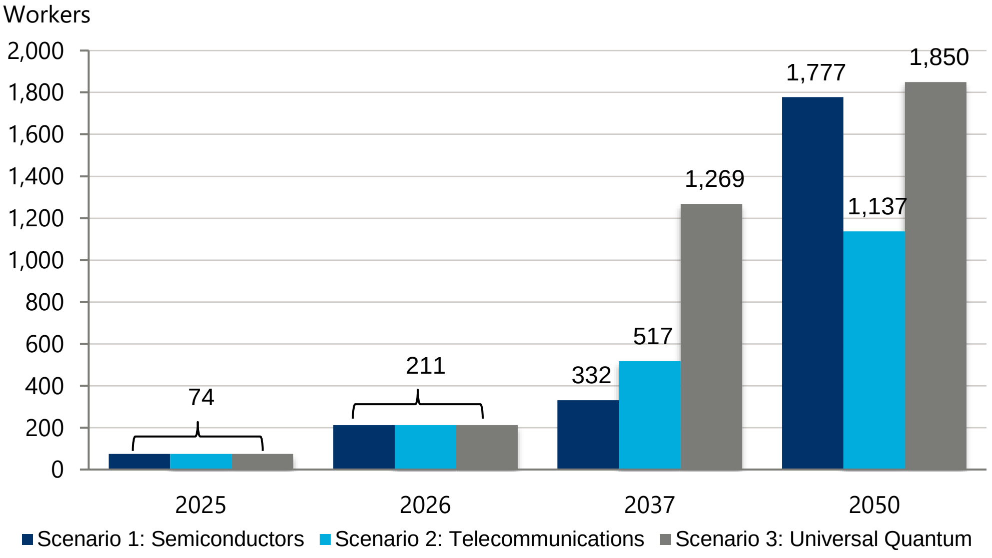


Source: Oxford Economics

The quantum computing industry in Sussex and Greater Brighton is forecast to generate between approximately 1,100 and 1,900 jobs by 2050 (Fig. 11).

For the region of the South East, this is equivalent to an average annual growth of 17%–19% between 2025 and 2050 for the quantum computing industry.

Fig. 11. Forecast of the number of jobs created by the quantum computing industry in the UK 2025–2050



Source: Oxford Economics

2.3.2 Future multiplier impacts of the quantum computing industry

Even in our future projections, the impact of the industry is not limited to the operations of the industry itself and extends to the contributions across the supply chain of the industry (indirect channel) and the impact of wage payments throughout the economy (induced channel).

We estimate that the quantum computing sector's procurement will support a gross value added contribution to the UK GDP of between £1.1 billion and £1.7 billion through the indirect channel by 2050. The sector will also support a UK GDP contribution of between £736 million and £1.2 billion in the consumer economy through the induced channel by 2050.

Within the South East, the quantum computing sector is forecast to support a GDP contribution of between £274 million and £446 million through the indirect channel by 2050. The sector is projected to also support a GDP contribution of between £215 million and £350 million through the induced channel by the same year.

Similarly, we forecast that the quantum computing sector's purchases of inputs of goods and services will support between approximately 14,600 and 23,800 jobs across the whole of the UK by 2050. The sector is projected to also support between 9,300 and 15,100 jobs through wage-consumption (or induced) impacts by 2050.

Within the South East, the quantum computing sector is projected to support between 3,100 and 5,100 jobs through the indirect channel by 2050. The sector is forecast to also support between 2,800 and 4,500 jobs through the induced channel by 2050.

2.3.3 Future total impacts of the quantum computing industry

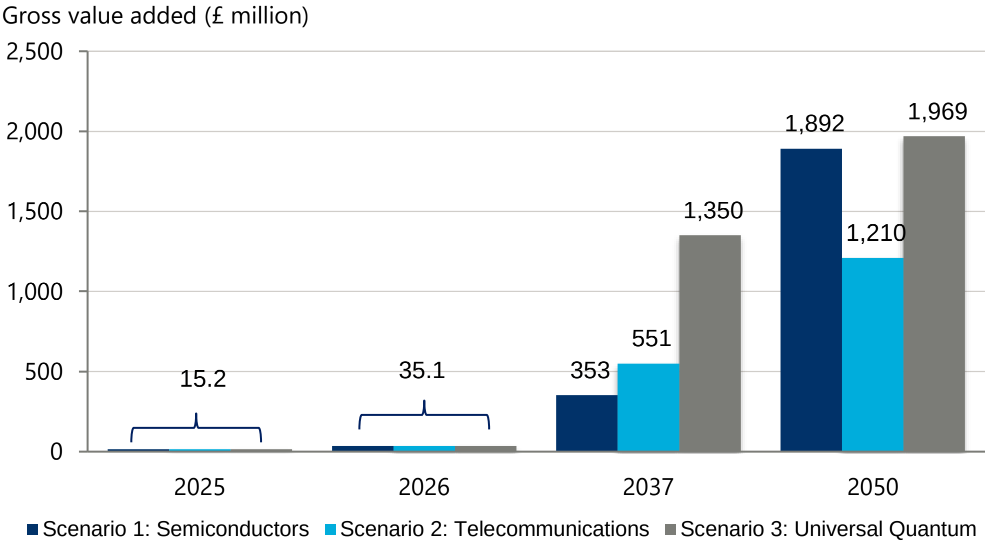
We estimate the turnover of the quantum computing industry across all impacts in 2025 across the whole UK economy to be £62.3 million. This is expected to grow by up to £144 million by 2026 under all three modelling scenarios. Under Scenario 3, the optimistic scenario, the turnover of the industry is forecast to grow to £5.5 billion by 2037 and £8.1 billion by 2050.

The turnover within the South East is estimated to be £29.9 million. This is expected to grow by up to £69.2 million by 2026 under all three modelling scenarios. Under Scenario 3, the optimistic scenario, the turnover of the industry in the region is expected to grow to £2.6 billion by 2037 and £3.8 billion by 2050.

Combining the three channels—direct, indirect and induced—we project that the region's quantum computing industry is likely to support a total gross value added contribution to GDP of between £2.5 billion and £4.1 billion by 2050 across the whole UK economy. The contribution to the South East is expected to be between £1.2 billion and £1.9 billion (Fig. 12).

For the region of the South East, this is equivalent to an average annual growth between 19% and 21% between 2025 and 2050 for the quantum computing industry. In comparison, the GVA of the Sussex and Greater Brighton economy is expected to grow at an annual average of 1.6% in the same time period.

Fig. 12. Forecast total contribution to the GDP of the South East by the quantum computing industry

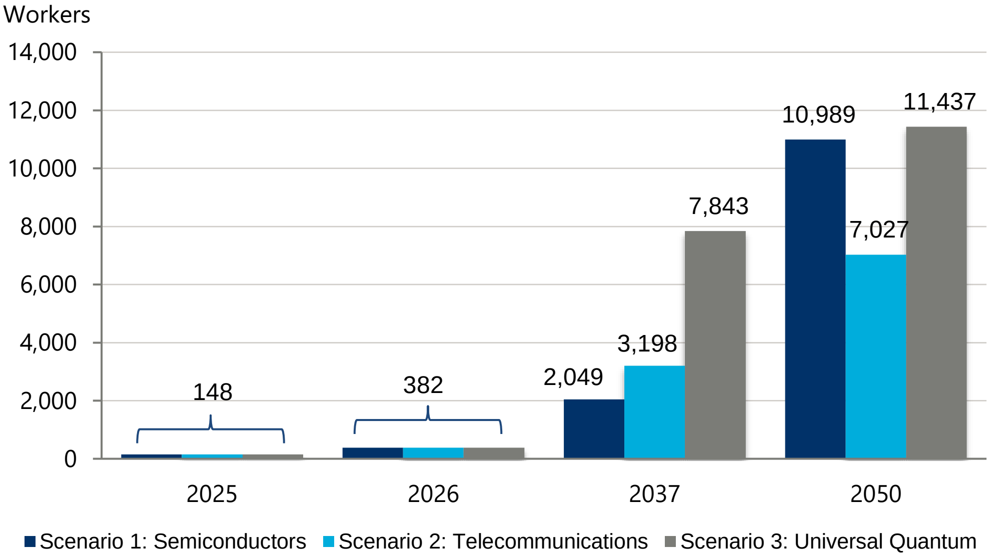


Source: Oxford Economics

Our modelling suggests that the quantum computing sector is projected to support between 25,000 and 40,800 people in employment across the UK economy by 2050. Of these, we estimate that only between 4.5% will be in the sector itself, with the rest forecast to be supported in its supply chain and through wage consumption impacts. The employment supported within the South East is expected to be between 7,000 and 11,400 (Fig. 13).

For the South East, this is equivalent to an average annual growth between 17% and 19% between 2025 and 2050 for the quantum computing industry. In comparison, the employment of Sussex and Greater Brighton economy is expected to grow at an annual average of 0.6% in the same time period.

Fig. 13. Forecast total number of jobs supported in the South East by the quantum computing industry 2025–2050



Source: Oxford Economics

2.4 RELOCATION RISKS AND POTENTIAL LOSS IN ECONOMIC BENEFITS

The analysis presented thus far relies on the assumption that the growth of the quantum computing sector in Sussex and Greater Brighton is underpinned by government funding and strategic support.

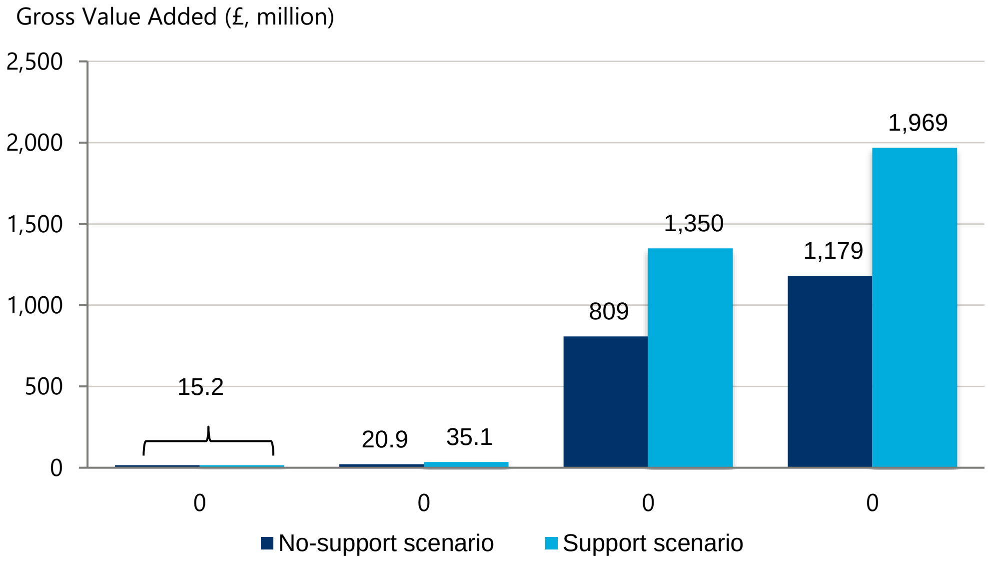
If sustained funding and infrastructure development do not materialise in Sussex and Greater Brighton, leading firms are likely to consider moving operations to locations with better funding opportunities. In these circumstances, companies will compare the availability of grants and contracts, access to facilities and talent, the local supply chains, and the speed with which they can scale. If alternative locations provide clearer paths to growth, their response may be to relocate core functions away from Sussex and Greater Brighton to jurisdictions with stronger long-term support.

The immediate effect of relocation would be a reduction in future regional employment, as hiring increasingly occurs overseas. This will lead to a lower direct contribution of the sector to regional and national gross value added. In parallel, indirect impacts will also decrease as local procurement falls as firms purchase less from nearby suppliers. Finally, induced impacts will also decrease as lower headcount and payroll leads to lower household spending impacts in the region.

We model this no-support scenario against Scenario 3 from the previous section, which represents our most optimistic scenario by assuming the sector will get government support to leverage significant private investment, serving to accelerate the development of the technologies.

Under this no-support scenario, we project that the region's quantum computing industry is likely to support a total gross value added contribution to GDP of £1.1 billion by 2050 in the region, which is about 60% of the projected figure in our support scenario.

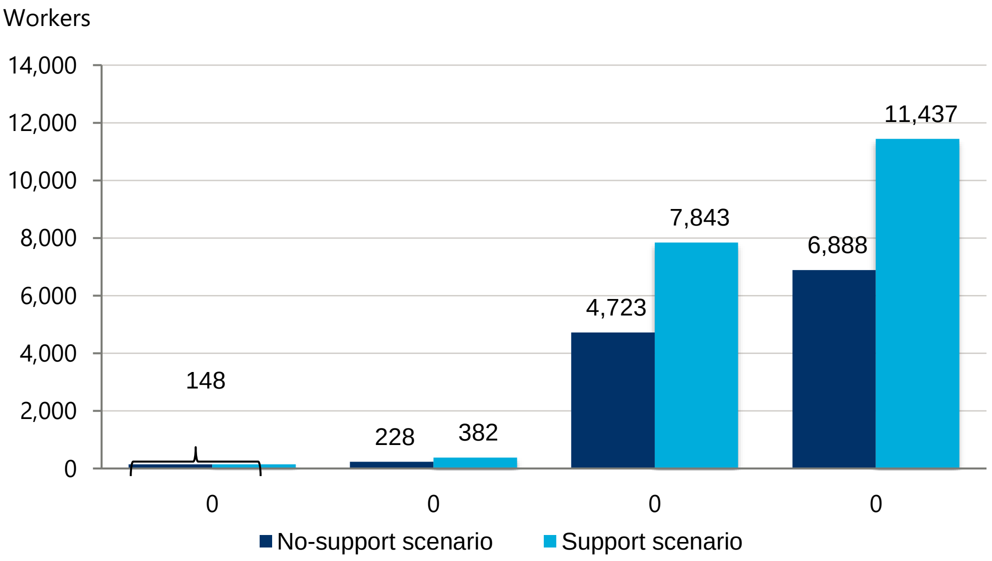
Fig. 14. Forecast total contribution to the GPD of the South East by the quantum computing industry – support and no-support scenarios



Source: Oxford Economics

Under this no-support scenario, the quantum computing sector is projected to support 6,900 jobs in the South East region by 2050, which is 60% of the equivalent figure in the support scenario.

Fig. 15. Forecast total number of jobs supported in the South East by the quantum computing industry 2025–2050 – support and no-support scenario



Source: Oxford Economics

Long term effects associated with the presence of innovation clusters and talent pipelines will also make it harder to retain or attract talent and investment, further amplifying the initial losses in the quantum computing sector.

The modelling presented in this section assumes a constant percentage reduction in regional quantum employment over the future years, with proportional declines in local procurement and payroll-driven spending. However, these figures should be treated as a conservative estimate of the potential impact of the relocation of the quantum computing ecosystem away from Sussex and Greater Brighton.

In practice, the importance of the region as a 'quantum ecosystem' is likely to decline more rapidly over time, as quantum capabilities become increasingly established in other jurisdictions. It is also possible that firms may choose to cease expansion in the region altogether and opt for formal relocation of all operations. Other secondary effects such as reduced university-industry collaboration and diminished cluster attractiveness will also lead to diminished economic benefits. As such, the presented results are likely to understate the potential long-term loss of employment, R&D activity, and economic value to the region and to the wider UK economy.

2.5 ADDITIONAL CONTRIBUTIONS OF THE QUANTUM COMPUTING INDUSTRY

2.5.1 Synergies with other technologies

In addition to the quantifiable economic impacts, the quantum computing sector in Sussex and Greater Brighton is likely to generate a range of wider benefits that are not captured in our modelling. A key area of these benefits arises from synergies with other advanced technologies, such as artificial intelligence, photonics, and high-performance computing. By enabling cross-sector collaboration, knowledge transfer, and joint innovation, the presence of a strong quantum ecosystem can amplify the capabilities of related technologies, driving productivity, creating new applications, and strengthening the broader regional and national technology landscape.

The intersection of quantum computing and AI is one of Sussex's strongest growth opportunities. Interviewees suggested that AI could be used to design better quantum schemes, sensors, and networks, accelerating experimentation beyond traditional trial-and-error methods. Interviewees added that AI could also help to solve complex computational problems within quantum systems, such as protein folding, leading to breakthroughs in materials and pharmaceuticals.

Looking ahead, one interviewee noted that quantum resources could enhance pattern and image recognition in AI algorithms, through more precise quantum measurement. Another interviewee suggested that quantum-inspired architectures could reduce AI's energy consumption. This aligns with Yin et al's study (2025), which found that a photonic quantum circuit outperformed classical algorithms and reduced energy consumption on small-scale machine learning tasks.[12]

Lastly, another academic who we interviewed, whose research in computational cancer genetics is already aided by machine learning and AI, highlighted that quantum computing's ability to manage probabilistic uncertainty could unlock new insights into gene interactions. The interviewee also highlighted that the University of Sussex already had strong AI foundations, positioning the region well for joint innovation.

[12] Yin Zhenghao et al, "Experimental quantum-enhanced kernel-based machine learning on a photonic processor" Nature Photonics, no. 19 (2025) pp.1020–1027

Together, these insights support combined investment initiatives that bridge Sussex and Greater Brighton’s strengths in quantum science and AI. For instance, joint research hubs or co-funded industrial partnerships, focusing on AI-assisted quantum design and energy-efficient computation.

3. THE ECONOMIC BENEFITS QUANTUM COMPUTING DELIVERS TO END USER SECTORS IN THE REGION

This chapter estimates the productivity gains end user customer sectors in Sussex and Greater Brighton will receive from the use of quantum computers in the future. It then goes on to qualitatively discuss the ongoing boosts and further economic benefits that innovation will bring.

3.1 ESTIMATING THE PRODUCTIVITY GAINS FROM QUANTUM COMPUTERS

Quantum computing has the potential to outperform classical machines on key classes of problems, triggering a major technological shift across industries spread across both the local and UK economy. By exploiting quantum phenomena to explore vast solution spaces, quantum systems could enable breakthroughs in industries such as pharmaceuticals, renewable energy, and financial services. A more detailed discussion of the applications of quantum technologies in various industries follows below.

Widespread adoption of the technology is expected to generate substantial productivity gains by accelerating production processes and speeding up discovery and design, despite the technology still being at an early stage. This, however, makes the forecasting of the precise economic impact difficult to quantify.

The standard approach in economic literature is to assess the impact of new technologies by drawing parallels with previous technological waves. Aghion and Bunel (2024), for example, predict the productivity gains of modern technologies like AI will resemble those seen during the late 1990s and early 2000s digital technology wave.[13]

Following a similar approach to the one proposed in their paper, we model quantum computing's potential sectoral productivity impact using US productivity growth data for 1997–2007, aligning with the methodology of Aghion and Bunel (2024). We assume the long-run effects of adopting quantum capabilities unfold in three phases:

- **Phase 1: technology development—**no industries have implemented any quantum computing capabilities as the technology is still being developed, therefore, the industry productivity is expected to grow at the same rate as current forecasts.
- **Phase 2: transitory productivity growth—**as the quantum computing technologies are fully developed, they can start being utilised by end user industries, leading to an increase in productivity growth.

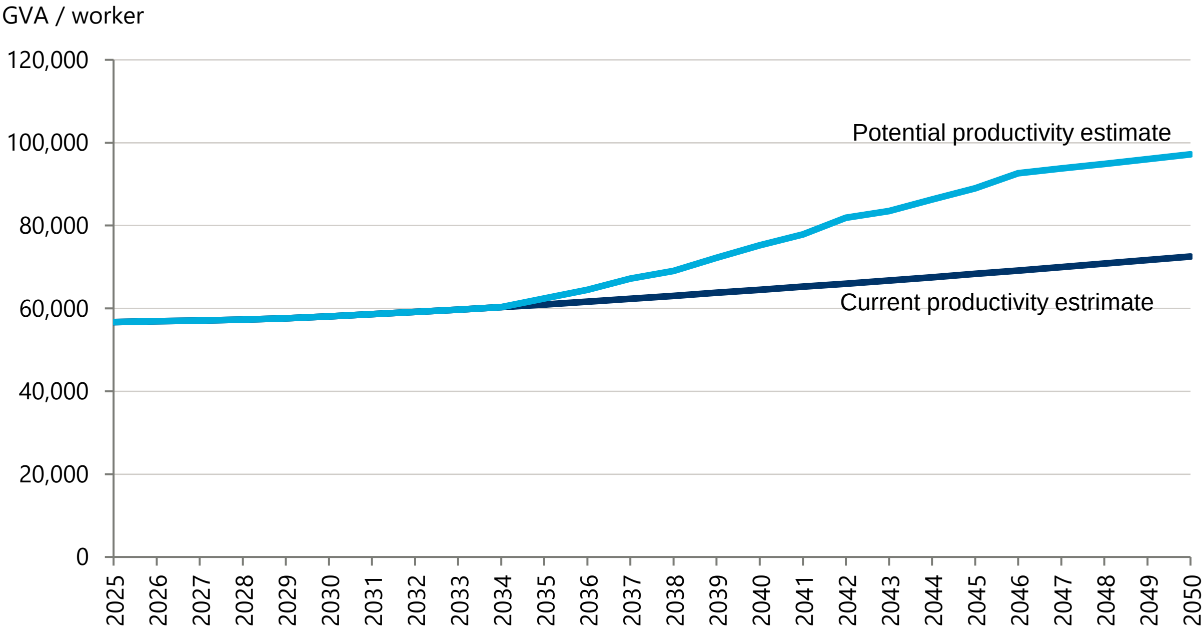
[13] Philippe Aghion and Simon Bunel, "AI and growth: Where do we stand?", San Francisco Fed, 2024.

- **Phase 3: technology utilisation—**once all relevant industries have adopted quantum computing, the productivity gains will cease and the industries will continue growing at the same rate as current forecasts.

The year in which productivity gains begin to appear is set as part of the modelling by aligning insights from stakeholder interviews and available literature on quantum computing. This choice does not change the core intuition or the long-run magnitude of the productivity effect. Shifting the start date simply translates the same adoption curve along the time axis. In other words, the uplift remains the same, but an earlier start brings the benefits forward.

Specific regional access to quantum capabilities is not expected to materially affect the productivity benefits to user industries.

Fig. 16. The effect of quantum computing adoption on potential productivity



Source: Oxford Economics

The productivity across the Sussex and Greater Brighton economy is expected to be 8% higher by 2050 compared to the current economy productivity forecasts. Fig. 17 shows the forecast of the potential productivity uplift by year.

Fig. 17. Economy-wide potential productivity uplift due to quantum computing

	Potential productivity forecast
2035	1%
2040	4%
2045	7%
2050	8%

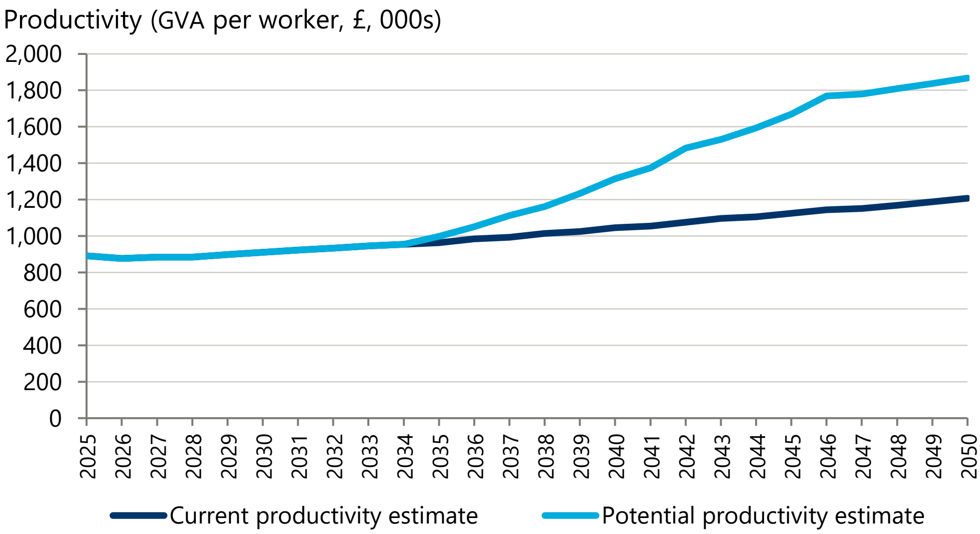
The economy-wide productivity figures are then adjusted to reflect the specific impact that quantum computing adoption could have on specific industries. We take a study by Economist Impact which quantifies the potential applications of quantum on a number of industrial sectors and use this to scale the impact on each industry's productivity within our model. [14]

3.1.1 Pharmaceutical industry

The pharmaceutical industry accounts for 1.8% of the GVA of Sussex and Greater Brighton and employs 0.1% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 1.2% CAGR between 2025 and 2050. Ways quantum could shift this trajectory is by enabling high-fidelity molecular simulations that identify promising drug compounds faster and more accurately, reducing late-stage failures, and by guiding the design of new formulations that achieve equivalent performance with less expensive ingredients, thereby lowering production costs.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 3% CAGR between 2025 and 2040, which translates into roughly a 55% uplift relative to the baseline outcome in 2050 (Fig. 18).

Fig. 18. Productivity gains in pharmaceutical industry due to quantum computing by 2050



Source: Oxford Economics

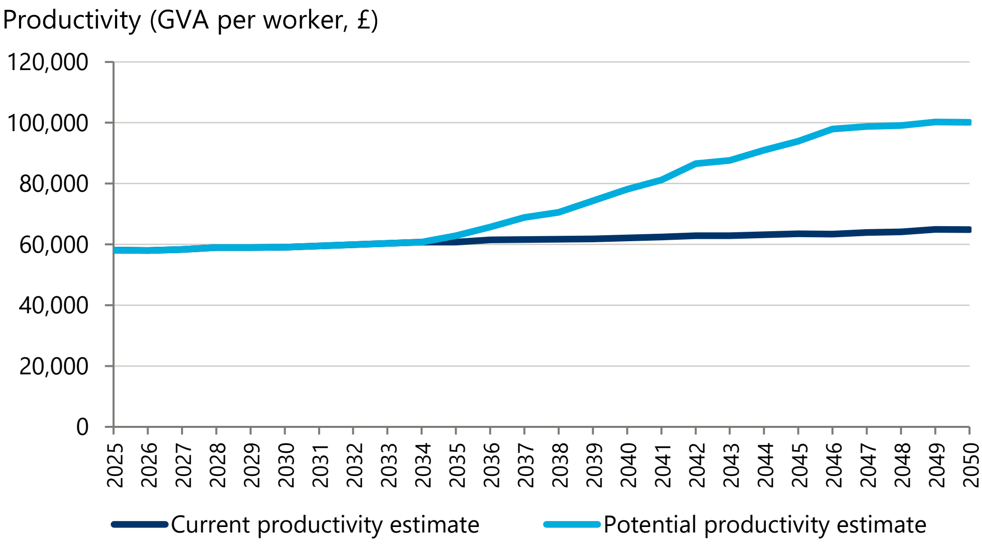
[14] The Economist Group, "Quantum Horizons: modelling the potential impacts of quantum computing", 2022

3.1.2 Electrical manufacturing

The electrical manufacturing industry accounts for 0.2% of the GVA generated in Sussex and Greater Brighton and employs 0.2% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 0.4% CAGR between 2025 and 2050. Quantum simulations and optimisation have the potential to accelerate materials discovery, device design, and process planning across electrical manufacturing, spanning motors, generators, transformers, electricity distribution, batteries, accumulators, domestic appliances, and lighting. The result is higher performance and efficiency, faster development cycles, reduced reliance on critical materials, and lower production and energy costs across the value chain.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 2.2% CAGR between 2025 and 2040, which translates into roughly a 54% uplift relative to the baseline outcome in 2050 (Fig. 19).

Fig. 19. Productivity gains in electrical manufacturing due to quantum computing by 2050



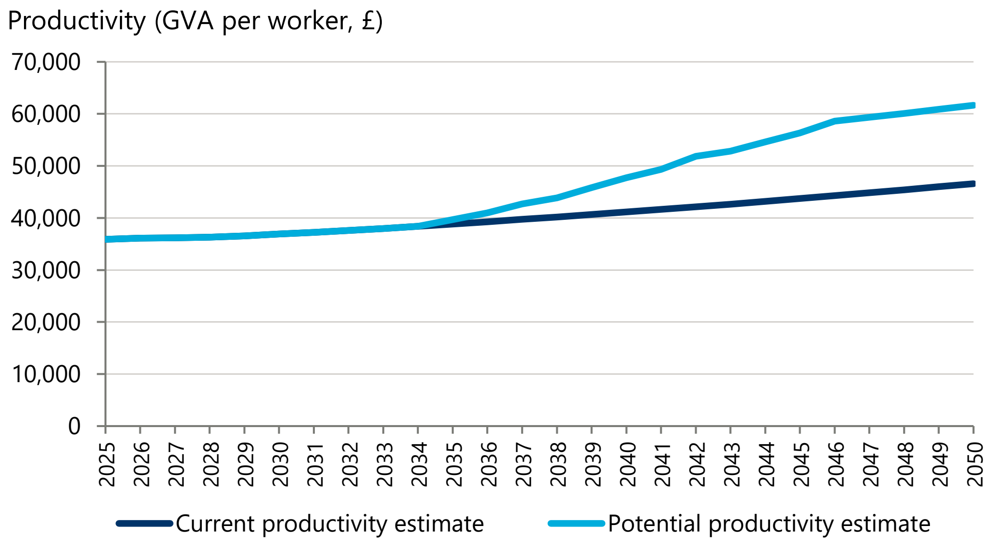
Source: Oxford Economics

3.1.3 Business services

The business services industry accounts for 9.6% of the GVA of Sussex and Greater Brighton and employs 15.1% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 1.0% CAGR between 2025 and 2050. Quantum could shift this trajectory by enabling advanced optimisation, simulation, and machine-learning methods that improve forecasting, pricing, routing, and resource allocation across activities such as consulting and advisory, IT and data services, accounting and legal workflows, marketing analytics, customer support, facilities management, and supply-chain coordination, thereby enhancing service quality, shortening turnaround times, and lowering operating costs.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 2.2% CAGR between 2025 and 2040, which translates into roughly a 32.4% uplift relative to the baseline outcome in 2050 (Fig. 20).

Fig. 20. Productivity gains in business services due to quantum computing by 2050



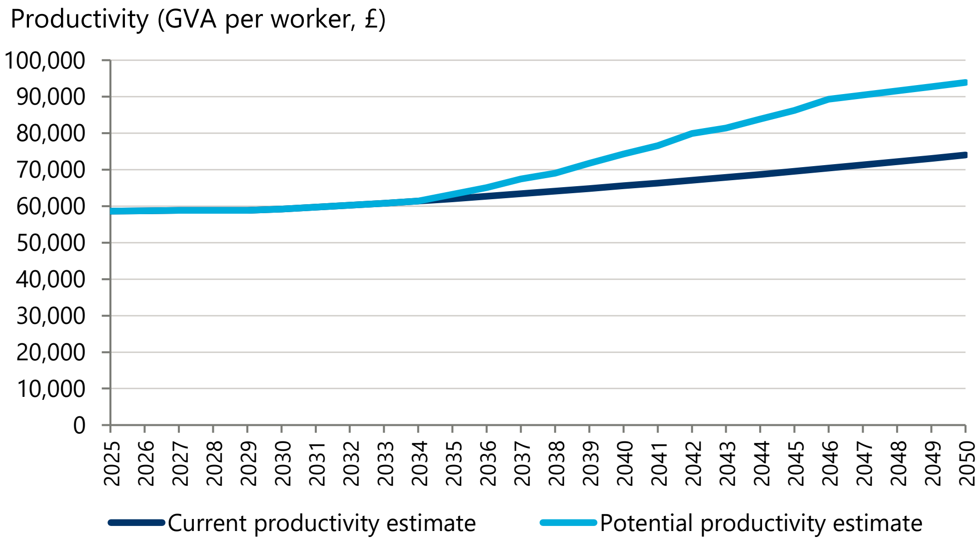
Source: Oxford Economics

3.1.4 Transport industry

The transport industry accounts for 5.0% of the GVA of Sussex and Greater Brighton and employs 4.8% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 0.9% CAGR between 2025 and 2050. Quantum could shift this trajectory by enabling real-time optimisation of delivery routes and fleet networks that incorporate variables such as weather and port availability, more sophisticated stress testing of supply chains, enhanced machine learning systems to facilitate autonomous driving, and simulations of highly complex traffic systems to aid infrastructure planning and reduce congestion, thereby lowering operating costs and improving service reliability.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 1.9% CAGR between 2025 and 2040, which translates into roughly a 26.8% uplift relative to the baseline outcome in 2050 (Fig. 21).

Fig. 21. Productivity gains in transport industry due to quantum computing by 2050



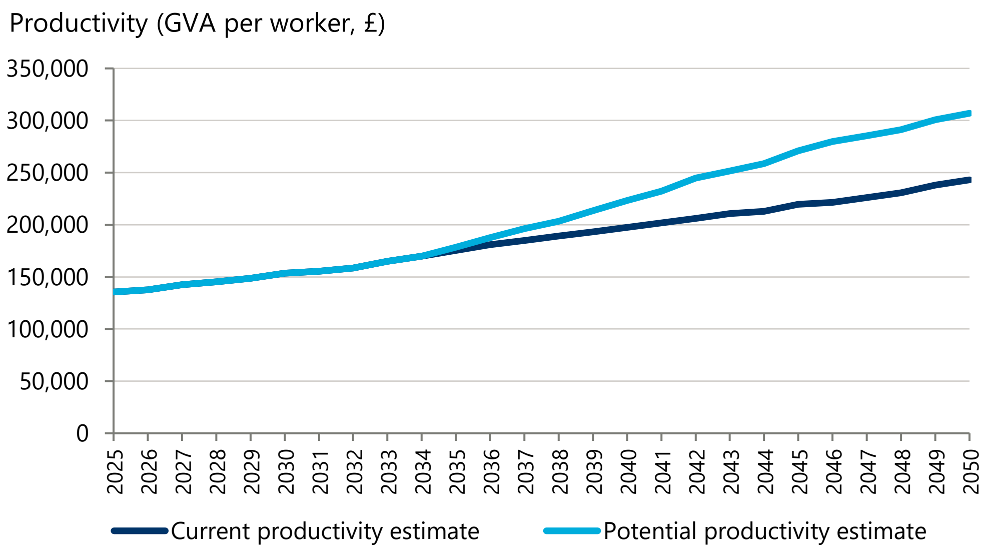
Source: Oxford Economics

3.1.5 Chemicals industry

The chemicals industry generates 0.3% of the GVA of Sussex and Greater Brighton and employs 0.1% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 2.4% CAGR between 2025 and 2050. Quantum could shift this trajectory by predicting molecular processes to reduce R&D costs and avoid trial-and-error lab experiments, and by facilitating the development of catalysts through quantum simulation techniques to cut energy use, lower production costs, and reduce supply-chain spend.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 3.3% CAGR between 2025 and 2040, which translates into roughly a 26.3% uplift relative to the baseline outcome in 2050 (Fig. 22).

Fig. 22. Productivity gains in chemicals industry due to quantum computing by 2050



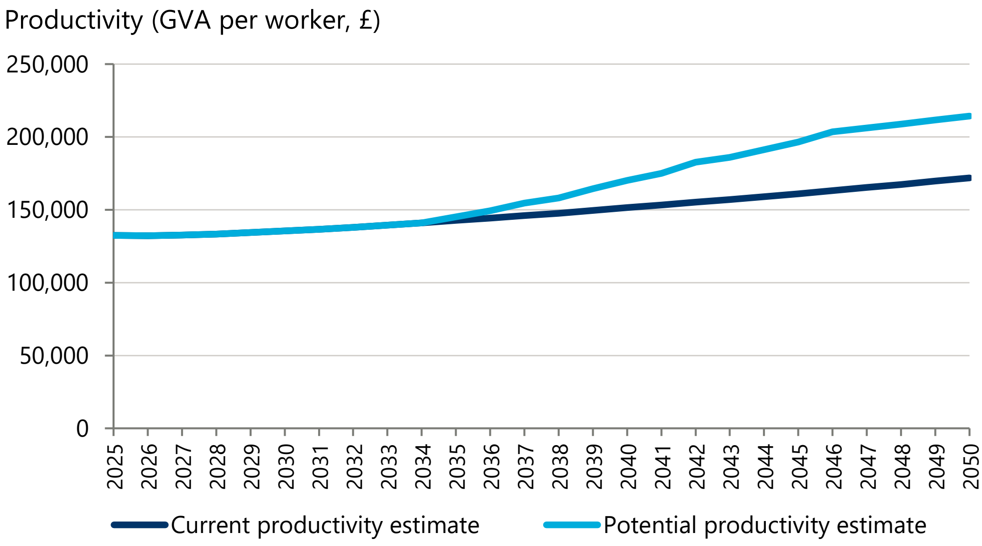
Source: Oxford Economics

3.1.6 Financial services

The financial services industry accounts for 7.2% of the GVA of Sussex and Greater Brighton and employs 3.1% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 1.0% CAGR between 2025 and 2050. Quantum could shift this trajectory by mitigating cyber risk and improving fraud detection through enhanced processing capabilities, and by enabling more advanced trading strategies that improve portfolio optimisation, thereby strengthening risk management and operational efficiency.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 1.9% CAGR between 2025 and 2040, which translates into roughly a 24.7% uplift relative to the baseline outcome in 2050 (Fig. 23).

Fig. 23. Productivity gains in financial services due to quantum computing by 2050



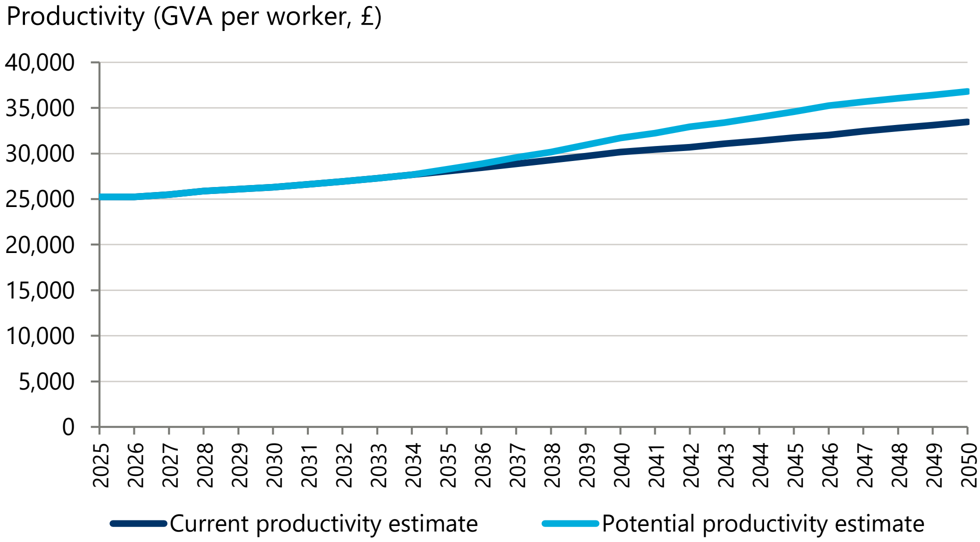
Source: Oxford Economics

3.1.7 Agriculture

The agriculture industry accounts for 0.5% of the GVA of Sussex and Greater Brighton and employs 1.2% of the workforce. Oxford Economics currently forecasts its productivity to grow at a 1.1% CAGR between 2025 and 2050. Quantum could shift this trajectory by facilitating technological breakthroughs through streamlining R&D costs. Examples include creating more environmentally safe chemicals that protect crops.

If adopted at scale, these capabilities could raise the sector's productivity path to about a 1.5% CAGR between 2025 and 2040, which translates into roughly a 10.0% uplift relative to the baseline outcome in 2050 (Fig. 24).

Fig. 24. Productivity gains in agriculture industry due to quantum computing by 2050



Source: Oxford Economics

3.1.8 Sectoral productivity forecasts summary

Fig. 25 contains the projections for the productivity gains in the different industries presented in previous sections.

Fig. 25. Industry productivity forecasts compared to productivity without quantum computing

Pharmaceuticals	Potential productivity forecast
2035	4%
2040	26%
2045	48%
2050	55%
Electrical manufacturing	**Potential productivity forecast**

2035	3%
2040	26%
2045	48%
2050	54%
Business services	**Potential productivity forecast**
2035	2%
2040	16%
2045	29%
2050	32%
Transport	**Potential productivity forecast**
2035	2%
2040	13%
2045	24%
2050	27%
Chemicals industry	**Potential productivity forecast**
2035	2%
2040	13%
2045	23%
2050	26%
Financial services	**Potential productivity forecast**
2035	3%
2040	12%
2045	22%
2050	25%
Agriculture	**Potential productivity forecast**
2035	1%
2040	5%
2045	9%

2050	10%

3.2 FURTHER IMPACTS OF QUANTUM COMPUTING

Our analysis has focused on how quantum computing capabilities raise productivity by boosting the efficiency and speed with which goods and services are produced. Yet an additional channel of impact on end user industries that is not captured in those estimates is the potential to generate new ideas, spark innovations, and even yield new products.

As discussed, the productivity gains from applying quantum to existing production processes are modelled as transitory impacts and will taper off once industries deploy these capabilities to their full potential. By contrast, quantum's ability to solve new and complex problems could support additional, ongoing growth by expanding the frontier of idea creation and innovation. However, because we do not yet know what those innovations will be, it remains very difficult to quantify these prospective benefits.

As highlighted by Aghion and Bunel, the transitory effect modelled in the previous section should therefore be complemented by a permanent effect on productivity growth, suggesting that our estimates of quantum computing's impact across industries are conservative. This permanent effect is expected to be especially large in sectors that devote a significant share of revenue to R&D, such as pharmaceuticals, where quantum computing can enhance the production of innovation and accelerate the discovery of new products.

4. BEST PRACTICE: IDENTIFYING CASE STUDIES FOR SUCCESSFUL INVESTMENT IN QUANTUM

The benefits outlined in this report, ranging from economic growth and productivity gains, are more likely to be realised if the quantum computing sector in Sussex and Greater Brighton is supported effectively. We firstly highlight how the UK, although exceptional at producing companies that develop transformative products and services, is currently at risk of not being able to fully capitalise on this advantage. The chapter then reviews case studies where quantum and other advanced technologies have been strategically supported, providing a blueprint of the type and level of intervention required to support the quantum computing sector in the region. The chapter finishes by summarising the academic literature on the benefits of high-technology firms clustering geographically. This highlights how the accelerated growth of a quantum ecosystem in Sussex and Greater Brighton is likely to lead to wider benefits.

4.1 THE ROLE OF PUBLIC SECTOR FUNDING

It has been widely recognised that the UK struggles to enable its brightest technology startups into world-leading companies.[15] As such the UK risks being an "incubator economy" for other nations, as innovative British companies shift their centre of gravity away from the UK because of more attractive financing options overseas. For example, many experts see DeepMind, an artificial intelligence company as emblematic of the UK's capacity to build high impact technology companies, but not to nurture their growth domestically. The company was founded in the UK in 2010 and acquired by Google in 2014. Acquisitions such as these prevent the UK from fully realising the benefits of its domestically developed technology.

Some experts believe that the acquisitions of companies such as DeepMind has meant that the UK has failed to capitalise on the moment to build foundational AI models. Giving evidence at the House of Lords Communications and Digital Committee, Barney Hussey-Yeo, the CEO of AI fintech Cleo, said he believed the UK had "missed the boat" on building so called foundational models (e.g., large-scale AI systems like GPT or Claude) which companies like DeepMind had the capabilities to do.[16] This is in spite of London being seen as the second-best place in the world after San Francisco to build an AI company.[17] The lack of capability to scale its technology companies and capture its value means that the UK is missing out on massive economic opportunity. For example, forecasts suggest that global foundation models' market size reached $13.7 billion in 2024 and is expected to expand at a CAGR of 28.4% from 2025–2033, attaining a value of $125.6 billion by 2033.[18] It is also important to consider

[15] House of Lords, Communications and Digital Committee. AI and creative technology scaleups: less talk, more action. 2nd Reports of Session 2024-25, February 2025. Accessed October 2025.

[16] House of Lords. Communications and Digital Committee. Corrected oral evidence: Scaling up: AI and creative tech. 19 November 2024.

[17] Ibid

[18] DataIntelo, Foundation Models Market, 2025 report. Accessed October 2025.

that there are wider economic benefits to having a strong domestic AI sector. For example, even after accounting for the size of its economy the US is currently the clear global leader in AI.[19] As a result, its economy has benefitted from large increases in investments in the infrastructure behind AI tools, for example in chips and data centres. Oxford Economics estimates that between 2022 Q4 and 2024 Q4 these investments added a net $50 billion to US GDP, equivalent to a 0.1 percentage point boost to growth.[20]

4.1.1 Focus on the quantum sector

We identified in our previous UK-wide study on quantum computing that all but one of the 16 quantum hardware firms operating in the UK had an overseas presence.[21] This move takes different forms: several have set up subsidiaries (e.g., Quantum Motion Technologies and Universal Quantum); while others have relocated their headquarters (PsiQuantum). Having an overseas presence is unusual for firms of this size in the rest of the economy. The motives behind these moves are likely to be multiple. One of the main ones is likely to be access to funding. This enables them to shift their centre of gravity towards countries with better funding opportunities. Since the publication of our report in February 2025, ION-Q, an American quantum computing company, announced that it would acquire Oxford Ionics, a private UK trapped-ion based firm. This was one of only two trapped-ion firms which were headquartered in the UK. However, under the National Security and Investment Act, the UK government has approved this acquisition on the basis that current and future hardware generations remain in the UK, as well as staff, intellectual property, and manufacturing capacity.

4.2 CASE STUDIES OF FUNDING QUANTUM COMPUTING

Several quantum ecosystems are fast developing around the world, supported in part by national and local government funding. We review how government funding has helped to support the creation of quantum campuses in both Illinois, Munich and Hanover.

4.2.1 Chicago, Illinois

Thanks in part to government investments at a state and federal level, a quantum ecosystem is fast developing in Chicago. In 2024, the Illinois state government committed $500 million in funding a quantum campus in its FY 2025 state budget. Much of this funding will go to building the campus, called the Illinois Quantum and Microelectronics Park (IQMP). The campus will include shared cryogenic facilities, equipment labs, and research spaces for both private companies and universities. The campus is projected to create thousands of jobs and generate up to $20 billion in economic impact.[22]

The following leading quantum companies/ programmes are based at the IQMP campus.

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[19] Oxford Economics, Feature Article: Benefits of AI boom will take longer to see for Europe,15 October 2025

[20] Oxford Economics, US: AI and the economy - Minor gains now, but future benefits, 20 February 2025

[21] Oxford Economics., Ensuring that the UK can capture the benefits of quantum computing, February 2025

[22] Press Release. July 2025 Gov. Pritzker Announced Infleqtion to Accelerate Quantum Computing in Illinois and Locate Computing Headquarters in Chicago. Accessed September 2025.

- **Psi Quantum:** the quantum hardware firm PsiQuantum (a UK founded company spun out of the University of Bristol) announced it was locating to the campus in 2024, bringing as many as 150 jobs.[23] In addition to benefitting from the campus funding, PsiQuantum is also estimated to have received other business incentives from the state of Illinois worth $200 million.[24]
- **Infleqtion:** the quantum hardware firm announced in July 2025 that it will headquarter its global quantum computing operations at the Illinois Quantum and Microelectronics Park, significantly expanding its workforce in the region. The company will develop the first utility-scale, neutral atom quantum computer at the park.[25] Under the Manufacturing Illinois Chips for Real Opportunity Act (MICRO), Infleqtion has committed to invest $14 million, and receive a tax credit in excess of $5 million.[26] The total value of investments and salaries as a result of the public-private partnership is expected to reach a value of $50 million.
- **IBM:** In December 2024, IBM announced that it would be establishing the new National Quantum Algorithm Centre at the park, in collaboration with the University of Chicago.[27] IBM will be deploying its next generation quantum computer, IBM Quantum System Two at the campus, which will serve as a core hardware facility for other quantum companies. The state of Illinois is providing a $25 million grant to the campus to purchase equipment and make the necessary technical preparations to deploy IBM's computer at the campus.[28]
- **Quantum Proving Ground:** in this programme quantum computing prototypes will be tested as part of the Quantum Benchmarking Initiative. The programme is benefitting from federal funding with the Defense Advanced Projects Agency (DARPA) committing up to $140 million of funding in this programme. At the same time, the state of Illinois is using some of its $500 million budget to match these federal funds.[29]
- **Diraq:** the Australian quantum computing company signed a letter of intent in May 2025 to join the IQMP campus.

Influence of the University of Chicago

The University of Chicago is an integral part of the quantum ecosystem in Chicago and is involved in multiple interlocking quantum initiatives related to IQMP system. The university has extensive quantum research capabilities; for example, in 2023, IBM launched a $100 million initiative with the University of Tokyo and the University of Chicago to develop a quantum centric supercomputer. Google has also committed $50 million to a partnership with the same universities to support

[23] The University of Chicago. "Startup to build massive quantum campus on Chicago's South Side", accessed November 2024.
[24] Illinois Public Radio. "Quantum business park coming to Chicago, backed by $700M from state of Illinois", accessed November 2024.
[25] Infleqtion, Infleqtion to Accelerate Next Generation Quantum Computing in Illinois
[26] Infleqtion, Infleqtion to Accelerate Next Generation Quantum Computing in Illinois
[27] IBM, December 2024. IBM and State of Illinois to Build National Quantum Algorithm Center in Chicago with Universities and Industries
[28] Gov. Pritzker Announces Collaboration with IBM to Build New National Quantum Algorithm Center
[29] Quantum Insider. "DARPA Plans To Establish Quantum-Testing Facility in Chicago with $140 Million Investment", accessed November 2024.

quantum research.[30] Through Chicago university's Polsky Centre for Entrepreneurship and Innovation it leads Duality, a first of its kind quantum accelerator programme. The programme provides quantum startups with training, mentorship, and technical expertise to scale their companies.

4.2.2 Munich Quantum Valley, Germany

The development of a quantum ecosystem in Munich, Germany, provides a second example of how coordinated state and federal investment can help to create a regional quantum ecosystem. Munich Quantum Valley (MQV) aims to develop and operate competitive quantum computers and accelerate commercialisation through shared infrastructure, industry partnerships, and talent programmes. Launched in 2022, the State of Bavaria committed €300 million to the venture. This is complemented by approximately €80 million in federal funding secured by Munich's scientific organisations.[31] Together, these investments are building a distributed quantum computing park to provide technological infrastructure for research projects and product developments within the region.[32] The MQV ecosystem is closely linked to the Leibniz Supercomputing Centre (LRZ), where quantum systems are being integrated with Bavaria's high-performance computing capabilities.[33]

The following quantum companies/programmes function within Munich's quantum ecosystem.

- **Alpine Quantum Technologies (AQT):** In December 2023, AQT announced the delivery of a trapped-ion quantum computer to the LRZ's Quantum Integration Centre, developed under the MQV framework. The project is funded by Bavarian State Ministries with around €9.8 million under the Hightech Agenda. The system will be made available to MQV member organisations, primarily for software and integration research, with further joint development expected between AQT and MQV partners in control electronics and laser technologies.[34]
- **IQM:** In June 2024, IQM opened a quantum data centre in Munich, designed to host multiple quantum computers for research and industrial users. The initiative was promoted by the Bavarian Minister of Economic Affairs as a key step to "strengthen the quantum computing ecosystem in Munich and Bavaria".[35]

University Influence

MQV is an alliance of leading Bavarian and national institutions, including Ludwig Maximilian University of Munich, the Technical University of Munich, the Friedrich-Alexander University of Erlangen-Nuremberg, the Bavarian Academy of Sciences and Humanities, the German Aerospace Center, the Fraunhofer Society, and the Max Planck Society. These institutions are jointly developing the quantum computing park, providing shared research facilities and creating a pathway for the

[30] The University of Chicago. "University of Chicago joins global partnerships to advance quantum computing", accessed November 2024.
[31] Technical University of Munich. "Munich Quantum Valley is launched", accessed October 2025.
[32] Munich Quantum Valley. Quantum Technology Park
[33] Leibniz Supercomputing Centre. Quantum Integration Centre of the LRZ, accessed October 2025.
[34] Alpine Quantum Technologies. A trapped-ion quantum computer for the Munich Quantum Valley, accessed October 2025.
[35] IQM IQM Quantum Computers opens quantum data centre in Germany to support industry applications, accessed October 2025

commercialisation of scientific advances through industry collaboration, spinouts, and workforce development programmes.[36]

Cultivation of Quantum Startups

The Munich quantum ecosystem currently has eight start-ups operating within it.[37] Many of these start-ups (e.g., Peak Quantum, Plancq, and Qlibri) were spun out from research taking place in the region. Government support for quantum infrastructure as well as the provision of incubator programmes, networking events, and educational resources means that locating within the Munich ecosystem offers substantial benefits to companies.[38]

Plancq is one example of a quantum start-up in the region that has benefitted from additional government funding. In 2024, the German Aerospace Center (DLR) awarded the company a €29 million contract to build and install a scalable neutral-atom-based quantum computing platform.[39] Several months later the company announced that it had raised a further €50 million.[40] Leading investors in the round were the European Family Office CATRON Holding and the DeepTech & Climate Fonds (DTCF) (which is funded by government). It is likely that initial government support through a procurement contract as well as subsequent contributions in the series A funding round helped "crowd in" private sector investment by boosting credibility and confidence in the company.

4.2.3 Hanover Quantum Valley

A similar such quantum ecosystem also exists in the Hannover region in Germany. The ecosystem is anchored by two major local universities with quantum specialisms, Leibniz University Hannover and the Technical University of Braunschweig. Both universities offer degree programmes in quantum engineering.[41] In 2020, the ecosystem received an initial grant of €25 million (from a mixture of state and private funding) to develop ion trap quantum computers.[42] The ecosystem has also benefited from federal funding, with the federal government awarding €15 million for 'QVLS-iLabs' from 2022-2025 and more than €1.5 billion expected to flow into quantum technologies in the region in the next 10 years. [43]This initiative aims to bring research and industry together with the goal of commercialising quantum technologies.[44] Moreover, the Lower Saxony region has provided a total of €4.1 million in funding to support the founding and development of 11 quantum technology startups in the region.[45]

[36] Bavarian State Ministry of Science and the Arts. From tissue analysis to network nodes: Free State funds quantum lighthouse projects with around 17 million euros, accessed October 2025.
[37] Munich Quantum Valley. Accessed October 2025
[38] Munich Quantum Valley. Accessed October 2025
[39] Planqc. Press release. Accessed October 2025
[40] Planqc. Press release. Accessed October 2025
[41] Quantum Frontiers. Become a Quantum Engineer Accessed October 2025
[42] Funding was provided by the Lower Saxony Ministry of Science and Culture and private funding from the Volkswagen Foundation
[43] Quantum Valley Lower Saxony, Strategy - QVLS | Quantum Valley Lower Saxony. Accessed October 2025.
[44] Quantum Valley Lower Saxony, Future Cluster QVLS-iLabs. Accessed October 2025
[45] Quantum Valley Lower Saxony, State and federal government have opened Lower Saxony´s new hub for the quantum technology industry. Accessed October 2025.

In 2024, the new location for shared quantum laboratory spaces was opened in Rolleiwerke; the site has 500 sqm of office and laboratory space.

4.3 OTHER TECHNOLOGIES CASE STUDIES

Public funding has often played a crucial role in the growth of early-stage technologies, with foundational government investments helping to spark subsequent waves of innovation. A frequently cited example is the space sector. Funding of space activities began in the 1950s and was predominately led by government as the large costs and risks involved made the sector inaccessible to private actors. This large-scale funding of space activities led to technologies that had wider applications throughout the economy. Other frequently cited examples can be found in the fields of energy (solar panels), communication (GPS technologies), and medicine (CAT scanners). There are obvious parallels here with the quantum sector. As well as the barriers to private sector funding due to funding scale and risk, the development of quantum computing is expected to benefit other industries with future applications ranging from medicine to financial services. However, because these wider benefits do not incentivise private investment—since investors cannot monetise them—there is a strong rationale for government providing funding support.

We use further examples of semiconductors and artificial intelligence to examine how countries have leveraged public investment and private capital to become world leaders in their respective technologies.

4.3.1 Advanced semiconductors: How Taiwan has developed into the world's leading semiconductor manufacturer

Taiwan dominates the production of advanced semiconductors, with a 92% market share in 2021.[46] The Taiwan Semiconductor Manufacturing Company (TSMC) is the largest player and the 11th most valuable company in the world.[47] However, Taiwan was not the first country to develop semiconductor capabilities; in the 1980s, the US was the dominant player in the technology.[48]

However, in the 1980s the Taiwanese government took several key steps to initiate the industry. Realising the substantial barriers to market entry, the government set up the Industrial Technology Research Institute (ITRI) in 1973, with a focus on acquiring knowledge in the semiconductor industry and diffusing it to local industry. The Taiwan Semiconductor Manufacturing Company (TSMC) was then formed as a spin-off from the (ITRI), with government funding 50% of the initial capital due to difficulties getting the necessary private funding.[49] Public investment continued to be high in the 1970s but private investment started to increase in the 1980s with the government selling its initial stake. Foreign and domestic investors increasingly invested in new semiconductor companies in Taiwan, with TSMC investing in semiconductor companies that complemented its industry.

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[46] BCG (April 1, 2021). Strengthening the Global Semiconductor Supply Chain in an Uncertain Era. Retrieved 27 November 2022, from https://www.bcg.com/publications/2021/strengthening-the-globalsemiconductor-supply-chain

[47] Economics Observatory, How did semiconductors become so central to Taiwan's economic progress?

[48] The rise of the Taiwanese Semiconductor Industry. Aalto University School of Business.

[49] Ibid.

The Taiwanese semiconductor ecosystem also benefitted from the formation of an Industrial Park in Hschinchu, located close to TSMC and near two leading engineering universities.[50] Government incentives encouraged most of the Taiwanese semiconductor firms to locate there, forming a cluster. Incentives included low interest loans, the rights to retain earnings up of to 200% of paid in capital, and a five-year income tax holiday within the first nine years of operation.[51] The clustering of companies enabled the companies to benefit from common specialised labour, supply chain, and knowledge. Furthermore, as Taiwanese semiconductor firms were producing different products, companies were able to collaborate with each other and form supply chains inside the industry. Tsai (2005) finds empirical support that significant R&D and spatial spillover effects were occurring in the Hsinchu Science Park.[52] In other words, knowledge and innovation were spreading between companies located there.

Today, Taiwan's lead in semiconductors is largely privately led but the government still plays a supportive role. For example, in 2023, policymakers passed laws which allow chip companies to credit 25% of R&D spending and 5% of new equipment costs against taxes.

In conclusion, the combination of governmental and private collaboration has enabled Taiwan to reach a leading position in semiconductor manufacturing, despite being a latecomer to industry.

4.3.2 Artificial intelligence: Comparison of the UK and French artificial intelligence sectors

Both the UK and French artificial intelligence sectors display considerable strengths. The UK's advantage in AI lies in its strong research strengths; the UK has a higher number of AI scientists and produces more academic AI research than France.[53] This arguably means the UK is in a fundamentally stronger position than France to develop AI technologies. However, supportive government policy in France is credited with giving the country an advantage in certain areas of AI development.[54] For example, France is home to Mistral AI, an open-source language model, recently valued at $14 billion that is competing with Chat GPT, Claude, and Gemini. In contrast, none of the UK's AI companies have anywhere near as large a valuation. Moreover, in the wider sector, French generative AI start-ups attracted six times more private funding in 2024 than the UK.[55] It seems likely that French government funding has helped to develop these companies and "crowd-in" private sector investment; France's cumulative government AI spending between 2018 and 2024 totalled €7.2 billion, 60% more than the UK.[56]

[50] Morris Chang, (2011). Pure play: A dedicated wafer foundry grows in Taiwan. IEEE Solid-State Circuits Magazine, 3(4), 21–24. https://doi.org/10.1109/MSSC.2011.942450

[51] Po-Young Chu et al (1997), 'An Empirical Study of R&D Investment Patterns, Effects, and Critical Factors in High-Tech Industries in Taiwan : The Case of the Hsinchu Science-Based Industrial Park'. Malaysian Management Journal 2 (2), 25–33, 1997.

[52] Diana Tsai 2005, 'Knowledge Spillovers and High-technology Clustering: Evidence from Taiwan's Hsinchu Science-Based Industrial Park', Contemporary Economic Policy 23(1):116-128

[53] Tortoise Media. AI: the French connection, September 2024

[54] House of Lords, Communications and Digital Committee,. AI and creative technology scaleups: less talk, more action. 2nd Reports of Session 2024–25, February 2025. Accessed October 2025.

[55] Tortoise Media. AI: the French connection, September 2024

[56] Ibid.

We also provide two examples of how public and private sector partnerships are helping to develop France's artificial intelligence sector. Firstly, France's publicly owned supercomputer, "Jean-Ray" will help to facilitate the growth of AI businesses. The computer is owned by GENCI, a public institution, with the French government funding its expansion.[57] For example, the French government provided €40 million of funding in 2024.[58] The massive computational power of the supercomputer will help to support the wider AI and research and community in France, allowing for training of complex AI models. Secondly, under its CIFRE programme, the French government facilitates public-private research in AI by allowing PhD students to work in private companies while pursuing their research at a public institution. Under this programme, the government provides funding for doctoral research conducted within a company, with co-funding from the company.

4.3 Benefits of innovative firms clustering together

Most of the case studies above focus on clusters of high-technology firms. We summarise the extensive academic evidence base on the growth and productivity benefits that arise from "innovation clusters". Innovation clusters occur when firms from similar or complementary high-tech sectors locate geographically close to one another, enabling knowledge sharing, collaboration, and the efficient movement of skilled labour.

- **High technology firms which move to large technology clusters increase their productivity.** Moretti (2021) uses longitudinal US patent data on 109,846 top inventors to estimate the impact of cluster size on inventor productivity.[59] The author finds that inventors who move into bigger high-tech clusters significantly increase their output and patent quality.
- **The benefit firms receive from knowledge transfers from local peers has been demonstrated to have a statistically significant impact on net sales.** Chyi et al. (2012) examine Taiwanese high-tech firms in Hsinchu Science Park using panel regressions and find that external R&D spillovers (from co-located peers) significantly boost firm performance.[60]

Given the strong evidence in the academic literature supporting the advantages of high-technology firms clustering geographically, it is likely that the proposed accelerated growth of a quantum ecosystem in Sussex and Greater Brighton would generate additional economic and productivity gains, benefitting firms both within and outside the sector.

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[57] Ibid.
[58] CNRS"This will probably be the largest AI-dedicated supercomputer in France", February 2024.
[59] Enrico Moretti, 'The Effect of High-Tech Clusters on the Productivity of Top Inventors', *American Economic Review* 111 (10): 3328–75**,** 2021.
[60] Yih-Luan Chyi et al. 'Knowledge Spillovers and Firm Performance in the High-Technology Industrial Cluster', Research Policy, Volume 41, ,2012

5. POTENTIAL CHALLENGES AND RISKS FOR THE QUANTUM COMPUTING INDUSTRY IN SUSSEX AND GREATER BRIGHTON

The benefits outlined in this report, ranging from economic growth and productivity gains to innovation spillovers, are more likely to be realised if the quantum computing sector in Sussex and Greater Brighton is supported effectively. To further understand what is required to achieve this, we conducted interviews with key stakeholders across industry, academia, and the wider innovation ecosystem. These conversations provided insight into the main challenges, risks, and barriers facing the sector. These included skills shortages, funding constraints, and coordination issues, helping to identify the interventions needed to ensure that Sussex and Greater Brighton can fully capture the potential of a thriving quantum ecosystem.

5.1 THE RISK OF UNDERFUNDING

If the quantum industry in Sussex and Greater Brighton is not sufficiently supported, it risks losing both talent and competitive advantage. Academics noted that skilled researchers might be drawn to London by higher salaries, while many PhD students moved overseas, often joining quantum startups in North America.

Underfunding may also lead to missed economic opportunities. One interviewee observed that many students enjoyed living in the Brighton area, but they were often absorbed into adjacent sectors such as data science, which often offered more competitive salaries. One academic added that difficulties obtaining UK grants delayed the creation of quantum spinouts, weakening the local innovation pipeline.

Strategically, Sussex and Greater Brighton face the risk of eroding specialist supplier capability. They currently benefit from a strong cluster of vacuum technology and mu-metal firms. These industries depend on niche physical skills that are not widely taught. Without intervention, the decline of these skills could expose the UK to supply-chain vulnerabilities in quantum manufacturing.

5.2 IDENTIFYING WHAT IS NEEDED TO REALISE THE REGION’S QUANTUM POTENTIAL

5.2.1 Talent, wages, and retention

Talent is the cornerstone of a competitive quantum ecosystem. The University of Sussex offers a unique environment where theorists and experimentalists can collaborate closely. However, interviewees emphasised that competitive pay and retention incentives are essential to reduce the flow of talent to London or overseas.

Several interviewees warned that tightening visa restrictions might further constrain access to international expertise, which is a significant risk for such a globally networked field.

Building robust talent pipelines will require structured placements, internships, and targeted technician programmes that give students practical exposure to industry. These pipelines are vital to support the region's quantum supply chains and sustain a skilled workforce.

5.2.2 Infrastructure and hardware access

Quantum research and commercialisation depend on access to specialised facilities, with academics involved in quantum research stressing the need for affordable laboratory and industrial space. Furthermore, academics called for greater investment in infrastructure such as magnetically shielded rooms, which would allow quantum sensors to be deployed in hospitals, for example. One academic noted that smaller universities often struggled to secure capital investment and suggested that government could open new funding channels to level the playing field.

5.2.3 Funding and investment conditions

Interviewees consistently noted that current funding models were too short term to support the long development cycles typical of quantum computing. Academics called for longer, more flexible grants, and for funding mechanisms that enable sustained collaboration.

One interviewee stressed that protecting intellectual property was key to attracting investors, citing the University of Oxford as a leading example of effective IP management.[61] Longer-term, flexible funding combined with robust IP frameworks would provide the stability required for quantum ventures to mature in Sussex and Greater Brighton.

5.2.4 Market creation

Creating early markets is vital to demonstrate value and stimulate private investment. Several interviewees emphasised the role of public procurement in validating new technologies. One interviewee proposed expanding the Quantum Catalyst Fund and introducing local Continuing Professional Development (CPD) initiatives to help industries such as finance and energy explore quantum applications.

Interviewees also suggested that public sector pilot projects, for instance with the NHS, Ministry of Defence, or Department for Transport, could showcase practical use cases, generate case studies, and attract commercial co-investment. Aligning such pilots with existing government programmes would amplify their economic impact.

[61] However, other interviewees reported that compared to the University of Sussex, Oxford University takes much higher ownership shares out of spin-out companies, which hinders scaling.

6. IDENTIFYING REGIONAL COLLABORATION OPPORTUNITIES

Building on the findings of the previous section, Sussex and Greater Brighton can accelerate the impact through coordinated region-wide action that connects universities, councils, industry, and investors.

6.1 BUILDING AND ATTRACTING A QUANTUM BUSINESS COMMUNITY

Sussex and Greater Brighton's future success in quantum will depend on its ability to both support existing innovators and attract new firms seeking research collaboration, skilled talent, and specialist infrastructure. A coordinated approach between universities, councils, and local economic partners is essential to position the region as an attractive, practical destination for quantum enterprises.

Establishing a "Quantum Sussex" cluster would give the region a clear identity and a single-entry point for investors and businesses. It could coordinate access to shared facilities, research partnerships, and professional networks while promoting Sussex and Greater Brighton's combined strengths in quantum, AI, and advanced manufacturing. This branding and coordination effort would not only help existing firms connect more effectively with academia, but also draw in external start-ups looking for an ecosystem with available talent, affordable space, and supportive institutions.

Councils and universities could jointly develop CPD programmes to help local industries explore quantum use cases. One academic noted that despite strong interest from sectors such as finance and energy, CPD efforts "never quite got off the ground" due to limited capacity at the University of Sussex. Hence, councils could assist with local forums and funding, while universities coordinate training for industry partners, to build demand and investment.

The University of Brighton's strong record in Knowledge Transfer Partnerships (KTPs) shows how academic expertise can translate into applied innovation. A unified approach between Brighton, Sussex, and Chichester universities could replicate this model for quantum and its supply chains, lowering adoption risks for SMEs and presenting Sussex and Greater Brighton as a connected, innovation-friendly region.

6.2 BUILDING A SKILLS AND APPRENTICESHIP ECOSYSTEM

Interviews revealed a clear need for deeper alignment between higher education, further education, and local employers to create a structured skills pathway into quantum computing. The University of Sussex already delivers advanced training through an online Quantum Technology Master's and a joint PhD with the University of Bristol (with commercialisation elements). However, there remains a gap in technician-level and applied apprenticeship provision.

Stakeholders proposed co-designed modules between universities and further education colleges, focusing on hands-on capabilities such as vacuum engineering, cryogenics, and mu-metal welding. Programmes could be delivered with regional firms such as Kurt J. Lesker and Universal Quantum to ensure direct industry relevance. Local councils could support these initiatives by brokering partnerships, aligning skills funding with innovation priorities, and co-investing in apprenticeship schemes.

Building on existing regional collaborations, such as Gatwick Airport's partnership with the Sussex & Surrey Institute of Technology to strengthen local technical education, these quantum-focused training routes could be embedded within broader STEM and engineering curricula. This would secure a resilient supply of specialist talent, reduce reliance on external recruitment, and link the quantum ecosystem to the region's wider economic development goals.

6.3 SUPPORTING SCALE-UP AND INNOVATION

Sussex and Greater Brighton already host several assets that support early-stage innovation. The Sussex Innovation Centre, based at the University of Sussex, provides affordable office space, commercialisation support, and a platform to connect enterprise and academia.

The Crawley Innovation Centre, acquired by Crawley Borough Council in 2025, offers a model of local government enabling growth in advanced engineering and emerging technologies, including quantum. It aims to provide growth space for small firms, connect them with apprenticeships through Crawley College, and link local universities with business R&D. Over time, this coordinated approach is expected to attract new manufacturing investment to the Manor Royal industrial area.[62]

Facilities like the Sussex Innovation Centre and Crawley Innovation Centre not only provide grow-on space and commercialisation support for local spinouts but also make the region more appealing to quantum firms relocating from other parts of the UK or overseas. They offer proximity to academic partners, a strong supply-chain cluster, as well as Gatwick Airport and major transport routes.

Community-based initiatives like Silicon Brighton, which supports around 40 technical meet-up communities and 200 partner companies, demonstrate the value of peer networks in building a regional innovation culture.

Industry integrators also play an important bridging role. Collaboration between risk analyst firm CDO2 and a research group at the University of Sussex on quantum-sensing applications for electric vehicle batteries, illustrates how partnerships between researchers and manufacturers can accelerate commercial adoption. This model could be replicated across sectors such as healthcare (e.g., NHS imaging), transport (e.g., Transport for London navigation), energy, and defence.

6.4 TARGETED INFRASTRUCTURE AND FUNDS

Shared investment in regional assets would improve access to high-value infrastructure for SMEs and start-ups. Establishing a regional quantum seed fund could bridge the gap between early research and venture-ready maturity, enabling firms to reach technology-readiness levels attractive to private investors. Aligning such initiatives with wider regional economic strategies, such as the Gatwick Diamond Initiative, would integrate quantum into broader innovation and investment priorities.

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[62] Crawley Borough Council Crawley Borough Council takes possession of Crawley Innovation Centre, accessed October 2025.

Together, these measures—from coordinated skills development and CPD delivery to targeted infrastructure and funding— would position Sussex and Greater Brighton as a cohesive, investable, and collaborative quantum region capable of competing with national and international clusters.

7. APPENDIX: METHODOLOGY

Estimating the economic impact of the quantum computing sector in Sussex and Greater Brighton

We conducted initial conversations with Universal Quantum about the active players in the Sussex and Brighton ecosystem, including names and commercialisation stage of the technology. For those that are commercialised and registered, we manually checked their employment numbers using Companies House and LinkedIn.

Office for National Statistics (ONS) data sources on turnover from Annual Business Survey (ABS) and employment from Labour Force Survey (LFS) and Business Register and Employment Survey in comparable industries were used to estimate the direct turnover of the quantum computing sector. The industry selected is SIC26: Manufacture of computer, electronic and optical products for hardware. As quantum computing remains in its early stages of development, it is not explicitly captured in existing industry classifications. While the comparison to SIC26 is not exact, it provides a relevant proxy for the purpose of this analysis. We then used ONS analytical input-output tables to translate these impacts into gross value added of the quantum computing industry.

This allowed us to calculate the direct economic impact of the quantum computing industry in Sussex and Greater Brighton, which can be interpreted as the industry's gross value added contribution to UK and regional GDP as well as the jobs the sector creates.

Methodology for capturing the indirect and induced impact of the quantum computing sector

We then use data on supply chain spending profiles from ONS input-output tables and the ABS and adjust it to reflect the specific profile of a quantum computing company at the early stages of development, utilising insights from our stakeholder interviews.

This allows us to calculate the indirect (supply chain) and induced (wage consumption) economic impact of the quantum computing industry in Sussex and Greater Brighton. Once again, this is quantified in terms of GDP contributions and jobs supported. By adding all these impact channels together, we will obtain the total impact of the industry.

Methodology for capturing the future impacts of the quantum computing sector

To forecast the potential growth of the industry, we utilised four scenarios as outlined below. This was done in order to address two main challenges in forecasting a sector such as quantum computing:

- The sector is relatively new and fast-growing making it difficult to estimate the future patterns of growth.
- It is difficult to estimate what funding will be available and how it will impact the sector.

The first two scenarios rely on data on similar technology revolutions and draw parallels from their growth. We utilise data from a number of countries on the telecommunications and semiconductor industries starting from the year 1980 as obtained from the Oxford Economics Global Industry Service. Desk research was conducted to inform the selection of years for the relevant phases of growth, such as R&D and commercialisation points.

The third scenario uses data on Universal Quantum's employment projections provided from staff at the firm to reflect an example which is close and relevant to the region.

The fourth scenario models a potential case in which government funding and infrastructure development do not materialise in Sussex and Greater Brighton and the companies in the region are forced to consider relocation. This is informed by conversations with staff at Universal Quantum on what portion of employment and operations is expected to remain in the region if the wider company opted for relocation.

All four scenarios are aligned in terms of the productivity data used to ensure comparability.

For all scenarios, the forecasted growth is presented in terms of direct, indirect and induced impacts and was quantified in terms of turnover, GDP contribution and jobs supported. Specific considerations were made to reflect the increased productivity of the sector as the technology is fully developed. Namely, the turnover, and subsequently GVA, of the sector per worker increases in the future.

Data from the ONS analytical regional input-output tables is used to isolate the impacts that the sector delivers to just the region of the South East.

Methodology for quantifying the impact of quantum computing on end-user industries

While quantifying the economic impact of the industry itself is important, much larger economic impacts are expected to come when end-user industries utilise quantum capabilities as part of their operations. Potential benefits of quantum computing to various sectors include efficiency gains, cost reductions, and increased competitiveness.

Following the consensus in economic literature, we model the potential impact of quantum computing by drawing parallels with previous technological revolutions. Aghion and Bunel (2024) predict that productivity gains of modern technologies such as AI would be comparable to those of the digital technology wave of the late 1990s and early 2000s.

Our model utilises data on the productivity growth in the United States between 1997 and 2007 to mirror the methodology used by Aghion and Bunel (2024).

The underlying data on the forecasted growth of each industry in Sussex and Greater Brighton is obtained from Oxford Economics' Global Industry Service, which forecasts variables of interest for over 100 sectors.

The long-term impact of industries implementing quantum computing capabilities is expected to occur in three phases, visualised below:

Phase 1: technology development – no industries have implemented any quantum computing capabilities as the technology is still being developed, therefore, the industry productivity is expected to grow at the same rate as current forecasts.

Phase 2: transitory productivity growth – as the quantum computing technologies are fully developed, they can start being utilised by end user industries, leading to an increase in productivity growth.

Phase 3: technology utilisation – once all relevant industries have adopted quantum computing, the productivity gains will cease and the industries will continue growing at the same rate as current forecasts.

The impact is quantified on the following industries (due to data availability): electrical manufacturing, business services, transport, chemicals, financial services, pharmaceuticals, and agriculture. Data from Economist Impact is utilised to adjust the average impact on each individual industry.

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