



Size & Health of the UK Space Industry 2021

Summary Report





About BryceTech

BryceTech is an analytic consulting firm serving government and commercial clients. Bryce provides unique, integrated insight into on the space economy. We understand the interplay of national security, civil, and commercial space. Many authoritative data sets characterising the space industry and sub-segments were originated by Bryce analysts. Bryce's expertise includes analysis of the space industry, finance and market analytics, technology readiness, cyber security, policy and economics, and strategy.

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Acknowledgements

This report, and the Size and Health Survey of the UK space sector on which it is based, were made possible through the support and engagement of the UK space industry. BryceTech would like to thank all participating organisations for their time and support in responding to this survey. We would also like to thank the Satellite Applications Catapult and Knowledge Transfer Network for providing specific input to support this research, as well as the UKspace trade association, Harwell Campus, and other organisations for helping promote and disseminate the survey.

BryceTech would particularly like to thank the UK Space Agency for their ongoing support and input, and for the opportunity to support this important project.

Cover and back page: Jacques Descloitres, MODIS Land Rapid Response Team, NASA/GSFC (<https://visibleearth.nasa.gov/images/58212/united-kingdom-ireland-and-northwest-europe>).



Source: Jacques Desclotres, MODIS Land Rapid (NASA) Response Team, NASA/GSFC

Key Findings

An Important Industry...

UK space-related organisations produced £16.5 billion in income in 2019/20. About a third (32%) of income was derived from exports, higher than the UK as a whole (28%). Europe was the largest source of exports income, followed by North America.

UK space activities have a strong commercial focus, with 83% of income derived from direct-to-consumer and business-to-business sales. Public customers accounted for 17% of income, with just over half attributed to defence which accounted for 9% of the total industry income.

Direct space employment was about 47,000 in 2019/20; space activities supported a total of approximately 190,000 jobs across the value chain. Space employment grew 6.7% from 2018/19, and comprised 0.14% of the UK workforce in 2019/20. The space industry

contributed £6.9 billion of direct gross value added (GVA) (0.31% of UK GDP), and £15.8 billion total GVA across the supply chain.

Labour productivity, (GVA per employee) was £146,000, 2.6 times the UK average of £57,000. The UK space workforce is the most highly qualified sector in the UK, compared to all other ONS sectors, with 87% of employees holding vocational degrees or higher.

An estimated £836 million was spent on space-related R&D in 2019/20, equivalent to 5% of total industry income. This is up 19% from the prior year, with increased R&D contributions from UKSA driving a large part of this change.

Since 2012, the population of space organisations has grown on average nearly 21% per annum, with 1,293 organisations recorded in the latest reporting period. Every region in the UK

hosts the headquarters of space organisations, with the South East, South West, East of England and Greater London hosting the largest space organisation presences.

A Resilient Industry...

Employment in the UK space industry grew by 6.7% from 44,040 in 2018/19 to 46,995 in 2019/20. Since 2000/01 employment in the industry has more than tripled, with an annual growth rate of 6%.

Space industry income remained stable in nominal terms (0.2% growth) and decreased only marginally in real terms (-1.7% 2018/19 and 2019/20). This is in contrast to the UK economy, which shrank by 9.9% in 2020.¹ Two of space industry's four segments experienced overall growth in real terms, with space manufacturing increasing by 1% (£23 million) and ancillary services by 4% (£20 million). The overall decrease in real space income, was driven by contractions in space operations (-4%, -£57 million) and space applications (-2%, -£280 million).

Activities that displayed the most significant percentage growth were: space tourism (34%, £1 million); launch and satellite insurance (incl. brokerage) (25%, £20 million); launch services (18%, £1 million); and other activities such as quantum key distribution (13%, £1 million). These also represent areas of global growth, with the UK space sector being particularly well poised to exploit them due to the upstream and downstream capabilities of the sector in the UK, in contrast to many other countries.

With Strong Future Potential...

Over the past decade (2012 to 2021), 145 unique investors in 38 companies invested nearly £6 billion across 90 investment deals with UK space organisations.

Sentiment regarding the space industry's three-year outlook was high among survey participants, with most expecting increases in income,

employment, exports, R&D spending, and investment over the next three years.

Sixteen percent of organisations responding to the survey cited the UK's spaceflight program as positively impacting their revenues over the past 12 months, with particular impact being derived from the beneficial supply-side effects of establishing UK launch capability.

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Note: Companies estimate income and employment across financial years, but these reporting years' start and end dates vary among companies. Therefore, estimates of space-related income and employment reflect the specific financial years of companies, and references to years in the report reflect financial years, not calendar years. Further, to maintain consistency with previous reports, survey respondents were asked to provide financial information pertaining to their most recent financial year, as in previous Size and Health surveys. Company financial years cover a range of different reporting periods that may differ from the government fiscal year of April 6th, 2019 to April 5th, 2020. A majority of firms by income and employment included in this study report results on a calendar year basis, with the most recent financial year available at the time of the survey being 1st January to 31st December 2020. Across the 1,298 organisations in the industry, 80% of income and 75% of employment was accounted for by firms reporting on the calendar year. As a result, COVID impacts falling outside the government financial year of April 6th, 2019 to April 5th, 2020 are covered in this report.

1.1. Objective

The annual *Size and Health of the UK Space Industry* report is the primary source of evidence used to track growth in the UK space sector. Commissioned by the UK Space Agency (UKSA), the report is a key resource for Government decision-making, informing work including the delivery of the new National Space Strategy.

With responsibility for the UK civil space programme, the UKSA aims to grow the UK space industry, build a strong national space capability, invest in early-stage R&D, and foster international collaboration. This work, in support of the National Space Strategy, will maximise economic and social benefits as well as inform policy making for the UK.

Size and Health of the UK Space Industry quantifies and tracks changes in the UK space industry, including growth estimates, breakdowns by subsector, and future expectations. The information presented reflects a national survey of space sector organisations, including self-reported data, interviews with sector leaders, supplementary research using publicly available data, and the results of modelling forecasts and analysis.

This 2021 Size and Health project has been carried out by BryceTech on behalf of the UKSA. This report details the results of the 2021 Size and Health project, including a full review of the size and health of the UK space sector, covering results for 2018/19 and 2019/20, and a forecasted estimate for 2020/21. The report measures industry growth, and highlights the nature and source of the growth, including trends within sub-sectors, sources of income, and future expectations.

This Size and Health project reflects an expanded scope to accurately assess the evolving space sector, while maintaining consistency with data and activity definitions from previous years. This expanded scope includes closer alignment with Organisation for Economic Co-operation and Development (OECD) best practices, further

refinement of the survey, including questions related to the UK's spaceflight programme, estimated environmental impact, and contribution to UN Sustainable Development Goals.

1.2. Scope

This report characterises the size (income, employment, and GVA) and health (growth in income, employment and GVA, as well as metrics tracking composition) of the UK space industry. The report presents the information by industry sector (space manufacturing, operations, applications, and ancillary services) and activity area within each sector. It also addresses other aspects of the UK space industry, including regional distribution, supply chain effects, support of wider GDP, total investment, future sentiment, and factors influencing growth. The report provides timely data for 2019/20, as well as updated estimates for 2018/19 and historical data from previous Size and Health reports.

For continuity, results in this report reflect sector and activity definitions used in previous reports. Previously used sector definitions do not align exactly with OECD sector definitions. Therefore, the 2021 Size and Health report also includes industry segmentation using OECD sector classifications. This will create a more standardised approach to definitions and align the methodology with wider measurement standards. For the current report, the change has introduced some challenges in the use of international comparison and the utilisation of previously defined information for some categories. To mitigate this issue, UKSA and BryceTech have initiated a transition from previous definitions to OECD standard definitions with the existing four main activity areas of space manufacturing, operations, applications, and ancillary services retained. As a first step, this report uses a streamlined version of OECD sector definitions (see [Annex A.1](#)). Future editions will further align with the OECD. This will facilitate comparison with OECD data.

In the UK, organisations meeting the following definitions and criteria are considered part of the 'space industry':

- Non-commercial organisations (e.g., universities, research institutes) that secure income to contribute space-specific research and expertise throughout the industry supply chain, often in partnership with commercial organisations. Non-commercial income includes government agency and institutional grant funding, core funding, research funding, tuition fees, departmental expenditures, and operating budgets.
- Commercial organisations (i.e., businesses, companies, firms) that earn revenue from the manufacture, launch and operation of satellites/spacecraft, and from meaningful utilisation of the signals and data supplied by satellites/spacecraft to develop value-added applications. Such organisations may also secure non-commercial income (e.g., grants) to undertake specific research and development.

'Space-related activity' is defined to include any of the following:

Space Manufacturing: Design and/or manufacture of space equipment and subsystems. *Includes: launch vehicles and subsystems, satellites/payloads/spacecraft and subsystems, scientific instruments (e.g., instrumentation for use in space-related experiments, astronomical instruments), ground segment systems and equipment (control centres and telemetry), suppliers of materials and components, scientific and engineering support, fundamental and applied research, space test facilities (e.g., provision of environmental testing services).*

Space Operations: Launch and/or operation of satellites and/or spacecraft. *Includes: launch services, launch brokerage services, proprietary satellite operation (including sale/lease of capacity, e.g., the lease of transponders on a satellite for the provision of broadcasting services), third-party ground segment operation, ground station networks, in-orbit servicing, debris removal, space surveillance & tracking*

(SST), space tourism (including services associated with the provision of space tourism, for example training, sales, and marketing), in-space manufacturing.

Space Applications: Applications of satellite signals and data. Includes: *direct-to-home (DTH) broadcasting, fixed and mobile satellite communications services (including very small aperture terminals (VSATs)), location-based signal and connectivity service providers, supply of user devices and equipment (e.g., satellite phones), processors of satellite data, applications leveraging satellite signals (e.g., GNSS devices and location based services) and/or data (e.g., meteorology, geographic information system (GIS) software and geospatial products), other (e.g. quantum key distribution).*

Ancillary Services: Specialised support services. Includes: *launch and satellite insurance (including brokerage) services, financial and legal services, software and IT services, market research and consultancy services, business incubation and development, policymaking, regulation, and oversight.*

This report preserves the usefulness of timeseries data and minimises any impact on indicators (such as income and investment data). Additionally, it includes data for the 2018/19 period and reflects improved data on industry participants and other methodological changes to provide further detail and insight on the industry. In this report, these improvements and changes include:

- The report and survey have been updated to better reflect the measures that are useful to industry and stakeholders.
- Expanded survey questions to address impacts of public funding and interactions with public institutions; nuance related to UK and non-UK activities of multinationals; barriers and opportunities; and the effectiveness of UKSA initiatives.
- The survey and subsequent analysis were expanded to include a breakdown

of income, gross value added (GVA), and employment by OECD sector, enabling greater comparability of the UK space industry with other countries based on OECD guidelines.

- Summaries of perceived barriers to private investment cited by survey respondents.

Core metrics pertaining to income, employment and GVA can be found in Section 2: Size of the UK Space Industry. Sector trends within these areas are provided in Section 3: Health of the UK Space Industry. Further, regional breakdowns of the UK Space Industry by geography, income and employment can be found in Section 4: Regional Distribution. An overview of the supply chain effects and economic impact of the industry is provided in Section 5: Economic Impacts. Section 6: Growth Influencers provides insights in areas such as the impact of UK spaceflight and barriers to investment. Finally, metrics pertaining to investment in the UK space sector, as well as future expectations of factors such as investment and income, can be found in Section 7: Total Investment.

1.3. Approach

This report combines insights from primary data (responses to an online survey and select interviews) and secondary data (desk-based research, modelling and analysis, and use of internal datasets, such as BryceTech's *Start-Up Space* dataset). It also incorporates economic impact analysis from Cambridge Econometrics, and additional insights where relevant from ongoing research in the UK space sector by the BryceTech Team, which included Senior Economist, Dr. Alexander Grous from the London School of Economics. The report encompasses around 1,300 UK-based space organisations.

The online survey comprised 39 questions across 12 lines of questioning and asked respondents to detail space-related activities such as space-related income and employment. To complete the survey, some respondents were contacted directly, while concurrent activities were also undertaken including promotion via social media, at space-

related events, and through industry groups and associations. The survey remained open for ten weeks and received 152 complete and partial responses. BryceTech safeguarded proprietary information and all information in this report is presented at an aggregate level. Quality assurance was conducted, and survey data was sanitised, validated, and incorporated alongside additional secondary research conducted by BryceTech.

Secondary data sources utilised include statutory financial reports, Companies House records, open source and subscription-based databases and information sources, BryceTech proprietary knowledge and databases, the Office for National Statistics (ONS) Annual Business Survey and supporting cross-economy data from ONS and Bank of England. For analysis of industry elements such as investment activities, BryceTech has used internal proprietary sources including its *Start-Up Space* dataset. This 2021 edition has sought to maintain an approach that minimises the ‘survey burden’ on organisations by fully leveraging these secondary data sources.

1.4. Caveats

The research and interviews were undertaken by a team of independent analysts with specialised expertise in the space sector. This ensures rigorous, fact-based analysis, with relevant methodologies and assumptions included throughout the report.

This analysis uses estimation and approximation techniques based on survey data, supplemented by financial data and other desk research where required. Despite the effort and emphasis put on identifying all relevant space companies for inclusion in the survey, it is reasonable to assume that some UK-based organisations with space-related activities may have been missed. Such omissions should be minor and have a negligible impact on estimates.

The currency for this analysis is GBP, and values have been converted to GBP using the prevailing exchange rate on the appropriate date

where data were obtained in another currency. The space economy’s supply chain sources a proportion of its inputs from overseas (foreign currency prices converted to GBP) while also exporting goods abroad (GBP prices converted to foreign currency), resulting in some non-business related income fluctuations that can be attributed to exchange rate fluctuations. It should be noted that due to rounding, some table rows in this report may not sum exactly to the total.



This chapter describes the size of the UK space industry. This analysis considers all organisations across the space value chain, from manufacturing to downstream services utilising space data.

All findings are presented in 2019/20 currency value unless indicated otherwise.

2.1. Income

The total UK space industry income was £16.5 billion in 2019/20, a decrease in real terms (inflation adjusted) from the £16.8 billion reported in 2018/19. In part, this drop in real terms revenue is due to reduced direct-to-home television (DTH)

and mobile satellite services (MSS) revenue. These activity areas decreased by a combined £317 million in real terms between 2018/19 and 2019/20.

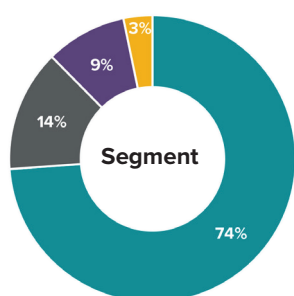
DTH remained the dominant activity within the industry, contributing 45% of total income. The share of income generated by DTH continued to remain constant, or decrease, in comparison to previous years, with 45% reported in 2018/19, and 48% in 2016/17. Without the inclusion of DTH, industry income in 2019/20 was £9.1 billion (compared to £9.2 billion in 2018/19).

Table 2.1. UK space industry income by segment, 2019/20.

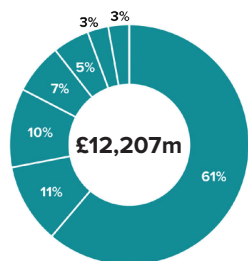
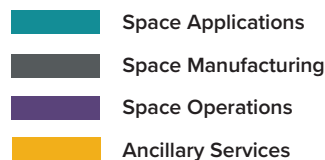
Segment	2019/20 (£m)
Space Applications	12,207
DTH	7,471
Non-DTH	4,736
Space Operations	1,512
Space Manufacturing	2,270
Ancillary Services	539
TOTAL	16,528

Source: BryceTech analysis.

Chart 2.2. UK space industry income by segment and activity, 2019/20.

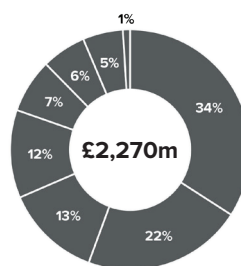


Segment	Income (£m)
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Ancillary Services	539



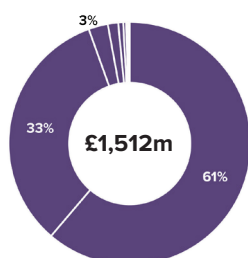
Space Applications

Activity	Income (£m)	%
Direct-to-home (DTH) broadcasting	7,471	61%
Supply of user devices and equipment	1,314	11%
Mobile satellite communication services	1,298	11%
Fixed satellite communication services (incl. VSAT)	832	7%
Applications leveraging satellite signals/data (e.g., nav, geospatial, telematics)	601	5%
Location-based signal service providers	345	3%
Processors of satellite data (e.g., EO)	341	3%
Other (e.g., quantum key distribution)	4	0%



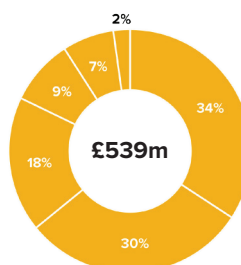
Space Manufacturing

Activity	Income (£m)	%
Satellites/payloads/spacecraft and subsystems	774	34%
Suppliers of materials and components	489	22%
Launch vehicles and subsystems	293	13%
Ground segment systems and equipment	269	12%
Scientific and engineering support	165	7%
Fundamental and applied research	136	6%
Scientific instruments	123	5%
Space test facilities	22	1%



Space Operations

Activity	Income (£m)	%
Proprietary satellite operation (incl. sale/lease of capacity)	926	61%
Ground station networks	503	33%
Third-party ground segment operation	39	3%
Space Surveillance & Tracking (SST)	21	1%
Launch services	10	1%
Space tourism	6	0%
Launch brokerage services	2	0%
Spaceports	2	0%
In-orbit servicing	1	0%
Debris removal	1	0%
In-space manufacturing	1	0%



Ancillary Services

Activity	Income (£m)	%
Software and IT services	184	34%
Market research and consultancy services	161	30%
Launch and satellite insurance (incl. brokerage) services	97	18%
Business incubation and development	47	9%
Policymaking, regulation and oversight	37	7%
Legal and financial services	12	2%

Source: BryceTech analysis. Note: Activity values may not add to segment totals due to rounding. Activity examples are provided in Section 1.2.

Income by Activity

Space applications was the largest of the four segments, with or without the inclusion of DTH, and contributed 74% of total income. Space manufacturing was second largest, contributing 14%, followed by space operations (9%), and ancillary services (3%).

Source of Income

Table 2.3 provides an overview of industry income segmented by the type of customer or funder procuring space-related goods and services. Industry income is largely driven by commercial end users, with a total of £13.7 billion (82.7%) derived from consumer and business transactions. The public sector accounted for £2.9 billion (17.3%) of transactions and was largely driven by defence sales (8.6%), followed by civil government including research/science

(4.4%), space agencies (3.0%), and the European Commission (1.3%). £106 million was derived from UKSA (up from £94 million in 2018/19).

Income by OECD Sector

Table 2.4 shows UK space industry income by OECD sector, a new addition to Size and Health of the UK Space Industry.

Further context and a mapping of OECD sector classifications to Size and Health activity classes can be found in [Annex A.1](#).

OECD sectors reflect the same patterns as those found in the standard Size and Health reporting framework. Satellite communications and broadcasting play a dominant role, comprising £10.4 billion of income under the initial breakdown by OECD sector. The UK's extensive value chain, with many providers of subsystems

Table 2.3. UK space industry income by income source, 2019/20.

Source of Income	2019/20 (£m)
Consumer (B2C, e.g., DTH sales to households)	8,344
Business (B2B, e.g., sale of components between businesses)	5,323
Defence/Military	1,416
Other Civil Government	547
UK Space Agency	436
Via European Space Agency (ESA) Contribution*	330
Non-ESA	106
European Commission (EC)	215
Research/Science Funding Body	181
Other Space Agency	66
TOTAL	16,528

Source: BryceTech analysis.

* The UK invests in programmes delivered by ESA on Member States' behalf, which enables UK participation in missions and technology development. A recent example is the UK built Solar Orbiter mission that is studying the Sun.

Table 2.4. UK space industry income by OECD sector, 2018/19–2019/20.

Sector	2019/20 Prices (£m)	
	2018/19	2019/20
Satellite Communications (incl. broadcasting)	10,805	10,449
Positioning, Navigation, Timing (PNT)	1,394	1,398
Earth Observation (incl. meteorology)	1,040	1,053
Space Transportation (incl. launch)	751	761
Space Exploration (incl. ISS, rovers, probes)	759	756
Science	958	975
Other (generic technologies or components)	1,115	1,135
TOTAL	16,821	16,528

Source: BryceTech analysis.

and components relevant to launch, satellite manufacturing, and spacecraft development, drives considerable income in other OECD sectors, such as space transportation and other generic technologies and components. This standardisation is a required step-change in the reporting of UK space sector activity as space exploration, and the associated international partnerships, grow in importance within the UK.

2.2. Exports

The UK's space industry has achieved considerable success in exports, with 32% (£5.3 billion) of income stemming from abroad (compared to 35.5%, or £5.8 billion, in 2018/19). This export share compares favourably with the UK as a whole, which saw 28% of GDP derived from exports in 2020.² Excluding DTH, approximately 50% of space income is derived from exports.

The primary export market for the UK is Europe, accounting for 48% of all exports and 15% of the total industry income. This is followed by North America (24% exports, 8% income), Asia, Oceania and Sub-Saharan Africa (19% exports, 6% income), Middle East and North Africa (5% exports, 2% income), and Central & South America (4% exports, 1% income).

2.3. Inputs (Domestic and Imports)

Based on a limited sample (78 respondents), the UK space industry imports more than half (59%) of inputs from suppliers overseas. Space organisations supplied more than half of the reported inputs of the UK suppliers, and nearly all (98%) reported inputs of foreign suppliers.

2.4. Gross Value Added

A key impact of any sector, region, or firm on a country's economy is its contribution to the output, or gross domestic product (GDP), of the country. Gross value added (GVA), or the value of income net of the cost of goods and services sold, constitutes an estimate of an industry's direct contribution to GDP.

Table 2.5. UK space industry income by customer region, 2019/20.

Location	2019/20 (£m)	2019/20 (%)
UK	11,272	68%
Exports	5,256	32%
<i>Rest of Europe</i>	2,522	15%
<i>Northern America</i>	1,248	8%
<i>Asia, Oceania, Sub-Saharan Africa</i>	981	6%
<i>Middle East & Northern Africa</i>	269	2%
<i>Central & South America</i>	235	1%
TOTAL	16,528	

Source: BryceTech analysis.

Table 2.6. UK space industry inputs by supplier region, 2019/20.

Location	2019/20 (£m)
UK space sector	3,321
UK non-space sector	666
Overseas (imports)	5,685
<i>Overseas space sector</i>	5,546
<i>Overseas non-space</i>	138
TOTAL	9,672

Source: BryceTech analysis based on a limited sample of survey respondents.

In 2019/20, the UK space industry is estimated to have directly contributed £6.9 billion of GVA to UK economic output, equivalent to 41% of space industry income. The remaining income is spent on intermediate inputs and capital stock. GVA can therefore be interpreted as a compound of profits, salaries paid, and the taxes levied on both items. GVA is provided in real terms unless stated otherwise. Despite the pandemic, the space sector showed only a marginal GVA contraction in 2019/20. This is likely due to the long lead-time for specialised manufacturing, a highly skilled and relatively inelastic workforce with long education and training pipelines, and the ability of large firms (that account for over 80% of revenue) to cope with this exogenous shock.

In the 2020 calendar year, the government provided targeted support to the space industry through its Space Sector COVID Support Plan

(SSCSP)³, and the Space Sector Export Academy. Throughout the COVID-19 pandemic, sectors such as recreation showed the most pronounced contraction in 2020–2021 revenue⁴ (58%) while construction revenue reduced by 20%, in contrast to the UK Space Sector, which displayed marginal contraction in revenue of 1.7%. This was significantly lower than manufacturing overall, which displayed a contraction in revenue of 17% in 2020.

Table 2.7. UK space industry Gross Value Added, 2019/20.

Year	Current Prices (£m)	2019/20 Prices (£m)
2018/19	6,727	6,861
2019/20	6,856	6,856
2020/21 (est.)	7,153	6,878

Source: BryceTech analysis.

2.5. Employment

The estimated employment in the UK space industry in 2019/20 was 46,995, the equivalent of 0.14% of total UK employment.

The space applications segment accounted for two-thirds of total employment (66%). This segment continued to be dominated by DTH, which represented 71% of employees within the segment, and 46% of all industry employees. Space manufacturing was the next largest segment in terms of employment (20%), followed by space operations (8%) and ancillary services (6%).

Table 2.8. UK space industry employment by segment, 2019/20.

Segment	Employees	%
Space Applications	30,847	66%
DTH	21,772	46%
Non-DTH	9,075	19%
Space Operations	3,814	8%
Space Manufacturing	9,504	20%
Ancillary Services	2,830	6%
TOTAL	46,995	100%

Source: BryceTech analysis.

Employment by Gender

Based on a limited sample of survey responses, roughly three-quarters (~76%) of employees in the UK space industry identify as male. About one in four (~24%) employees identify as female, while less than half a percent (0.2%) identify as gender non-binary. This distribution is roughly comparable to the 2020 Space Census.⁵

Table 2.9. UK space industry employment by gender, 2019/20.

Gender	2019/20
Male	75.9%
Female	23.9%
Other preferred	0.2%

Source: BryceTech analysis based on a limited sample.

2.6. Productivity & Skills

Labour productivity (GVA per employee) for the UK space industry in 2019/20 is estimated at £146,000 (roughly similar to the 2018/19 value of £149,000) – equivalent to 2.6 times the UK's average labour productivity (£57,000).⁶

The labour productivity likely reflects the highly skilled nature of the UK's space industry workforce. The space industry has an educated workforce relative to other industries based on survey responses: the majority of employees

Table 2.10. Labour productivity of the UK space industry, 2016/17–2019/20.



Source: BryceTech analysis, previous Size and Health reports.

have a university education, with 36% holding a master's degree or higher, and 37% holding a bachelor's degree. About 14% of the workforce hold a vocational qualification (e.g., a Higher National Certificate (HNC), or Higher National Diploma (HND)), and the remaining 13% hold other qualifications.

2.7. Research and Development

An estimated £836 million was spent on space-related R&D (equivalent to 5% of total industry income) in 2019/20. Of this investment, 36% was internal, and 64% was external. (government funding to government recipients was included in the external category). A considerable proportion of the increase seen over the prior year (£702 million in 2018/19, as measured in previous report) was due to greater R&D allocation from UKSA.

R&D is pivotal in the UK Government's National Space Strategy to spur a long term vision of innovation through public-private investment and the participation of civil and defence space activities. High R&D levels are promoting the commercialisation and export of both intellectual property, and activities with the Government investing an additional £1.4bn in addition to the £5bn committed for example to enhance the military's satellite communications.⁷



This chapter describes the health of the UK space industry. This analysis considers all organisations across the space value chain, from manufacturing to downstream services utilising space data.

All findings are presented in 2019/20 currency value unless indicated otherwise. Growth rates shown are in real terms (inflation adjusted) and are compound annual growth rates (CAGR).

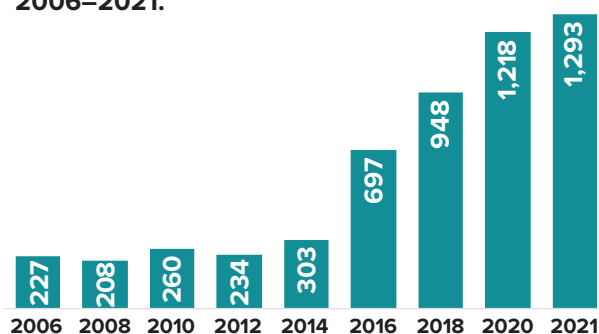
3.1. Composition

The UK space industry is comprised of 1,293 organisations and includes a range of organisation sizes, from pre-revenue start-ups to multinational conglomerates with hundreds of millions of pounds in space-related income. However, the industry continues to be highly concentrated with nine organisations accounting for 81% of total space-related income. A further 130 organisations each earn in excess of £5 million and contribute the next 16% of income, whilst an additional 1,154 organisations account for the remaining 3%.

3.2. Population Growth

The population of UK space organisations grew to 1,293 organisations, up from 1,218 in the previous

Table 3.1. UK space industry population, 2006–2021.*



Size & Health Edition	Population*	CAGR (%)
2006	227	
2008	208	-4%
2010	260	12%
2012	234	-5%
2014	303	14%
2016	697	52%
2018	948	17%
2020	1,218	13%
2021	1,293	6%

Source: BryceTech analysis, previous Size and Health reports.
* Population refers to number of organisations contributing to total industry income.

year. Over the last nine years, the population of space organisations has grown on average nearly 21% per annum.

Twenty-seven new incorporations were observed in 2020. Though lower than 2019, this difference likely reflects the fact that there were companies so young that they have yet to be identified

and incorporated into the dataset of UK space companies. The latest year of new incorporations has consistently risen across past reports as newer companies are incorporated.

3.3. Income Growth

As shown in Table 3.2, the 2019/20 UK space industry income dropped marginally by 1.7% in real terms compared to 2018/19. This is in contrast to the overall UK economy, which shrank by 9.9% in 2020, largely due to the COVID-19 pandemic.¹ In nominal terms, the space industry grew by 0.2%. Detail about change in income by segment and income by segment between 2018/19 and 2019/20 is shown in Table 3.3.

Over the longer-term, Chart 3.4 shows that UK space industry income has more than tripled (x3.3) in real terms since the turn of the millennium, with a CAGR of 6.4% since 2000/01. Income has increased by nearly sixty percent in real terms in the last decade.

The flatter growth observed in the UK space industry since 2016/17 is consistent with trends in the global space economy. This can be seen within data collected and analysed by BryceTech on behalf of the Satellite Industry Association, which covers global revenues from satellite manufacturing, ground segment and services. This analysis has shown that global revenues in these areas have remained largely flat from 2016 onwards, with an

Table 3.2. UK space industry income, 2010/11–2020/21 (est.).

Year	Current Prices (£m)	2019/20 Prices (£m)	Real Growth
2010/11	9,188	11,038	6.5%
2011/12	11,087	12,770	15.7%
2012/13	11,848	13,297	4.1%
2013/14	13,347	14,640	10.1%
2014/15	13,702	14,873	1.6%
2015/16	13,998	15,178	2.1%
2016/17	14,792	15,864	4.5%
2017/18	15,242	15,898	0.2%
2018/19	16,492	16,821	5.8%
2019/20	16,528	16,528	-1.7%
2020/21 (est.)	17,027	16,372	-0.9%

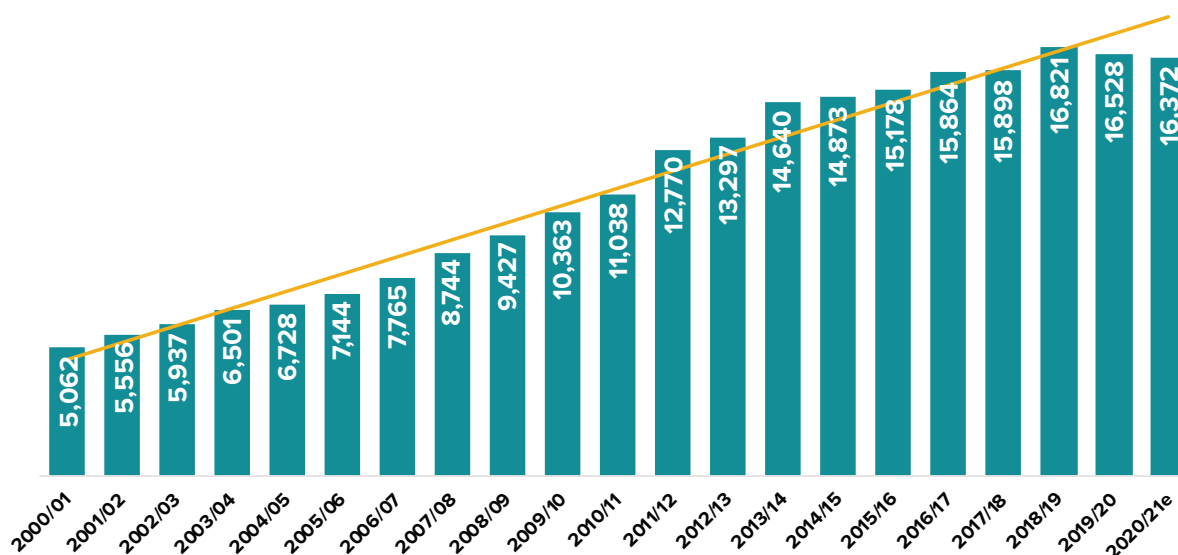
Source: BryceTech analysis, previous Size and Health reports.

Table 3.3. UK space industry income growth by segment and activity between 2018/19–2019/20 in 2019/20 prices.

Segment	Activity	2019/20 Prices (£m)		Growth YoY%
		2018/19	2019/20	
Space Manufacturing	Launch vehicles and subsystems	291	293	1%
	Satellites/payloads/spacecraft and subsystems	767	774	1%
	Scientific instruments	109	123	13%
	Ground segment systems and equipment	276	269	-3%
	Suppliers of materials and components	496	489	-1%
	Scientific and engineering support	169	165	-2%
	Fundamental and applied research	115	136	18%
	Space test facilities	25	22	-12%
	Segment Total:	2,247	2,270	1%
Space Operations	Launch services	9	10	18%
	Launch brokerage services	2	2	4%
	Proprietary satellite operation (incl. sale/lease of capacity)	988	926	-6%
	Third-party ground segment operation	41	39	-3%
	Ground station networks	501	503	0%
	In-orbit servicing	1	1	0%
	Debris removal	1	1	77%
	Space surveillance & tracking (SST)	21	21	3%
	Space tourism	5	6	34%
	In-space manufacturing	1	1	0%
	Spaceports	2	2	-6%
	Segment Total:	1,569	1,512	-4%
Space Applications	Direct-to-home (DTH) broadcasting	7,641	7,471	-2%
	Fixed satellite communication services (incl. VSAT)	884	832	-6%
	Mobile satellite communication services	1,445	1,298	-10%
	Location-based signal service providers	354	345	-2%
	Supply of user devices and equipment	1,218	1,314	8%
	Processors of satellite data (e.g., EO)	336	341	1%
	Applications leveraging satellite signals/data (e.g., nav, geospatial, telematics)	605	601	-1%
	Other (e.g., quantum key distribution)	3	4	13%
	Segment Total:	12,487	12,207	-2%
Ancillary Services	Launch and satellite insurance (incl. brokerage) services	77	97	25%
	Legal and financial services	15	12	-20%
	Software and IT services	181	184	2%
	Market research and consultancy services	159	161	1%
	Business incubation and development	52	47	-9%
	Policymaking, regulation and oversight	34	37	7%
	Segment Total:	519	539	4%
TOTAL UK SPACE INDUSTRY INCOME		16,821	16,528	-2%

Source: BryceTech analysis.

Chart 3.4. Long-term UK space industry income, 2000/01–2020/21 (est.) in 2019/20 prices (£m).



Source: BryceTech analysis, previous Size and Health reports.

average year-on-year growth rate of 0.05%, and a compound annual growth rate across the 2016–2020 period of -0.12%. In 2020, a decrease in real revenues was seen from 2019, with global revenue falling to £207 billion from £212 billion in the year before. The 2020 decrease can be attributed to COVID-19 impacts on sectors such as Fixed Satellite Services (FSS), as well as longer-term trends such as the shift in television viewership away from traditional models, resulting in downward pressure on satellite broadcasting revenues.⁸

Two of four segments experienced overall growth in real terms, space manufacturing (+1%, +£23 million), and ancillary services (+4%, +£20 million). Two saw decreases in income, space operations (-4%, -£57 million) and space applications (-2%, -£280 million).

Activities that displayed the most significant percentage growth were: space tourism (34%, £1 million); launch and satellite insurance (including brokerage) (25%, £20 million); launch services (18%, £1 million); and other activities such as quantum key distribution (13%, £1 million). These also represent areas of global growth, with the UK space sector being particularly well poised to exploit them due to the upstream and downstream capabilities of the sector in the UK, in contrast to many other countries.

Activities with the most significant percentage declines were: legal and financial services (-20%, -£3 million); space test facilities (-12%, -£3 million);

mobile satellite communication services (-10%, -£147 million); proprietary satellite operation (-6%, -£62 million); and fixed satellite services (-5%, -£52 million). Some of these activities also reflected a contraction due to the COVID-19 pandemic. A polarisation was observed in this respect. Specifically, variable activities with shorter lead-times, or those reflecting more elastic costs such as non-essential functions, showed greater contraction. Other activities with longer lead-times and fixed costs reflected smaller contractions.

The declines in income from MSS, proprietary satellite operation, and FSS—as well as DTH, which saw a considerable absolute decline of £170 million—can largely be explained by the impact of the COVID-19 pandemic on these activity areas. For example, DTH income was affected by the cancellation of sporting activities which would otherwise have been broadcast to users, leading to subscriber loss.⁹ MSS firms saw declines in aviation and maritime sectors due to travel disruptions caused by the pandemic. Satellite communication companies in general have also been struck by more long-term strains on turnover, most prominently the increased downward price pressure caused by the introduction of high-throughput satellite (HTS) connectivity.¹⁰

Table 3.5 presents industry income growth by OECD sector. With growth of 17.9% over the previous year, fundamental and applied research

Table 3.5. UK space industry income growth by OECD sector.

Sector	2019/20 Prices (£m)		CAGR %
	2018/19	2019/20	
Fundamental and Applied Research Activities	115	136	17.9%
Dedicated Ancillary Services	299	316	5.6%
Scientific and Engineering Support	169	165	-2.1%
Supply of Materials and Components	496	489	-1.4%
Design and Manufacturing of Space Equipment and Subsystems	1,167	1,189	2.0%
Integration and Supply of Full Space and Ground Systems	276	269	-2.5%
Operation of Space and Ground Systems	1,569	1,512	-3.6%
Supply of Devices, Products, Supporting Consumer Markets	1,218	1,314	7.9%
Supply of Services Supporting Consumer Markets	11,514	11,138	-3.3%
TOTAL	16,821	16,528	-1.7%

Source: BryceTech analysis.

activities had the most significant growth across the space industry. The supply of devices and products supporting consumer markets and dedicated ancillary services both saw increases of 7.9% and 5.6% respectively.

Of those sectors showing declines, operation of space and ground systems, and supply of services supporting consumer markets saw the most notable changes, with decreases of -3.6% and -3.3% respectively.

3.4. Employment Growth

Estimated employment in the UK space industry rose 6.7%, from 44,040 to 46,995. Table 3.6 shows growth since 2010/11, with total space employment increasing by 62% since 2010/11. This growth is counter to the rate of redundancies recorded since the beginning of the COVID-19 pandemic in the UK economy. These redundancies exceed the highest rate recorded during the 2008 to 2009 financial crisis. Employment reduced 1.1% between January to March and September to November 2020¹¹ while in the Space Sector, growth of 6.7% was observed between 2019 to 2020.

Long-term growth in space employment can be observed when considering trends since the turn of the millennium. Between 2000/01 and today, the space industry has demonstrated a compound annual growth rate of 6%, more than tripling in size.

Table 3.6: UK space industry employment, 2010/11–2020/21 (est.).

Year	Employees	Growth YoY%
2010/11	28,942	-0.2%
2011/12	32,024	10.6%
2012/13	33,882	5.8%
2013/14	37,391	10.4%
2014/15	38,522	3.0%
2015/16	41,690	8.2%
2016/17	41,929	0.6%
2017/18	44,052	5.1%
2018/19	44,040	-0.03%
2019/20	46,995	6.7%
2020/21 (est.)	47,872	1.9%

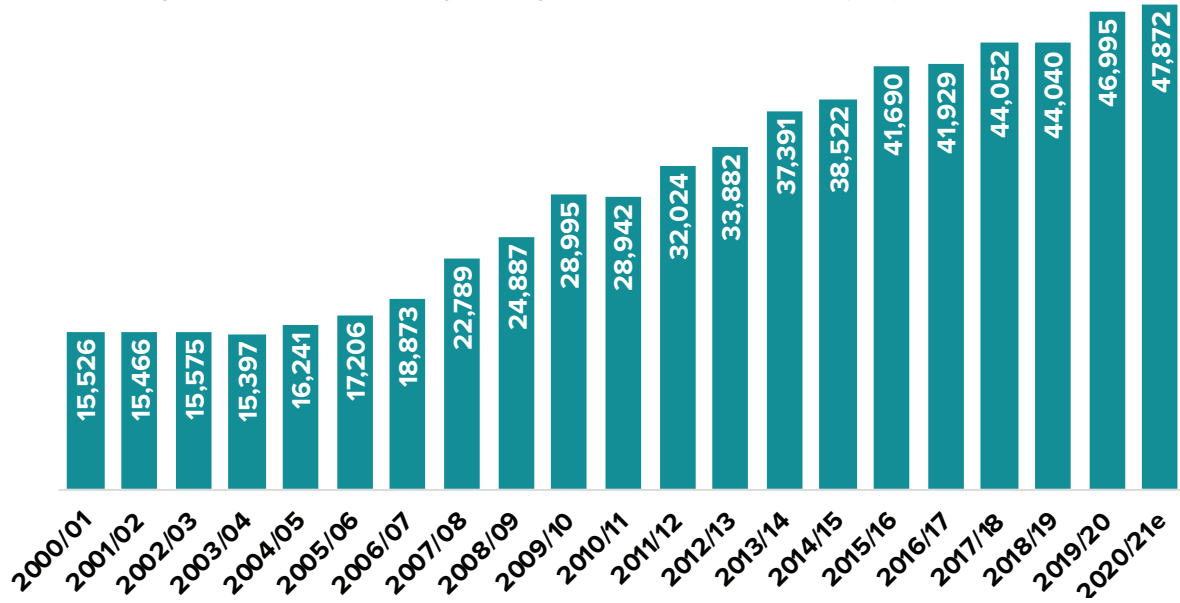
Source: BryceTech analysis, previous Size and Health reports.

Table 3.7. UK space industry Gross Value Added, 2010/11–2020/21 (est.).

Year	Current Prices (£m)	2019/20 Prices (£m)	Growth YoY%
2010/11	4,130	4,962	5.30%
2011/12	4,597	5,295	6.70%
2012/13	5,044	5,661	6.92%
2013/14	5,020	5,506	-2.74%
2014/15	5,132	5,570	1.17%
2015/16	5,257	5,700	2.33%
2016/17	5,663	6,073	6.55%
2017/18	6,438	6,715	10.56%
2018/19	6,727	6,861	2.19%
2019/20	6,856	6,856	-0.08%
2020/21 (est.)	7,153	6,878	0.31%

Source: BryceTech analysis, previous Size and Health reports.

Chart 3.8. Long-term UK space industry employment, 2000/01–2020/21 (est.).



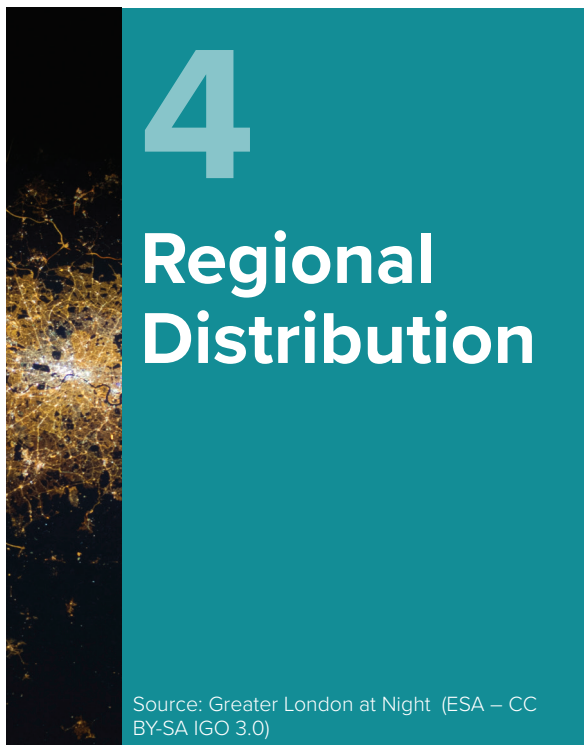
Source: BryceTech analysis, previous Size and Health reports.

3.5. GVA Growth

In 2019/20, the UK space industry accounted for 0.31% of UK GDP.¹² The space industry’s GVA decreased slightly between 2018/19 and 2019/20 in real terms to £6.9 billion. GVA has grown by 41% since 2010/11, demonstrating a compound annual growth rate of 4%.

of territorial units for statistics (NUTS) level 1 classifications to define the geographies of larger regions. These classifications divide the UK into 12 geographic areas, as shown in Table 4.1 along with the Crown Dependencies.

As was observed in 2018/19, space-related activity sites are concentrated in the South and East of England—comprised of South-East (450 sites), London (317 sites), South-West (215 sites) and East of England (168 sites) regions. Scotland is home to 144 sites, Wales 59, and Northern Ireland to 29 sites.



4.1. Presence

This report continues the practice of prior reports of using the EU-standard nomenclature

4.2. Income

Income is assigned to the location of an organisation’s headquarters. Income is typically not meaningfully allocable to multiple locations, given interdependencies among the sites of organisations with multiple locations. This is expected to contribute at least partially to the considerable geographical concentration of income. For example, a company headquartered in London may have multiple sites across the UK contributing value to the UK economy, however, its revenues will be captured under its primary location in London.

Table 4.2 shows that Greater London accounted for the largest proportion (£10.2 billion, 61.7%) of total UK space industry income in 2019/20, followed by the South East (£4.2 billion, 25.3%), East of England (£1.1 billion, 6.8%) and South West

Table 4.1. UK space organisation population by region, 2019/20.

Region	Space Organisations
South East	450
London	317
South West	215
East of England	168
Scotland	144
North West	105
West Midlands	104
East Midlands	97
Yorkshire and the Humber	65
Wales	59
North East	54
Northern Ireland	29
Crown Dependencies	1
Other (no postcode, remote)	7
TOTAL	1,815

Source: BryceTech analysis.

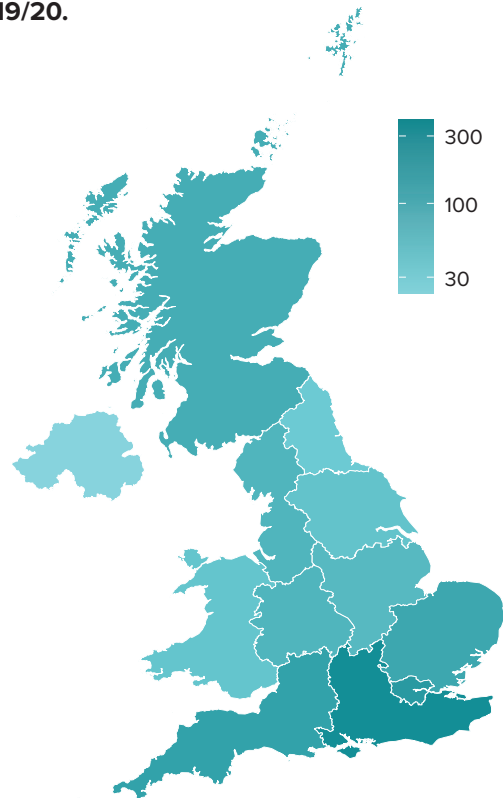


Table 4.2. UK space industry income by region, 2019/20.

Region	Number of Organisations Headquartered in Region	2019/20 Prices (£m)
Greater London	255	10,196
South East	343	4,175
East of England	115	1,116
South West	127	271
Scotland	101	141
North West	73	121
West Midlands	72	116
North East	39	113
East Midlands	67	97
Yorkshire and the Humber	41	90
Northern Ireland	18	46
Wales	37	42
Crown Dependencies	0	0
Other (no postcode, remote)	5	1
TOTAL	1,293	16,528

Source: BryceTech analysis.

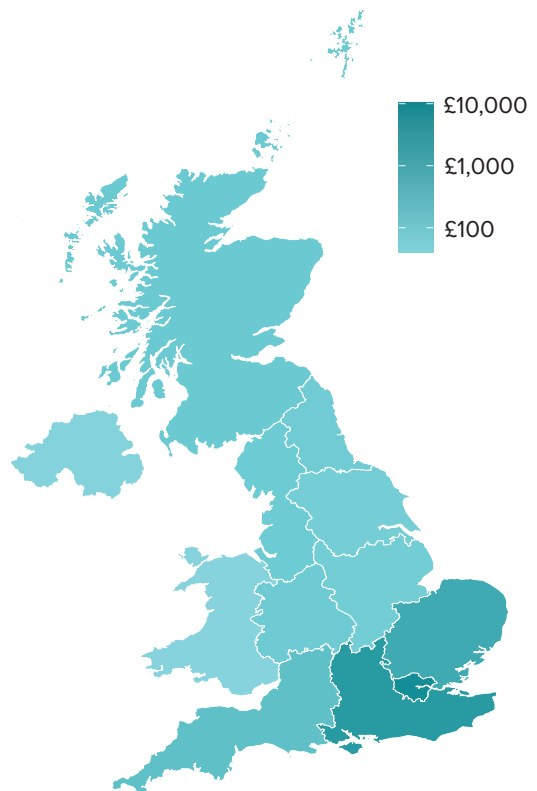
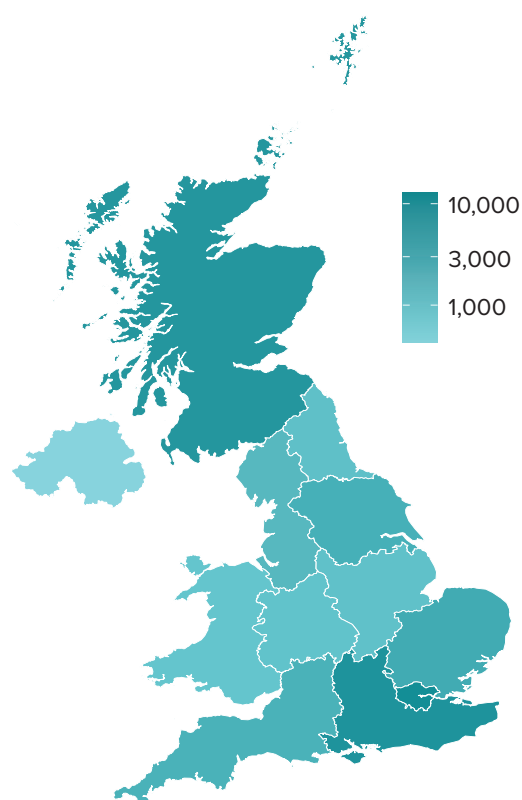


Table 4.3. Estimated UK space industry employment by region, 2019/20.

Region	Number of Organisations Headquartered in Region	Employment
Greater London	255	12,764
South East	343	9,880
Scotland	101	8,440
East of England	115	3,273
Yorkshire and the Humber	41	2,669
South West	127	2,476
North West	73	1,978
North East	39	1,365
East Midlands	67	1,324
West Midlands	72	1,244
Wales	37	1,109
Northern Ireland	18	431
Crown Dependencies	0	2
Other (no postcode, remote)	5	40
TOTAL	1,293	46,995



Source: BryceTech analysis.

(£0.3 billion, 1.6%). Together, the four regions account for 95% of total UK space income.

4.3. Employment

Space industry employment continues to be widely distributed across the regions of the UK.

Table 4.3 shows estimated UK space industry employment by region for 2019/20. London remains the region most populated by individuals engaged in the space sector at 12,764 (27%). The South East is the second most populous at 9,880 (21%) and Scotland the third at 8,440 (18%). Together, the three regions account for 66% of UK space employees.

The economic impact of the UK space industry on the national economy can be measured in terms of direct, indirect, and induced economic impacts.

Indirect and induced effects result from direct impacts; for instance, the income that supplying industries receive from the UK space industry (as part of the indirect impact) will not only be utilised

by suppliers to buy their own inputs, but also by labour. Suppliers' employees will in turn spend their salaries for purchases of consumer goods from within the economy (i.e., an induced effect). In other words, indirect effects can be thought of as the value added, and employment supported, within the value chain that supports the space industry. Induced effects can be thought of as the further economic activity which is supported by the spending of employees.



Economic multipliers allow the estimation of the total (combined direct, indirect, and induced) economic impact of the UK space industry on the national economy.

The total economic impact of the UK space industry in this report has been estimated using input-output analytical tables (IOATs) published by the ONS¹³ to develop a series of multipliers. The multipliers estimate the extent to which the space industry's direct output generates additional activity throughout the economy through indirect and induced effects.

Indirect and induced employment effects were estimated utilising further data such as household spending and employee compensation. Summing the direct, indirect and induced impacts yields an estimate of the total economic impact of the UK space industry, in terms of GVA and employment.

5.1. Gross Value Added

The Type II GVA multiplier, measuring direct, indirect and induced effects, was estimated at 2.3 (slightly down from 2.4 in the previous Size &

Health report). The Type II multiplier implies that each £1 of space industry GVA generates £1.30 worth of GVA in the supply chain and supporting sectors. Variance from the previous Size & Health report can be largely attributed to use of detailed input-output tables compared to the supply and use tables used in the prior report.

The contribution of the UK space industry to the UK economy, including indirect and induced effects, is therefore estimated at £15.8 billion in 2019/20. This implies that the sector's direct GVA of £6.9 billion produces an additional GDP contribution of £9.0 billion to the UK economy through indirect and induced impacts.

5.2. Employment

The Type II employment multiplier, measuring direct, indirect, and induced effects, is estimated to be 4.0 (up from 2.8 in the previous edition). This estimate suggests that the activity of 100 employees in the space industry supports roughly 300 additional employees among suppliers and in other economic sectors (such as retail and services).

Using this multiplier, we estimate that the total UK-based employment supported by the activities of the UK space industry in 2019/20 is estimated to be around 190,000 employees. Direct employment in the space industry (46,995) therefore supports approximately 143,000 additional UK jobs through indirect and induced effects.

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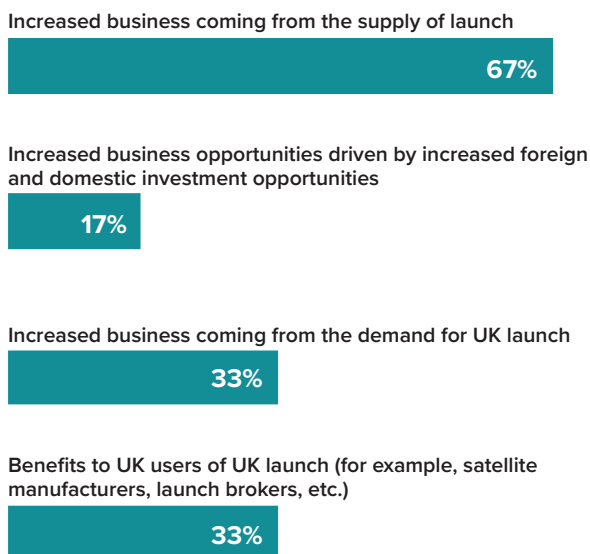
Growth Influencers

Source: North Yorkshire region taken by NovaSAR-1 (Airbus/SSTL)

6.1. UK Spaceflight Programme

Survey respondents were asked, ‘Has the UK spaceflight programme (defined as the spaceport, linked launch service providers, and launches occurring in the UK) positively impacted your revenue in the past 12 months?’ Sixteen percent of respondents answered yes, with the benefit drivers as shown in Chart 6.1.

Chart 6.1. Benefit drivers of UK spaceflight, by percentage of respondents contributing.



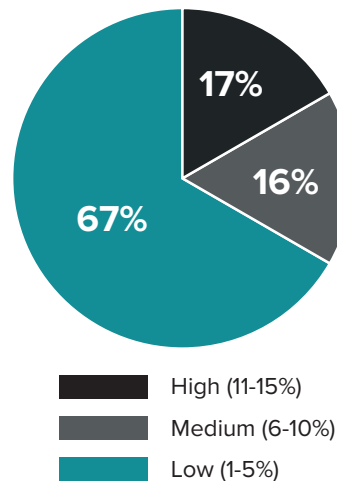
Source: BryceTech analysis.

Seventeen percent (17%) of organisations that perceived the UK launch as positively affecting their revenue viewed the impact as high, while 16% felt it was medium, and two-thirds of organisations (67%) cited the impact of UK spaceflight as having a low impact on their business. (Impacts on revenue of 1 to 5% were designated as low, 6 to 10% medium, and 11 to 15% high.)

6.2. UN Sustainability Goals

As displayed in Chart 6.3, of those organisations that responded, no less than 26% reported that they contribute towards at least one UN Sustainability Goal. The most common goal that organisations reported to contribute towards was Goal 9—‘to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation’—of which 65% reported to be contributing towards. The second most common was Goal 13—‘to take urgent action to combat climate change and its impacts’—to which 62% reported to be contributing.

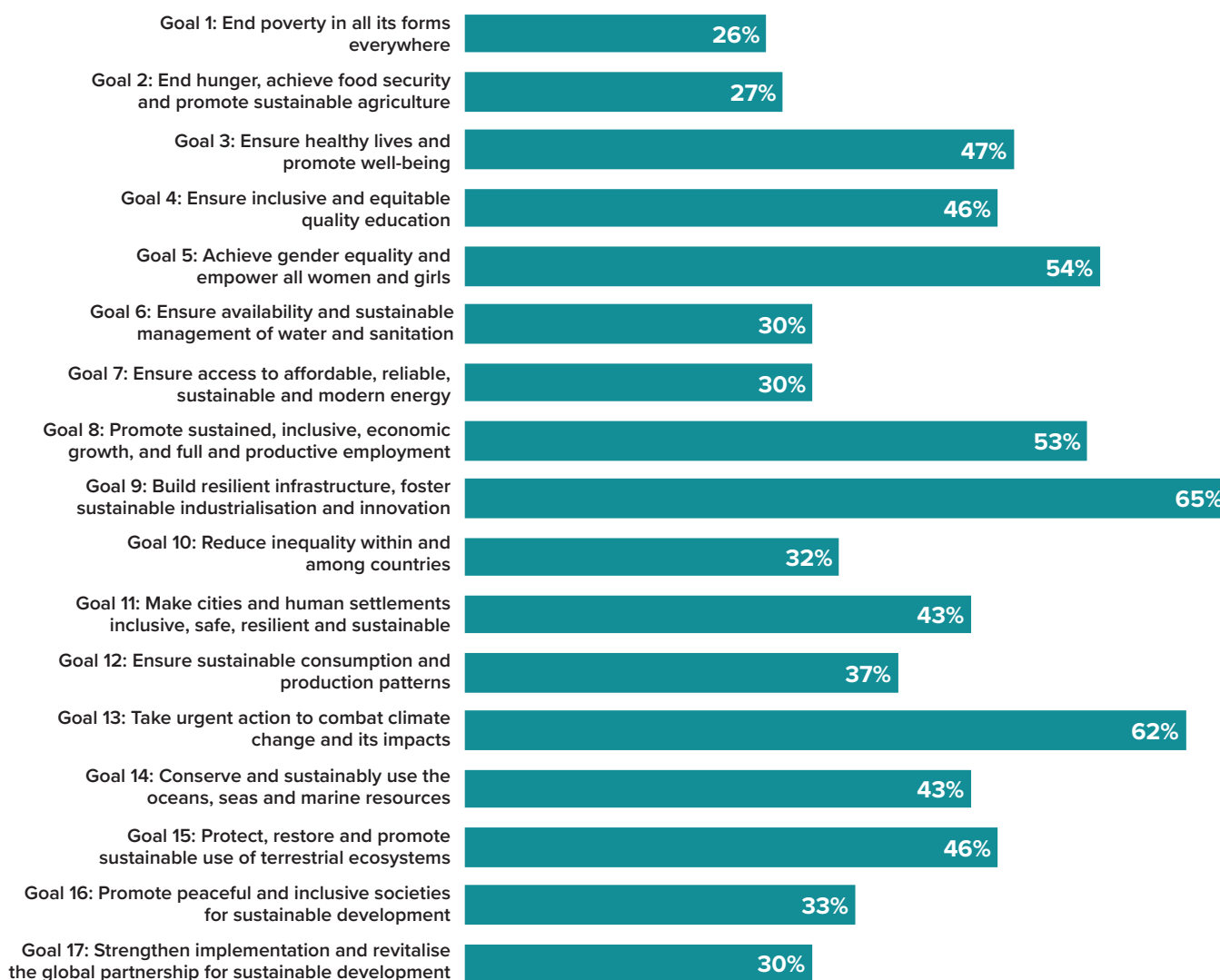
Chart 6.2. Expected magnitude of UK spaceflight impact on income.



6.3. Barriers to Investment

Survey respondents were asked an open-ended question: What are the greatest barriers for you in attracting private investment in the UK space sector? Forty-five organisations, representing about 5% of income, responded to the question.

Chart 6.3. The UK space industry’s contribution to UN Sustainability Goals, by percentage of respondents contributing.



Source: BryceTech analysis based on a limited sample of survey respondents.

The UK and European Investment Landscape

About a third of organisations responding raised the challenging investment landscape in the UK and Europe, especially when compared to the experience of companies in foreign markets. Multiple respondents noted that large-scale investments required for mid- and late-stage growth is difficult to obtain in the UK, citing the US as a market where large-scale funding of £100 million or above is more easily found. Concerns included comparably few venture capital funds in the UK targeting space and a general lack of understanding among investors of the UK space market and the nuances and difficulties of investing in space companies. Several SMEs

also noted the difficulty of managing staff and resource trade-offs between seeking investment and maintaining the company’s revenue pipeline. Two foreign-headquartered organisations indicated that it was difficult for them to establish/expand their presence in the UK, hindering their own investment in their UK operations.

The Role of Government

Approximately one third of organisations responding suggested ways in which improved government funding and contracting practices could mitigate barriers. Suggestions included government taking a larger role as an anchor customer, increased use of public-private partnerships and matching funding, greater ease

and speed in obtaining government contracts (including less organisational fragmentation), further focus on commercial initiatives with realistic timelines, more support for space hardware development, and more core funding of space R&D to aid new IP. Several organisations also suggested more specificity on budgets and timelines in the National Space Strategy and, generally, more clarity on future government budgets and plans.

Other Responses

Other barriers to raising investment mentioned by individual respondents included banking system difficulties for non-UK resident business owners, upstream costs, lack of visibility, lack of relevant space programs to the respondent (specifically human spaceflight), and lack of quality teams to invest in. In addition, seven respondents said they had no issue/were not raising investment.

6.4. Carbon Emissions

This year's Size and Health survey included questions enquiring about organisations' annual carbon emissions, as well as methods of measurement or estimation.

Organisations that responded (9) reported a total of 54,387 tons of carbon emissions for their organisations. This represents the carbon emissions of responding organisations, who accounted for 1% of industry income (not for the industry overall).

Respondents provided a wide variety of methods utilised to estimate their carbon emissions. Several companies reported using energy consumption and government conversion factors to determine their emissions. Others reported working with partner organisations to determine their footprint. Others still reported using specialised business tools to produce internal estimates.

The inclusion of questions regarding carbon emissions this year sets the foundation for

more targeted questions based on estimation techniques in future studies. Further, more and more companies include carbon reporting in their annual accounts. As carbon reporting becomes more widespread and standardised, future Size and Health reports will build up a more detailed and comprehensive picture of industry emissions.



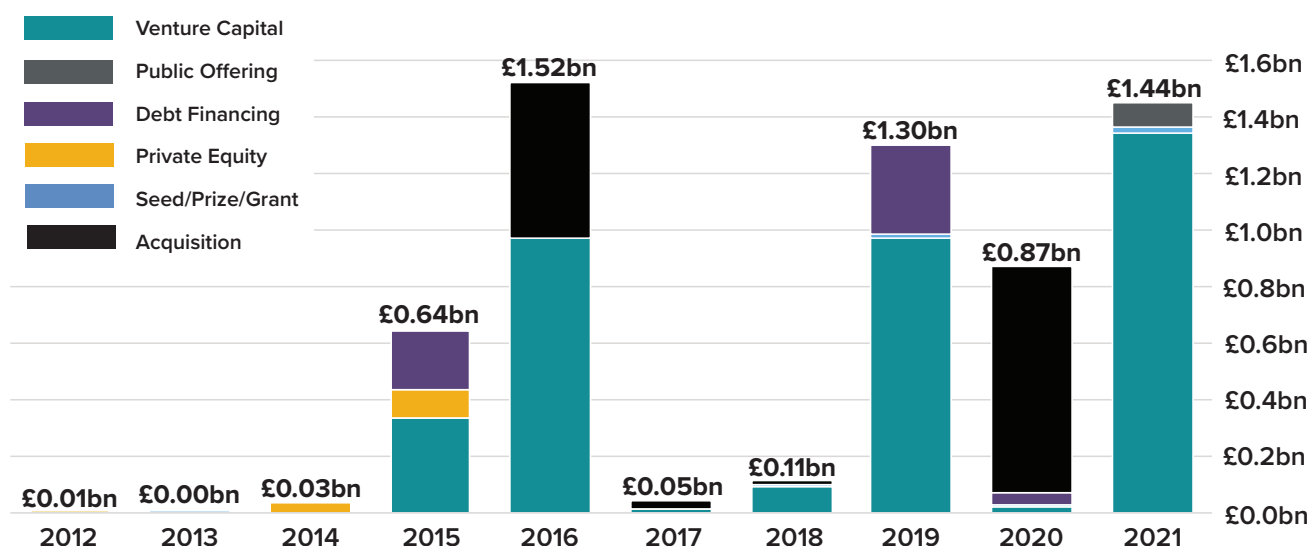
7.1. Investment Monitor

Considering announced investments into the UK-headquartered space start-ups over the past decade (2012 to 2021), 145 unique investors invested nearly £6 billion in 38 companies across 90 investment deals.* This places the UK as the second largest attractor of private investment in emerging space companies in the world.

Private investment, which includes venture capital, private equity, and seed investments, represents 82% of deals and 66% of total magnitude invested over the past decade. Non-private investment (including public offering, acquisition, debt financing, and select prizes and

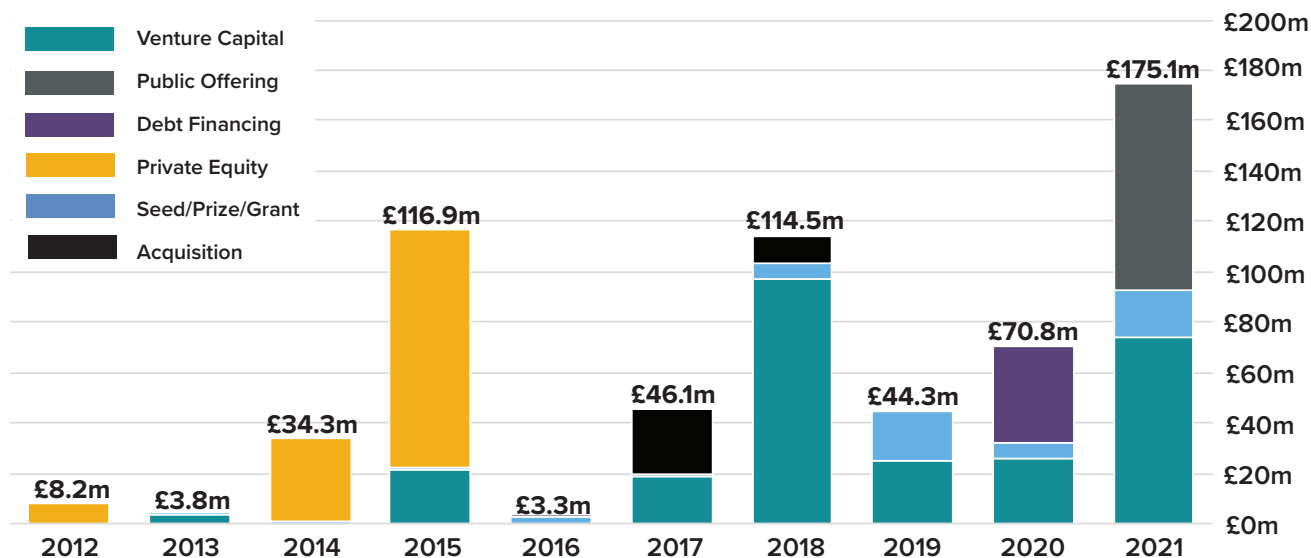
* Methodological, currency exchange rate, and investment deal timings, alongside further factors may drive differences in investment magnitude compared to other studies of UK space investment activity.

Chart 7.1. Total invested (all deals), by year.



Source: BryceTech analysis.

Chart 7.2. Total magnitude invested (deals <£100 million only), by year.



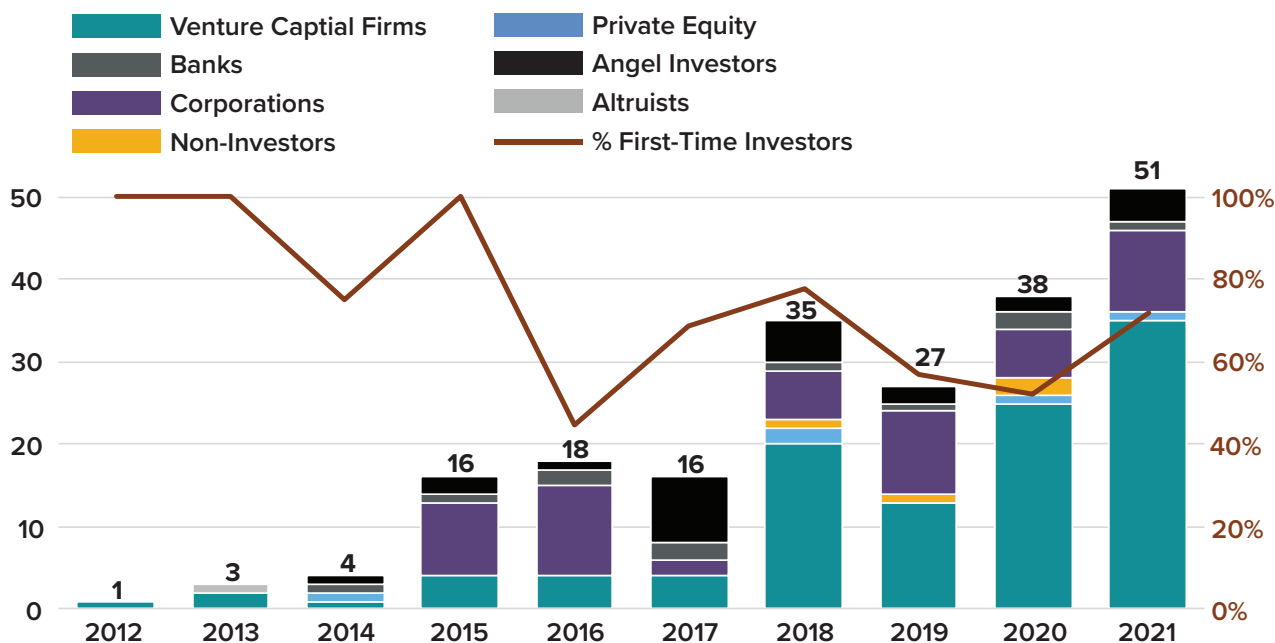
Source: BryceTech analysis.

Table 7.3. Volume of investments into the UK space industry by type and year.

Investment Type	Total investment deals per year									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Seed/Prize/Grant	1	3	1	3	4	1	4	3	7	6
Venture Capital	0	1	0	3	1	4	10	7	4	11
Private Equity	1	0	2	1	0	0	0	0	0	0
Debt Financing	0	0	0	1	1	1	1	1	1	0
Acquisition	0	0	0	0	1	1	1	0	2	0
Public Offering	0	0	0	0	0	0	0	0	0	1
TOTAL	2	4	3	8	7	7	16	11	14	18

Source: BryceTech analysis.

Chart 7.4. Population of investors, by year.



Source: BryceTech analysis.

grants from government organisations) represents 18% of deals and 34% of total magnitude invested. Venture capital was the most common type of investment (41 deals), followed by the seed/prize/grant category (33 deals).

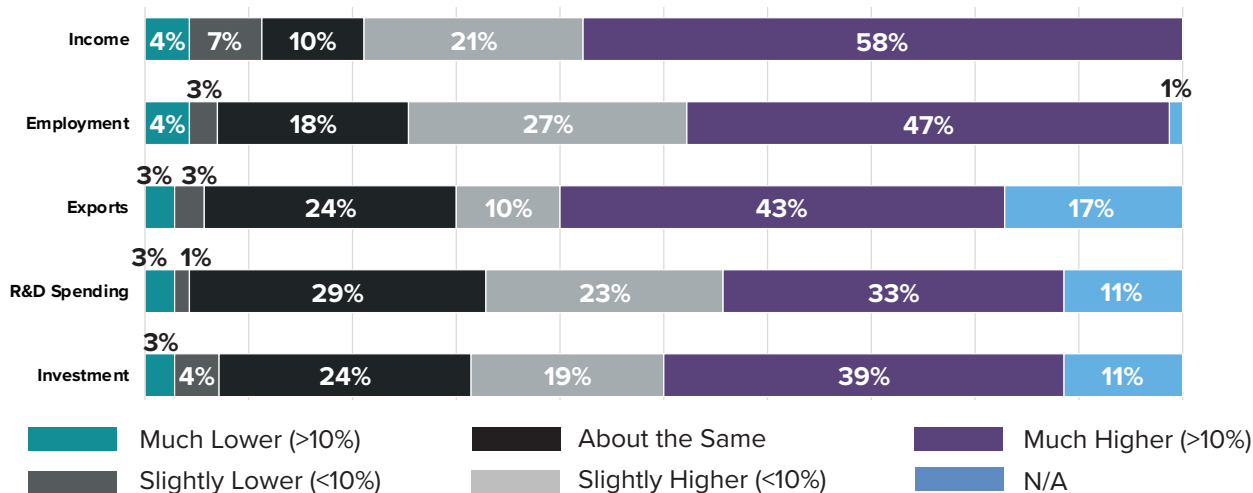
Of the £6 billion invested, over 70% went to satellite operator OneWeb. Filtering out these large investments in OneWeb shows a generally increasing trend in the totality invested in UK space organisations. The UK space investments trended upward: from 2 in 2012 to 18 in 2021, and the population of investors went from 1 in 2012 to 51 in 2021; this trend is driven primarily by private investors. An average investment magnitude—that is, the total investment divided

by the number of deals—of £67 million was invested in UK-headquartered space start-ups during the 2012–2021 period.

7.2. Three-Year Outlook

More than half of the survey respondents expected income, employment, exports, R&D spending, and investment to be higher over the next three years than in the previous three years, with some variation. More respondents expected growth to occur in income and employment than in exports, R&D spending, and investment. Among respondents who expected declines (less than 10% in most areas), a greater number expected declines in income, employment and investment than in exports and R&D spending.

Chart 7.5. Three-year outlook for UK space income, employment, exports, R&D, investment.



Source: BryceTech analysis.

A

Annex

Source: British Isles Seen from the International Space Station (NASA/ESA)

A.1. Ensuring Alignment with OECD Best Practices

The Size and Health Survey has used a consistent set of sector and activity definitions for several years. For the purpose of reporting trends and insights it was important to recognise these definitions going forward. However, it

is acknowledged that the current definitions are not directly aligned with OECD definitions, posing some challenges in comparing the results utilising international standards and the sharing of standardised information.

The 2018 Size and Health report made reference to space domains. As the space domains have been used to cross reference with the OECD sectors, a mapping exercise was conducted to demonstrate the links between the existing Size and Health definitions and the OECD definitions. This mapping is demonstrated in Table A1.1. The OECD definitions include sectors and activities, and were mapped against the Size and Health definitions. The mapping of activities uses the acronyms described in Table A1.2 (where M indicates Manufacturing, O for Operations, A for Applications, and S for ancillary Services). The emphasis was placed on maintaining the integrity of timeseries data and to minimise any impact on indicators (e.g., income, investment data).

The existing four main activities were retained this year, with the potential to expand and further align with the OECD activities in future surveys, particularly as the industry grows and the disaggregation of data becomes increasingly valuable.

UKSA Size & Health
OECD

Table A1.1. Sector definition mapping.

	Space Manufacturing						Space Operations	Space Applications	Ancillary Services
	Upstream						Downstream		
	Fundamental and Applied Research Activities	Dedicated Ancillary Services	Scientific and Engineering Support	Supply of Materials and Components	Design and Manufacturing of Space Equipment and Subsystems	Integration and Supply of Full Space and Ground Systems	Operation of Space and Ground Systems	Supply of Devices, Products Supporting Consumer Markets	Supply of Services Supporting Consumer Markets
Satellite Communications (incl. broadcasting)	M7	M8, S1, S2, S6	M6	M5	M2	M4	O2, O3, O5	A5	A1, A2, A3, S2, S3, S4, S5
Positioning, Timing, and Navigation (PNT)	M7	M8, S1, S2, S6	M6	M5	M2	M4	O2, O3, O5	A5	A4, A6, A7, S2, S3, S4, S5
Earth Observation (incl. meteorology)	M7	M8, S1, S2, S6	M6	M5	M2	M4	O2, O3, O5	A5	A6, A7, S2, S3, S4, S5
Space Transportation (incl. launch)	M7	M8, S1, S2, S6	M6	M5	M1, M2	M4	O1, O2, O4, O5, O9, O11	--	S1, S2, S3, S4, S5
Space Exploration (incl. ISS, rovers, probes)	M7	M8, S1, S2, S6	M6	M5	M2, M3	M4	O3, O4, O5	--	A7, S2, S3, S4, S5
Science	M7	M8, S1, S2, S6	M6	M5	M3	M4	O3, O4, O5	A5	A6, A7, S2, S3, S4, S5
Other (generic technologies or components)	M7	M8, S1, S2, S6	M6	M5	M2, M3	M4	O2, O3, O4, O5, O6, O7, O8, O9, O10	A5	A6, A7, A8, S2, S3, S4, S5

Table A1.2. Current size and health segment and activity definitions.

Segment	Activity	Acronym
Space Manufacturing	Launch vehicles and subsystems	M1
	Satellites/payloads/spacecraft and subsystems	M2
	Scientific instruments	M3
	Ground segment systems and equipment	M4
	Suppliers of materials and components	M5
	Scientific and engineering support	M6
	Fundamental and applied research	M7
	Space test facilities	M8
Space Operations	Launch services	O1
	Launch brokerage services	O2
	Proprietary satellite operation (incl. sale/lease of capacity)	O3
	Third-party ground segment operation	O4
	Ground station networks	O5
	In-orbit servicing	O6
	Debris removal	O7
	Space surveillance & tracking (SST)	O8
	Space tourism	O9
	In-space manufacturing	O10
	Spaceports	O11
Space Applications	Direct-to-home (DTH) broadcasting	A1
	Fixed satellite communication services	A2
	Mobile satellite communication services	A3
	Location-based signal service providers	A4
	Supply of user devices and equipment	A5
	Processors of satellite data (e.g., EO)	A6
	Applications leveraging satellite signals/data	A7
	Other (e.g., quantum key distribution)	A8
Ancillary Services	Launch and satellite insurance (incl. brokerage) services	S1
	Legal and financial services	S2
	Market research and consultancy services	S3
	Business incubation and development	S4
	Policymaking, regulation and oversight	S5
	Software and IT services	S6

Endnotes

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