

JEDHub

Joint Economic Data Hub

Annual Economic Report

Capturing and quantifying the contribution of the defence sector to the UK economy

March 2022

Foreword

JEDHub Annual Economic Report

The UK's domestic defence sector is a strategic national capability, providing essential capabilities to our Armed Forces and those of our allies and partners, and contributing to the economic wellbeing of communities the length and breadth of the UK. Growing our understanding of the defence sector's contribution to the UK economy is an important objective for both Government and industry and that is why we have been working together to establish the Joint Economic Data Hub (JEDHub) as an important deliverable of the 2021 Defence and Security Industrial Strategy.

Assessing the sector's economic impact was a key recommendation of Rt Hon Philip Dunne's report in 2018 which led to the JEDHub being established within the UK Defence Solutions Centre (UKDSC): a joint endeavour between the Government and the Defence Growth Partnership (DGP).

Better, more granular economic data is needed to improve our understanding of the defence sector's contribution to the UK economy and to help inform decision making. With that aim, UKDSC has worked collaboratively with MOD, other government departments, DGP companies, trade bodies and academics to develop the JEDHub. A key part of this work has been collecting and aggregating data from defence companies through a new survey, the results

of which can be presented with other sources of economic data to present a comprehensive, impartial and objective economic picture.

It is with great pleasure that, with the publication of this first Annual Economic Report, we can say that the JEDHub has achieved its first key output which provides new insights into how the defence sector contributes to the prosperity of the UK. We are incredibly grateful to all those who have supported this work, in particular all of the DGP companies and key members of their supply chains who responded to the survey.

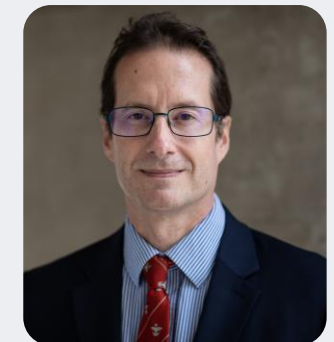
We are also extremely grateful to Professor Ron Smith of Birkbeck, University of London, Emeritus Professor of Economics Keith Hartley, University of York and Professor Trevor Taylor at the Royal United Services Institute, for independently reviewing this first Annual Economic Report. Their feedback has been taken into account in this report and in our plans for future work.

This report is an important starting point. We will continue to work with stakeholders to enhance the JEDHub's capabilities and develop a deeper understanding of the defence sector's contribution to the UK economy. Through iterating and expanding the Annual Survey and making greater use of other rich data sources such as the Office for National Statistics' data, we are extremely excited for the JEDHub's future.



Samira Braund

Chief Executive Officer,
UK Defence Solutions Centre



Nick Toogood

Director, MOD Industrial
Strategy and Exports

Executive Summary

A Growing Sector (pages 5-7)

The 2021 JEDHub Annual Survey contains data from 26 companies who supported 92k defence FTE jobs in 2020, up from 88k in 2019, distributed across all parts of the UK. The South West and North West of England combined accounted for over 45% of surveyed defence jobs.

**4.6%
employment
growth 2019-20¹**

With an International Perspective (pages 8-9)

Over a third of surveyed jobs were supported by international business in 2020. On a deliveries basis, in 2020 the UK exported \$5.0bn of defence materiel to over 60 markets worldwide with the air sector accounting for the most UK exports.

**\$4.6bn
average annual
UK defence
exports 2016-20²**

Through a Diverse Supply Chain (pages 10-13)

Using data from ONS matched to the JEDHub sample frame, around two-thirds of observed employees were found in manufacturing in 2020. Within this figure, employees were associated with many different manufacturing industries, including those within military aircraft, ships and other military equipment. In the remaining third of employees, industries such as computing services and engineering activities were well represented.

**Two thirds of
defence supply
chain jobs in
manufacturing³**

Driving Productivity and Wages (pages 14-15)

Three of the main defence manufacturing industries contributed an estimated £83,626 in GVA per worker on average in 2019, higher than the UK manufacturing average. The average FTE job salary among the surveyed companies in 2020 was 16.7% greater than the UK average.

**On average more
productive than
wider
manufacturing⁴**

Investing in the Future (pages 16-17)

The defence sector continues to invest in future skills and technologies to meet customer demands. JEDHub surveyed apprentice and graduate recruitment grew 4.6% from 2019 to 2020, developing high skilled careers of the future. In 2019, gross UK expenditure on defence R&D was £2.0bn, with approximately 17k FTE employees working in defence R&D carried out by industry.

**Proportion of
industry
investment in
defence R&D up
8.9% since 2015⁵**



Introduction

The UK's defence sector makes an important contribution to our national security and economic prosperity, but it has been challenging to objectively quantify this contribution.¹ Based in the UKDSC and sponsored by the Ministry of Defence (MOD), the JEDHub's development is overseen by government and industry partners in the DGP, working together to provide better, consistent and impartial economic data. Growing our understanding of the economic contribution of the defence sector is the primary aim of the JEDHub.

This first annual report summarises the economic contribution of the defence sector against 5 inter-related themes:



All outputs of the analysis within these 5 themes provide only details of the direct impact of defence, unless explicitly stated otherwise. Analysis of indirect impacts would provide further understanding of the defence sector's economic contribution, particularly at a regional and local level, and this is an area we will consider as we develop the JEDHub.

This report provides new insights on the economic impact of the defence sector,² drawing on new information from the JEDHub's first Annual Survey of the 11 members of the DGP

and 15 of their leading supply-chain companies who responded to the survey.³ These companies are listed on page 19. The report also draws on data from the Office for National Statistics (ONS), Government Departments and defence trade publications. Sources are listed throughout, with a detailed list and supporting annexes provided at the end of this publication.

This first annual report is an important step in improving our understanding of the defence sector's economic contribution at a UK, national and local level. Overseen by partners across government and industry, as well as an independent academic review panel, we will continue to grow our access to wider sources of data and analysis so that future annual reports will increase in reach, fidelity and maturity.



1. A key part of the challenge is that 'defence' does not have a standard industrial classification (SIC) (like other parts of the economy), and economic activity supported by defence is found across different SIC codes/areas of economic activity.
2. The JEDHub developed a working definition of the "defence sector" which was used in the 2021 survey; it represents those activities that support the production and delivery of military goods or services for a defence customer (UK or international). As such this report does not include data on the economic impacts of MOD's own activities (e.g. MOD's internal employment and skills investment).
3. All analysis of JEDHub Survey data uses only the responses from these 26 companies. Where other data sources are cited, the analysis is not limited to the impact of these 26 companies.

UK Defence Sector: Jobs and Turnover

The UK defence sector makes an important contribution to the UK's national security by designing, developing, and supporting battle-winning capabilities for the UK's Armed Forces and allies. It also contributes directly to the UK's economic wellbeing, bringing advanced jobs, capabilities and investment to the UK.

The sector has a wide regional footprint and supports high-value, high-skilled jobs across the UK. There are key manufacturing and service hubs UK-wide, which make an important contribution to local communities and regional investment. Greater data availability in

future versions of this report should allow more accurate modelling of the local and regional impact of the defence industry.

The analysis in this section of the report uses data collected from the JEDHub's own Annual Survey of 26 UK defence companies, alongside information provided by ADS, the MOD and the ONS to develop a representation of the national, regional, and local impact of the defence sector across the UK through jobs, revenue, and demographics.

£25.3bn

2020 total UK defence sector turnover.
15% real growth since 2015.¹



The turnover data above comes from the work completed for the annual ADS Facts and Figures 2021 report.

JEDHub Annual Survey Results for 2020

All figures in this box represent the results from the 26 responses to the 2021 JEDHub Annual Survey.

92,000

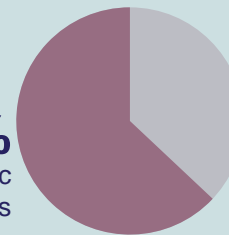
Approximate total direct defence Full-Time Equivalent (FTE) jobs

4.6%

Growth in FTE jobs from 2019

63%
Domestic Business

Turnover breakdown by source



37%
International Business*



Approximate direct FTE jobs by turnover source

*International Business measured by turnover from international sales.

The JEDHub Survey provides an accurate number of employees working in defence within the surveyed sample frame. Though this approach omits a portion of the UK defence population, it allows a focused and accurate analysis of key factors about known defence jobs. The remaining analysis in this section of the report (UK Defence Sector) focuses on the JEDHub Survey results.

Other organisations use different methodologies to provide estimates for total jobs in the UK defence sector. The MOD estimate that 125,000 direct jobs were supported in 2019/20 through MOD expenditure with UK industry and commerce,^{2,3} whilst ADS estimate 133,000 direct employees worked in the UK defence sector in 2020.¹

UK Defence Sector: Industry Across the UK

The JEDHub Survey shows the distribution of the 92k surveyed UK defence FTE jobs in 2020.

Defence jobs contribute to delivering high wages, skills and levels of productivity across all International Territorial Level 1 (ITL1) regions of the UK.

The JEDHub Survey identified defence sector roles in every ITL1 region of the UK. 83% of defence jobs were in 4 English regions (the South West, North West, South East and East) and Scotland. 80% of direct MOD expenditure with industry in 2020/21 was also with these 5 regions.¹

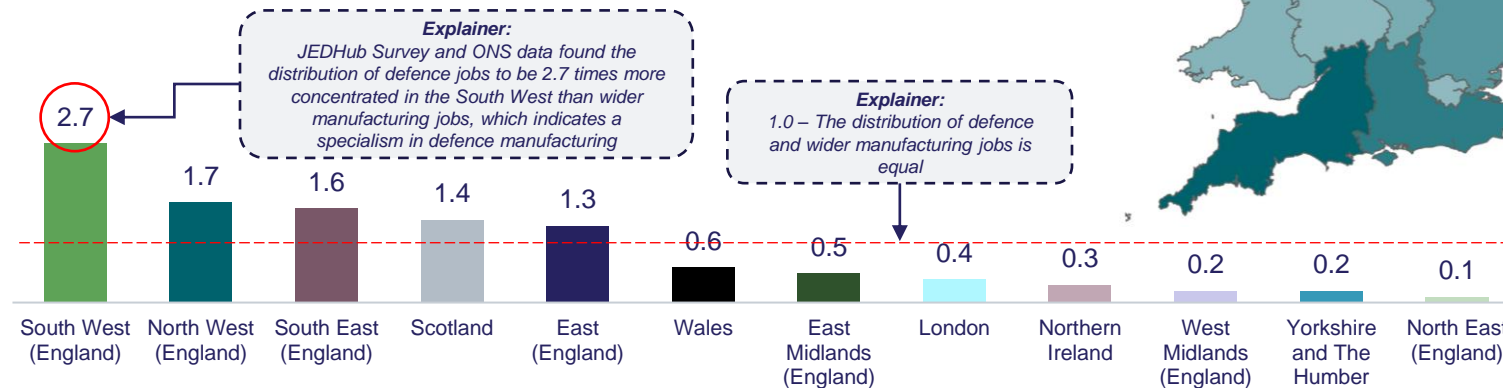
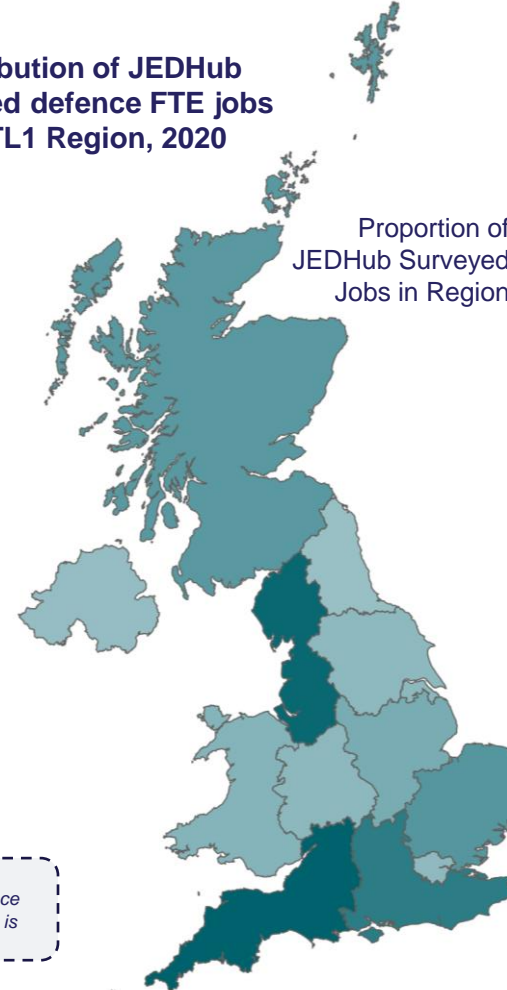
In total, JEDHub surveyed jobs in these five ITL1 regions grew by 4.9% between 2019 to 2020.

At a more local level, local defence employment hotspots were found in Lancashire, Cumbria, Gloucestershire, Wiltshire, Bath and Devon. The defence sector also makes an important contribution to local communities through providing highly skilled and well-paid roles.

The map to the right shows the density of JEDHub surveyed defence jobs by ITL1 region.

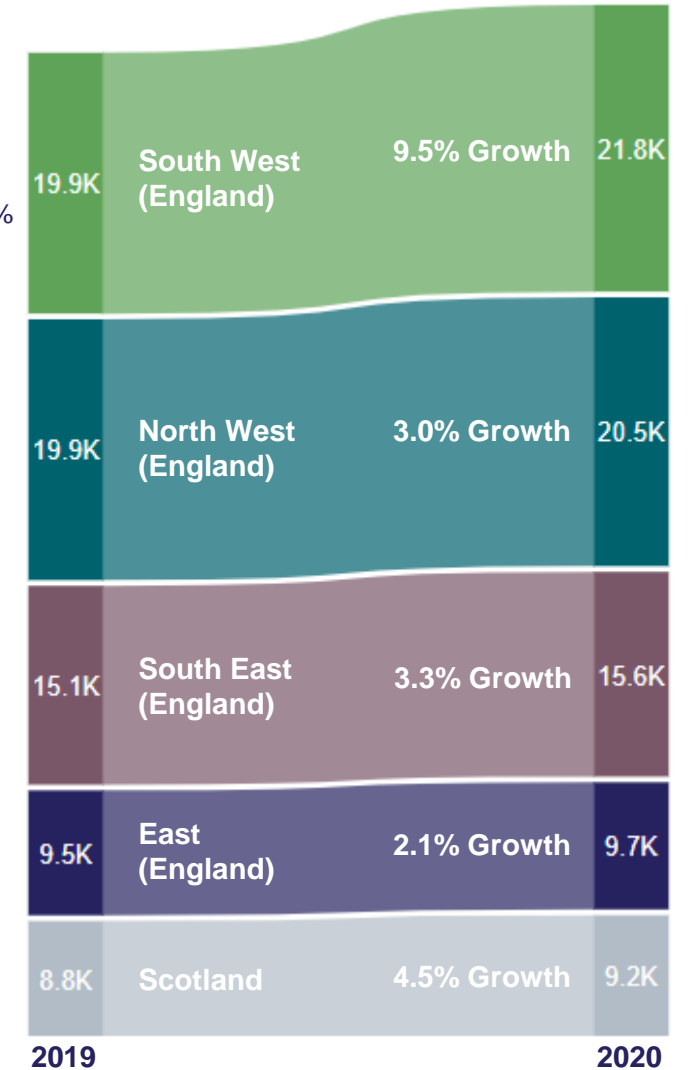
The graph below shows whether defence jobs identified by the survey are under or overrepresented in each region, relative to the share of wider manufacturing jobs in the UK, as identified by ONS.²

Distribution of JEDHub Surveyed defence FTE jobs by ITL1 Region, 2020



Explainer:
JEDHub Survey and ONS data found the distribution of defence jobs to be 2.7 times more concentrated in the South West than wider manufacturing jobs, which indicates a specialism in defence manufacturing

Explainer:
1.0 – The distribution of defence and wider manufacturing jobs is equal








No. of JEDHub Surveyed defence FTE jobs by ITL1 Region, 2019-2020 (Top 5 regions)

Location Quotient – JEDHub Survey defence FTEs vs ONS manufacturing jobs by region, 2020

Sources: ¹MOD regional expenditure with UK industry and commerce and supported employment 2020/21, ²Employees in the UK - Office for National Statistics (ons.gov.uk)

UK Defence Sector: People

Top 5 Employment Capability Areas in JEDHub Surveyed Companies, 2020:

-  **Combat Air**
• 28% of total employment
-  **Sub-Surface Maritime**
• 18% of total employment
-  **Surface Maritime**
• 14% of total employment
-  **Weapons and Ammunition**
• 12% of total employment
-  **Land**
• 9% of total employment

Significant levels of employment were identified across all five defence domains: land, sea, air, cyber and space.

£45,000

The approximate mean average FTE job salary among the surveyed companies in 2020

4.7% salary growth since 2019

16.7% greater than the UK mean average annual full-time salary in 2020¹

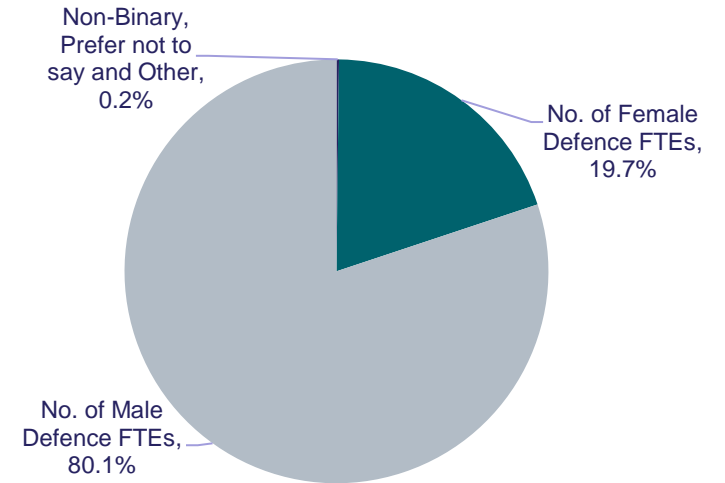
The JEDHub Survey results provide details on the employment structure and demographics of the defence sector.

Combat Air had the largest proportion of employment of the surveyed population; there were also large populations working within the Maritime, Weapons and Ammunition and Land domains.

Salaries in the defence sector grew from 2019 to 2020 with the average defence salary in 2020 from surveyed companies 16.7% greater than the ONS published mean annual salary for the UK.

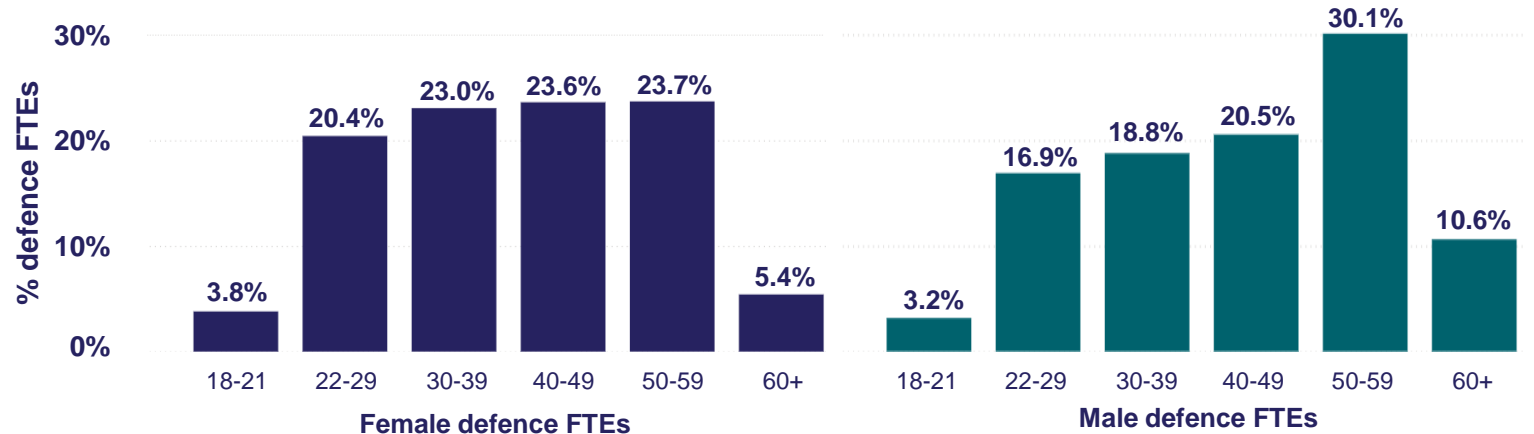
Whilst the proportion of female employees in the defence sector is small relative to male employees, the proportion of female employees in the UK defence sector increased from 19.1% to 19.7% from 2019 to 2020. This figure is consistent with Women in Defence UK which suggest 19% of Defence Sector jobs are held by women.²

The distribution of male employees by age was clearly skewed, with over 40% of the male workforce in the 50+ age groups. However, both the female and male workforce are younger on average in 2020 than in 2019, which is indicative of a potential shift in demographics.



Gender breakdown of JEDHub Surveyed defence FTEs, 2020

Distribution of JEDHub Surveyed Male and Female jobs by age group, 2020



Sources: ¹Earnings and hours worked, industry by four-digit SIC: ASHE Table 16 - Office for National Statistics (ons.gov.uk), ²Women in Defence UK | Promoting Gender Balance Across Defence (Includes both UK Armed Forces and MOD Civil Service employment)

International Trade in Defence

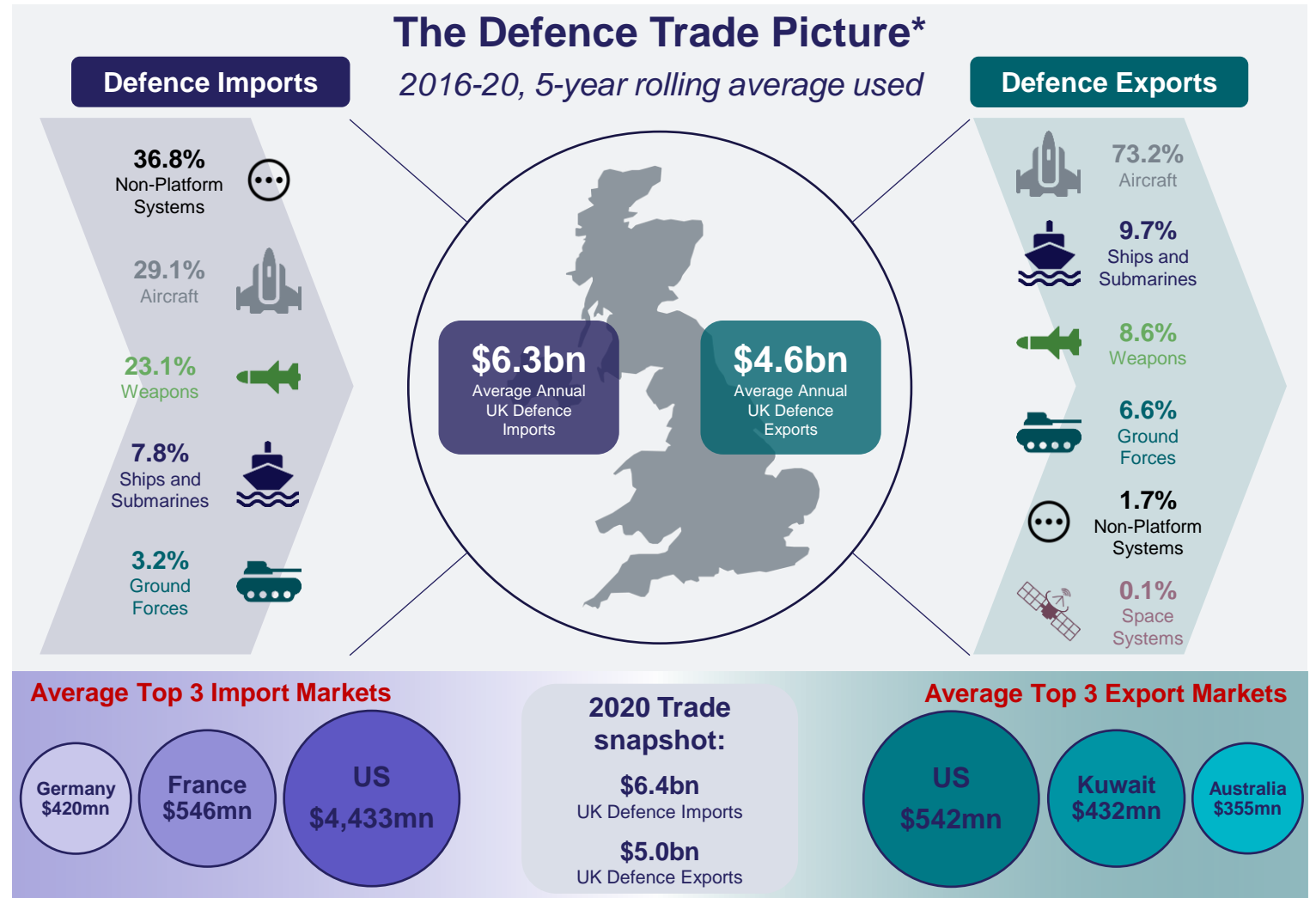
The Value of International Trade

International Trade is vital to the UK economy and the Government's strategy for a Global Britain. As part of the Government-wide drive to 'Build Back Better', the Department for International Trade has outlined an export strategy, with the central vision: ['Made in the UK, Sold to the World'](#); this strategy aims to significantly bolster UK exports in the coming years, allowing the UK economy to take advantage of the range of benefits this will provide. Trade of goods and services supports economic growth, jobs and prosperity across the nation. Exporting businesses

are more profitable, pay higher wages and remain internationally competitive. Importing also provides significant benefits through technologies and investment made elsewhere. In the defence sector, industrial collaboration with allies and partners can support the development of domestic skills and industrial capabilities, reduce our costs and share technology to mutual benefit, strengthening international relationships. Eurofighter Typhoon and the Joint Strike Fighter (F-35) are notable examples of this approach.

The strategic value of international trade extends beyond the value of traded goods and services. Strong alliances and partnerships worldwide are more important than ever for the UK, and these benefits are important to consider alongside the UK's defence exports. In almost every aspect of UK national

security and prosperity, the UK must work with others due to the global nature of today's threats, opportunities and supply chains. Defence exports and international collaborative projects are a major contributor to strengthening existing partnerships and building new ones.



***Sources and Notes:** The Janes Global Platforms & Systems (GPS) database assesses markets on a deliveries basis in USD, using system level data. This data captures sub-tier activity and business-to-business activity (e.g. the Eurofighter Typhoon, aspects of which account for both imports and exports), rather than solely end-product level data. Space, Services and Infrastructure-related data are limited in the database. *Non-Platform Systems* encompasses a broad range of programmes, including those such as IT systems which can add significant value. All statistics are based on UKDSC analysis of Janes GPS data. Further information on the Janes GPS methodology can be found in Annex B.

A Focus on Defence Exports

UK Defence Export Orders, 2020¹

DIT Defence & Security Exports 2020

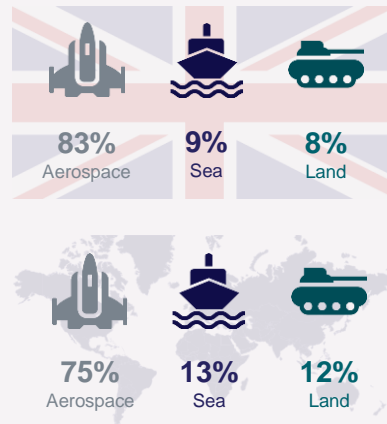
£7.9bn

UK Defence Exports (Orders), 2020¹

2nd Largest Defence Exporter

On an orders basis, using a 10-year rolling average¹

The distribution of UK defence exports by domain is similar to that seen in the global market, right¹



Explainer:

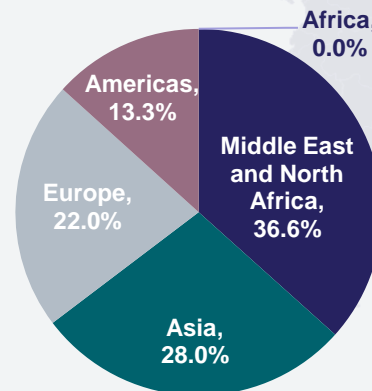
DIT DSE export figures assess the value of defence orders placed, whilst Janes GPS assesses the value of deliveries made in the given year. This methodological variance results in the difference in observed findings.

Whilst both methods provide value, the JEDHub has opted to conduct most of the trade analysis in this report using the Janes GPS deliveries data, with a view to making cross-sector comparisons in future report iterations.

UK Exports, 2016-20: \$22.7bn²

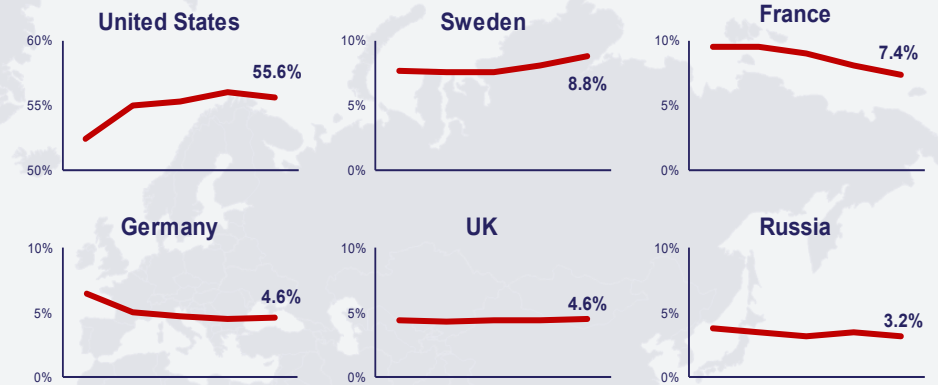
From 2016-20, the UK exported defence materiel to **62** markets globally, with these sales summing to **\$22.7bn²**. The *Middle East and North Africa* represented the largest regional export market in this period. UK sales to this region rose by 122.5%, from \$0.8bn to \$1.8bn in the five-year period 2016-2020. In contrast, sales to Europe have decreased over the same period, falling 37% from \$1.7bn to \$1.1bn.

UK Exports by Region, 2020²



Janes GPS Export Deliveries

Top 6 Defence Exporters by % Global Market Share, 2016-20* ²



Note: Different axes have been used on the US chart

In 2020, the UK occupied the 5th largest percentage market share (4.6%) of known global defence exports, measured in deliveries by Janes GPS. This represents a slight increase from the 4.4% seen in 2019.

It is well-established that the US dominates the global defence market, as shown in these data. Sweden has also been particularly prominent in recent years, with trade levels driven by *Non-Platform System* sales to the US Air Force. On a global scale, in 2020 the known defence export market remained consistent, rising 0.5% to \$109.0bn. This may indicate a level of resilience in defence trade, in a year when the IMF observed wider global trade of goods to have shrunk by 4.6%.³

***Notes:** The Janes GPS database assesses 70 markets globally, capturing over 95% of accessible Western defence markets. Whilst data is captured on the Russian and Chinese markets, it is not as complete as that collated for others, meaning their observed presence in the global defence market may be underestimated.

MOD Expenditure with Defence Suppliers

What do we know about the direct MOD Supply Chain?



10,000

Organisations paid directly by the MOD in 2020/21¹



Top 18

Suppliers paid over £500m receive around 50% of total MOD spend¹



The UK MOD buys a wide range of products and services from the UK defence industry and from suppliers based overseas. Direct contracts are heavily skewed towards large primes due to the long-term and complex nature of military procurement and technologies and are thus often sourced without competition.

However, the broader supplier base is critical to the MOD through both direct spend outside of the defence sector (e.g. construction, consulting services), and indirectly through the highly diversified supply chain.

Competitive tenders are also important for driving value for money, and introducing new capabilities and suppliers, particularly SMEs.

MOD's direct and indirect expenditure with SMEs through the supply chain is captured each year by Cabinet Office as part of the Government's commitment to support SMEs through government procurement.

MOD's procurement spending with SMEs has been increasing with the intention to continue to grow the proportion of procurement spend with SMEs up to 25% direct and indirect spend by 2022.³

SMEs play an important role in the MOD's supply chain

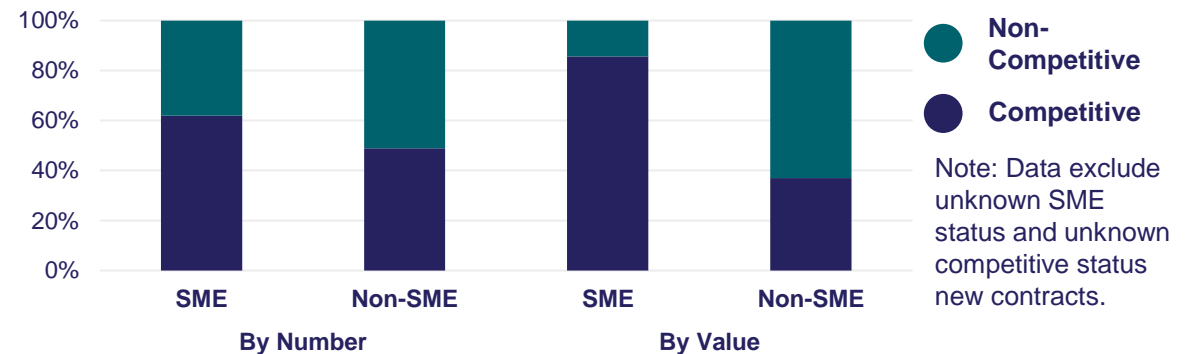
Total SME spending: Latest data from the Cabinet Office show that MOD spent **£1.1bn directly with SMEs** in 2019/20 and a further **£3.4bn indirectly reached SMEs** through the supply chain. This accounted for 21.3% of a total £21.1bn MOD procurement spend in the 2019/20 financial year.²



New contracts placed by MOD: In 2020/21, **37%** of around 2,250 new MOD contracts placed were with SMEs, representing **10%** of these new contracts **by value**.¹

The data below shows that new contracts placed with SMEs in 2020/21 tended to be **let competitively**, relative to non-SMEs, particularly by value.¹

Proportion of competitive and non-competitive contracts, 2020/21

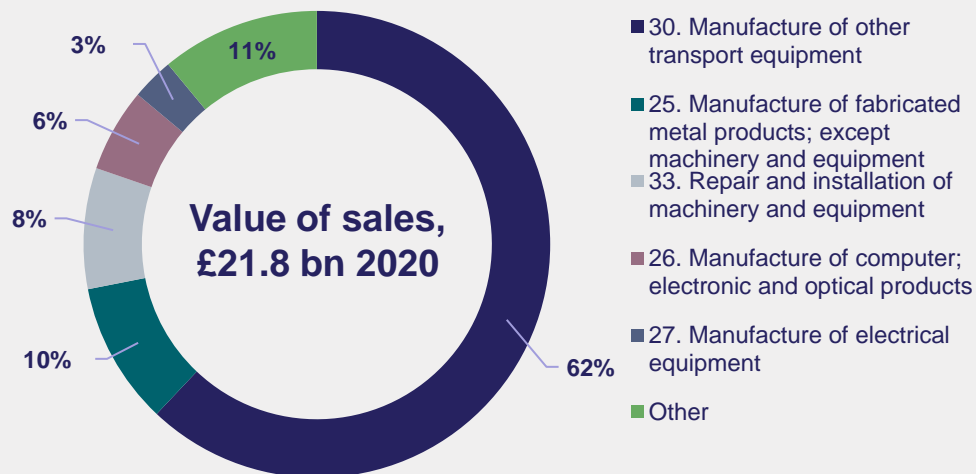


UK Defence Suppliers: Sales by Product and Industry

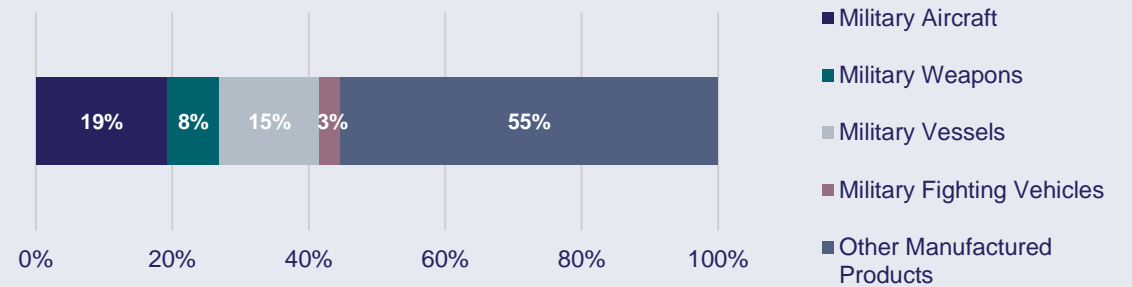
By matching the selection of companies who received the JEDHub Annual Survey (the “sample frame”) against ONS PRODCOM Microdata it is possible to analyse the range of manufactured products they sell, including whether they sell any of the four specific products designed for Military use: military aircraft, military vessels, military weapons and military fighting vehicles (see notes for full definitions and Product Codes).

Sales in the matched sample frame totalled **£21.8bn in 2020** – a figure broadly in line with the £25.3bn value provided by ADS – and are dominated by the manufacture of ‘other transport equipment’ which includes three of the four military specific product codes. There is a relatively broad range of other manufacturing sectors represented in the sample frame such as the manufacture of fabricated metal products (including 25.4 Weapons), repair and installation of machinery; the manufacture of computer, electronic and optical parts; and electrical equipment. **This analysis shows the diversity of the defence supply chain, and thus its importance to wider manufacturing sectors. Further, this diversity supports the resilience of the defence supply chain.**

In all categories, while some of these manufactured products will be for civilian use, many will be for military customers or produced under sub-contracts or supply chain linkages. Sales values will also capture export as well as domestic sales.



Total sales value by division (2 digit SIC) for matched JEDHub sample frame companies, 2020



Over half of the sales value in the matched sample frame were in the wider manufacturing supply chain in 2020, outside the four military product areas.

By comparing sales values for the four military products with published ONS data, we can see that the sample frame was well targeted and captured 70% of military weapons sales, 96% of military vessels, 90% of military aircraft, and 76% of military fighting vehicles. Together military product sales represented around 45% of sales value in the sample frame, with the remainder in other manufactured products which will be for a mixture of civilian and defence use.

Examples of these other products that are likely to have strong defence applications include:

- 26511150 - Instruments and appliances for aeronautical or space navigation (excluding compasses).
- 26512020 - Radar apparatus.
- 25501280 - Drop forged steel parts for locomotives or rolling stock, aircraft, spacecraft, electrical machinery and equipment, optical, photographic, cinematographic, measuring, checking or precision apparatus.

Notes: 39 companies from the JEDHub sample frame were successfully matched into ONS PRODCOM microdata, including many of the larger defence primes. Note: many sample frame companies do not manufacture goods so would not be present in PRODCOM microdata. Further information about the quality of these data and methodology for this analysis is found in Annex C PRODCOM codes start with the same 2 digits as their SIC division and have been aggregated on that basis in this analysis. SIC divisions grouped into “other” are: SIC 28, 24, 29, 21, 22, 23, 31, 13, 32, 18. Military Aircraft is defined as PRODCODE 30309999: Manufacture, installation and repair of military aircraft and parts thereof. Military vessels is defined as PRODCODE 30119999: Manufacture, installation and repair of military vessels and parts thereof. Military weapons is defined as PRODCODE 25408999: Manufacture of military weapons and parts thereof. Military fighting vehicles is defined as PRODCODE 30409999: Manufacture of military fighting vehicles.

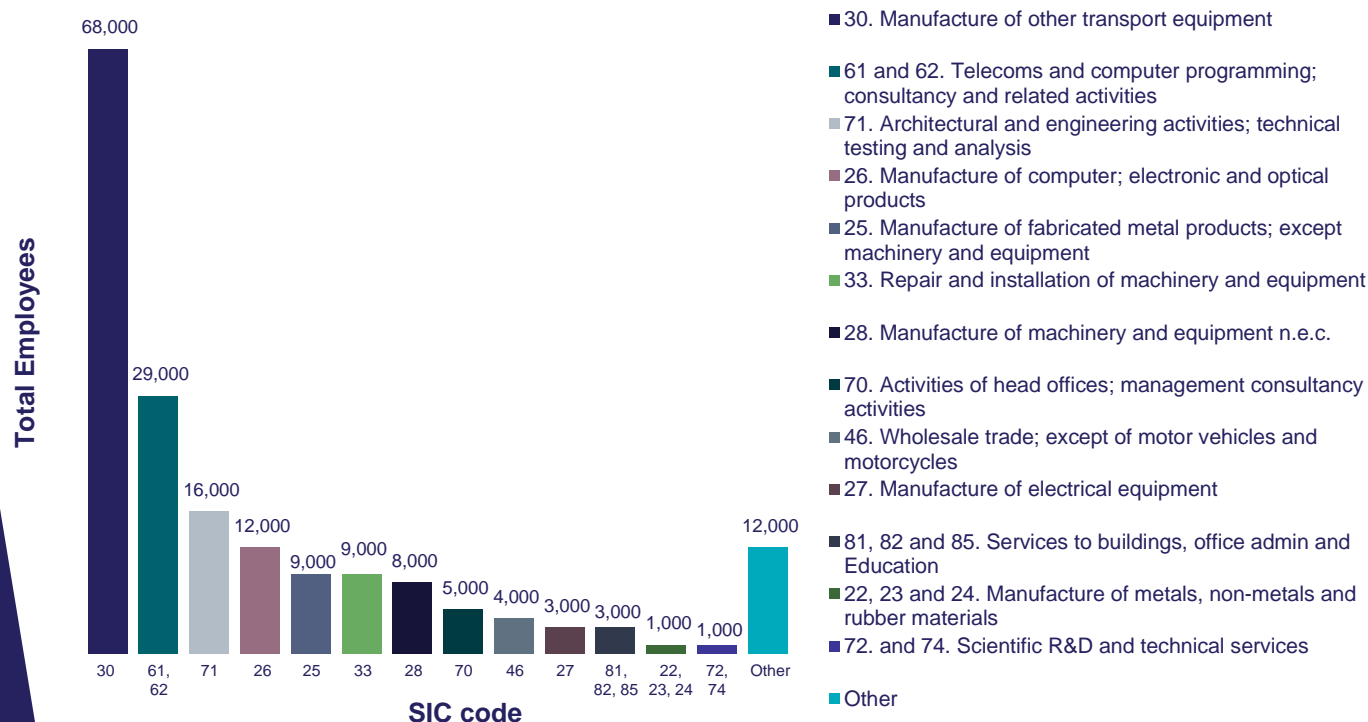
Sources: [ONS PRODCOM data, 2020](#)

UK Defence Suppliers: Employment by Industry

By matching the range of companies who received the JEDHub Annual Survey (the “sample frame”) against ONS BRES Microdata it is possible to analyse total employees of these companies by industry, and the location of these employees in Great Britain (see notes for more details of matching rate and definitions).

Following a similar pattern to the PRODCOM sales analysis, the sample frame showed that just over 40% of the total of **179,000** jobs are in the divisions most associated with defence manufacturing equipment - division 30 “other transport equipment” (includes SIC 30.3 aircraft, 30.4 military fighting vehicles and 30.1 ships) and division 25 “Manufacture of fabricated metal products (which contains 25.4 Weapons). However, this data also showed a range of other employees in telecom and computing programming (SIC 61 and 62) and engineering activities and technical testing (SIC 71). Again, **this analysis illustrates the breadth of both manufacturing and service industries associated with and supported by the defence industry.**

Total employees by division (2 digit SIC) for matched JEDHub sample frame companies, 2020



How many jobs are in manufacturing?

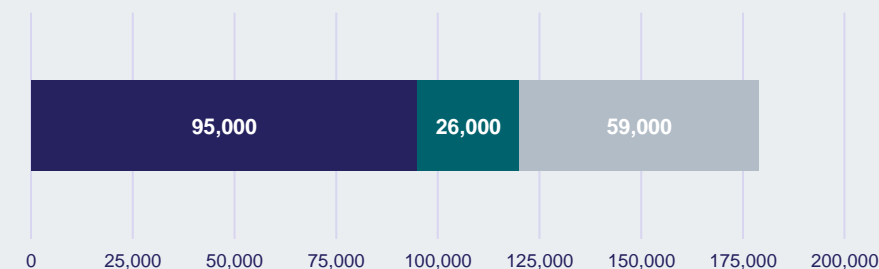
Two-thirds (120,000) of the 179,000 employees in the sample frame were associated with manufacturing industries – and within that 95,000 were associated with companies that manufacture at least one type of military-use product using the same definitions as the PRODCOM analysis (see notes for more details). The remaining one-third of employees were associated with different types of service industries.

179,000

Total defence and civil employees in JEDHub sample frame, 2020

Total JEDHub sample frame matched jobs, 2020

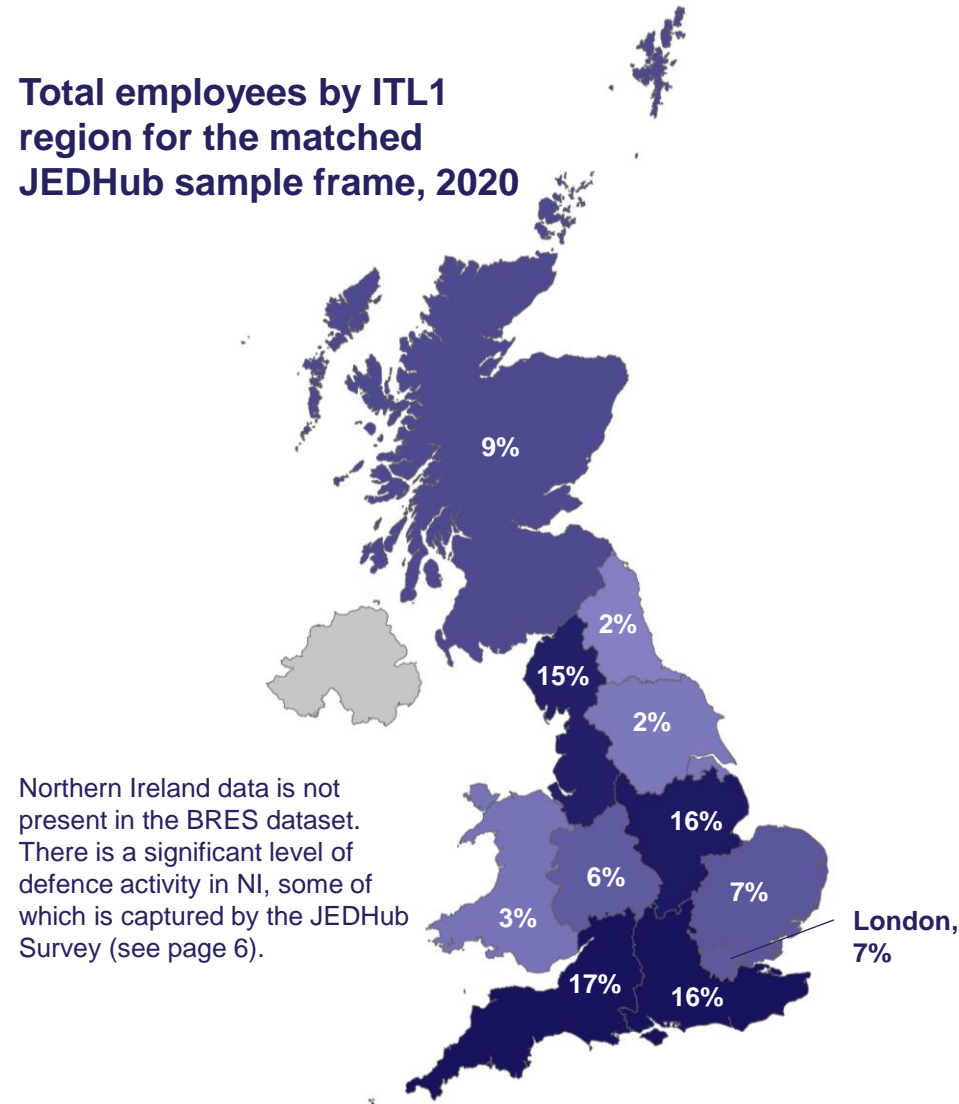
- Matched Reporting Units with sales in at least one military product found in PRODCOM
- Matched Reporting Units with no military product sales in PRODCOM
- Matched Reporting Units not present in PRODCOM



Sources and Notes: 62 companies from the JEDHub sample frame were successfully matched into ONS BRES microdata, including many of the larger defence primes and supporting suppliers. Further information about the quality of this data and methodology for this is found in Annex C. Other divisions defined as: SIC 29, 52, 53, 69, 63, 77, 45, 32, 95, 47, 51, 21, 42, 13, 11, 18, 49, 73, 20, 64. Reporting Units with any military product sales are defined by any of the four PRODCOM military codes (30309999, 30119999, 25408999 and 30409999). Northern Ireland is not present in the BRES micro dataset. Totals may not sum due to rounding.

UK Defence Suppliers: Employment by Nation and Region

Total employees by ITL1 region for the matched JEDHub sample frame, 2020



Northern Ireland data is not present in the BRES dataset. There is a significant level of defence activity in NI, some of which is captured by the JEDHub Survey (see page 6).

On a regional basis – The East Midlands is added to the top 5 regions most associated with Defence employment found elsewhere in this Report. Employees in these six regions were largely associated with companies in the sample frame that produce manufactured goods and are found in the PRODCOM analysis. In contrast, London has a greater proportion of employees associated with sample frame companies that produce services output.

How many of these jobs are “defence” jobs?

This analysis using BRES microdata includes employees that produce goods and services for both civilian and defence customers. An assumption would need to be applied to these totals about the proportion of jobs associated with defence customers to obtain an estimate of “defence jobs”. Elsewhere in this report the JEDHub survey gives a directly measured figure for defence jobs from responding companies and future analysis could integrate these two methods to obtain estimates for employment in a greater share of the defence sector and its supporting supply chain companies.

Sources and Notes: 62 companies from the JEDHub sample frame were successfully matched into ONS BRES microdata, including many of the larger defence primes and supporting suppliers. Further information about the quality of these data and methodology for this analysis is found in Annex C. Employees are allocated by Local Unit within the dataset to a ITL Level 1 region. ONS define a Local Unit as an individual site (for example a factory or shop) in an enterprise. Northern Ireland is not present in the BRES micro dataset.

UK Defence Sector Productivity: Generating Value

Measuring Defence Output

The Gross Value Added (GVA) of a sector measures the contribution of that sector to total economic output, or Gross Domestic Product (GDP), a standard measure of economic health.

Productivity measures how efficiently inputs are converted to outputs, more specifically it often refers to GVA per worker.

Industry adds value to an economy beyond direct GDP contributions, some of which is quantifiable, and much is included through other sections of this report.

Sustainable Productivity Growth

Wider economic measures also reflect the value of a sector. A wage premium in the sector not only reflects greater employee compensation but can serve as a proxy for a higher skilled workforce.

With JEDHub surveyed jobs growing across most regions of the UK between 2019 and 2020, the sector is driving a demand for high productivity, highly skilled and high wage jobs across the UK. FTE jobs growth of 9.8%, 5.2% and 5.2% in Northern Ireland, Scotland and Wales respectively also reflects the contribution of defence to all nations in the Union.

Ensuring sustainable growth means that the value and jobs generated by the sector are not transitory and will continue to contribute to the economic prosperity of the nation.



Jobs Growth Across UK

JEDHub survey data found there to have been growth in FTE jobs in 11 of 12 ITL1 regions across the UK between 2019 and 2020, despite the contraction in manufacturing jobs due to the Covid-19 pandemic



Estimated direct GVA of the UK defence sector in 2020¹

Real growth of 14% since 2015



Sustainable Output Growth

15% real growth in defence sector turnover from 2015 to 2020¹

UK Defence Sector Productivity: GVA per Worker

Productivity is a useful measure for cross-sector, international or temporal comparisons as it is independent of differences in the size of the workforce.

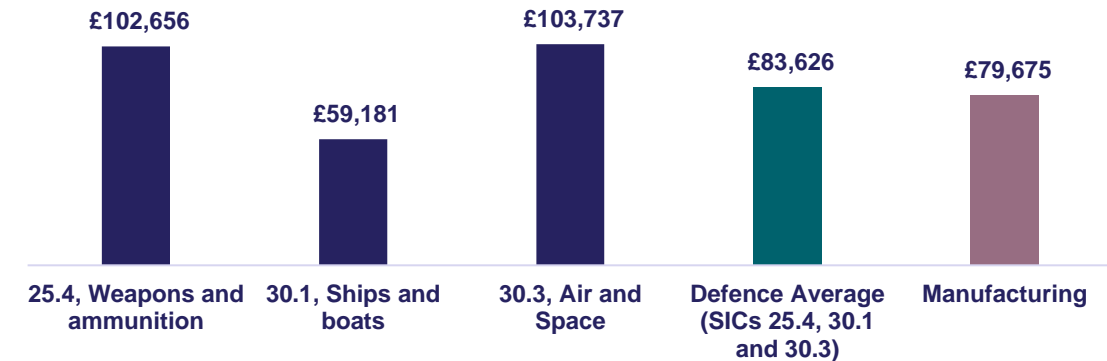
Productivity can indicate the level of skills, technology adoption, infrastructure and even employee wellbeing within a sector, as all contribute to the productivity of a workforce.

This report measures GVA per worker using ONS data to measure the productivity of three key defence manufacturing sectors: ships & boats, air & spacecraft, and weapons & ammunition. These industries have been specified to reduce the level of non-defence activity captured in the productivity measure.

The data suggest that these UK defence manufacturing sectors are 5% more productive than wider UK Manufacturing; the sectors of the manufacture of Weapons & Ammunition and of Air & Spacecraft are particularly productive.

Due to this approach, this section does not include productivity data on other key defence capability manufacturing which make up a large portion of UK defence industrial activity (e.g. land sector), companies who report economic activity in alternative SIC codes, or defence service sectors. All of these will contribute significant value to defence output and employment, in addition to the data displayed in this analysis.

Average worker productivity (GVA per Worker) by SIC code, 2019¹:



£83,626

GVA / Worker

Estimated average annual worker productivity across three defence manufacturing sectors, 2019¹*

5% greater than the Manufacturing average.

Productivity Growth

The productivity of the manufacture of weapons and ammunition, ships and boats, and air and spacecraft grew by **11%**, **4.3%** and **1.0%** respectively from 2018 to 2019.¹



Defence Manufacturing Sector ¹ *	Weighted Total GVA	Weighted Total Employment	GVA per Worker, 2019
Ships and boats, 30.1	£1.42bn	23,940	£59,181
Air and spacecraft, 30.3	£1.83bn	17,594	£103,737
Weapons and Ammunition, 25.4	£1.25bn	12,160	£102,656
Total	£4.49bn	53,694	£83,626

***Notes:** The average annual worker productivity was estimated using SIC codes for the following defence manufacturing sectors: Manufacture of Air and Spacecraft, Manufacture of Ships and Boats, and Manufacture of Weapons and Ammunition. Therefore, the total GVA and employment figures in the table above do not represent an estimated value for the whole defence industry. Further information on the methodology applied can be found in Annex D.

Innovation & Investment in UK Defence

The UK's investment in science and technology (S&T) and R&D capabilities grows and sustains skills and jobs across the country. Investment programmes attract allies and partners to work with the UK and sustain our economic and security resilience. They are the basis for generating military capabilities and other tangible and intangible assets, which are themselves levers of national power and influence.

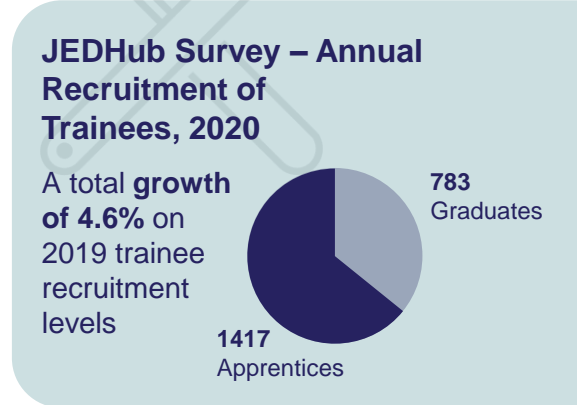
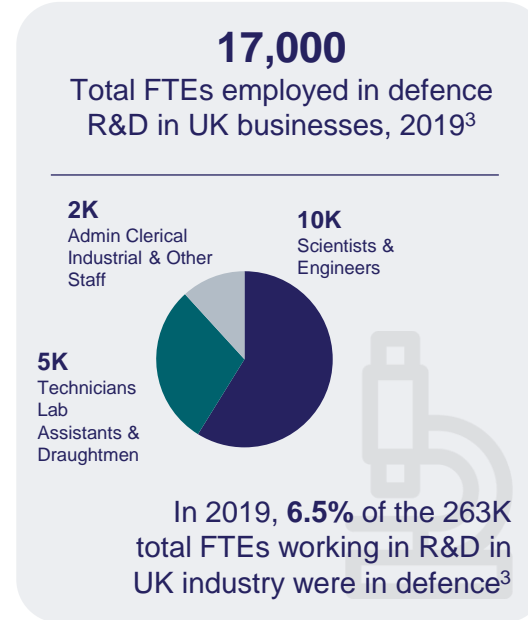
Furthermore, evidence has highlighted the value of investments made in R&D, suggesting that on average **every £1 of public R&D investment generates around £7 of benefit to the UK.**¹ Sustaining strategic advantage through S&T and strengthening the S&T base is an essential component of the UK's national security and international policy. Defence is already a prominent aspect of government R&D investment, and the [2021 Spending Review](#)

included commitments to further increase government-wide investment.

There will be a level of UK R&D undertaken by non-defence organisations, which is not captured in the data presented. This additional activity may support future defence technologies through exploitation of emerging technologies and dual-use systems.

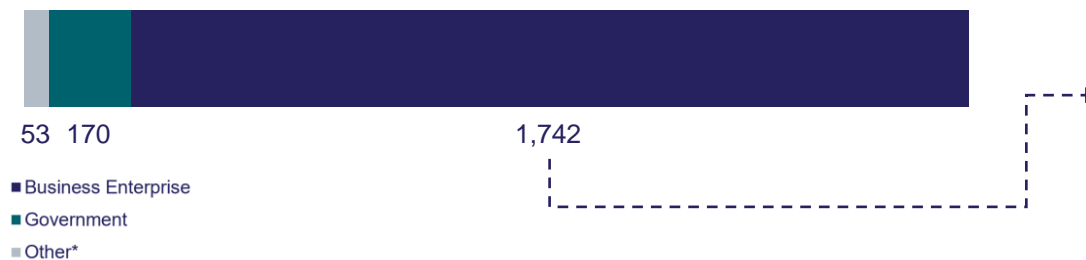
In defence, R&D activity is often conducted by SMEs supported by primes, providing an opportunity for growth.

The UK is a highly attractive destination for Foreign Direct Investment (FDI) from around the world. In defence, attracting appropriate FDI supports high-level skills and technologies, which benefit the economy and the capabilities of the Armed Forces (see next page).

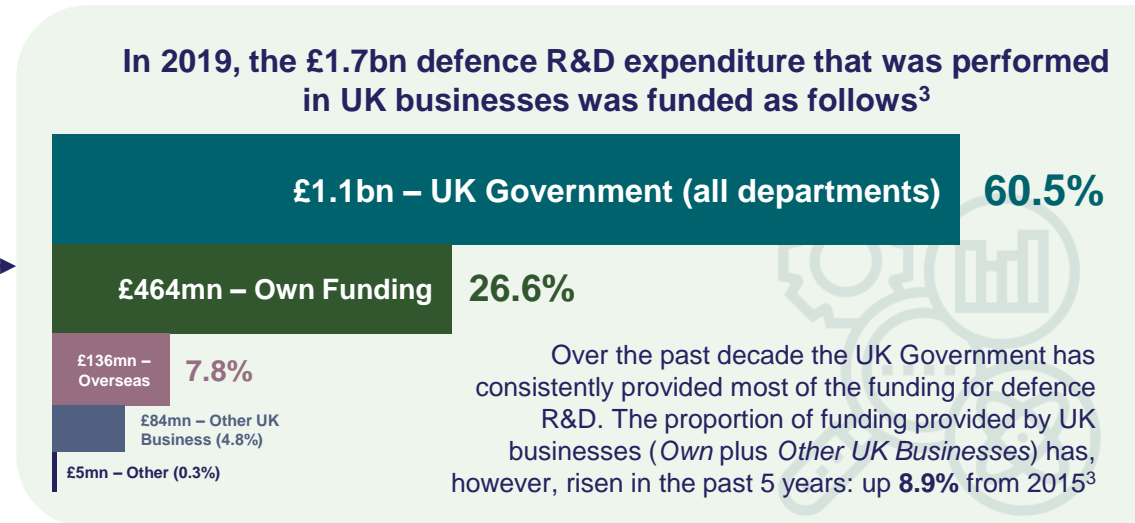


£2.0bn

Gross UK spending on defence R&D, 2019. Split by sector below (£mn)*²

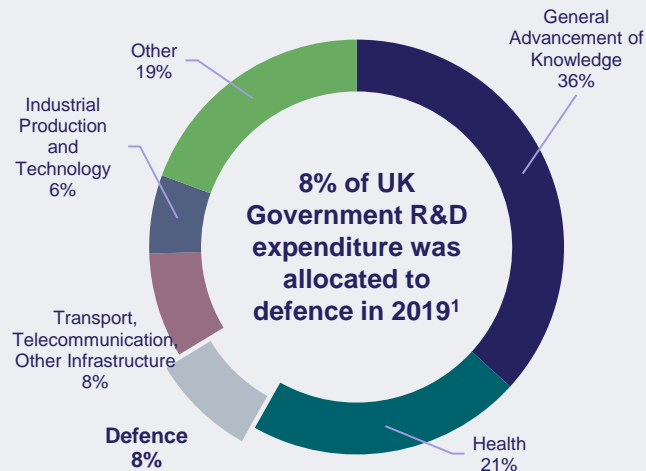


¹Notes: Data showing defence R&D by sector of performance. 'Other' refers to 'Higher Education', 'Private Non-Profit', 'UK Research and Innovation', which have been combined due to disclosive data. 2019 represents the most recent year of commonly available data



Innovation & Investment: Comparisons at Home and Abroad

UK Government Expenditure on R&D by Socio-Economic Objective, 2019¹



UK MOD R&D spend, 2019: **£1.0bn**
Total UKG R&D spend: **£12.2bn**

Of the **£1.0bn** spent by MOD on R&D in 2019, in-house expenditure accounted for **£170mn**, **£904mn** was attributed for R&D. Additionally, the MOD received **£57mn** of funding.

98.8% of the £904mn provided by MOD for R&D in 2019 was received by UK business.¹

The [2021 Integrated Review of Security, Defence, Development and Foreign Policy](#) outlines plans for at least £6.6bn of investment in advanced and next-generation defence R&D over four years.

FDI within JEDHub Surveyed Companies^{†3}

Of the 66 firms in receipt of the JEDHub 2021 Annual Survey, 60 have been matched to the UKDSC's Investment Analysis Toolset (IAT). Between 2016 and 2021, the IAT finds **14** of these companies have received FDI, totalling a value of **£186.5mn**.

£186.5mn
Invested into JEDHub surveyed companies, 2016-2021

Between 2016 and 2021, the top three sources of foreign direct investment into these companies were Germany (57.7%), Norway (24.4%), and the Netherlands (5.6%).

3rd Largest R&D Budget Allocated to Defence amongst OECD Countries*²

OECD Government Budget Allocations for R&D (GBARD) data on defence finds the UK to have had the **3rd** greatest budget allocation for defence R&D in 2019, and the **4th** largest proportion of total R&D budget allocated to defence within the OECD group of countries.²

*Notes: GBARD data does not cover the majority of non-OECD countries, including major defence players such as Russia and China. Budget Allocation data has been provided due to limited availability of gross expenditure R&D statistics

[†] Notes: Data has been captured using the UKDSC Interactive Analysis Toolset, which draws from and corroborates between a range of reputable subscription-based data sources. FDI data has been tracked using the IAT to that related to the highest UK-registered reporting unit for JEDHub surveyed businesses, whose activity is solely defence. This ensures that deals, investments and company data captured are relevant to the UK defence sector, and other business involvements do not affect the presented data. Some FDI may be missing from the data, particularly that pertaining to intracompany trading, investment from foreign parent companies and foreign takeovers, thus foreign ownership in the sector should also be considered.

Conclusions and Next Steps

This report identifies some of the principal ways in which the UK's defence sector contributes to the economy, and sets a strong foundation for building on these themes in future JEDHub development.

For the first time, new insights have been obtained by collecting data directly from companies via the JEDHub Annual Survey. This has allowed a picture to be developed of employment, based on customer split and capability segment, as well as more granularity on the location of defence jobs in the UK. In addition to the new insights from the survey, this report pulls together in a single place a number of sources to build a better overall picture of the defence sector.

As the JEDHub takes this work forward, it will continue to be guided by these four key principles:



Joint Activity between the UKDSC, government, industry and academia, recognising that data and expertise reside across a number of different entities;



Independent and Impartial to ensure that government, industry and other users have confidence in its quality and impartiality;



Better, Consistent Data that provides greater granularity and fidelity showing trends over time; and



Collect Once, Use Many to support synergies across government and industry and to reduce the burden on the companies providing the data.

Working closely with its stakeholder community, the JEDHub has identified a number of important priorities for the year ahead, which include:

- Launching a digital version of the JEDHub 2022 survey to ease the challenge of data collection and analysis;
- Widening the sample size to ensure we can capture a sector wide perspective from survey responses;
- Maximising opportunities to leverage other data sources, particularly expanding on ONS Microdata and SIC code analysis;
- Aiming to provide more data about the economic contribution at a national, regional and local level, including indirect impacts; and
- Continuing to develop the JEDHub.org portal to become the recognised resource for economic data for the UK defence sector.

Thank you for reading this first JEDHub Annual Economic Report. This is an important milestone as we continue to grow our understanding of the economic contribution of the UK defence sector.



Sources and Acknowledgements

Sources:

- [*ADS: Facts and Figures 2021*](#)
- [*Central government spend with SMEs 2019 to 2020 - GOV.UK \(www.gov.uk\)*](#)
- [*DIT DSE Defence & Security Exports for 2020*](#)
- [*IMF: Report for Selected Countries and Subjects \(imf.org\)*](#)
- [*Janes GPS*](#)
- [*JEDHub Annual Survey 2021*](#)
- [*MOD regional expenditure with UK industry and commerce and supported employment 2019/20*](#)
- [*MOD regional expenditure with UK industry and commerce and supported employment 2020/21 - GOV.UK \(www.gov.uk\)*](#)
- [*MOD trade, industry and contracts 2021 - GOV.UK \(www.gov.uk\)*](#)
- [*OECD Government Budget Allocations for R&D*](#)
- [*ONS Annual Survey of Hours and Earnings \(ASHE\)*](#)
- [*ONS Gross Domestic Expenditure on Research and Development, UKL 2019*](#)
- [*ONS Business Enterprise Research and Development, UK: 2019*](#)
- [*ONS Research and Development Expenditure by the UK Government: 2019*](#)
- [*ONS GDP output approach – low-level aggregates*](#)
- [*ONS UK manufacturers' sales by product \(PRODCOM\)*](#)
- [*ONS Business Register and Employment Survey \(BRES\)*](#)
- [*Opportunity and Innovation: The Defence Small and Medium-sized Enterprise \(SME\) Action Plan*](#)
- [*UKRI infrastructure roadmap - Progress report*](#)
- [*Women in Defence Charter \(womenindefenceuk.com\)*](#)

The 2021 JEDHub Annual Economic Report was produced collaboratively with the support of the JEDHub Delivery Working Group, consisting of representatives from the following organisations:

- *UK Defence Solutions Centre*
- *Ministry of Defence*
- *Department for Business, Energy and Industrial Strategy*
- *Department for International Trade*
- *Her Majesty's Treasury*
- *Office for National Statistics*
- *ADS*
- *MakeUK*
- *Defence Growth Partnership*

The JEDHub would like to thank the following companies for their completion of the 2021 survey:

- **The Defence Growth Partnership:** Airbus, Atkins, Babcock International Group, BAE Systems, General Dynamics, Leonardo, MBDA, QinetiQ, Raytheon, Rolls-Royce, Thales
- **15 responding supply chain companies:** Aerospace Airworthiness Consultants, Astute Electronics, Avalon Aero, Axis Electronics, Boeing, Brookhouse Aerospace Limited, Cablesan, EPS Logistics Technology, Forged Solutions Group, Glenair, L3Harris Technologies UK, Marshall ADG, Newton Europe, Portsmouth Aviation, RLC Aerospace

Additionally, the JEDHub would like to thank the wider JEDHub Industry Working Group for their contribution to the development of this report.

Find more on the JEDHub website, [here](#)

JEDHub

Joint Economic Data Hub

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ANNEX A: 2021 JEDHub Annual Survey Data and Methodology

Quality Report – JEDHub Survey

Background and Context

The purpose of the Annual Survey was to draw out new insights on the economic impact of the defence sector, by collecting data directly from industry. Other publicly available data on the economic impact of defence, such as employment, are largely based on estimation and modelling.

The main focus of the survey was to identify greater fidelity and granularity related to employment themes within the surveyed population, which includes some of the UK's largest defence suppliers.

When referring to the defence sector, a working definition was agreed between the JEDHub Delivery Working Group, which included relevant cross-government and trade body experts:

'the defence sector represents those activities that support the production and delivery of goods or services (including subcontracted work) for a defence customer (UK or international).'

This definition underpinned the annual survey questions, which companies were asked to consider when evaluation which elements of their business constituted defence business.

Methodology

The sample of companies used for the Annual Survey was derived by self-selection. It included all 11 DGP companies, who were then asked to identify their top 10 suppliers by spend. The remaining companies were considered for inclusion in the sample on the basis of the defence sector definition above. For example, enabling companies identified by the DGP companies, such as recruitment companies, were omitted. This left 55 supply chain companies that received the survey in addition to the 11 DGP companies (66 in total).

The survey sought to gather data on:

- Company Revenue
 - Of which, defence
 - Source (domestic/international, MOD/OGD/Industry)
 - Capability Breakdown
- National and Local Employment
- Employment demographics (age, gender, wages, experience)

The capability segments were agreed with Working Group Members:

- Air: Combat Air, Rotary Wing, Fixed Wing Other
- Cyber
- Space
- Weapons and ammunition (including missile systems)
- Military C3 (Command, Control and Communications, including Crypt Key - excluding space and cyber capabilities)
- Cross-cutting and enabling capabilities (ISR; CBRN; EMA; T&E)

In total, of the 66 companies to receive the survey, 26 responded (39% response rate).

Data Aggregation

Survey returns were aggregated in a Master spreadsheet, on a company-by-company basis, by the Industrial Programmes team. Company responses were reviewed for consistency and where necessary, clarification was sought. Once aggregation was completed, all data was anonymised to ensure individual companies were not identifiable.

Emerging visualisations were created from the master spreadsheet and shared within the MOD analyst community, and subsequent meetings of the JEDHub Delivery Working Group and Industry Working Group members for 'sanity' checking throughout the process.

Quality Report – JEDHub Survey

Quality Assurance

Prior to receiving the survey returns, a testing spreadsheet was created by the UKDSC which contained dummy data to simulate possible errors and flag where responses would need to be queried with companies for clarification. Each individual survey return was checked for consistency and fullness of responses, enabling the aggregation process to be carried out.

The processing of the survey returns and subsequent outputs were checked by members of the Industrial Programmes team. This involved one member of the team carrying out some of the processing and then a separate member reviewing the work and then performing spot checks checking against the original returns.

Once the dataset had been anonymised, quality assurance sessions were held between the Industrial Programmes team and UKDSC to get feedback on the outputs.

Limitations

Due to the self-selection methodology used for the sample, we are unable to identify how representative the surveyed companies are compared to the defence sector as a whole, and therefore can't use this data to make any assumptions about the wider sector. Self-selection increases the risk of biases existing in the sample, as we do not know whether the companies contain demographics that reflect the broader defence sector – for example, given their size, it is possible that all 11 DGP companies have similar employment characteristics, but these characteristics might not be reflective of all companies operating within the sector. In the Report, we have been clear in classifying results being just from the 26 companies who responded to the survey.

The analysis of the ONS Microdata will hopefully help in the development of a method to improve the coverage and representativeness of future JEDHub surveys.

A further limitation is that the quality assurance of the survey data could only be performed by members of the Industrial Programmes team, as per the data confidentiality arrangements in place with industry. Ideally, it would have been good practice to have a MOD team with analytical capability to check that the data and outputs were consistent. To mitigate this risk, the Industrial Programmes team spoke to members of the MOD analysis community and the UKDSC to check the approach to aggregating the data, and outputs were checked against other published sources of data to ensure they were of the right magnitude.

Quality Report – JEDHub Survey

Comparability

Employment data collected from the survey are not directly comparable with Official Statistics published by MOD on employment supported by MOD expenditure with industry.¹ This is due to a number of source data and methodology differences:

- The JEDHub sample frame used contains a limited number of companies that does not comprise the full defence sector. The survey outputs contain information representing only those twenty six companies that responded to the survey.
- Official Statistics published by MOD are based on total MOD spending with UK industry, using additional information from ONS on jobs/turnover to estimate that number of jobs supported. MOD spending includes elements of spending that wouldn't necessarily be considered as 'defence', such as construction, utilities and financial services.
- MOD supported jobs do not include jobs resulting from Defence Exports. The returns from the companies surveyed does include jobs from International business.

ADS also produce an estimate of direct jobs supported in the Defence Sector in their annual Industry Facts and Figures report.² This report uses MOD spending data as its initial source but excludes elements of spending that aren't considered as defence, and includes an estimate of jobs supported by defence export orders, to produce an overall estimate based on a definition of the 'Defence Sector'. The outputs from this survey therefore shouldn't be directly compared to the ADS figures given the different methodologies used.

Relevance, Timeliness and accessibility

Relevance - The outputs are relevant to members of the defence sector that wish to know more about defence employment in the UK nations and regions. This analysis will be of interest to users from media, politicians, policy professionals, students and members of the general public.

Timeliness – Survey data was collected for Calendar Years 2019 and 2020. Each subsequent survey will be based on the previous calendar year.

Accessibility - is maintained by providing visualisations of data with accompanying narrative and any caveats or notes to the charts provided on the same page.

Confidentiality and Security

The data collected from the JEDHub Annual Survey was provided under a data sharing agreement between the DGP companies and the MOD, which limited receipt and handling of survey responses only to members of the Industrial Programmes team for the purpose of aggregation and anonymisation.

Analysis of the data outputs was carried out by MOD and UKDSC analysts on the aggregated and anonymised data sets in line with the agreement.

All data has been held on secure networks and systems which have been accredited by the MOD. Data shared between the MOD and UKDSC has been via the Kahootz online secure file transfer platform.

¹[MOD regional expenditure with UK industry and commerce and supported employment 2019/20 - GOV.UK](#), ²[Facts & Figures 2021 - ADS](#)

ANNEX B: Janes GPS Data and Methodology

- Janes describe the GPS database used in the international trade analysis produced in this report as covering ‘the 70 largest defence markets that Western-oriented firms can address’, accounting for over 95% of this Western addressable defence market space. The database provides a 10-year forecast of procurement and R&D programmes, as well as prior years’ actuals dating back to 2012.
- The dataset is pulled together using a web-scraping process conducted by a team of analysts, alongside inputs from country and regional experts. This is a similar methodology that is used elsewhere to produce export data. Where possible, Janes GPS uses official government sources (budgets, strategy reviews, contract data etc.). It also draws on trade press reporting and company press releases. US data is primarily sourced from US DoD procurement and RDT&E justification documents.
- The dataset measures exports and imports as sales from the systems and components source country to final product end-customer, regardless of any intermediary transactions or international movements. This method ensures there is no double-accounting and allows for more accurate tracking of UK-produced components of platforms.

ANNEX C: Supply Chain Methodology

Quality report – Supply chain analysis using ONS Microdata

1. Background and Context

The purpose of analysing the ONS Microdata obtained under a MOD-ONS Data Access Agreement is to provide additional insights and context for the companies included in the JEDHub sample frame (66 companies). For example, where records are matched, it helps provide an estimate of these companies' sales and/or employees broken down by Product, Standard Industrial Classification (SIC) and International Territorial Level (ITL) 1 region. This complements the analysis of the JEDHub survey contained elsewhere in this Report, which achieved a 40% response rate (26/66 companies), including many of MOD's largest primes.

The analysis in this Report is therefore useful to enable a greater understanding of the aggregate picture of the JEDHub sample frame, regardless of whether individual companies responded to the survey this year or not. In addition, the analysis helps us understand the coverage of the sample frame by comparing against ONS microdata and published sources. This understanding of the coverage of the sample frame helps provide a direction for improving the overall representativeness of the sample frame for future JEDHub surveys of the defence sector in the UK.

2. Methodology and Production: General Overview

The analysis in this Report is based on PRODCOM and BRES microdata for 2020. A mapping file was also provided, containing the Reporting Unit reference identifiers for the sample of companies that received a JEDHub survey questionnaire in 2021 (66 companies).

i) PRODCOM Methodology

PRODCOM data for reference period 2020 were analysed in the following ways:

- Matching was done against the Reporting Unit References and Product Description using the lookups that ONS had provided under the Data Access Agreement. Data brought back was where we had exact matches only.
- Data on product sales value for each matched Reporting Unit was then extracted, ensuring no duplicate values were included. The following flags were also created:
 - Whether a Reporting Unit had any non-zero sales value under any of the four Military Codes¹;
 - Whether a Reporting Unit was included in the final JEDHub Sample Frame and;
 - Whether the Reporting Unit was a Defence Growth Partnership (DGP) company².

Analysis and aggregation of this processed output file was undertaken to produce the charts within this Report. There was a focus on the aggregating the sales of Reporting Units with military products compared with the sales of Reporting Units that had non-military product sales and breaking down the sales of each Reporting Unit by SIC division.

Limitations/Assumptions:

Data was successfully matched for 38 of 66 companies within the JEDHub sample frame. Although most of the remaining non-matched companies were service companies and would not be expected to be present in PRODCOM microdata, there were also some smaller manufacturing companies within the sample frame which were not present in the PRODCOM dataset. This represents a gap in the coverage of this analysis.

1. The four military-use Prodcum codes are 30119999 Manufacture, installation and repair of military vessels and parts thereof, 30309999 Manufacture, installation and repair of military aircraft and parts thereof, 30409999 Manufacture of military fighting vehicles and 25408999 Manufacture of military weapons and parts thereof

2. All names of companies were removed from the final outputs and disaggregation to DGP company level was not included in the analysis due to disclosure risks.

Quality report – Supply chain analysis using ONS Microdata

ii) BRES Methodology

BRES data for reference period 2020 were analysed in the following ways:

- These data were mapped against the full list of Reporting Unit references that were in the JEDHub sample frame.
- The variables of interest for each Reporting Unit were: i) weighted totempee; ii) division (the 2 digit SIC classification of the Local Unit³); and iii) NUTS1 (the ITL Level 1 region of the Local Unit).

The output was then flagged in the following ways for each Reporting Unit:

- Whether the Reporting Unit was present in PRODCOM 2020 dataset.
- Whether the Reporting Unit was present in PRODCOM 2020 and had any sales in any of the four specified military codes ⁴
- Whether a Reporting Unit was included in the final JEDHub Sample Frame and
- Whether the Reporting Unit was a DGP company ⁵

Analysis and aggregation of this processed output file was undertaken to produce the charts within this Report. There was a focus on aggregating the employees of Reporting Units with military products sales; other manufacturing sales, and service sector sales and breaking down the employees of Reporting Units by SIC division and ITL 1 region.

Limitations\Assumptions:

Data was successfully matched for 61 of 66 companies within the JEDHub sample frame, including almost all large defence primes. The missing Reporting Units therefore represent a relatively small gap in the coverage of this analysis.

It is important to note that the BRES analysis contained in this Report cannot be broken down into which jobs are associated with military output within each Reporting Unit. This detail is not included in the ONS microdata or BRES business questionnaire. However, as explained in the Report, it is possible to make an assumption about the share of employees that are associated with defence output with the use of additional information such as the directly measured defence jobs captured in the JEDHub survey. By combining both methods of analysis, in the future, it would be possible to reach an estimate of defence employees based on the JEDHub sample frame.

3. Quality Management and accuracy

The data processing and outputs from the PRODCOM and BRES files were independently checked and verified by a statistical team using a different coding language, and any errors were corrected. ONS officials advised on disclosure control issues within the output files. Chart files were independently produced from the processing work, and checked by a third team. Data were compared with ONS published sources for PRODCOM 2020 and where close similarities were found, this was taken as indirect evidence that analysis of ONS microdata contained in the this Report had been undertaken correctly and findings in this Report are accurate.

3. An individual site (for example a factory or shop) in an enterprise is called a local unit (ONS).

4. The four military-use Prodcom codes are 30119999 Manufacture, installation and repair of military vessels and parts thereof, 30309999 Manufacture, installation and repair of military aircraft and parts thereof, 30409999 Manufacture of military fighting vehicles and 25408999 Manufacture of military weapons and parts thereof

5. All names of companies were removed from the final outputs and disaggregation to DGP company level was not included in the analysis due to disclosure risks.

Quality report – Supply chain analysis using ONS Microdata

4. Relevance, Timeliness and accessibility

Relevance - The analysis of ONS microdata linked to companies in JEDHub sample frame is relevant to users that wish to know more about the characteristics of those matched companies and their estimated product sales and employee totals, industry and ITL Level 1 distribution captured from official ONS sources. This analysis will be of interest to users from media, politicians, policy professionals, students and members of the general public.

Timeliness - The analysis in the Supply Chain section uses the latest data available with a reference period of 2020.

Accessibility - is maintained by providing visualisations of data with accompanying narrative and any caveats or notes to the charts provided on the same page.

An appendix file of open source tables for each chart contained in pages 11-13 of the report is available for users to recreate their own analysis if required.

5. Comparability

i) These data should not be directly compared with Official Statistics published by MOD on employment supported by MOD expenditure with industry⁶. This is due to a number of source data and methodology differences:

- The data used in the supply chain analysis contained in this Report is derived solely from ONS microdata sources, using a matched group of companies that were included in the JEDHub annual survey (the Sample Frame). Published MOD Official Statistics are based on Management information held within internal payment systems.

- Data on total employees in the analysis contained in this Report includes all jobs associated with matched Reporting Units in the Sample Frame whereas MOD statistics estimate direct and indirect jobs associated with MOD direct spending with industry. As such, analysis in this Report will include some jobs associated with civilian output produced by defence companies in the sample frame, but MOD statistics on direct and indirect jobs are only those associated with MOD spending. The latter estimates are therefore based on a different definition of the defence sector in the UK to the analysis in this Report. They also do not include export-related employment.

Both methods and analysis therefore have some limitations and care should be taken with the interpretation of their respective findings. Further background quality information about Official Statistics on employment supported by MOD Expenditure is published by MOD.⁷

Quality report – Supply chain analysis using ONS Microdata

ii) ADS also produce an estimate of direct jobs supported in the Defence Sector in their annual Industry Facts and Figures report.⁸

The ADS method uses MOD spending data as its initial source but excludes elements of spending that aren't considered as defence, and includes an estimate of jobs supported by defence export orders, to produce an overall estimate based on a definition of the 'Defence Sector'.

For similar reasons to the comparability of MOD Official Statistics, the analysis of BRES microdata in this Report should not be directly compared to the ADS estimates. They are using different data sources and methodologies to estimate the total or upper limit of the number of defence employees in the UK.

The analysis of BRES microdata in this Report can however act as a benchmark against MOD published Official Statistics and the ADS figures, and help in the development of a method to improve the coverage and representativeness of future issues of the JEDHub survey.

6. Confidentiality and Security.

This analysis was produced under a Data Access Agreement between MOD and ONS (signed September 2021), permitting access to PRODCOM and BRES 2020 microdata files and a mapping file of Reporting Unit IDs for the 66 companies within the JEDHub survey.

All data has been held on secure networks and systems which have been accredited by the MOD. Data shared between the ONS and MOD has been via the ONS online secure file transfer platform.

We have ensured appropriate Disclosure Control protocols were used to produce these data and charts. These have been verified by ONS, so data is only shown in aggregate and by categories such as SIC classifications and ITL 1 territories of the UK.

In BRES analysis, data have been rounded to the nearest 1,000 employees and to the nearest £1m using PRODCOM to protect individual data points being disclosed.

ANNEX D: Productivity Methodology

Data and Methodology:

- The analysis on worker productivity presented in this report is based on UK DSC analysis of ONS datasets, using 2018 and 2019 data as the most recently available.
- This analysis does not represent the whole of the UK defence sector, using only data associated with three industry SIC codes – 25.4 manufacture of weapons and ammunition, 30.1 manufacture of ships and boats, 30.3 manufacture of air and spacecraft – thus the data should not be compared with other attempts to quantify the total value and productivity of the UK defence sector.
- Values for total GVA use the ONS annual low-level aggregates of UK output gross value added (GVA), the Quarter 3 (July to Sep) 2021 release. Seasonally adjusted chained volume measures (Worksheet 2a) were used to account for inflation between 2018 and 2019.
- Values for total employment use the ONS Business Register and Employment Survey (BRES) dataset. The 2019 revised results were used with total employment including working proprietors. Three digit SIC industry data is found in BRES table 2.
- GVA per worker is calculated by dividing total GVA by total employment.
- Though the data does not disaggregate civil activity within these manufacturing sectors, the total GVA and employment have been weighted according to the proportion of military sales within the SIC codes using the revised 2019 ONS PRODCOM dataset, August 2021 release. These weightings represent the percentage of total UK manufacturer sales in the 4-digit SIC industry accounted for by the total sales value of the defence-specific PRODCODES (25408999, 30119999 and 30309999 for military weapons, military vessels and military aircraft respectively).
- The defence weightings applied are: 95% for SIC 25.4, 70% for SIC 30.1 and 19% for SIC 30.3.

Quality Management and Accuracy:

- All data and analysis has been peer reviewed internally at the UK DSC, and independently through the Annual Economic Report review process.
- In full transparency, all data tables associated with the analysis are available online at JEDHub.org.

Data Confidentiality:

- All data used in the analysis is open and publicly available from the ONS website and is sourced below.