



The economic contribution of the UK Maritime Sector

A Cebr report for Maritime UK

April 2022

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Authorship and acknowledgements

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NB The industry figures making up the broad Maritime Sector are not always additive because some of the reports have been customised to cater for the overlap between certain industries. Simply adding together the industries would therefore produce a degree of double counting. Nonetheless, the broad Maritime report has had this double counting stripped out.

The report does not necessarily reflect the views of Maritime UK.

London, April 2022

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Headline findings

Report Purpose

- The Centre for Economics and Business Research (Cebr) has been commissioned by Maritime UK to **quantify the economic contribution of the Maritime Sector to the UK economy**. This report forms one of ten reports assessing the contribution of the Maritime Sector as a whole, at an industry-level, and in Scotland, Northern Ireland, the Liverpool City Region and the Solent LEP region.

Defining the Maritime Sector

- The Maritime Sector is defined as consisting of the individual **shipping, ports, leisure marine, marine engineering and scientific** and **maritime business services (MBS)** industries, each of which comprises a diverse array of activities. This report draws upon a combination of data sources, including company financial database FAME, industry sources and publicly available data to **quantify both the direct and aggregate economic impact of Maritime Sector activities in the UK economy in the years 2010 to 2019**.

Economic contribution of the Maritime Sector

- The Maritime Sector makes a substantive macroeconomic contribution to the UK through **turnover, Gross Value Added (GVA), employment** and through the **compensation of employees (COE)**. It is estimated that **the sector directly supported just over £55 billion in business turnover, £18.7 billion in GVA and 227,100 jobs for UK employees in 2019**. The **marine engineering and scientific (MES)** and **shipping** industries are the **largest constituent industries** in terms of economic activity, **contributing £5.7 billion and £6.6 billion in GVA respectively**, and directly supporting around **80,400 jobs and 60,500 jobs** in 2019.
- In 2019, it is estimated that the Maritime Sector directly contributed to the UK economy:



- The substantial direct economic contribution of the Maritime Sector exceeds those of other comparable industries. For example, the sector's direct turnover contribution of £55 billion compares to £53 billion from the Road and Other Land Transport industry in 2019; similarly, the sector's direct GVA contribution of £18 billion compares favourably to £10 billion from the Air Transport industry as well as the £7 billion from the Rail Transport industry.
- The direct contribution of the Maritime Sector through turnover, GVA and employment has **increased since 2010**, when turnover, GVA and employment are estimated to have been £35.9 billion, £13.4 billion and 192,000 jobs respectively. **Average productivity** in the

Maritime Sector – as measured through the GVA generated by each job – **exceeds that of the national average**. Average productivity in each maritime industry also exceeded the national average in each year from 2010 to 2019, barring the leisure marine industry.

- The Maritime Sector also helped to **raise billions of pounds each year for the UK Exchequer** and made a **sizeable contribution to UK trade through exports of goods and services**. The sector contributed an estimated total of just under **£5.2 billion in tax revenues in 2019, or 0.63% of total UK tax revenues**, spread across Income Tax, NICs, VAT, Corporation Tax and Business Rates. The Maritime Sector **exported £15.1 billion of goods and services in 2019, or around 2.2% of the UK total**.
- After quantifying the indirect economic impacts through the industry supply chains and induced effects on the wider employee spending, it is estimated that the **Maritime Sector helped to support a total of £48.9 billion of GVA in 2019**. This implies that, **for every £1 of GVA directly generated by the Maritime Sector, a further £1.62 was supported** through its associated supply chains (indirect impacts) and wider spending (induced impacts) across the UK economy.
- These aggregate economic impacts associated with the Maritime Sector also extend to turnover, employment and the compensation of employees. It is estimated that the Maritime Sector **helped to support a total of £116.0 billion in turnover, 1,064,000 jobs and £23.4 billion through the compensation of employees in 2019**:



- While the economic contribution of the industry is spread across all UK regions, **London contributes the most to turnover, GVA and employee compensation** (in terms of both direct and aggregate impacts) **as well as employment** (in terms of aggregate impact). In 2019, it is estimated that the industry in **London directly contributed £15.3 billion of turnover** (27.5% of the industry) and **45,900 jobs** (20.2%), although the latter is slightly lower than the direct employment effects of the South East region which accounted for 20.7% of the total. After indirect and induced effects are considered, the **aggregate contribution from London rises to £29.0 billion of turnover (29.5%) and 149,500 jobs (26.9%)**.

Economic contribution of the Maritime Sector

- We have modelled the Maritime economy as a function of its macroeconomic drivers and industry features to produce projections of GVA and Turnover over the next five years. Our model shows that the **sector is set to grow at a Compounded Annual Growth rate (CAGR) of 3.9% which translates into cumulative growth of 16.6% for 2021-2025, in nominal terms**.

- Within the considered horizon arising out of the Covid-19 pandemic, this **relatively strong growth is resulting from** the combination of a **quick recovery** in global maritime transport, **moderate GDP growth projections**, and **high costs reflecting ambitious investments** in infrastructure, technology, education and environmental sustainability. We expect these investments to lead to major gains in efficiency and productivity over the longer term.

1. Introduction

Cebr is pleased to present this report, which examines the economic impact of the Maritime Sector on the UK economy, to Maritime UK. For the purposes of this study, the Maritime Sector is broadly defined as comprising of the individual shipping, ports, marine engineering and scientific (MES), marine leisure and Maritime Business Services (MBS) industries; each of these industries comprises numerous and diverse activities which are reflected in the study.

This report forms one of ten reports on the economic contribution of the Maritime Sector. The other reports focus on the economic contribution of each of the five constituent Maritime Sector industries at the UK level, and the economic contribution of the sector in Scotland, Northern Ireland, the Solent LEP and the Liverpool City Region. It is therefore important to consider this report as part of the wider framework set out in the ten reports, which set out the impact of the Maritime Sector both at a national and regional level.

Our examination spans the period from 2010 to 2019 (inclusive), with the latter being the latest year for which full data are available, and endeavours to capture the full economic 'footprint' of the maritime sector. As such, our report is not confined to direct ongoing contributions to GDP and employment through the maritime sector's operations and activities in the UK, but also provides assessments of the associated indirect and induced multiplier impacts.

Maritime UK previously commissioned Cebr in 2017 and in 2019 to produce the same study focused on measuring the impact of the maritime sector to the UK economy.

1.1 About Maritime UK

Maritime UK is the industry body for the UK's Maritime Sector, representing companies and partner organisations in the shipping, ports, marine and maritime business services industries. It acts to promote the sector, influence government and drive growth.

1.2 Purpose of this report

This research provides up-to-date insights on the size and performance of the UK maritime sector, presenting a range of statistics and figures which demonstrate different aspects of the economic value brought by the sector to the UK economy. The intention of this is to empower Maritime UK with a thorough and comprehensive knowledge and evidence base, such that they can support and advocate for the sector across the UK.

As such, Cebr has focused on the following key economic indicators: business turnover, employment, Gross Value Added (GVA), the compensation of employees, the Exchequer contribution (through tax revenues raised) and exports of goods and services.

The study also seeks to identify the contribution of the Maritime Sector at a regional level (across the former Government Office Regions), after accounting for the relatively high concentration of economic activity taking place in the City of London.

It should be noted that given the data lags associated with many of the official national statistics used within this study, it is not possible for our analysis to capture the full extent to which the sector was directly affected by the COVID-19 pandemic in 2020/21. As such, because of the timeframe examined in this report, this research offers a picture of the value of

the maritime sector right before the pandemic occurred. Further to this, our research does consider the impacts of Covid in our Forward Look section, where we provide forecasts for the Maritime Sector as well as for each of its five constituent industries and the four regions included within our analysis.

1.3 Overview of the study and methodology

Objectives of the study

This report provides a thorough and comprehensive examination of the role of the Maritime Sector in the UK and its constituent sub-regional economies. It presents a range of analyses demonstrating different aspects of the value contributed by the overall sector, including direct contributions to GDP and employment, indirect and induced multiplier impacts and the Maritime Sector's contribution to the UK Exchequer through tax revenues raised.

To produce a robust study, it is necessary to analyse the available data to ensure that it captures the full range of activities that should be included in establishing the total economic 'footprint' of the industry. Following the collation of the necessary data which capture these activities, the values of key economic indicators were established to demonstrate the impact of the sector. The key macroeconomic indicators include:

- GVA¹ contributions to UK and regional GDP generated by the Maritime Sector, directly and through indirect and induced multiplier impacts.
- Jobs supported by the sector, including direct, indirect and induced jobs through multiplier impacts.
- The value of the turnover of the Maritime Sector and, again, the turnover supported in the UK and regional economies through multiplier impacts.
- The value of employee compensation² generated by the Maritime Sector, representing the total remuneration of employees operating in the sector.
- The contribution of the Maritime Sector through revenues raised for the Exchequer.
- The value of goods and services exported by the industries comprising the Maritime Sector.

¹ GVA, or gross value added, is a measure of the value of production in the national accounts. Conceptually it can be considered the value of what is produced, less the value of intermediate goods and services used to produce it. GVA is distributed in three directions – to employees, to shareholders and to government. It is often used as the proxy for the contribution of a sector or industry to GDP: strictly this relationship is $GVA + Taxes\ on\ products - Subsidies\ on\ products = GDP$.

² Compensation of employees (COE) or employee compensation, is the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter. This consists of wages paid to employees; employers' actual social contributions (excluding apprentices); employers' imputed social contributions (excluding apprentices); and employers' social contributions for apprentices.

In addition to the core modelling and analysis, we also undertake a range of comparisons to contextualise the findings, including:

- How the economic indicators vary over the period 2010-2019.
- How the economic indicators vary across the different industries of the maritime sector.
- How the economic indicators for the maritime sector vary across the different UK nations and regions.
- How the indicators for the maritime sector compare with other important sectors of the UK economy.

Mapping the UK Maritime Sector

Here we set out how the Maritime Sector has been defined for the purposes of the study. On a holistic level, the wider sector can be disaggregated into the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries, which in themselves are formed of numerous individual and distinct activities.

Building up on the experience gained through previous studies for Maritime UK, Cebr has subsequently undertaken a mapping exercise based on the previous study to identify how each of these five industries align with the national accounts. For most industry activities, a corresponding Standard Industrial Classification (SIC) code exists which enables the identification and quantification of the direct economic impacts using publicly available data sources. A minority of activities do not map neatly against the SIC framework, necessitating the use of industry or local-level data for quantification purposes.

The mapping of the maritime sector has remained the same as in the 2019 Cebr study and is broken down as follows:

- **Shipping industry**
 - International passenger transport (cruise and ferry);
 - Domestic and inland waterway passenger transport;
 - International freight transport (bulk, container, gas and tanker);
 - Domestic & inland waterway freight transport;
 - Other shipping activity.
- **Ports industry**
 - Warehousing and storage;
 - Port activities and management;
 - Stevedores, cargo and passenger handling;
 - Border agency, HMRC and public sector employees operating in ports.
- **Leisure marine industry**
 - Recreational marine activities, marine finance and legal activities and general marine services;
 - Boatbuilding (marine leisure vessels);

- **Marine engineering and scientific industry**
 - Shipbuilding;
 - Marine renewable energy;
 - Marine support activities for offshore oil and gas, engineering and mining;
 - Marine science and academic activities, including government vessels and technical consulting;
- **Maritime Business Services industry**
 - Shipbroking services;
 - Maritime Insurance services;
 - Maritime Financial services;
 - Maritime Legal services;
 - Ship Surveying and Classification activities;
 - Maritime Education (including Maritime university courses and cadetships);
 - Maritime Consultancy; and
 - Maritime Accountancy.

Here we focus solely on the Maritime Sector on a holistic basis; a full description of how the direct, aggregate and regional economic impacts of each industry have been measured can be found in Cebr's separate reports for each industry.

Quantifying the direct economic impacts of the Maritime Sector

The first stage of the study, discussed in more detail in Cebr's separate reports on the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries, involved mapping the activities of each industry against the National Accounts framework, in order to establish clarity on the precise definition of activities as they map against the Standard Industrial Classification (SIC) framework.³

In essence therefore, this involves taking each of the sector and industries' activities, and mapping these to the most relevant Standard Industrial Classification (SIC) code in order to identify the activity's economic data. It is clear from Cebr's analysis that the majority of activities do map neatly onto the National Accounts framework. As a result, Cebr has been able to exploit company financials data in addition to publicly available data sources such as the Annual Business Survey to gather data for some constituent activities of the sector.

³ The United Kingdom Standard Industrial Classification of Economic Activities (SIC) is used to classify business establishments and other standard units by the type of economic activity in which they are engaged.

In order to quantify the direct economic impacts of the Maritime Sector, a number of different approaches have been taken which reflect the degree of alignment (or otherwise) for each activity against the National Accounts framework. They are as follows:

- The major source of data used to quantify the direct economic contribution of the Maritime Sector is the Financial Accounts Made Easy (FAME) database, which provides business demography and financial accounts data for companies operating in the UK Maritime Sector. The FAME database has been used to generate estimates for the business turnover, GVA, employment, the compensation of employees and profitability of the sector and industries.
- For those industries and constituent activities which do not map neatly against the national accounts framework, a combination of industry sources (such as the British Marine Key Performance Indicators) and publicly available data sources have been used to generate direct economic impact estimates.
- As FAME does not provide data on exports of goods and services, data have instead been sourced from both the ONS Pink Book or industry sources such as the UK Chamber of Shipping's (UKCoS) Annual Sea Inquiry. In some instance the ONS Supply Use Tables have been used to generate estimates.
- Data for the direct economic contribution of each industry have by extension been used to quantify the contribution that the Maritime Sector makes to the UK Exchequer, and the productivity of the sector in terms of GVA per job.

Again, a more detailed description of sources used for each industry and their constituent activities can be found in Cebr's separate industry reports, which quantify the economic contribution of each industry.

Quantifying the aggregate economic impacts of the Maritime Sector

After collation and interrogation, the direct economic impacts of the Maritime Sector have then been embedded within Cebr's economic impacts models of the UK economy. For each of the activity groups, the direct impacts are then combined with the bespoke economic multipliers to generate indirect, induced and aggregate impacts. These multipliers were calculated by Cebr, using our input-output modelling approaches, as these activities are not 'standard' sectors reported in the ONS' input-output tables. Cebr's models establish the relationships between industries through supply chain linkages, as well as industries' linkages with government, capital investors and the rest of the world (through trade).

The models produce three types of impact for four indicators – turnover, GVA, employment and the compensation of employees. The three types of impact are:

- **Direct impact:** this is the value generated and jobs supported directly by the economic activities within the UK Maritime Sector.
- **Indirect impact:** this is the value and jobs supported in industries that supply inputs to the UK Maritime Sector industry.

- **Induced impact:** this is the value and jobs supported in the wider economy when the direct and indirect employees of the sector spend their wages and salaries on final goods and services.

These three impacts are then combined to convey the aggregate impact associated with each industry and activity within the Maritime Sector in terms of turnover, GVA, employment, and the compensation of employees.

Consistent with previous analysis, these models have been adjusted to remove any potential double-counting (for example where one industry within the Maritime Sector purchases goods and services from another).

Removal of “double-counting” effects

As this report considers the activities of the entire Maritime Sector (as defined above), when quantifying the associated aggregate economic impacts it is necessary to consider and account for the crossovers or interlinkages that will exist between each of the constituent industries. For example, the UK shipping industry will purchase a significant amount of services from either the UK ports or UK Maritime Business Services industries. So if we were to simply apply multipliers to each of the five maritime industries and combine the resulting aggregate impacts, we would in effect be double-counting some of the economic contributions, and would by extension overstate the aggregate impacts of the sector.

To avoid double-counting it has therefore been necessary to remove these surplus interlinkages from our analysis. In practice, this involves removing coefficients relating to affected industries within Cebr’s input-output models which would otherwise feature as part of the maritime industry multipliers. For example, the coefficient reflecting the additional activity generated when the shipping industry consumes ports services has been removed. As a result, the summation of the aggregate economic impacts taken from Cebr’s individual industry reports will not align with the aggregate economic impacts for the Maritime Sector as presented in this report (and the Maritime Sector aggregate impacts will necessarily be lower).

Changes from 2019 Cebr study

The main change to the methodology compared to the one used in the 2019 Cebr study is that we have developed an even more robust approach for the quantification of the economic impacts for the Maritime Business Services industry. Due to the difficulty in mapping and quantifying this particular industry, for our 2017 study we relied in large part on the 2016 PwC report,⁴ at the time the only study that had been published on the industry. For the second iteration of our study, in 2019, we relied on a survey we carried out and discussions with industry representatives as well as our own expertise on the topic to develop a more advanced methodology. This involved a targeted approach whereby we could build up a picture of the industry and its associated activities on a bottom-up basis for a significant part of the industry, but still utilised PwC’s 2016 report to drive some of the assumptions. For this new study we

⁴ PwC (2016), ‘Catching the Wave: UK maritime professional services competitiveness study.’

developed our bottom-up methodology even further such that it is even more robust and reflects the size and value of the industry more precisely.

In addition, we have updated the underlying supply-use data within our input-output models, to reflect updated ONS data released over the intermediary period. This means the models now represent a more contemporaneous structure of the economy.

Since 2019, we have also further refined our input-output modelling framework. The conceptual framing of our methodology remains the same, but for industries which span multiple SIC codes (such as the Maritime Sector and many of the constituent industries) the models themselves have been adjusted to simplify the required data inputs. For the sake of consistency with our previous research, these further refinements are not fully reflected within the results presented in Section 3. However we do present these supplementary figures alongside further detail in Annex B: **Supplementary results of aggregate economic impact analysis**.

1.4 Structure of the report

The remainder of the report is structured as follows:

- **The direct economic impact of the Maritime Sector** outlines the direct economic impacts of the Maritime Sector. We consider the direct impacts through turnover, GVA, employment, the compensation of employees, the contribution to the UK Exchequer through tax revenues contributed by the industry, and the contribution through exports.
- **Aggregate economic impact of the Maritime Sector** considers the multiplier impacts of the Maritime Sector through the activities it stimulates in local supply chains and in the wider economy when employees directly and indirectly employed by the different industries spend their wages and salaries in the local and wider economy.
- **The regional economic impact of the Maritime Sector** examines the direct and multiplier impacts of the Maritime Sector at a regional level, as disaggregated by the 12 former Government Office Regions (GORS).⁵
- **The UK Maritime Sector: A forward look** provides forecasting analysis for the Maritime Sector in the context of the current economic climate, with a focus on the impact of Covid-19 on the sector.
- **Annex A: Full set of direct economic impacts by region** sets out the full set of direct economic impacts by region.
- **Annex B: Supplementary results of aggregate economic impact analysis** presents the supplementary results of the aggregate economic impact analysis based on our updated input-output methodology.

⁵ These are: Scotland, Wales, Northern Ireland, the East of England, the East Midlands, London, the North East, the North West, the South East, the South West, the West Midlands, and Yorkshire and the Humber.

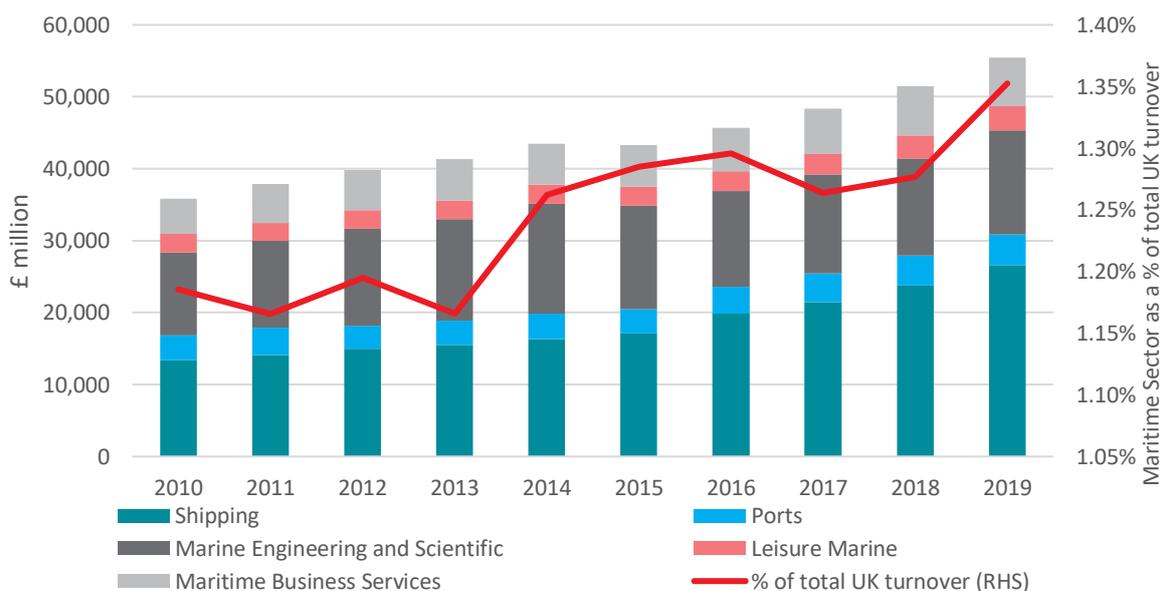
2. The direct economic impact of the Maritime Sector

The direct contribution of the Maritime Sector is measured in terms of the following key macroeconomic indicators: turnover, GVA, employment, the compensation of employees, the Exchequer contribution through tax revenues raised, and exports.

2.1 The direct economic impact through turnover

Error! Reference source not found. below shows the breakdown of business generated by the Maritime Sector and its constituent industries between 2010 and 2019, expressed as a share of the total UK Non-Financial Business Economy.⁶ Overall, the Maritime Sector contributed an estimated £55.5 billion in turnover in 2019, or 1.35% of total UK turnover. This is an increase of approximately £20 billion on the 2010 level of turnover (£35.9 billion), and in nominal terms the Maritime Sector turnover has been growing over the past 5 years.

Figure 1: The estimated turnover of the Maritime Sector, and expressed as a share of total UK turnover from the non-Financial Business Population, 2010 to 2019



Source: FAME, UKCoS, British Marine, SMI, ONS, PwC, ABS, Cebr analysis

The largest constituent industry within the Maritime Sector in terms of turnover directly generated was the shipping industry, with £26.7 billion of business turnover in 2019, with marine engineering and scientific second, contributing £14.5 billion. Shipping also grew the

⁶ This is the total level of turnover for businesses not in the Financial Services industry as taken from the Annual Business Survey; The Annual Business Survey covers only the UK Non-Financial Business Economy, which accounts for approximately two thirds of the UK economy in terms of Gross Value Added (GVA). Simply put, this is the turnover for businesses that do not trade in financial/investment-related goods and services.

most over the period considered, both in nominal terms (£2.2 billion) and as a percentage (52% growth since 2010). This growth is largely driven by turnover for international passenger transport (cruise and ferry), which grew by over £6 billion (and accounts for almost half of the total growth of the sector) over the assessed period. This is consistent with very solid growth in the global cruise industry over similar timeframes, with The Cruise Lines International Association reporting growth of over 20% from 2011 to 2016.⁷

Combined, the shipping and MES industries contributed 74.2% of total Maritime Sector turnover in 2019 establishing a new peak over the past 10 years. Although this joint percentage contribution is relatively consistent over the period, and in 2010 stood at 69.5%.

In line with increases in turnover directly generated by the Maritime Sector, average profitability (as measured using the ratio of gross profits to turnover) in the Maritime Sector is estimated to have grown since 2010. Table 1 shows trends in profitability for the sector and across each industry. The overall average profitability of the industry rose from 18% to 20%; in other words, for every £1 in turnover generated by a business in the Maritime Sector in 2019, an estimated 20 pence was generated in gross profit, compared to 17 pence in 2010. However this growth over the assessed period was actually driven by strong increases in profitability from 2010 to 2014, since, profitability has actually fallen slightly, by 0.7 percentage points from the 2016 peak of 20.6%

Table 1: Estimated average profitability (gross profit ratio) of the Maritime Sector and constituent industries

Profitability	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
UK Maritime Sector	17.7%	18.4%	19.7%	19.8%	20.5%	19.4%	20.6%	19.3%	19.2%	20.3%
Shipping industry	16.4%	17.4%	19.8%	20.1%	23.4%	24.4%	25.9%	23.1%	22.0%	24.5%
Ports industry	29.2%	29.9%	34.0%	33.5%	32.8%	33.7%	35.2%	34.5%	32.5%	31.2%
Leisure marine industry	13.4%	12.0%	11.5%	11.6%	11.6%	11.7%	14.3%	15.3%	15.3%	14.6%
MES industry	17.9%	18.7%	18.7%	17.9%	15.7%	12.6%	10.9%	9.9%	11.0%	11.8%
MBS industry	14.7%	15.6%	17.8%	19.3%	21.4%	16.4%	18.2%	19.5%	19.0%	17.7%

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Over the majority of the period, the most profitable industry was the ports industry. Weighting each year equally, it had an average profitability of 33%. Shipping and the MBS industry were second and third respectively, with average rates of 22% and 18%. Average profitability increased in every industry from 2010 levels to 2019, except for the marine engineering industry, where profitability fell by approximately 6 percentage points. Driven by the declining offshore support activities for the oil & gas sector, the marine engineering industry went from being the second most profitable industry in 2010 to the least profitable in 2019. By the same

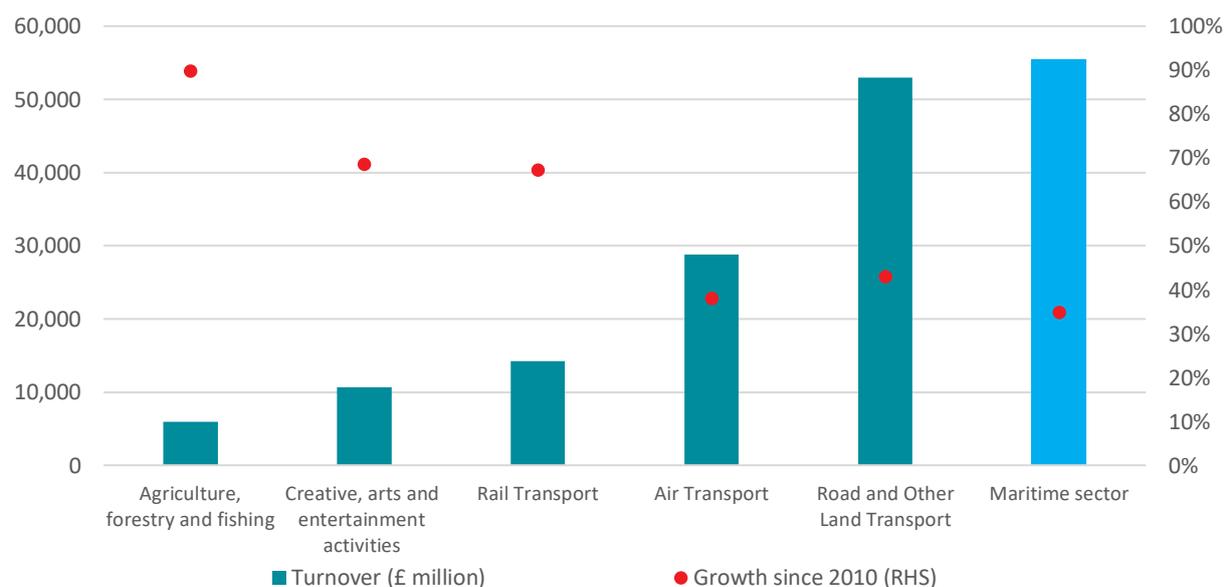
⁷ Maritime Executive. (2018). [‘Cruise Industry Poised for Growth’](#).

metric, average profitability increased the most in the shipping industry, with an 8.1 percentage point rise.

Maintaining the UK's competitive advantage as a leading maritime nation is also a key theme in the UK's Maritime 2050 strategy report.⁸ This is targeted through a series of themes, setting out the overall vision for the sector, with those of particular pertinence to firm profitability including maintaining fiscal attractiveness, the efficiencies available through the UK's maritime cluster, government support of maritime innovation and a modern regulatory framework. All this is promising for a continued trend of strong business profitability in the Maritime Sector, if the sector can successfully bounce back following the economic downturn as a result of the pandemic.

To place the Maritime Sector's direct contribution through turnover in context, Figure 2 below compares turnover in the Agriculture, Forestry and Fishing; Creative, Arts and Entertainment; Rail Transport; Air Transport; and Road and Other Land Transport industries with that of the Maritime Sector; both in absolute levels and growth since 2010. Turnover data for the comparable industries has been sourced from ADS Group 9 and the Annual Business Survey (ABS).

Figure 2: The direct contribution through turnover of the Maritime Sector against comparable sectors in 2019, and growth against the 2010 level



Source: ADS, ONS, Cebr analysis

In 2019, Maritime Sector turnover exceeded that of all the other sectors considered, at £55.5 billion although Road and Other Land Transport was within £2.5 billion. Turnover generated by the Maritime Sector in 2019 is estimated to have increased by approximately 35% since

⁸ Department for Transport. (2019). '[Maritime 2050](#)'.

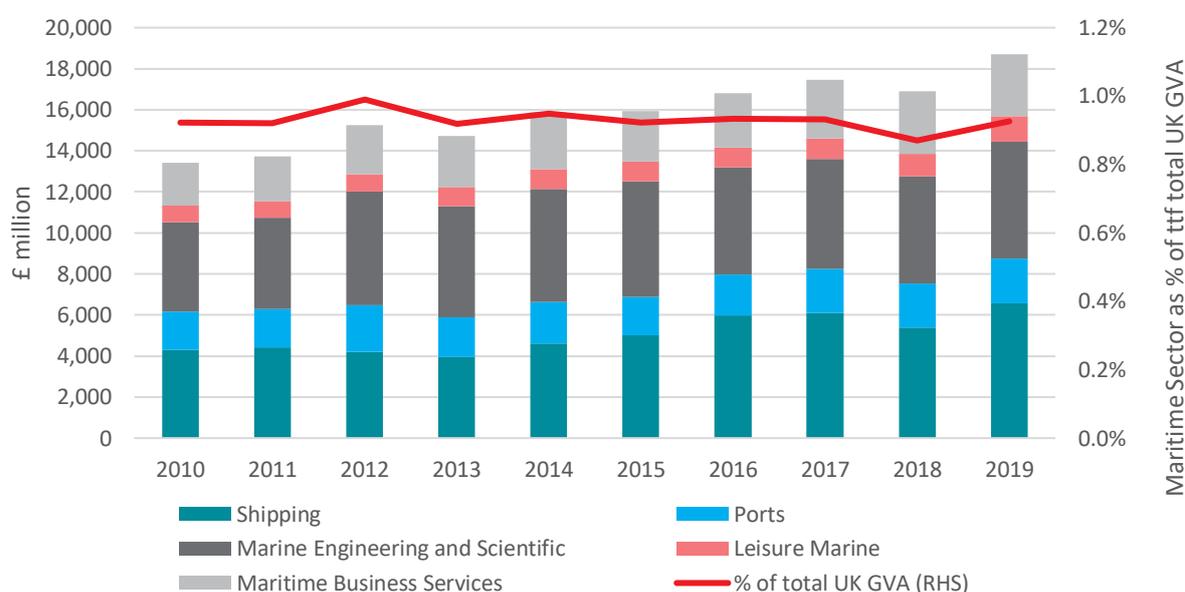
⁹ <https://www.adsgroup.org.uk/about/>

2010, with this outturn comparing favourably to the other two industries with the highest 2019 level of turnover (Road and Other Land Transport and Air Transport).

2.2 The direct economic impact through GVA

This subsection illustrates the contributions in terms of the GVA from the Maritime Sector to UK GVA. Figure 3 shows this direct impact, disaggregated by industry in the years 2010 to 2019, as well as the Maritime Sector's share of total GVA in the UK. It is estimated that the Maritime Sector directly contributed a total of £18.7 billion in GVA in 2019, an increase of 39% from £13.4 billion in 2010.

Figure 3: The direct contribution of the Maritime Sector through GVA, and the sector's share of total UK GVA, 2010 to 2019,



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The majority of this cumulative 39% increase occurred in three year-on-year jumps. GVA increased by £1.5 billion, £1.2 billion and £1.8 billion in 2012, 2014 and 2019 respectively, with GVA growth relatively flat in the other years, or declining (GVA fell by £500 million in 2013 and again in 2018). As a percentage of UK GVA, Maritime Sector GVA in 2019 improved over the previous year, and was recorded at 0.93%, slightly lower than the peak in 2012 of 0.99%.

These three different increases occurred for differing reasons, and are worth examining separately. The GVA increase in 2014 was primarily driven by the 17% GVA growth of the shipping industry, although the GVA contribution from Maritime Business Services also grew by £0.3 billion.

The largest increase, occurring in 2012, was driven by strong growth in the ports (£0.4 billion) and marine engineering and scientific (£1 billion) industries. Within each of these constituent industries, the most significant factor was a rise of over £0.5 billion in GVA associated with marine oil and gas support activities alone.

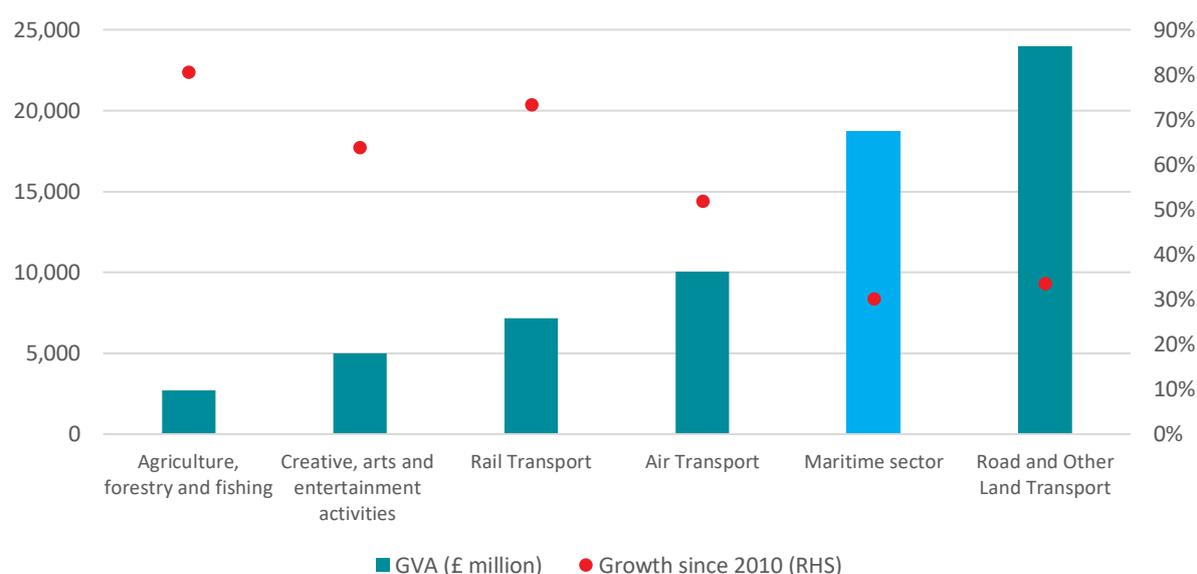
This intuitively is likely to be linked to UK natural gas prices, with the demand for support services derived from the demand for oil and gas itself. Looking at trends in the UK National

Balancing Point (NBP) price,¹⁰ this does seem correlated with economic activity associated with marine oil and gas support activities, albeit with a slight lag (which makes sense, as the level of support activity required would be expected to have a degree of stickiness, as market changes take time to filter through supply chains). The level of economic activity supported by these support activities are very volatile. The GVA impact generated here decreased from £2.6 billion in 2010 to £2 billion in 2011, and then increased to around £2.5 billion in 2012-2013 only to decrease again to £2.1 billion in 2014.

The majority (65% in 2019) of GVA was contributed by the shipping and marine engineering and scientific industries. In terms of the observed £5.3 billion GVA growth for the entire sector, £2.2 billion (around 42%) was due to increasing GVA in the shipping industry. The marine engineering & scientific and the MBS industries contributed £1.3 billion and £1 billion in GVA growth, respectively. In percentage terms, GVA in the shipping industry grew by the most from 2010 to 2019 (52%), with Leisure Marine Services second (51%). All five of the constituent industries saw a GVA growth of at least 15% from 2010 to 2019.

Following Figure 2, **Error! Not a valid bookmark self-reference.** below compares Maritime Sector GVA against those of comparable activities in 2019.

Figure 4: The estimated GVA of the Maritime Sector against comparable industries in 2019, and growth against the 2010 level



Source: ADS, ONS, Cebr analysis

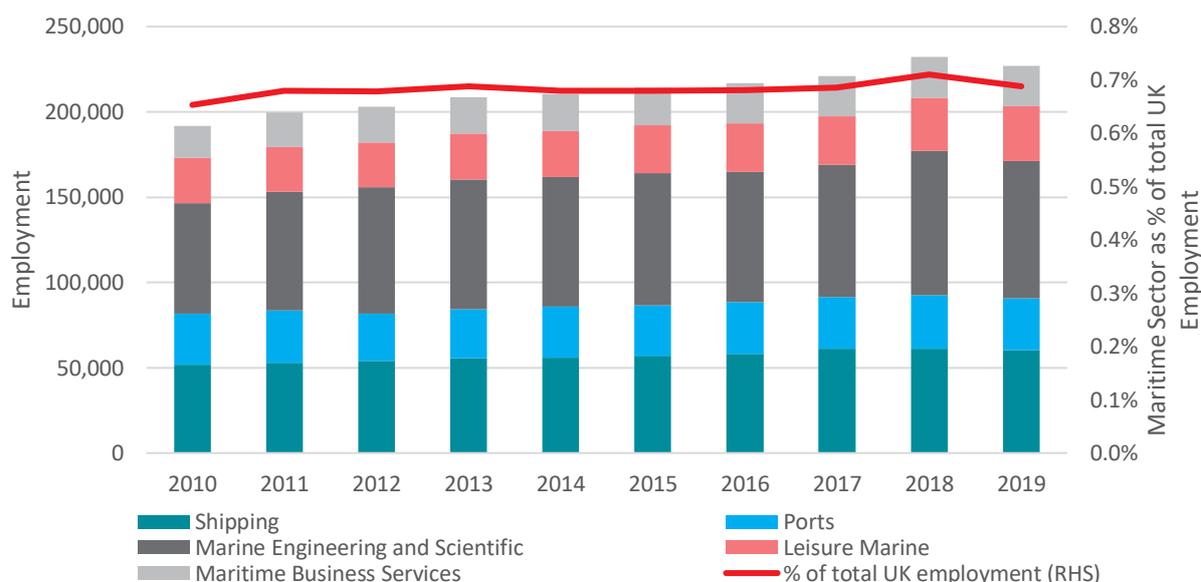
The Maritime Sector is larger than the entire Rail and Air Transport Sectors, along with the Creative, Arts and Entertainment activities and Agriculture, Forestry and Fishing sectors. In 2019, only GVA from Road and Other Land Transport (£23.9 billion) exceeds that of the Maritime Sector.

10 ERCE. (2019). [‘UK Natural Gas NBP Spot Price’](#).

2.3 The direct economic impact through employment

In addition to its contribution through GVA, the Maritime Sector also directly supports a significant number of jobs. **Error! Not a valid bookmark self-reference.** below highlights the direct contribution of the Maritime Sector to UK employment, again disaggregated by individual industry.

Figure 5: The direct contribution of the Maritime Sector through employment, and the sector's share of total UK employment, 2010 to 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

It is estimated that the Maritime Sector directly supported around 227,000 jobs for UK employees in 2019, an increase of 35,000 jobs (18%) on the 192,000 provided in 2010. The sector's share of total UK employment remained broadly stable over this period, on average around 0.68%. As with turnover, in each year the MES and shipping industries contributed the lion's share of employment, equating to 62% in 2019. Employment over the period increased for every constituent industry, however in the case of ports, this was the smallest increase of about 200 jobs.

Based on trends in GVA and employment presented in Figure 2 and In addition to its contribution through GVA, the Maritime Sector also directly supports a significant number of jobs. **Error! Not a valid bookmark self-reference.** below highlights the direct contribution of the Maritime Sector to UK employment, again disaggregated by individual industry.

Figure 5, employees operating in the Maritime Sector are highly productive, as measured by GVA per job.

Table 2 below shows the estimated productivity of jobs in the sector and across each industry across the years 2010 to 2019, and compared against the UK economy as a whole.

Table 2: Productivity (GVA per job) in the Maritime Sector and constituent industries

GVA per job	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
UK economy	46,953	47,857	48,973	50,158	51,356	52,546	53,779	55,066	56,088	56,670
UK Maritime Sector	69,858	68,874	78,836	70,499	75,385	74,332	77,548	78,999	72,760	82,329
Shipping industry	83,139	83,492	91,632	71,293	82,339	87,729	102,726	100,142	87,888	108,327
Ports industry	62,206	61,305	83,032	66,903	66,948	63,733	65,238	69,521	68,516	72,447
Leisure marine industry	30,285	29,986	32,260	34,524	34,984	34,706	33,799	34,127	35,865	38,273
MES industry	67,471	63,985	74,386	71,240	72,767	72,618	68,650	69,545	61,686	70,926
MBS industry	109,867	110,463	114,381	116,045	128,611	110,255	112,342	121,825	125,905	126,535

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

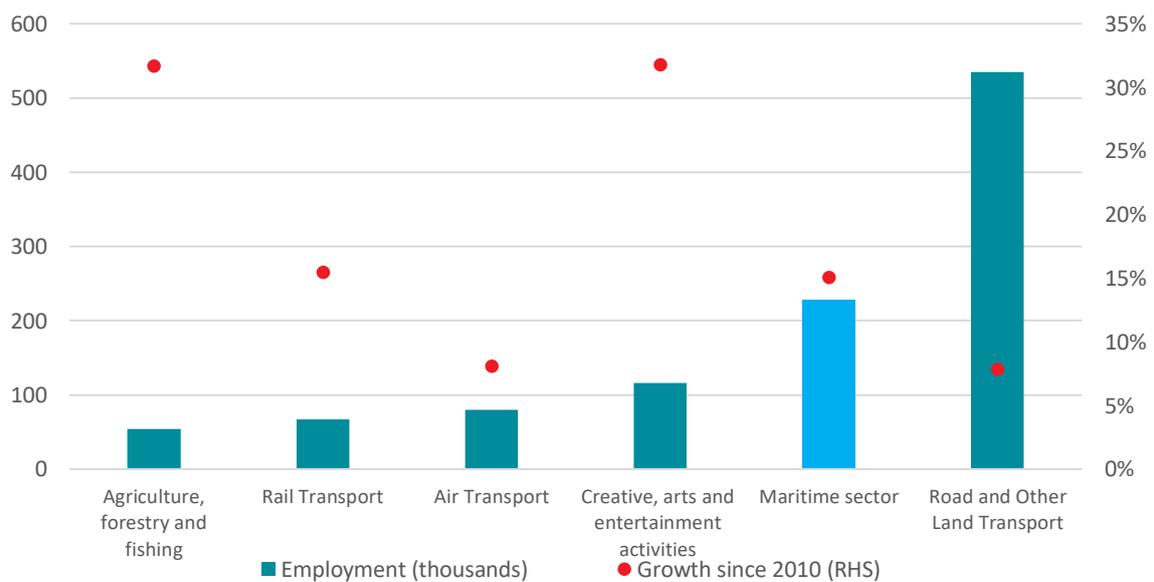
The average job in the Maritime Sector in 2017 raised approximately £82,300 in GVA, and so compares favourably to the UK average of £56,600. The average job in each constituent industry bar leisure marine was more productive than the UK average in each year, with those operating in the Maritime Business Services industry and shipping industry averaging over £100,000 of GVA produced per job in 2019. Every industry increased in productivity over the period, and barring Marine Engineering Services and Maritime Business Services, also reached its peak in 2019. For these two industries i.e. Marine Engineering Services and Maritime Business Services, the peaks were reached in 2012 (£74,400) and 2014 (£128,600) respectively.

Maintaining and improving this impressive productivity record is also a focus moving forwards. Investment in technology such as autonomous vessels and autonomous freight movement through ports has the potential to be beneficial in this regard, and is targeted in the Maritime

2050 strategy report.¹¹ Additionally, focus has been placed on addressing the relatively flat productivity in the MES industry, with long-term support of the Maritime Enterprise Working Group. This is a body set up following the publication of the National Shipbuilding Strategy in 2017,¹² and the Maritime 2050 strategy highlights the importance of working with the group to raise productivity and secure a sustainable and globally successful UK shipbuilding sector – one of the constituent activities in the marine engineering and scientific industry. Further focusing in on MES, it is encouraging that despite the slight headline decrease over the decade preceding the pandemic, GVA per worker in the marine renewable energy sub-industry increased substantially (over 47% from 2010 to 2019). This is particularly pertinent given the recent moves in this direction, particularly in the light of the recent government commitment to cut greenhouse gas emissions to almost zero by 2050.¹³

Figure 6 compares the direct contribution that the Maritime Sector made through UK employment in 2019 against comparable industries. Employment in the Maritime Sector compares favourably, with 2019 employment and growth since 2010 second and fourth respectively, out of the six considered industries.

Figure 6: The estimated employment of the Maritime Sector against comparable industries in 2019, and growth against 2010 level



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

11 Department for Transport. (2019). ['Maritime 2050: Navigating the Future'](#).

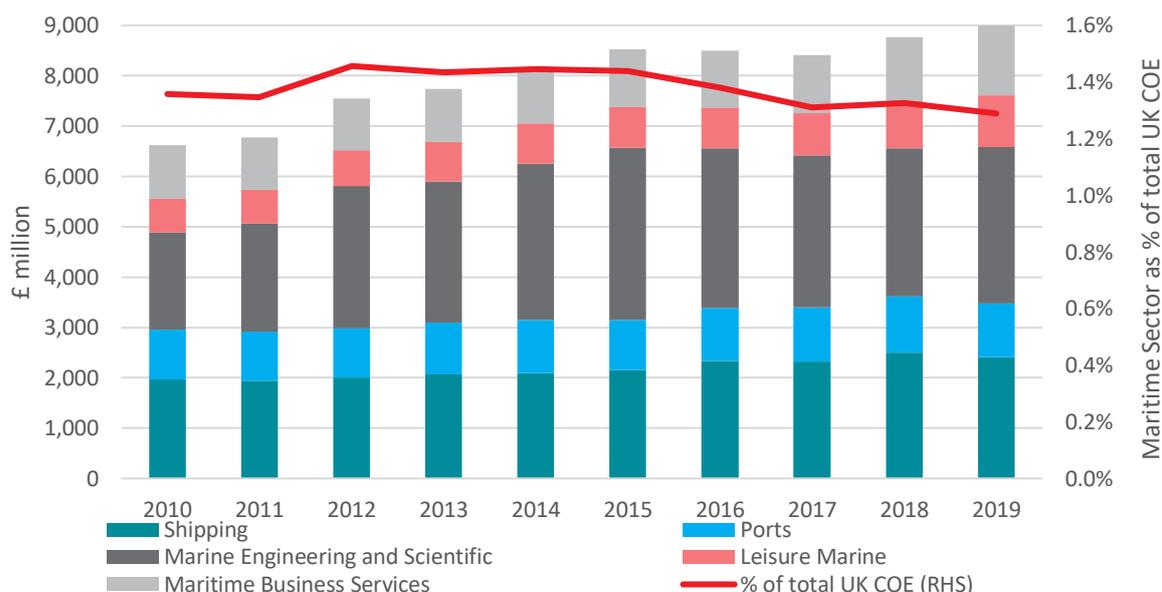
12 Ministry of Defence. (2017). ['National Shipbuilding Strategy'](#).

13 UK Government (October 2021). ['Net Zero Strategy: Build Back Greener'](#).

2.4 The direct economic impact through the compensation of employees

Error! Not a valid bookmark self-reference. below illustrates the compensation of employees which is directly supported by the Maritime Sector in 2019, disaggregated by industry. It also illustrates the proportion of all direct employee compensation in the Maritime Sector which is directly supported by the industry.

Figure 7: The direct contribution of the Maritime Sector through the compensation of employees, and the sector's share of total UK employee compensation, 2010 to 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

It is estimated that the Maritime Sector directly contributed just under £9 billion through the compensation of employees in 2019; equivalent to around 1.3% of the total employment costs of the total UK Non-Financial Business Economy. Overall, the sector increased its direct employee compensation by £2.3 billion over the assessed period, although as a share of total UK employee compensation this was down from a level of 1.36% in 2010.

Due to both its high direct employment contribution (35% of the Marine Sector total), and high average employee compensation, the MES industry contributed the highest share (around 34.5% in 2019). The total growth in Marine Sector employee compensation was also driven primarily by the £1.2 billion increase in MES industry, although in percentage terms leisure marine industry employee compensation increased the most (55% higher in 2019 than in 2010).

The shipping and MES industry together contributed about 61% of employee compensation, and 68% of the growth since 2010.

2.5 The direct contribution of the Maritime Sector to the UK Exchequer

This subsection discusses the contribution of the Maritime Sector to the UK Exchequer through tax revenues. For each industry and constituent activity, Cebr has calculated the contributions in terms of the tax heads listed below:

- Income Tax;
- National Insurance Contributions (NICs) – from both employees and employers;
- Value-Added Tax (VAT);
- Corporation Tax;
- National Non-Domestic Rates (Business Rates).

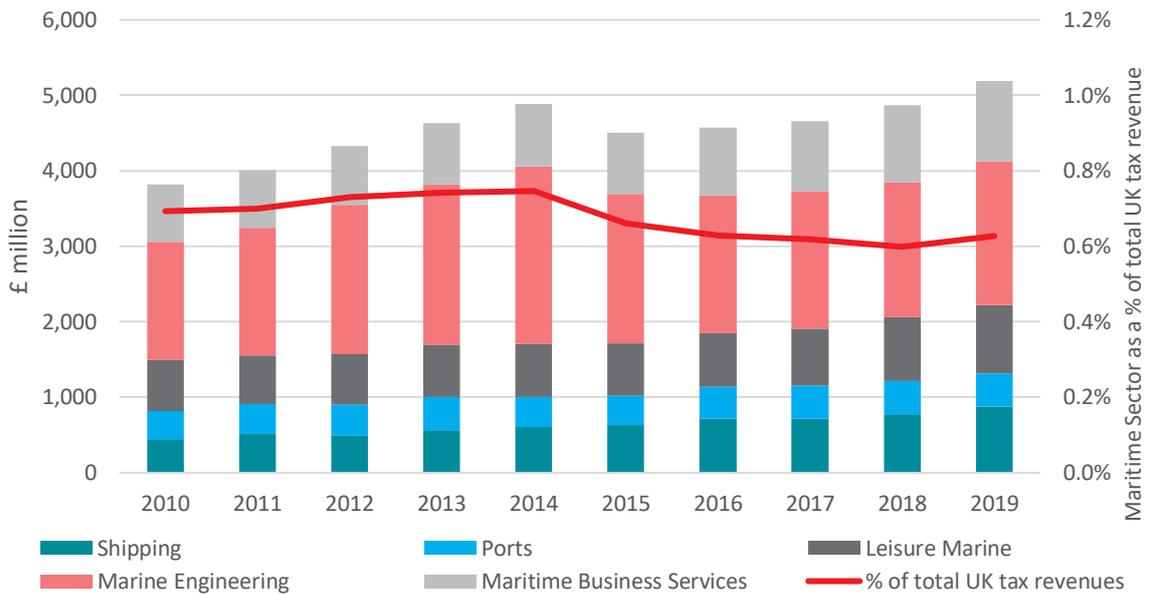
For the personal taxes listed above, Income Tax and NICs revenues have been calculated by applying tax rates to the estimated wages and salaries paid to employees operating in each industry; rates and thresholds have been sourced from HMRC for the years 2010 to 2019. Wages and salaries for employees have been sourced from FAME and the Annual Survey for Hours and Earnings (ASHE).¹⁴

For the business taxes listed above and aside from revenues raised from the Tonnage Tax regime applied to the shipping industry (discussed in Cebr's separate report on the economic contribution of the shipping industry), Corporation Tax revenues have been estimated by applying HMRC estimates for Average Effective Tax Rates (AETRs) to the estimated Gross Profit of each industry activity. Business Rates have been estimated using the average level of Business Rates paid as a proportion of GVA, drawing upon the ONS Annual Business Survey (ABS).

Figure 8 shows the direct contribution of the Maritime Sector to the UK Exchequer across the years 2010 to 2019, disaggregated by industry and expressed as a share of total UK tax revenues.

14 The Annual Survey of Hours and Earnings (ASHE) provides data on the levels, distribution and make-up of earnings and hours worked for UK employees by sex and full-time or part-time status in all industries and occupations.

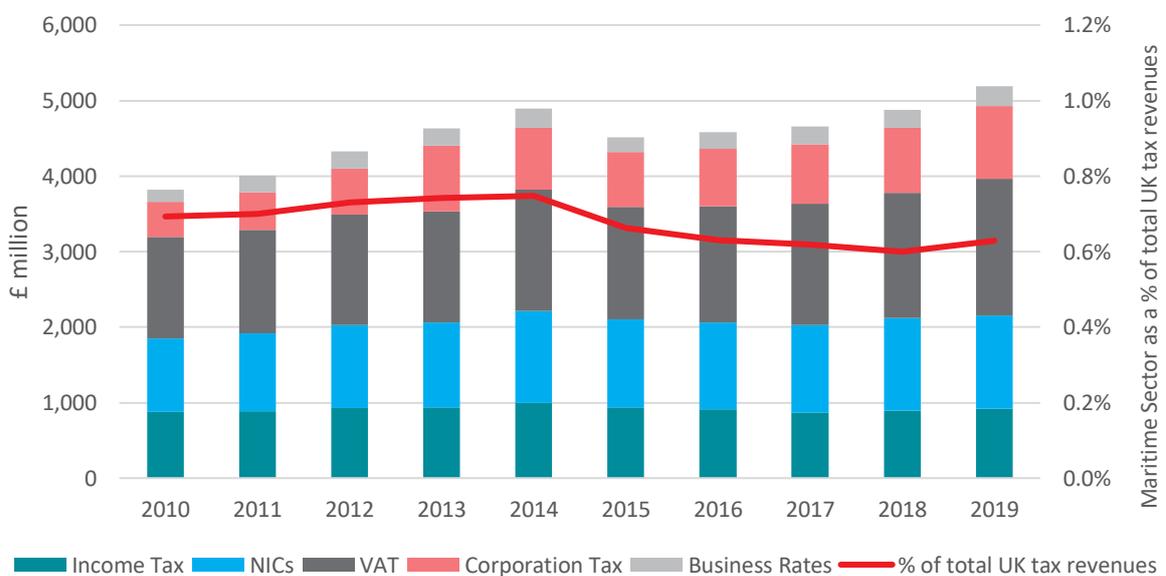
Figure 8: The direct contribution of the Maritime Sector to the UK Exchequer, and the share of total UK tax revenues, 2010 to 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, HMRC, Cebr analysis

The Maritime Sector is estimated to have directly generated £5.2 billion in tax revenues for the UK Exchequer in 2019, 36% higher than the £3.8 billion in 2010. In all years, the MES industry contributed the most, with on average 42% of the total sectoral contribution. Shipping benefits from the tonnage tax regime, hence the lower tax contributions. Exchequer contributions increased over the period for every constituent industry, however as a share of total UK tax revenue, Maritime Sector Exchequer contributions fell slightly, from 0.69% of the total UK revenue in 2010 (and a 2014 peak of 0.75%), to 0.63% in 2019. **Error! Not a valid bookmark self-reference.** below disaggregates the Exchequer contribution of the Maritime Sector by tax head.

Figure 9: The direct contribution of the Maritime Sector to the UK Exchequer, by tax head, 2010 to 2019



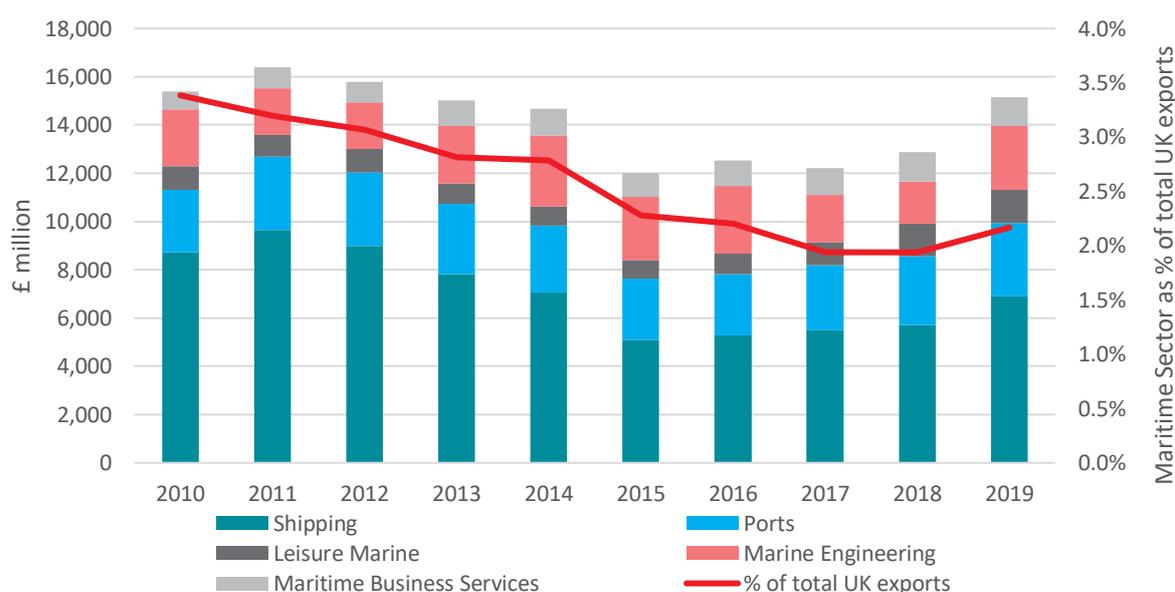
Source: UKCoS, British Marine, PwC, FAME, ONS, HMRC, Cebr analysis

VAT formed the largest component of Exchequer contributions, with £1.8 billion in 2019 and constituting almost 34% of total revenues from the sector from 2010 to 2019; this is despite the assumed zero contribution from those businesses undertaking shipping, ports and shipbuilding activities (among others). The sector also contributed over £1 billion in NICs in 2019, although in percentage terms, Corporation Tax revenue increased the most over the period and actually more than doubled from £460 million in 2010 to £960 million in 2019, thereby registering a 109% growth rate.

2.6 The direct contribution of the UK's exports of products and services

In this subsection we consider the contribution that the Maritime Sector makes to goods and services exported from the UK. We compare this total value to the total value of products and services exported from the UK.¹⁵ Figure 10 shows trends in the value of services exports from the Maritime Sector between 2010 and 2019, with exports then expressed as a share of the total value of UK exports across the same period.

Figure 10: Exports of goods and services from the Maritime Sector, and the share of total UK exports, 2010 to 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, HMRC, Cebr analysis

The Maritime Sector is estimated to have exported services valued at £15.1 billion in 2019. This is 2% lower than the £15.4 billion in 2010, and 8% below the 2011 peak of £16.4 billion. In recent years the steady decline in the export value has stabilised, with the figure in 2019 26% above the 2015 trough. Still, the proportion of UK exports supported by the Maritime Sector has fallen from 3.4% in 2010 to 2.2% in 2019. This decline is primarily driven by a £1.8

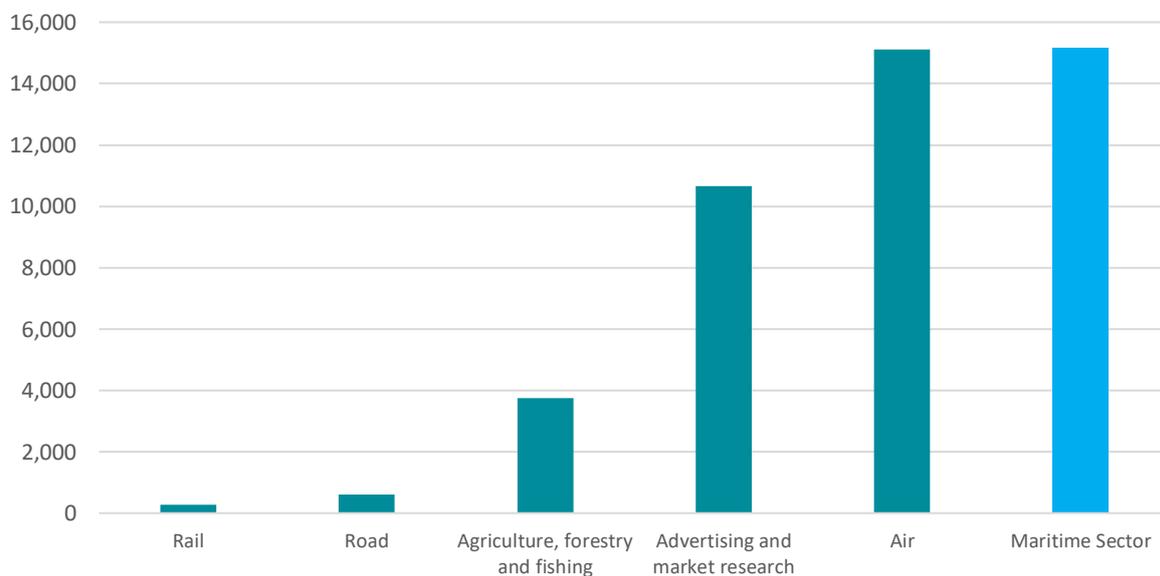
15 A full description of how the value of industry exports have been calculated can be found in each of Cebr's reports for the Shipping, Ports, Marine and Maritime Business Services industries.

billion decline in the value of exports from the shipping industry. Stripping this out, the value of exports from every other industry has risen from its 2010 levels.

There are targeted ways in which the Maritime Sector can address declining exports. One of the impacts of Brexit is a decline in the value of the pound, which as of January 2022 is still 6% lower (against the US dollar) than in June 2016. This has the potential to help UK exporters, as UK goods and services become more competitive. This could indeed help explain why exports been increasing since 2017.

Figure 11 compares exports from the Maritime Sector against those from other comparable sectors. We observe that amongst all categories, in 2019 the value of exports of products and services from the Maritime Sector was the highest. While it was substantially larger than that of the Rail, Road, Agriculture, forestry and fishing and Advertising and market research sectors, it overtook the value of exports from the Air travel sector by £40 million.

Figure 11: Exports of services from the Maritime Sector in 2019 against comparable activities, £ million



Source: ADS, ONS, Cebr analysis

3. Aggregate economic impact of the Maritime Sector

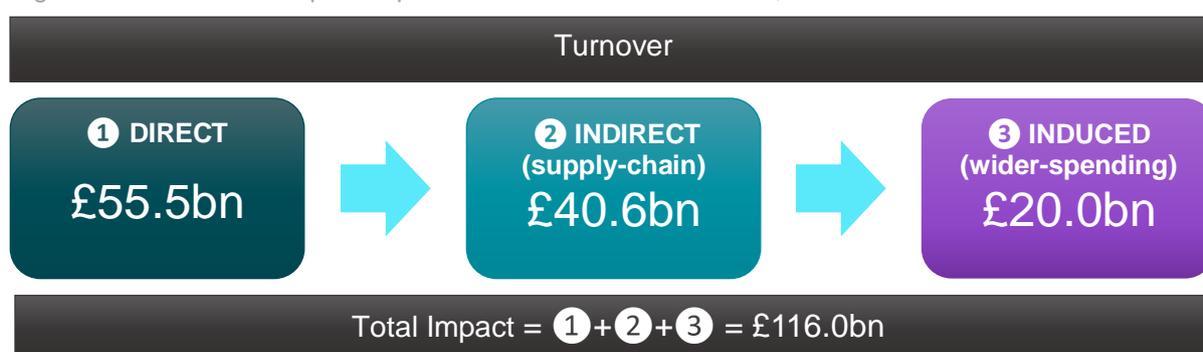
This section sets out the aggregate economic impacts of the Maritime Sector, by taking into account the indirect (or supply chain) and induced (employee spending) impacts that arise from the activities of firms within this industry. The four macroeconomic indicators for which the aggregate economic impacts have been calculated are as follows: business turnover; GVA; employment; and the compensation of employees. Multipliers have been generated from Cebr's economic impact model for the UK. Note that the methodology used to generate these multipliers is consistent to that employed in our 2019 study.

Within this report, we also present estimates for the aggregate impact of the Maritime Sector, incorporating methodological refinements made to the modelling framework which have been developed since 2019. These figures based on Cebr's updated methodology can be found in Annex B: [Supplementary results of aggregate economic impact analysis](#).

3.1 The aggregate economic impacts through turnover

Figure below illustrates the turnover multipliers for the Maritime Sector within the UK. Combined, the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries contributed £55.5 billion in direct turnover. However, considering the turnover supported in the industries' supply chains (indirect impact) and when employees (and supply chain employees) spend their earnings (induced impact), a total aggregate turnover footprint of £116.0 billion is supported. Approximately £40.6 billion of this is due to the indirect impact, and £20.0 billion due to the induced impact.

Figure 12: Turnover multiplier impacts of the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Another way of conceptualising this is the additional value of the turnover supported, for every pound earned in the Maritime Sector. Based on these figures, for every £1 of turnover initially generated by the Maritime Sector in 2019, a further turnover of £1.09 was supported through its indirect and induced impacts in the UK economy.

Table shows the breakdown of this estimated aggregate turnover impact, by considering the impacts from the individual industries in the Maritime Sector.

Table 3: Turnover impact of the Maritime Sector by industry, £ million, 2019

Turnover in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	55,475	40,644	19,965	116,084
Shipping	26,651	16,657	6,285	49,593
Ports	4,193	3,494	2,322	10,009
Leisure marine	3,411	2,870	1,801	8,083
Marine engineering and scientific	14,498	13,106	7,073	34,676
Maritime Business Services	6,722	4,517	2,484	13,722

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Within this aggregate economic contribution, the activities of the shipping industry supported the largest turnover impact, with £49.6 billion in 2019. After shipping, the MES industry supported the most in aggregate turnover, with £34.7 billion in 2019. The ports and marine engineering & scientific industries had the highest aggregate multiplier, with every £1 of direct turnover supporting a total aggregate turnover footprint of £2.39 in the UK economy.

Table below presents in each year the direct contribution to turnover from the Maritime Sector, alongside our estimate of the composite turnover multiplier that applies to the entire sector, together with some indicative estimates for the aggregate impact.¹⁶ Our estimates indicate a composite turnover multiplier value of 2.04, with the direct impact rising from £35.9 billion in 2010 to £55.5 billion in 2019.

Table 4: Direct and total turnover impact of the Maritime Sector, £ million, 2010 to 2019

	Direct Impact	Composite Turnover multiplier	Aggregate Impact
2010	35,858	2.09	76,889
2011	37,871		81,120
2012	39,800		85,230
2013	41,327		88,532
2014	43,501		93,333
2015	43,252		92,297
2016	45,712		96,615
2017	48,356		101,976
2018	51,458		107,972
2019	55,475		116,084

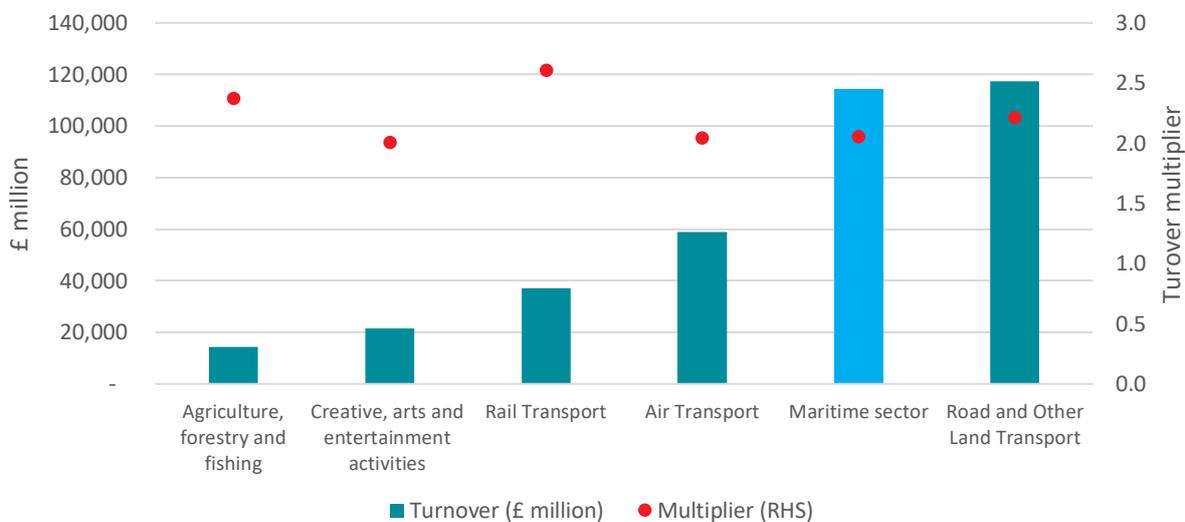
¹⁶ Note that we are applying our multipliers as calculated using our latest input-output model, to the figures for the whole decade. So we are in effect assuming the multipliers calculated based on the 2019 direct impacts also apply back to 2010.

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

To place these results in context, Figure A.2 below compares the total turnover impact of the Maritime Sector against the comparable sectors identified in the previous section. In addition, the turnover multipliers associated with each activity are also presented.

Figure below compares the total turnover impact of the Maritime Sector against the comparable sectors identified in the previous section. In addition, the turnover multipliers associated with each activity are also presented.

Figure 13: The aggregate turnover impact and turnover multiplier of the Maritime Sector against comparable industries, 2019

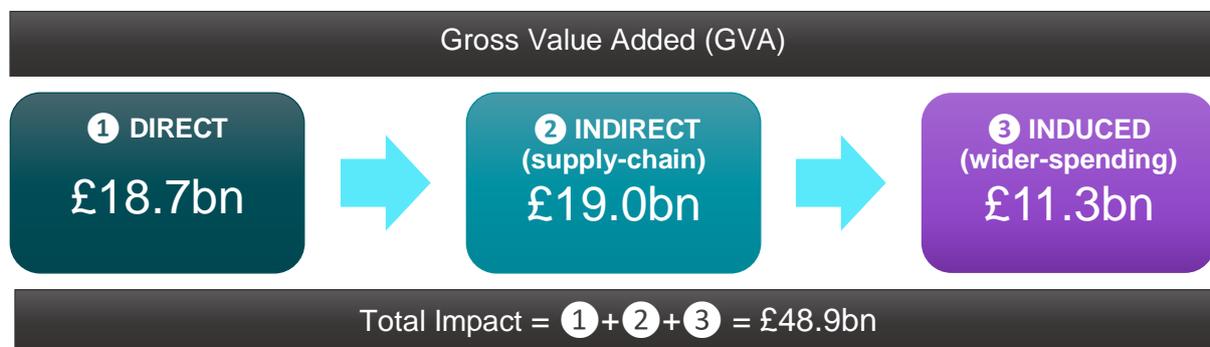


Source: ADS, ONS, Cebr analysis

3.2 The aggregate economic impacts through GVA

Figure below illustrates the GVA multipliers for the Maritime Sector within the UK. As for turnover, the direct impact is augmented by the indirect (supply-chain) and induced (wider employee spending) impacts, to estimate the aggregate economic footprint of the sector.

Figure 14: GVA multiplier impacts of the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The Maritime Sector directly contributed £18.7 billion in GVA in 2019, and once the indirect and induced economic channels are taken into consideration the sector supported £48.9 billion

in GVA. Therefore, for every £1 of GVA directly generated by the Maritime Sector in 2019, a further GVA impact of £1.62 was supported through its associated supply chains and wider spending impacts in the UK economy.

Table below shows the estimated direct and total GVA impacts from the individual industry activities when taken in isolation. Within the aggregate economic contribution of £48.9 billion, the shipping, then MES industries made the largest aggregate contributions, with £17.6 billion and £16.4 billion respectively in 2019.

Table 5: GVA impact of the Maritime Sector by industry activity, £ million, 2019

GVA in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	18,698	18,984	11,255	48,938
Shipping	6,560	7,479	3,519	17,557
Ports	2,195	1,807	1,417	5,420
Leisure marine	1,226	1,103	806	3,135
Marine engineering and scientific	5,703	6,475	4,223	16,401
Maritime Business Services	3,015	2,120	1,290	6,425

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table below presents, in each year, the direct contribution to GVA from the Maritime Sector, alongside our indicative estimate of the aggregate GVA that applies to the entire industry. Note that just like for Table , the aggregate impacts timeseries is an indicative estimate. The total GVA impact has increased by 39.2% from £35.1 billion in 2010 to £48.9 billion in 2019. This is just over the total UK GVA growth over the same period, which increased by 38.9%, per ONS data.

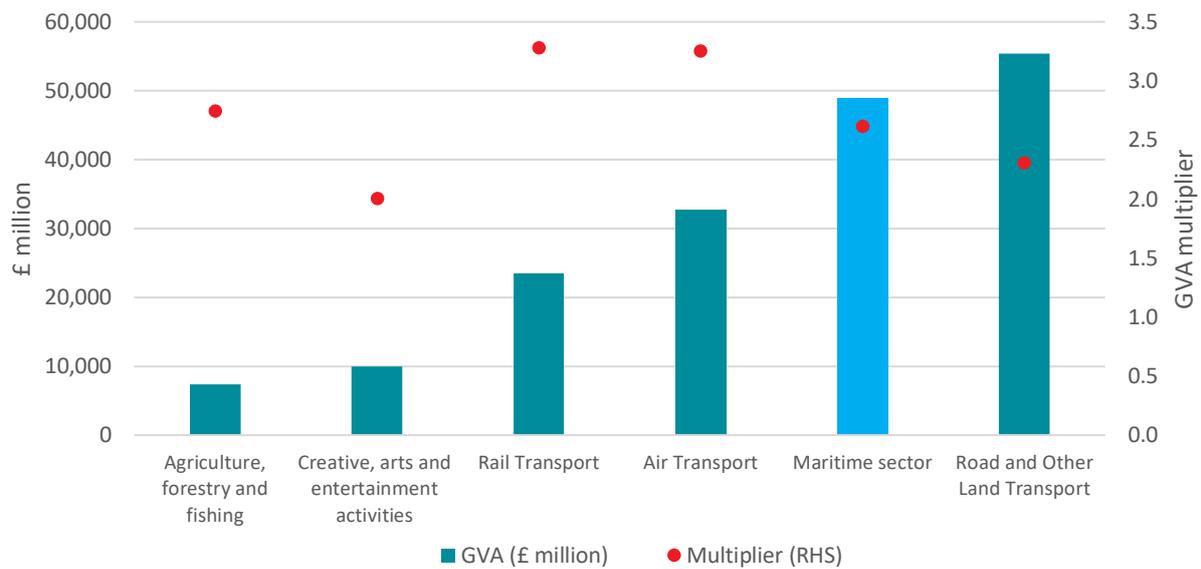
Table 6: Direct and total GVA impact of the Maritime Sector, £ million, 2010 to 2019

	Direct Impact	Composite GVA multiplier	Aggregate Impact
2010	13,411	2.62	35,151
2011	13,740		35,985
2012	15,237		40,009
2013	14,709		38,585
2014	15,876		41,547
2015	15,938		41,941
2016	16,809		44,064
2017	17,456		45,670
2018	16,903		44,046
2019	18,698		48,938

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

To place these results in context, Figure below compares the total GVA impact of the Maritime Sector against the comparable activities identified in the previous section. In addition, the GVA multipliers associated with each activity are also presented.

Figure 15: The aggregate GVA impact and GVA multiplier of the Maritime Sector against comparable industries, 2019



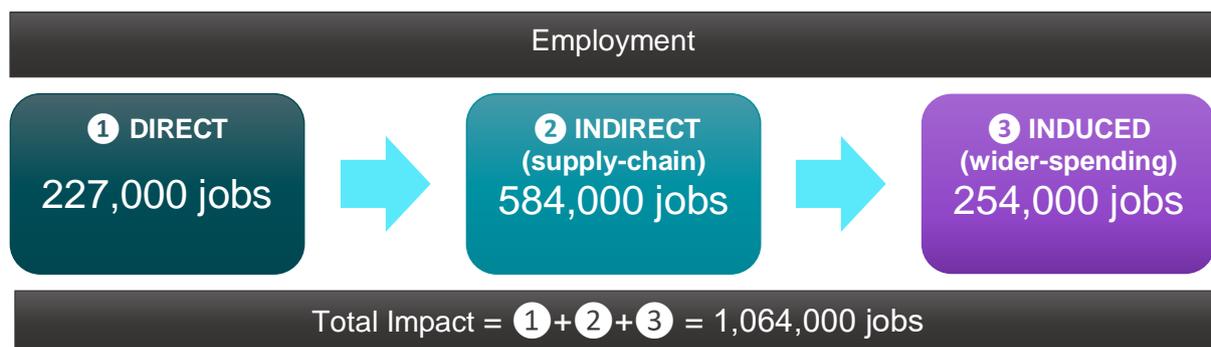
Source: ADS, ONS, Cebr analysis

The total GVA impact of the Maritime Sector in 2019 exceeded that of all of the comparative sectors except Road and Other Land Transport. However, the GVA multiplier of the Maritime Sector in 2019 (2.57) was greater than that of the Creative arts and entertainment activities (2.01) and Road and Other Land Transport (2.31).

3.3 The aggregate economic impacts through employment

Figure illustrates the aggregate employment impacts for the Maritime Sector, in 2019.

Figure 16: Employment multiplier impacts of the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

In addition to the 227,000 jobs directly provided by the Maritime Sector, a cumulative 837,000 are supported by the indirect and induced effects. Notably this means that the Maritime Sector supports over 1 million jobs, when considering the direct and multiplier effects. Additionally, for every job directly provided by the Maritime Sector in 2019, a further 3.69 jobs were supported through its associated supply chains (indirect impacts) and wider employee spending (induced impacts) in the UK economy.

Table below shows the estimated aggregate employment impacts from the individual industries when taken in isolation. Just like the previous study, the highest employment multiplier is found in the shipping industry. However, as mentioned in the methodology section earlier in the report we have refined our input-output modelling process, resulting in a lower employment multiplier for this industry. Further detail is available in Section 1.3. The high employment multiplier (10.66) associated with the shipping industry in the UK drives the aggregate employment impact across the sector.

Table 7: UK Employment impact of the Maritime Sector by industry activity, thousands of jobs, 2019

Employment in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	227	584	254	1,064
Shipping	61	417	168	646
Ports	30	17	10	58
Leisure marine	32	20	10	62
Marine engineering and scientific	80	90	46	217
Maritime Business Services	24	38	19	81

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table below presents in each year the direct employment from the Maritime Sector, alongside the domestic employment multiplier that applies to the entire sector.

Table 8: Direct and aggregate UK employment impact of the Maritime Sector, thousands of jobs, 2019

	Direct Impact	Composite Employment multiplier	Aggregate Impact
2010	192	4.69	901
2011	199		931
2012	203		953
2013	209		976
2014	211		986
2015	214		1,005
2016	217		1,021
2017	221		1,054
2018	232		1,084
2019	227		1,064

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The total employment impact has grown from around 901,000 jobs in 2010 to 1,064,000 jobs in 2019, an increase of 18%. The composite multiplier has fluctuated slightly over the period, however as of 2019 it is marginally higher than in 2010. This compares favourably to an increase in UK employment of 13% over the same period, per the ONS.

To place these results in context,

Table A.8: UK Employment impact of the Maritime Sector by industry activity, thousands of jobs, 2019

Employment in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	227	584	254	1,064
Shipping	61	417	168	646
Ports	30	17	10	58
Leisure marine	32	20	10	62
Marine engineering and scientific	80	90	46	217
Maritime Business Services	24	38	19	81

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table A.9 below presents in each year the direct employment from the Maritime Sector, alongside the domestic employment multiplier that applies to the entire sector.

Table A.9: Direct and aggregate UK employment impact of the Maritime Sector, thousands of jobs, 2019

	Direct Impact	Composite Employment multiplier	Aggregate Impact
2010	192	4.69	901
2011	199		931
2012	203		953
2013	209		976
2014	211		986
2015	214		1,005
2016	217		1,021
2017	221		1,054
2018	232		1,084
2019	227		1,064

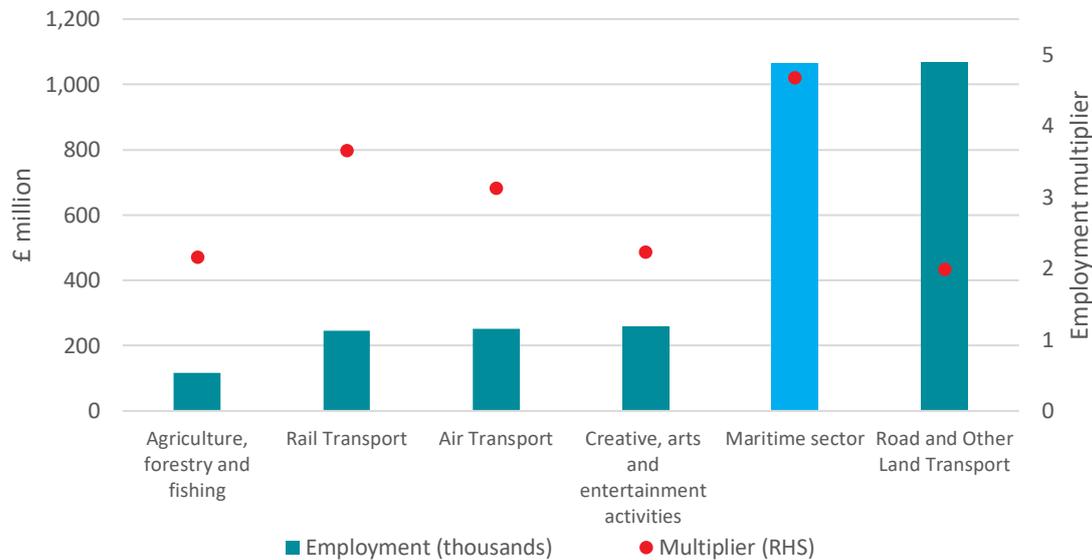
Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The total employment impact has grown from around 901,000 jobs in 2010 to 1,064,000 jobs in 2019, an increase of 18%. This compares favourably to an increase in UK employment of 13% over the same period, per the ONS.

To place these results in context, Figure A.6 compares the total employment impact of the Maritime Sector in 2019 to the comparable sectors identified in the previous section. In addition, the employment multipliers associated with each activity are also presented.

Figure compares the total employment impact of the Maritime Sector in 2019 to the comparable sectors identified in the previous section. In addition, the employment multipliers associated with each activity are also presented.

Figure 17: The aggregate employment impact and employment multiplier of the Maritime Sector against other industries, 2019



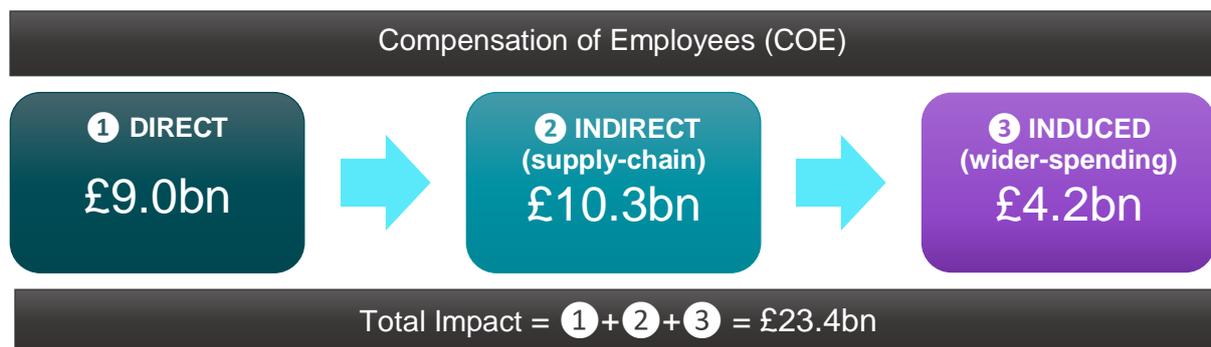
Source: ADS, ONS, Cebr analysis

In 2019 the Maritime Sector had the second largest employment impact at 1.06 million jobs, just behind Road and Other Land Transport which supported close to 1.07 million jobs. In terms of the employment multiplier, the Maritime Sector in 2019 had highest value (4.69) across the categories mentioned, followed by Rail Transport (3.66).

3.4 The aggregate economic impacts through the compensation of employees

In this final subsection we consider the aggregate economic impact of the Maritime Sector through the compensation of employees. Figure illustrates the direct, indirect and induced impacts of employee compensation associated with the sector.

Figure 18: Multiplier impacts for the compensation of employees for the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

In addition to the £9.0 billion in direct employee compensation provided, £10.3 billion in employee compensation is supported in the supply-chains of the Maritime Sector, and £4.2 billion due to wider employee spending. Overall, the Maritime Sector supports a total of £23.4 billion in employee compensation. For every £1 directly raised in the compensation of

employees in 2019, a further of £1.61 in employee compensation was supported through the associated supply chain effects and wider employee spending in the UK economy.

Table below shows the direct and aggregate impact through the compensation of employees across each industry. Of the £23.4 billion aggregate economic impact for the Maritime Sector, the largest impact (£8.6 billion) was supported by the shipping industry.

Table 9: Impact through the compensation of employees of the Maritime Sector by industry activity, £ million, 2019

Compensation of Employees in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	8,978	10,268	4,196	23,442
Shipping	2,397	4,651	1,534	8,582
Ports	1,063	707	386	2,156
Leisure marine	1,038	743	388	2,170
Marine engineering and scientific	3,105	2,937	1,319	7,360
Maritime Business Services	1,376	1,229	569	3,174

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Finally, Table A.10 below shows the direct and aggregate impact through the compensation of employees across each industry. Of the £23.4 billion aggregate economic impact for the Maritime Sector, the largest impact (£8.6 billion) was supported by the shipping industry.

Table A.10: Impact through the compensation of employees of the Maritime Sector by industry activity, £ million, 2019

Compensation of Employees in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	8,978	10,268	4,196	23,442
Shipping	2,397	4,651	1,534	8,582
Ports	1,063	707	386	2,156
Leisure marine	1,038	743	388	2,170
Marine engineering and scientific	3,105	2,937	1,319	7,360
Maritime Business Services	1,376	1,229	569	3,174

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Finally, Table A.11 below shows the trend in the direct impact and aggregate support from the Maritime Sector, from 2010 to 2019. Our indicative estimate of the aggregate impact through the compensation of employees has grown from £17.4 billion in 2010 to £23.4 billion in 2019. This has been driven by an increasing direct impact, with the size of the composite multiplier relatively stable over the period.

below shows the trend in the direct impact and aggregate support from the Maritime Sector, from 2010 to 2019. Our indicative estimate of the aggregate impact through the compensation of employees has grown from £16.8 billion in 2010 to £23.4 billion in 2019. This has been

driven by an increasing direct impact, with the size of the composite multiplier relatively stable over the period.

Table 10: Direct and aggregate impact through the compensation of employees of the Maritime Sector, £ million, 2010 to 2019

	Direct Impact	Composite Employee Compensation multiplier	Aggregate Impact
2010	6,616	2.61	17,452
2011	6,769		17,801
2012	7,541		19,709
2013	7,735		20,190
2014	8,155		21,216
2015	8,513		22,153
2016	8,496		22,290
2017	8,405		22,059
2018	8,701		22,838
2019	8,978		23,442

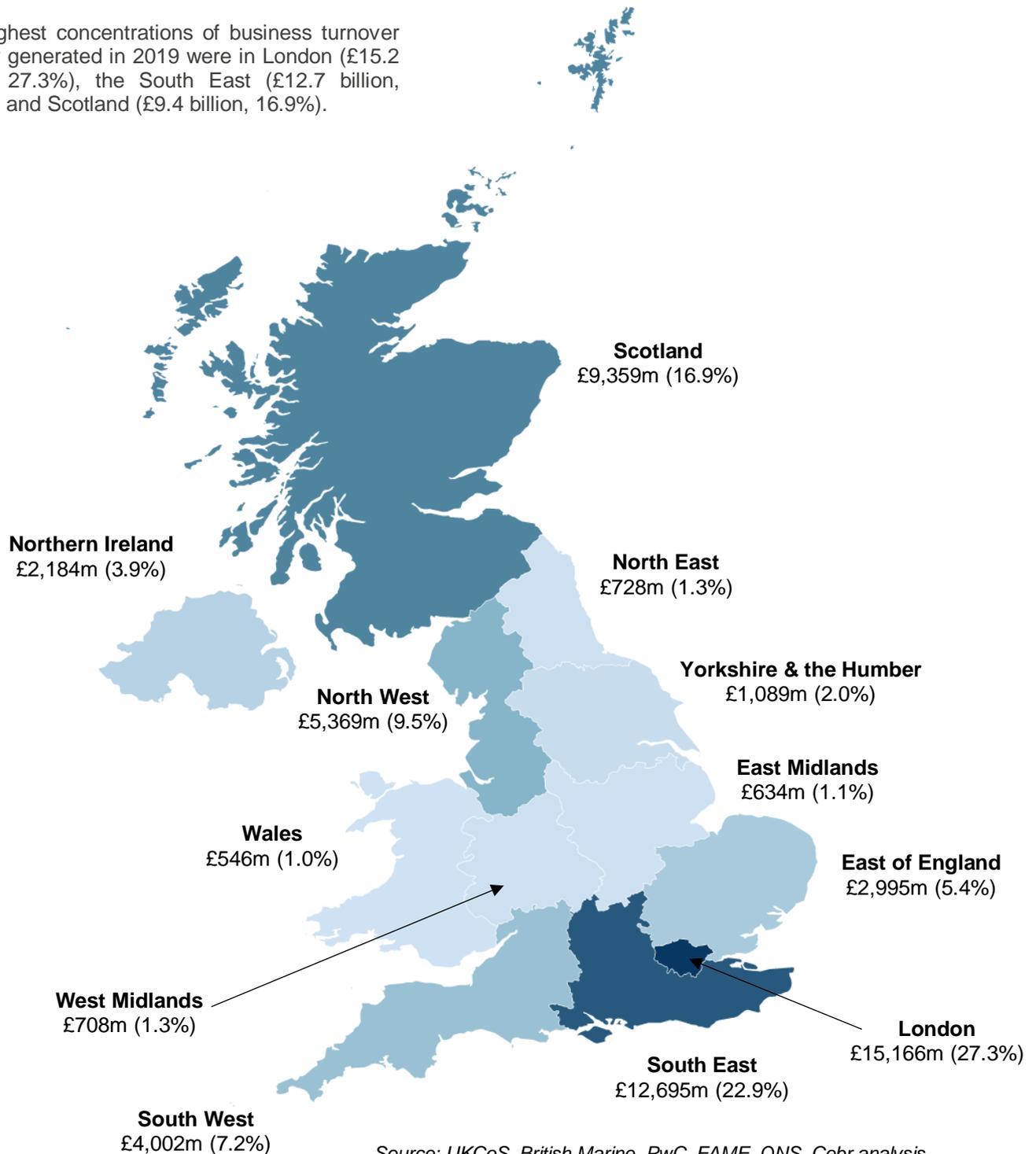
Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

4. The regional economic impact of the Maritime Sector

4.1 The direct economic impact of the Maritime Sector by UK region

Figure 19: Regional breakdown of turnover directly contributed by the Maritime Sector, £ million, 2019

The highest concentrations of business turnover directly generated in 2019 were in London (£15.2 billion, 27.3%), the South East (£12.7 billion, 22.9%) and Scotland (£9.4 billion, 16.9%).

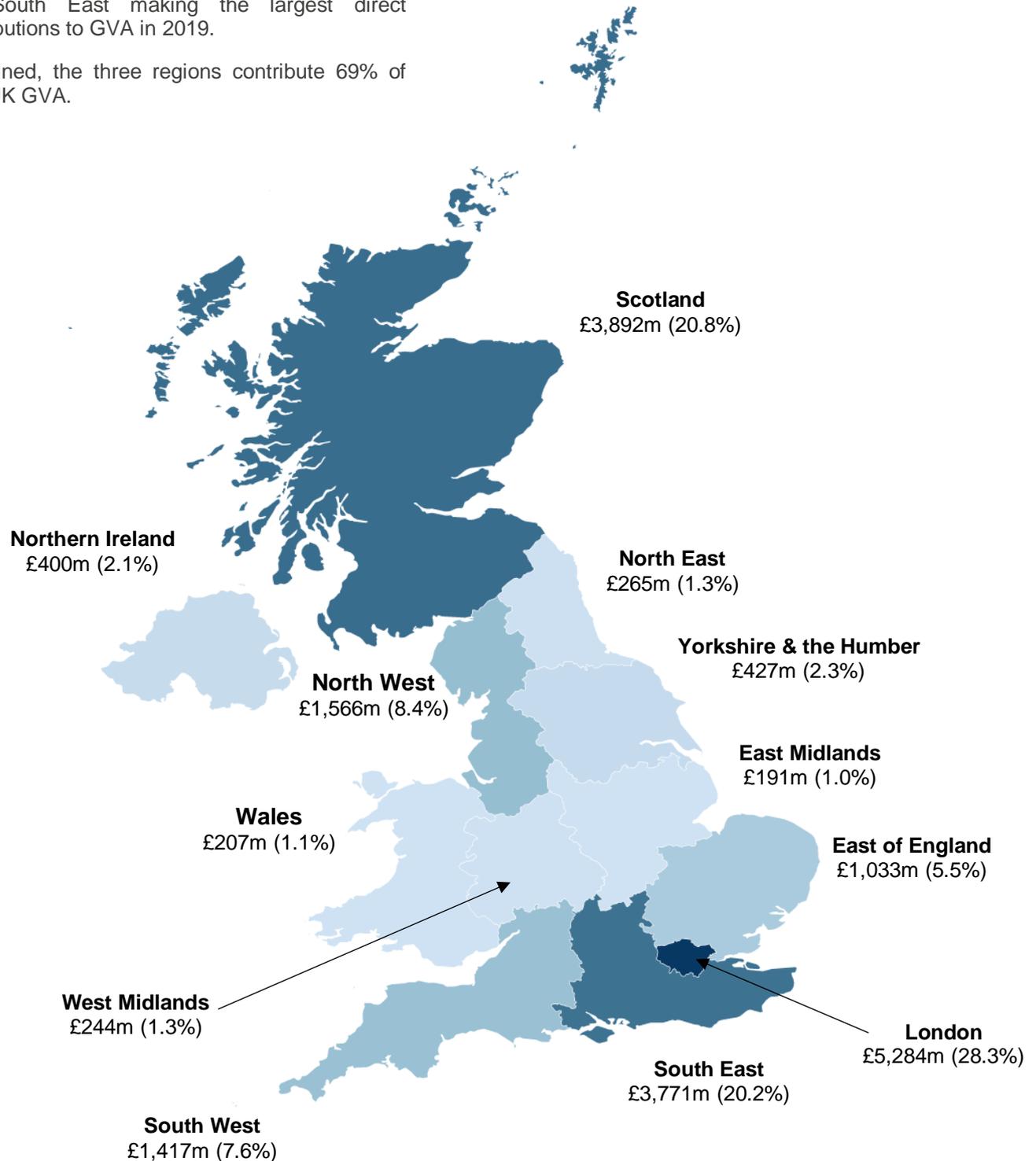


Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Figure 20: Regional breakdown of GVA directly contributed by the Maritime Sector, £ million, 2019

An inspection of the regional breakdown of GVA yields similar results, with London, Scotland and the South East making the largest direct contributions to GVA in 2019.

Combined, the three regions contribute 69% of total UK GVA.

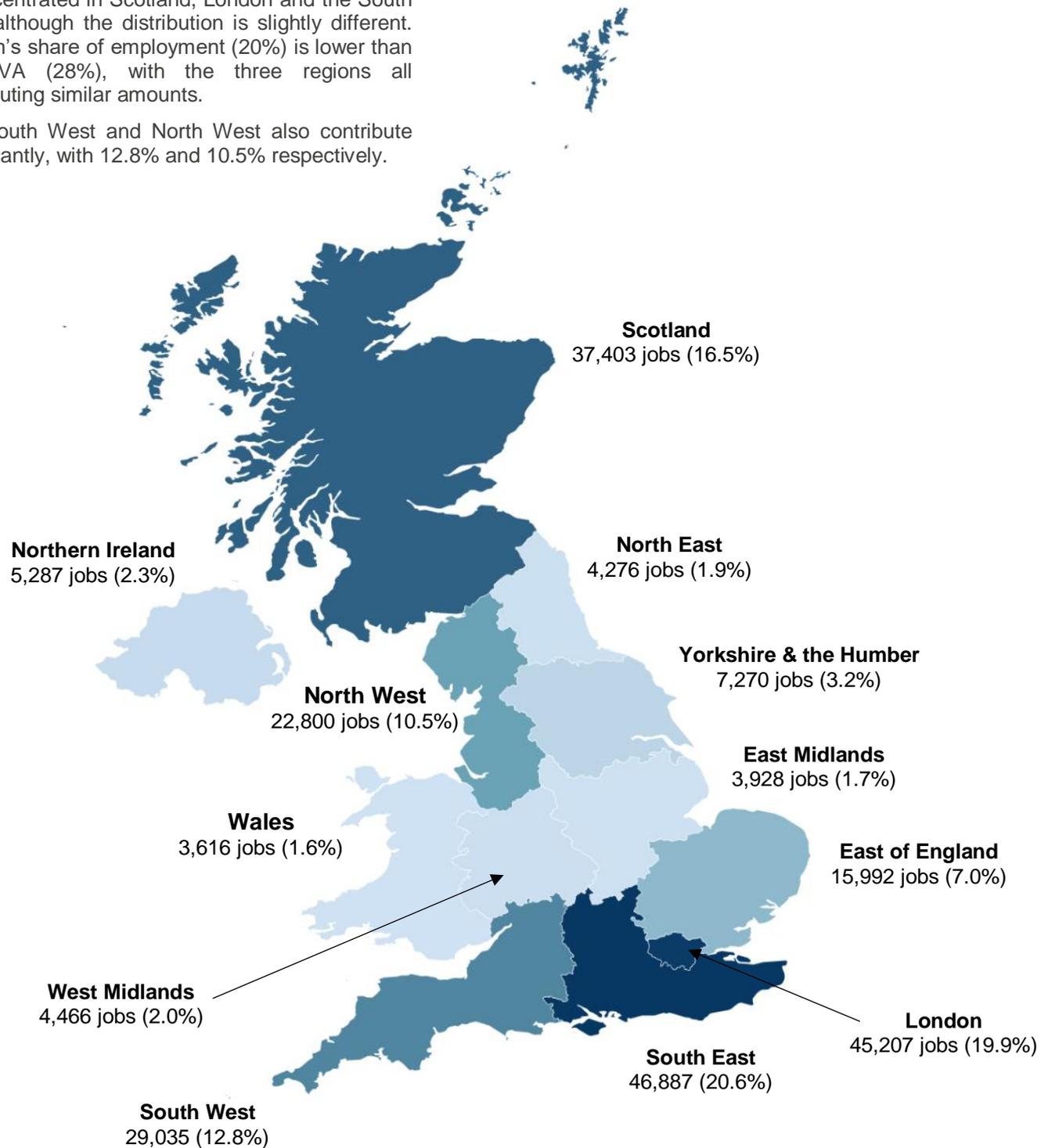


Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Figure 21: Regional breakdown of employment directly contributed by the Maritime Sector, 2019

Once again, the majority of the direct employment is concentrated in Scotland, London and the South East, although the distribution is slightly different. London's share of employment (20%) is lower than for GVA (28%), with the three regions all contributing similar amounts.

The South West and North West also contribute significantly, with 12.8% and 10.5% respectively.

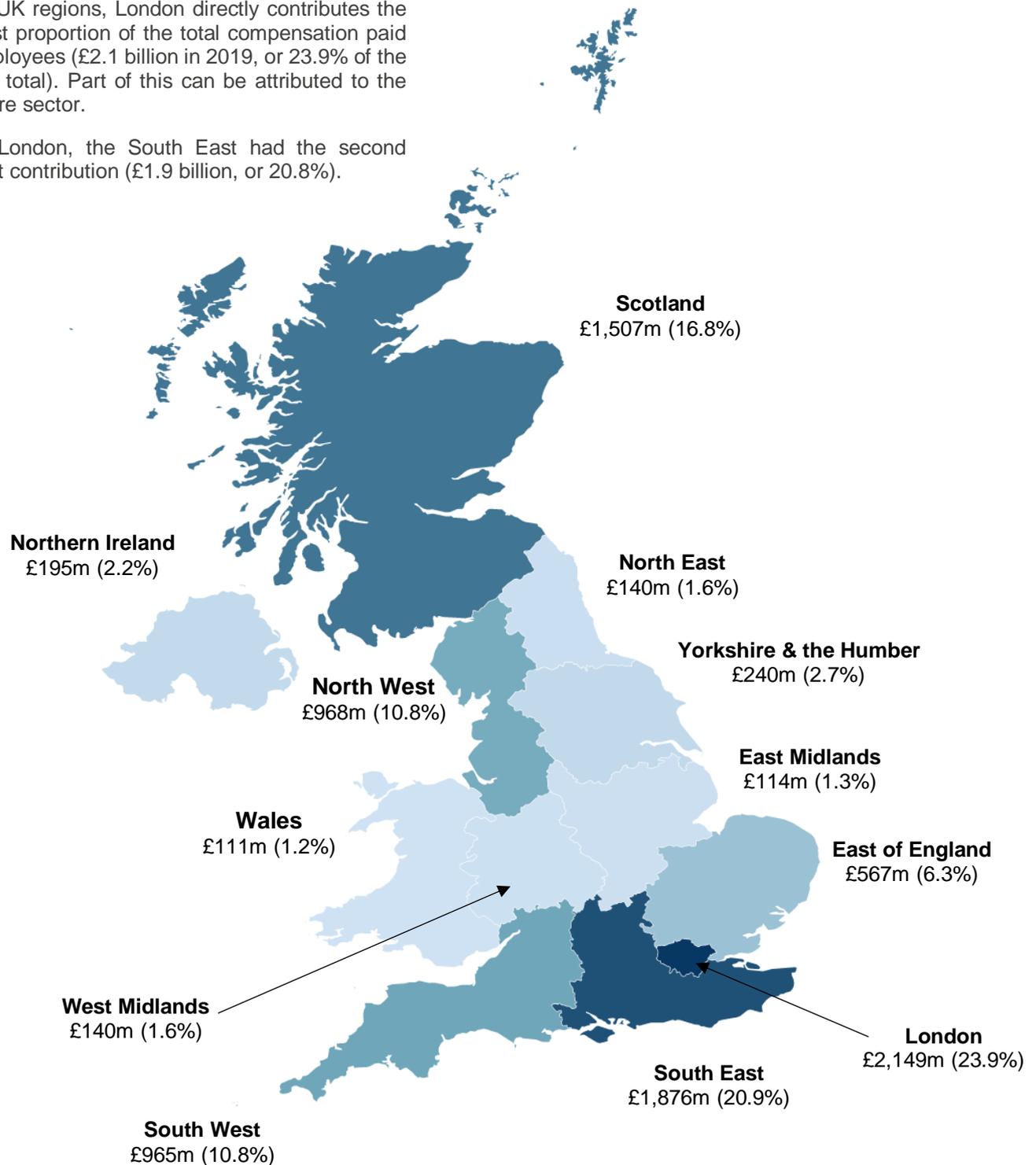


Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Figure 22: Regional breakdown of the COE directly contributed by the Maritime Sector, £ million, 2019

Driven by a high proportion of employment and higher average wages and salaries than most other UK regions, London directly contributes the highest proportion of the total compensation paid to employees (£2.1 billion in 2019, or 23.9% of the sector total). Part of this can be attributed to the offshore sector.

After London, the South East had the second largest contribution (£1.9 billion, or 20.8%).



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

4.2 The aggregate economic impact of the Maritime Sector by UK region

This final subsection examines the aggregate economic impact of the Maritime Sector across each region for the four macroeconomic indicators covered in the previous subsections.

In order to estimate the aggregate economic impact of the sector at a regional level, the direct economic impacts as already estimated were combined with Cebr's regional economic impact models, within which the activities of the Maritime Sector were separately identified and isolated. It should be noted that the economic impact multipliers as estimated for each region are necessarily lower than the equivalent multiplier for the sector as a whole, reflecting the leakage of impacts when the activity of the sector in a particular region imports inputs from elsewhere in the UK outside that region.

The aggregate economic impacts for business turnover and GVA by region

Per Sections **Error! Reference source not found.** and **Error! Reference source not found.**, it is estimated that a total of £55 billion in turnover and £19 billion in GVA was directly contributed by the Maritime Sector in 2019, and £114 billion and £48 billion respectively supported in aggregate across the UK regions.

Table 11 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2019, alongside the sector multiplier for each region. For GVA, the

Region	Turnover			GVA		
	Direct Impact	Sector Multiplier	Aggregate impact	Direct Impact	Sector Multiplier	Aggregate impact
Scotland	9,359	2.19	20,473	3,892	3.37	13,104
Wales	546	1.90	1,039	207	2.32	480
Northern Ireland	2,184	1.79	3,900	400	2.40	961
East of England	2,995	1.97	5,904	1,033	2.39	2,474
East Midlands	634	2.03	1,288	191	2.27	434
London	15,166	1.80	27,271	5,284	2.21	11,681
North East	728	1.93	1,404	265	2.20	583
North West	5,369	1.91	10,245	1,566	2.45	3,842
South East	12,695	1.85	23,497	3,771	2.49	9,377
South West	4,002	1.90	7,599	1,417	2.51	3,562
West Midlands	708	1.82	1,286	244	2.10	514
Yorkshire and the Humber	1,089	1.96	2,135	427	2.30	984

highest multipliers are associated with the South West, the South East, and Scotland.

Table 11: Regional breakdown of business turnover and GVA supported by the Maritime Sector, £ million, 2019

Region	Turnover			GVA		
	Direct Impact	Sector Multiplier	Aggregate impact	Direct Impact	Sector Multiplier	Aggregate impact
Scotland	9,359	2.19	20,473	3,892	3.37	13,104
Wales	546	1.90	1,039	207	2.32	480
Northern Ireland	2,184	1.79	3,900	400	2.40	961
East of England	2,995	1.97	5,904	1,033	2.39	2,474
East Midlands	634	2.03	1,288	191	2.27	434
London	15,166	1.80	27,271	5,284	2.21	11,681
North East	728	1.93	1,404	265	2.20	583
North West	5,369	1.91	10,245	1,566	2.45	3,842
South East	12,695	1.85	23,497	3,771	2.49	9,377
South West	4,002	1.90	7,599	1,417	2.51	3,562
West Midlands	708	1.82	1,286	244	2.10	514
Yorkshire and the Humber	1,089	1.96	2,135	427	2.30	984

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

For both turnover and GVA, the highest level of direct support is generated in Scotland, London and the South East. Given the relatively higher variance in direct impact size compared to multiplier size, the highest levels of aggregate support are also in these three regions. Just considering the multipliers, the highest turnover and GVA multiplier is in Scotland.

For contextual purposes, by comparing the aggregate impacts with regional GVA data from ONS, we can estimate the percentage of economic activity in a region that is supported by the Maritime Sector. This is estimated to be highest in Scotland, where 4.9% of total GVA is supported by the Maritime Sector. In second and third place are London and South East, with 2.8% and 2.7% respectively.

The aggregate economic impacts for employment and the compensation of employees by region

Finally, Table 12 shows the breakdown of direct and aggregate economic impacts for employment and the compensation of employees in 2019, alongside the respective multipliers for each region.

Table 12: Regional breakdown of employment and employee compensation supported by the Maritime Sector, 2019

Region	Employment (thousands of jobs)			Compensation of Employees (£ million)		
	Direct Impact	Sector Multiplier	Aggregate impact	Direct Impact	Sector Multiplier	Aggregate impact

Scotland	37	3.07	115	1,507	2.72	4,102
Wales	4	2.15	8	111	2.05	228
Northern Ireland	5	2.95	16	195	2.62	512
East of England	16	2.35	38	567	2.26	1,280
East Midlands	4	2.08	8	114	1.87	213
London	45	2.97	134	2,149	2.33	4,997
North East	4	2.20	9	140	2.06	287
North West	24	2.59	62	968	2.38	2,302
South East	47	2.78	130	1,876	2.61	4,897
South West	29	2.18	63	965	2.10	2,024
West Midlands	4	2.22	10	140	1.99	279
Yorkshire and the Humber	7	2.30	17	245	2.08	511

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

In 2019, London was the region with the largest aggregate impacts through employment with 134,000 jobs, as well as the region with the greatest employee compensation at £5 billion. As for the multipliers, the highest employee compensation multiplier was in the North West, London, and Scotland where it was 2.72 in 2019. Scotland was also the region with the highest employment multiplier at 3.07, thereby making a significant contribution to the aggregate impact, despite a lower direct impact than the South East.

As for GVA, we can estimate the percentage of total regional employment that is supported by the Maritime Sector. This is highest in the North East, with 6.7% of all employment supported by the Maritime Sector. In Wales, the East Midlands, and Yorkshire and the Humber, the Maritime Sector also makes notable employment contributions, with 5.6%, 3.4%, and 3.0% of all employment supported by this sector, respectively.

5. The UK Maritime Sector: A forward look

In this final section of the report we present projections for the Maritime economy for the period 2021-2025. The section starts off by discussing the key trends and themes that will be shaping the future of the Maritime Sector in the UK and in the rest of the world. We then describe the conceptual approach that we have developed to produce projections of the direct economic impacts after 2019, including (but not exclusively) the effects of Covid-19. Finally, we present our forecasts of Maritime turnover and GVA over the period 2021-2025.

Maritime worldwide trends and key themes shaping the future UK Maritime economy

This section provides a summary of the trends and events set to shape the future of the Maritime Sector in the UK and in the rest of the world. A number of policy documents underpin this section, in particular the UNCTAD's 'Review of Maritime Transport 2021',¹⁷ and the Department for Transport's 'Maritime 2050: Navigating the Future',¹⁸ papers. These relate to the global maritime sector's Covid recovery as well as long term policy trends.

The main factor driving our forecasts is the recovery from the pandemic. Domestically, we have so far seen a quick recovery. Following the successful rollout of the UK vaccination programme and the lifting of public health restrictions, the UK's economic output reached pre-pandemic levels in November 2021. However, we have seen that the economic recovery and the reopening associated with the pandemic have not been linear. The latest wave resulting from the newer Omicron variant is associated with milder symptoms, and is unlikely to impact the economic activity in the UK and elsewhere as severely as previous waves. But it is not certain that potential future variants would be as seemingly mild as Omicron. A strong rebound globally resulting in growth in seaborne trade would be good news for the UK Maritime Sector as it is a facilitator of global trade, from shipping to the world leading maritime business services it provides.

Below we highlight the other worldwide trends that will influence the evolution of the Maritime Sector:

- Despite the initial downturn suffered as a result of Covid, the outlook for global seaborne trade is positive for the next few years, and as such this forecasted growth in trade is likely to represent the main opportunity, facilitating a favourable outlook for the Maritime Sector. The volume of goods transported by ships and demand for maritime services has grown strongly and steadily in the decade preceding the Covid-19 pandemic. The growth is set to match or exceed 2019 levels in 2021-22, with containerized and dry bulk commodities expected to experience the strongest growth.

¹⁷ United Nations Conference on Trade and Development. (2021). ['Review of Marine Transport 2021'](#).

¹⁸ Department for Transport. (2019). ['Maritime 2050: Navigating the Future'](#).

- Strong economic and population growth in Africa and Asia is likely to shift trading patterns opening new opportunities for the UK. On the other hand, an ageing population in many developed countries might lead to decreasing demand for some products and create challenges for the UK workforce. This trend has not changed considerably with respect to our previous study, and remains of interest and relevance.
- The world's economic centre is moving eastwards with Asia's middle class forecast to grow 153% by 2030 adding 2 billion additional consumers. Implications for the Maritime Sector include the need for UK ports to stay ahead of the curve in terms of efficiency and for suppliers to the manufacturing sector to position themselves well to meet future demand. In the context of Covid, this may become increasingly more relevant, as the efficient handling and economic recovery in Asia seen in 2020 and early 2021 may have helped make it leap further ahead. However, developments in late 2021 and early 2022 have called this possibility into question, as China has struggled with containing the spread of Covid and has some cities in total lockdown as a result of its zero-Covid policy.
- Climate change and significant climatic events are likely to change the patterns of trade while amplifying the need to protect the marine ecosystem. Aside from massive economic impacts through a variety of channels, increasing sea levels are likely to have direct disruptive consequences on port operations. This consideration has become even more relevant since the previous Cebr study was released in 2019, and the UK Government has since published a detailed policy document outlining its commitment to a Net Zero strategy.

Alongside these trends, like in our previous study we focus on the key development areas within Maritime in the UK, drawing particular emphasis on the objectives and initiatives set out by the government and the industry as part of the Maritime 2050 Strategy document. The below section provides a summary of these themes as key drivers of the UK Maritime Sector.

- A key objective for the sector will be retaining its competitive advantage. It is the UK government's intention to work alongside the Maritime Sector to retain the best possible fiscal regime as already demonstrated by the introduction of the Tonnage Tax in 2000. Further to this, the successful implementation of the stated policy goals in the UK Government's Maritime 2050 strategy will prove key in retaining and enhancing the competitive advantage of the UK as a maritime nation. To this end, the Government is developing proposals for a new Merchant Shipping Act 1995, which previously consolidated and streamlined much of the UK's maritime legislation, some of which dated back to the end of the 19th century. The UK is aiming to be one of the top ten shipping registers, which is another example of how the country is building its competitiveness. With this objective in mind, the UK Ship Register (UKSR) has already opened up the flag considerably and now accepts ship owners from Commonwealth countries and 20 other nations.
- Technology will act as a driver of change within all Maritime industries. Technological advancements will directly drive the output of the MES industry, but also act as an enabler or a driver for other key themes within the 2050 strategy. We have already observed this in the past with respect to the emergence of autonomous vessels and we expect technology to become all the more necessary in the future. We note, for instance, that the aim to reduce emissions by 50% by 2050 and the movement towards 'Smart Ports' can only be successfully achieved if technology enables it.

- The UK is a major hub for maritime education as demonstrated by its leading maritime training programmes and apprenticeships. This is an area that the government, alongside the industry, want to boost by 2050. Skills are vitally important in the Maritime Sector and, with the emergence of international competitors such as Singapore, it is increasingly important to retain the UK's skill advantage. This is the rationale behind the various initiatives launched by the sector, amongst which we note the £30m a year invested via SMarT plus training since 2018.
- A number of initiatives in the UK and worldwide have been launched to reduce the economy's environmental impact, with some directly targeting the Maritime Sector. The primary target will be the reduction in carbon emissions worldwide by at least 50% by 2050, although recent UK government policy has gone further in calling for a 100% reduction by 2050. Accordingly, the IMO Strategy on reduction of Greenhouse gas (GHG) emissions from ships aims to bring emissions down at least 50% by 2050 compared to 2008. Other IMO's initiatives include the 2020 sulphur regulation, which entered into force on 1 January 2020, and imposes a 0.50% sulphur limit for marine fuels in use on ships operating outside sulphur emissions control area. The UK government is committed to increasing public and private R&D spending to 2.4% of GDP. As noted above, the key to a cleaner industry will be technological advancement.
- The Maritime Sector is the main facilitator of trade, borne out in the fact that 95% of UK internationally traded goods are transported via ships. Seaborne trade provides 25% of the country's energy supply and 48% of the food supply. We note that shipping has experienced a stronger performance over the period 2010-2015 amongst the other Maritime industries. As such, the evolution of the Maritime Sector will heavily depend on trade prospects. Although trade reliance on shipping may decline somewhat as a result of new technologies such as 3D printing and other modes of transport expanding, the Maritime Sector will still be the primary mode of transport for international trade in the foreseeable future. Furthermore, the UK's need to establish a post-Brexit trading framework with the rest of the world is also becoming increasingly important. Indeed, since Cebr published the previous study, there has been progress made on this front, such as the trade deals signed with Japan and Australia, the ongoing negotiations to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and the recent launch of trade talks between the UK and India. Linking this is the emergence of Africa and Asia, where there will likely be large opportunities to expand trade beyond the already established trading partners. Government and industry are already committed to fostering UK exports through a number of short-, medium- and long-term initiatives that have been detailed in a Trade Route Map.¹⁹ In the short-term, the government has committed to conducting an industry competitiveness study, considering the case for free ports, creating a network of UK Export Champions, starting engagement for establishing new shipping routes in the Arctic and seeking continuity for the existing EU FTAs.

19 Department for Transport. (2019). ['Maritime 2050: Trade Route Map'](#).

- Investment in infrastructure will be needed in conjunction with technological advancements to begin establishing ‘Smart Ports’ throughout the UK and in order to open new opportunities such as boosted offshore wind generation.
- The industry and government aim to maintain the security and resilience of UK waters and overseas territories while also investing in the technology to tackle the emerging threat of cybercrime. This is increasingly important when considering the Royal Navy has responsibility for all UK and Red Ensign Group Vessels globally.²⁰

The Maritime Sector Forecast (2021-2025)

Modelling approach

Cebr additionally investigated the relationship between the maritime economy and a number of economic variables through an econometric approach. Our findings show that the UK Maritime Sector is primarily linked to national GDP and energy (oil and gas) production. After having established Maritime economy’s elasticities to GDP and energy production, we project these historical relationships forward to produce a forecast of Maritime turnover and GVA. The output of this model constitutes our baseline forecast.

For our forecast model we rely on Cebr’s in-house macroeconomic model of the UK economy, which contains projections for macroeconomic variables such as GDP and inflation. We build up on this as the baseline forecast and introduce more sector- and industry-specific assumptions which are used to adjust the relationships between the maritime sector and some of the key drivers (or factors) identified which influence its evolution.

To identify the sector-specific assumptions, we drew on the trends and key themes identified in the previous sub-section. Each assumption has been assigned a specific weight reflecting its relevance to the wider Maritime Sector and a set of adjustment factors have been produced.

Applying the adjustments to the baseline forecast, we obtain our central forecast of the Maritime Sector turnover and GVA over the period 2021-2025. It should also be noted that our historical analysis of maritime ends in 2019. This requires us to produce a “now-cast” for the first year (2020) for which we know the actual value of the drivers but not of Maritime turnover and GVA and a forecast for the following period. Note that it is not possible for us to produce a similar “now-cast” for 2021 due to the data lags associated with several of the maritime sector-specific inputs into our model, such as freight and sea passenger data.

²⁰ The Red Ensign Group (REG) is a group of British shipping registers. The registers are operated by the UK, the Crown Dependencies (Isle of Man, Guernsey and Jersey) and UK Overseas Territories (Anguilla, Bermuda, British Virgin Islands; Cayman Islands, Falkland Islands, Gibraltar; Montserrat, St Helena, Turks & Caicos Islands).

Modelling Assumptions

UK GDP

Cebr's Forecasting and Thought Leadership team produces regular forecasts of key economic indicators for the UK national and regional economies which can directly inform our analysis. We therefore rely on our own forecast of UK national GDP. Cebr expects UK GDP to grow at a strong Compounded Annual Growth rate (CAGR) of 2.4% over 2021-2025. This compares to a lower CAGR of 1.9% over the five years preceding the global pandemic (2015-2019). Despite the so far successful vaccine rollouts across most of the developed world, the potential development of new variants as well as the risks to global supply chains being halted due to the low vaccination rates in much of the developing world, though the link between vaccination rates and economic disruption has weakened due to the rise of the Omicron variant. Nevertheless, a certain level of uncertainty characterises the forecast; and so the effects of the ongoing Covid-19 pandemic could shift the projections.

Seaborne trade

As previously outlined, seaborne trade represents the main opportunity for the Maritime Sector over the near term. We consider both worldwide and UK-specific trade projections within our modelling framework, which naturally includes the effects of the pandemic on global maritime trade.

The Covid-19 pandemic has disrupted global maritime transport. However, it has in large part performed better than expected and the full extent of this impact has been less damaging than for other sectors of the global economy. Following the economic downturn suffered during 2020, UNCTAD projects shipping volumes increased by 4.3% in 2021, to exceed their 2019 levels.²¹ After this initial recovery, worldwide trends indicate a period of moderate growth in trade. Per UNCTAD projections, over the 2022-2026 period, total maritime trade is expected to have a compound annual growth rate (CAGR) of 2.4% – which is below the 2.9% observed over the previous two decades.

The IMF expects global sea trade to moderate along with GDP,²² which aligns with the rest of the literature; according to the OECD, a 1% increase in GDP is expected to correspond to a 1.1% growth in seaborne trade.²³

Production of energy: Oil & Gas

We rely upon the Oil and Gas Authority (OGA)'s latest projections, which show a constant decline in oil and gas production for the period up to 2035. Energy production has an ambiguous effect on the Maritime Sector. While it contributes to its direct economic impact through what we have defined as "Marine Engineering and Scientific", it can negatively affect

21 United Nations Conference on Trade and Development. (2021). ['Review of Marine Transport 2021'](#).

22 IMF (2021). ['World Economic Outlook: Managing Divergent Recoveries'](#).

23 OECD. (2018). ['Growth prospects, challenges and uncertainties for selected ocean industries'](#).

trade. An increase in domestic production leads the country to rely less on imported energy, hence implying a reduction in total UK trade. The fact that 25% of the country's energy supply is imported by ship, explains the negative relationship between the Maritime economy and energy production.

Sea passengers

The Maritime Sector also plays a key role in tourism and leisure, and this is something that has been particularly affected by Covid. In 2019 over 2.1 million cruise passengers passed through UK ports, but this figure is estimated to have decreased to 107,000 (a decrease of 95%) in 2020. However, this massive downturn was not felt as strongly in the more general sea transportation of passengers. In 2019, over 18.4 million international ferry passengers and almost 42 million domestic sea passengers travelled on UK short sea routes. In 2020 it is estimated that these decreased by 63% and 51%, respectively (to 6.9 and 20.6 million passengers).

High investment

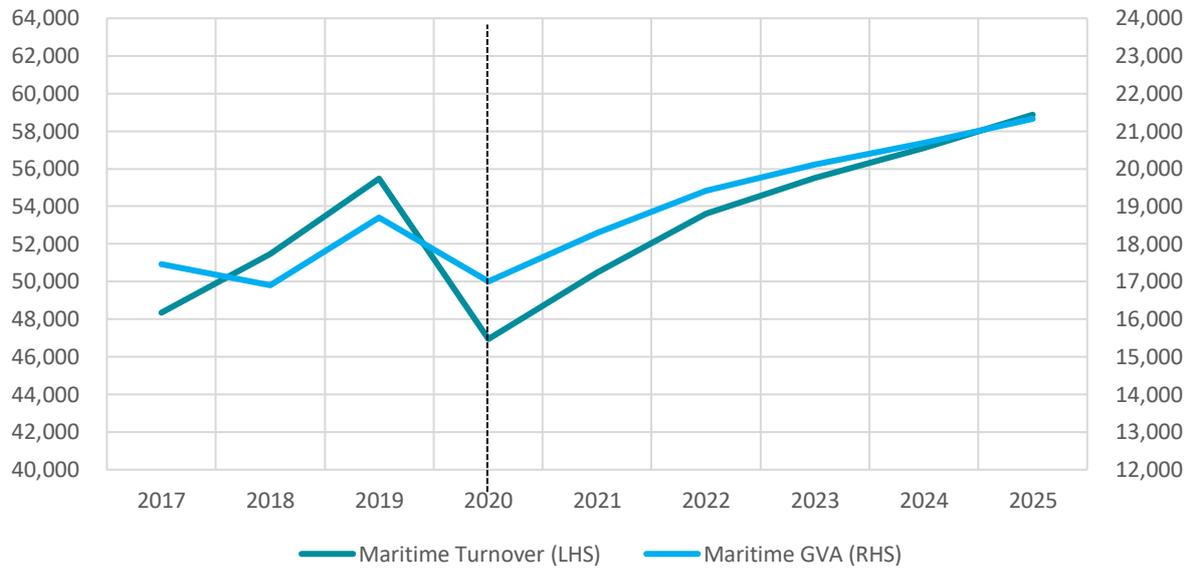
The Maritime 2050 strategy document outlines a large number of recent or planned investments in infrastructure, technology and education as well as ambitious environmental targets. We expect the UK Maritime Sector to experience major improvements over the longer term thanks to greater level of efficiency and productivity, however higher short-term costs might weigh on growth trends.

The 2021-2025 forecast

Figure 23 shows the Maritime Sector experiencing steady growth over the five year horizon. Our forecast indicates that maritime turnover and GVA are set to grow at a Compounded Annual Growth rate (CAGR) of 3.9% over the considered period. This translates into cumulative growth of 16.6% for 2021-2025, which is in a comparable range to the trajectory experienced over recent years.

In line with the rest of the analysis, turnover and GVA have been projected in nominal terms. When the forecast is considered alongside projected inflation, cumulative growth is about 4.2%.

Figure 23: Maritime Sector turnover and GVA trends and projections, £ million, 2017 to 2025



Source: UKCoS, British Marine, PwC, FAME, ONS, Oil and Gas Authority, DfT, Cebr analysis

Annex A: Full set of direct economic impacts by region

Table A.1: Direct economic impact of the Maritime Sector through turnover, £ million, 2010 to 2019

TURNOVER	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	26,222	27,392	29,392	29,576	31,430	31,015	34,357	37,119	39,510	43,386
Scotland	7,690	8,164	8,476	9,661	10,421	9,640	8,575	8,688	9,330	9,359
Wales	1,016	1,336	1,073	1,164	719	1,376	949	775	849	546
Northern Ireland	929	979	858	925	931	1,221	1,831	1,774	1,767	2,184
East of England	2,212	2,692	2,593	2,577	2,563	2,341	3,292	2,852	3,275	2,995
East Midlands	442	387	457	450	1,490	529	557	535	593	634
London	6,643	10,070	10,300	9,864	10,361	12,888	11,584	12,186	12,490	15,166
North East	724	813	747	943	1,116	887	769	827	787	728
North West	1,870	2,459	2,484	2,755	2,977	2,797	3,386	5,150	6,281	5,369
South East	5,569	6,128	7,961	7,460	7,893	6,426	9,288	10,473	10,208	12,695
South West	6,979	2,748	3,155	3,921	3,373	3,556	3,629	3,402	3,730	4,002
West Midlands	443	380	373	464	658	495	623	453	887	708
Yorkshire and the Humber	1,342	1,715	1,321	1,141	1,000	1,096	1,229	1,241	1,258	1,089

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table A.2: Direct economic impact of the Maritime Sector through GVA, £ million, 2010 to 2019

GVA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	9,490	10,054	11,086	10,660	11,757	11,501	12,529	13,080	12,713	14,199
Scotland	3,346	2,962	3,509	3,444	3,515	3,734	3,435	3,718	3,543	3,892
Wales	341	432	377	364	364	406	439	281	295	207
Northern Ireland	234	291	265	240	239	297	406	376	353	400
East of England	913	897	984	930	991	879	1,191	1,050	1,069	1,033
East Midlands	198	147	183	193	373	195	169	178	169	191
London	3,663	3,964	3,887	3,768	4,464	4,608	4,432	4,418	4,186	5,284
North East	304	319	327	361	431	330	281	304	284	265
North West	748	844	877	1,016	1,107	1,170	1,287	1,263	1,301	1,566
South East	1,868	2,106	2,849	2,378	2,507	2,276	3,062	3,619	3,535	3,771
South West	922	935	1,235	1,362	1,215	1,326	1,281	1,537	1,431	1,417
West Midlands	214	138	166	159	232	202	229	165	234	244
Yorkshire and the Humber	661	704	577	493	437	515	597	545	504	427

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table A.3: Direct economic impact of the Maritime Sector through employment, jobs, 2010 to 2019

EMPLOYEES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	143,792	149,003	154,435	158,146	155,823	162,119	166,398	171,774	181,666	180,829
Scotland	36,913	37,378	38,170	39,315	44,991	41,124	38,496	39,761	40,394	37,403
Wales	7,255	8,401	6,163	6,985	6,049	6,704	6,451	4,308	4,857	3,610
Northern Ireland	4,017	4,695	4,170	4,165	3,713	4,453	5,410	5,128	5,413	5,287
East of England	16,788	16,142	15,708	15,917	15,825	14,584	17,846	16,033	18,103	15,992
East Midlands	3,854	3,169	3,766	3,764	6,182	3,985	3,455	3,880	4,136	3,928
London	32,905	37,376	36,959	36,631	38,357	44,475	39,524	39,629	41,052	45,207
North East	6,424	6,668	6,148	7,691	8,257	6,509	5,781	4,939	4,976	4,276
North West	14,176	15,059	15,078	17,825	17,492	19,226	20,351	19,977	22,225	23,800
South East	30,743	33,258	39,720	35,432	34,500	33,847	39,546	44,033	46,786	46,887
South West	23,147	21,842	24,174	28,507	24,268	26,200	26,024	29,880	30,298	29,024
West Midlands	4,395	3,214	3,425	3,489	4,011	4,320	4,110	3,297	4,895	4,466
Yorkshire and the Humber	11,360	12,274	9,457	8,890	6,930	8,973	9,761	10,106	9,197	7,250

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table A.4: Direct economic impact of the Maritime Sector through the compensation of employees, £ million, 2010 to 2019

COMPENSATION OF EMPLOYEES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	5,208	5,245	5,975	6,015	6,250	6,245	6,335	6,630	6,853	7,165
Scotland	1,017	987	1,207	1,344	1,617	1,874	1,705	1,446	1,511	1,507
Wales	190	346	192	226	152	208	206	132	143	111
Northern Ireland	200	191	168	151	137	186	250	198	194	195
East of England	504	535	580	586	568	507	666	562	622	567
East Midlands	91	76	98	123	218	126	108	106	110	114
London	1,460	1,661	1,691	1,697	1,786	2,045	1,830	1,866	1,855	2,149
North East	191	193	142	232	272	218	178	194	158	140
North West	533	544	570	597	695	726	706	769	915	968
South East	1,355	1,122	1,676	1,379	1,373	1,220	1,500	1,714	1,714	1,876
South West	622	636	786	1,008	944	970	901	1,005	1,034	965
West Midlands	105	86	111	111	158	149	145	114	157	140
Yorkshire and the Humber	348	392	321	281	237	283	302	301	288	245

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Annex B: Supplementary results of aggregate economic impact analysis

This section sets out the Maritime Sector's aggregate economic impact, calculated utilising an updated methodology. The difference with the figures presented in **Aggregate economic impact of the Maritime Sector** relates to the multipliers and the underlying input-output modelling.

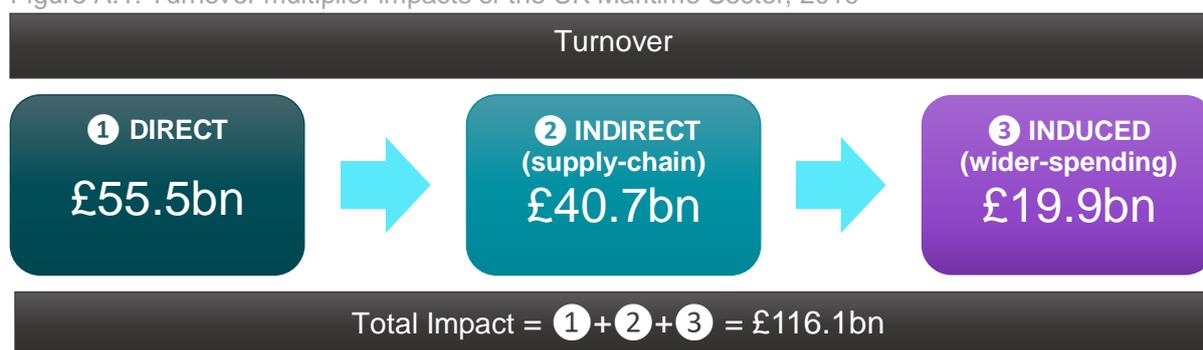
Since our 2019 study, we have adjusted our modelling for the shipping industry specifically. Due to the methodology underpinning the calculation of the direct impact of the shipping industry, the ONS' input-output analytical tables provide data for SIC 50 (Water Transport, which constitutes the shipping industry), which did not align with our own findings on the industry. We have further refined how this is reflected within the input-output models, adjusting our modelling accordingly and we believe it now represents a more robust and precise picture of the aggregate impact of the shipping industry. Given that the modelling for the shipping industry is based on the associated structure of the industry, this has led to a change in the multipliers for the sector and the industry. More specifically, it has led to a decrease in the type I and type II employment multipliers and an increase in the type I and type II compensation of employees multipliers for the shipping industry and, by extension, for the maritime sector.

While the new methodology makes these bespoke adjustments to the shipping industry specifically such that its operational structure – as indicated by the findings of our direct impact analysis – is a better representation of the actual industry, Cebr understands the benefits of having comparable figures using a similar methodology across different years and reports. As such, in consultation with Maritime UK, we provide both sets of aggregate impact figures within the report, one using the previous methodology and here the other, utilising the updated methodology.

The aggregate economic impacts through turnover

Figure A.1 below illustrates the turnover multipliers for the Maritime Sector within the UK. Combined, the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries contributed £55.5 billion in direct turnover. However, considering the turnover supported in the industries' supply chains (indirect impact) and when employees (and supply chain employees) spend their earnings (induced impact), a total aggregate turnover footprint of £116.1 billion is supported. Nearly £40 billion of this is due to the indirect impact, and £20 billion due to the induced impact.

Figure A.1: Turnover multiplier impacts of the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Another way of conceptualising this is the additional value of the turnover supported, for every pound earned in the Maritime Sector. Based on these figures, for every £1 of turnover initially generated by the Maritime Sector in 2019, a further turnover of £1.09 was supported through its indirect and induced impacts in the UK economy.

Table A.5 shows the breakdown of this estimated aggregate turnover impact, by considering the impacts from the individual industries in the Maritime Sector.

Table A.5: Turnover impact of the Maritime Sector by industry, £ million, 2019

Turnover in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	55,475	40,644	19,965	116,084
Shipping	26,651	16,657	6,285	49,593
Ports	4,193	3,494	2,322	10,009
Leisure marine	3,411	2,870	1,801	8,083
Marine engineering and scientific	14,498	13,106	7,073	34,676
Maritime Business Services	6,722	4,517	2,484	13,722

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Within this aggregate economic contribution, the activities of the shipping industry supported the largest turnover impact, with £49.6 billion in 2019. After shipping, the MES industry supported the most in aggregate turnover, with £34.7 billion in 2019. The ports and marine engineering & scientific industries had the highest aggregate multiplier, with every £1 of direct turnover supporting a total aggregate turnover footprint of £2.39 in the UK economy.

Table A.6 below presents in each year the direct contribution to turnover from the Maritime Sector, alongside our estimate of the composite turnover multiplier that applies to the entire sector, together with some indicative estimates for the aggregate impact.²⁴ Our estimates

²⁴ Note that we are applying our multipliers as calculated using our latest input-output model, to the figures for the whole decade. So we are in effect assuming the multipliers calculated based on the 2019 direct impacts also apply back to 2010.

indicate a composite turnover multiplier value of 2.09, with the direct impact rising from £35.9 billion in 2010 to £55.5 billion in 2019.

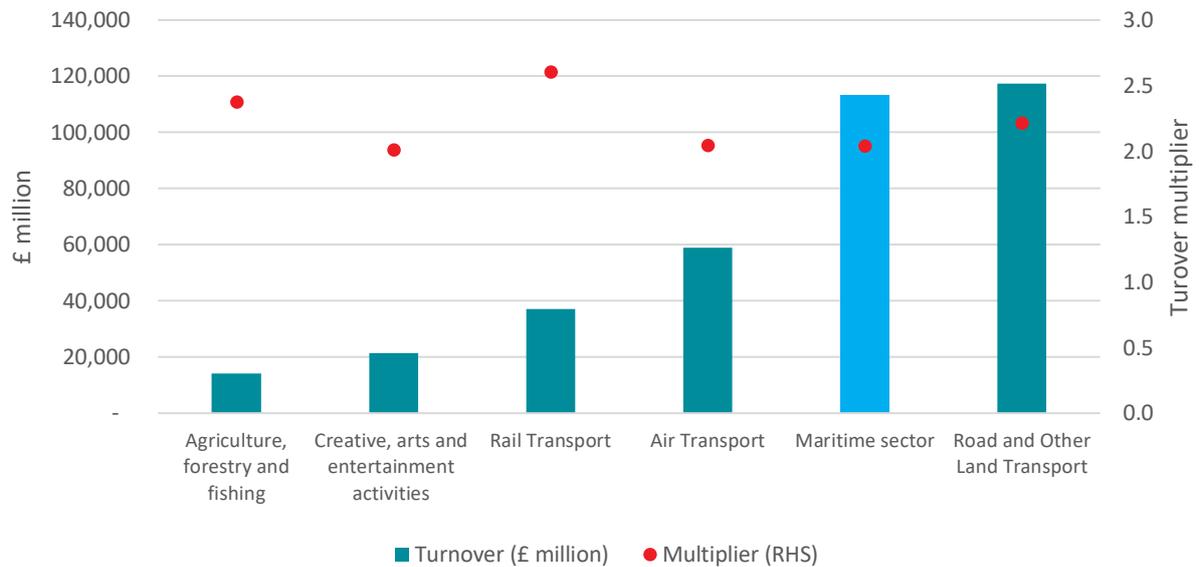
Table A.6: Direct and total turnover impact of the Maritime Sector, £ million, 2010 to 2019

	Direct Impact	Composite Turnover multiplier	Aggregate Impact
2010	35,858	2.09	76,889
2011	37,871		81,120
2012	39,800		85,230
2013	41,327		88,532
2014	43,501		93,333
2015	43,252		92,297
2016	45,712		96,615
2017	48,356		101,976
2018	51,458		107,972
2019	55,475		116,084

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

To place these results in context, Figure A.2 below compares the total turnover impact of the Maritime Sector against the comparable sectors identified in the previous section. In addition, the turnover multipliers associated with each activity are also presented.

Figure A.2: The aggregate turnover impact and turnover multiplier of the Maritime Sector against comparable industries, 2019

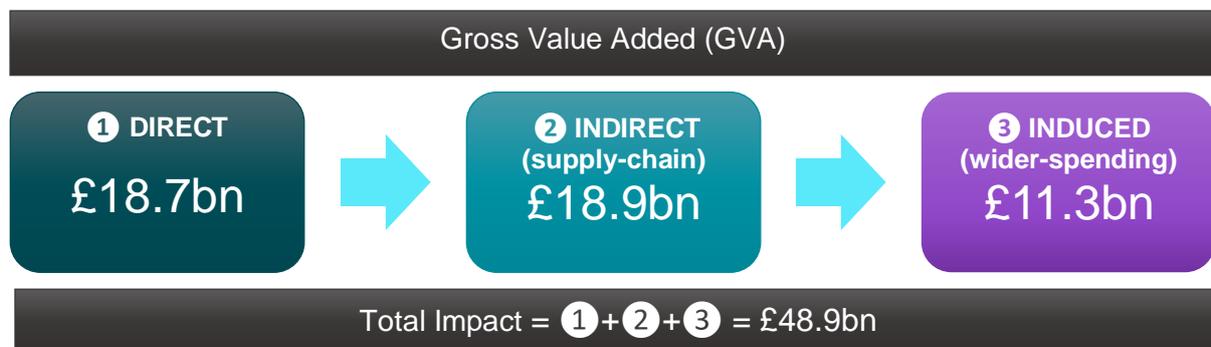


Source: ADS, ONS, Cebr analysis

The aggregate economic impacts through GVA

Figure A.3 below illustrates the GVA multipliers for the Maritime Sector within the UK. As for turnover, the direct impact is augmented by the indirect (supply-chain) and induced (wider employee spending) impacts, to estimate the aggregate economic footprint of the sector.

Figure A.3: GVA multiplier impacts of the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The Maritime Sector directly contributed £18.7 billion in GVA in 2019, and once the indirect and induced economic channels are taken into consideration the sector supported £48.9 billion in GVA. Therefore, for every £1 of GVA directly generated by the Maritime Sector in 2019, a further GVA impact of £1.62 was supported through its associated supply chains and wider spending impacts in the UK economy.

Table A.6 below shows the estimated direct and total GVA impacts from the individual industry activities when taken in isolation. Within the aggregate economic contribution of £48.9 billion, the shipping, then MES industries made the largest aggregate contributions, with £17.6 billion and £16.4 billion respectively in 2019.

Table A.6: GVA impact of the Maritime Sector by industry activity, £ million, 2019

GVA in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	18,698	18,984	11,255	48,938
Shipping	6,560	7,479	3,519	17,557
Ports	2,195	1,807	1,417	5,420
Leisure marine	1,226	1,103	806	3,135
Marine engineering and scientific	5,703	6,475	4,223	16,401
Maritime Business Services	3,015	2,120	1,290	6,425

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table A.7 below presents, in each year, the direct contribution to GVA from the Maritime Sector, alongside our indicative estimate of the aggregate GVA that applies to the entire industry. Note that just like for Table , the aggregate impacts timeseries is an indicative estimate. The total GVA impact has increased by 38.9% from £35.2 billion in 2010 to £48.9 billion in 2019. This matches the UK GVA growth over the same period, which also increased by 38.9%, per ONS data.

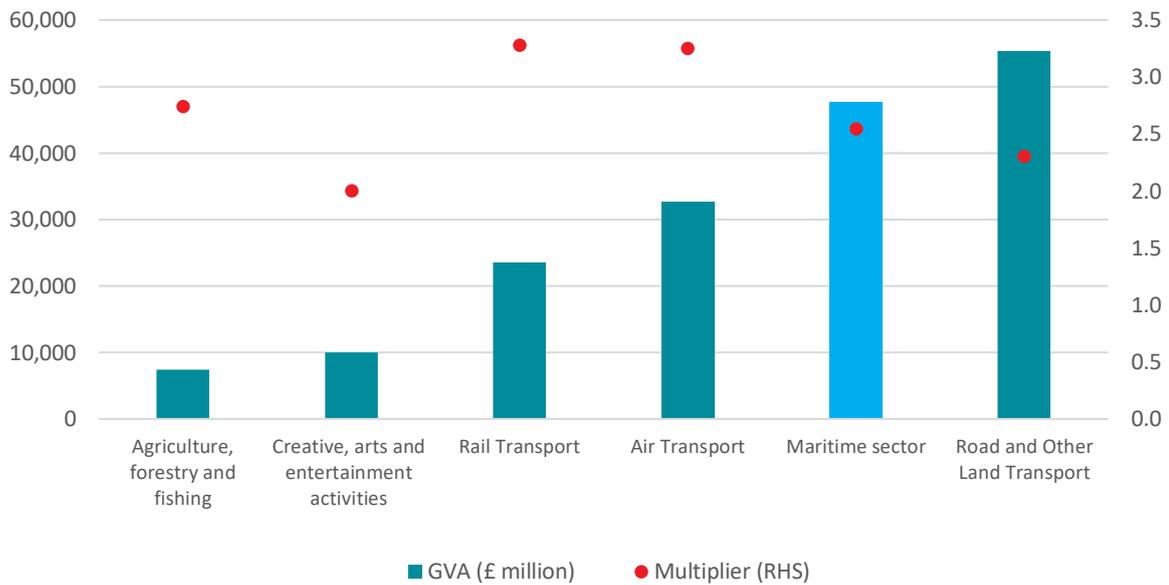
Table A.7: Direct and total GVA impact of the Maritime Sector, £ million, 2010 to 2019

	Direct Impact	Composite GVA multiplier	Aggregate Impact
2010	13,411	2.62	35,151
2011	13,740		35,985
2012	15,237		40,009
2013	14,709		38,585
2014	15,876		41,547
2015	15,938		41,941
2016	16,809		44,064
2017	17,456		45,670
2018	16,903		44,046
2019	18,698		48,938

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

To place these results in context, Figure A.4 below compares the total GVA impact of the Maritime Sector against the comparable activities identified in the previous section. In addition, the GVA multipliers associated with each activity are also presented.

Figure A.4: The aggregate GVA impact and GVA multiplier of the Maritime Sector against comparable industries, 2019



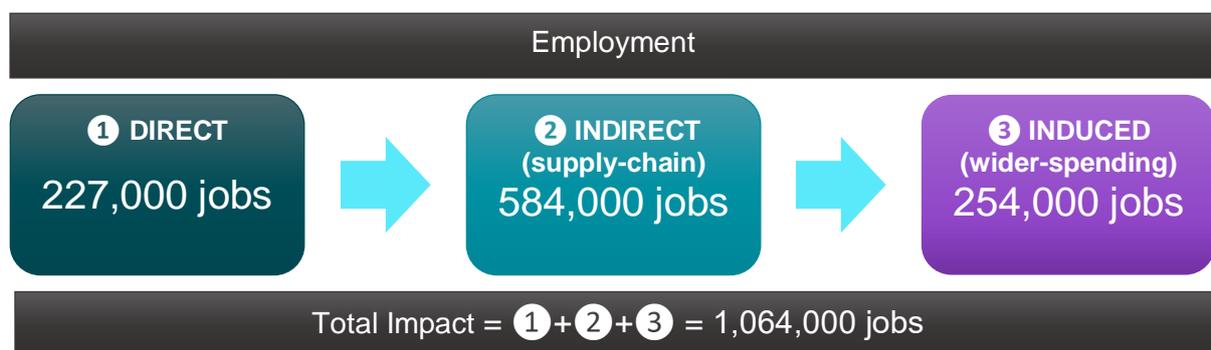
Source: ADS, ONS, Cebr analysis

The total GVA impact of the Maritime Sector in 2019 exceeded that of all of the comparative sectors except Road and Other Land Transport. However, the GVA multiplier of the Maritime Sector in 2019 (2.55) was only greater than that of the Creative arts and entertainment activities (2.01) and Road and Other Land Transport (2.31).

The aggregate economic impacts through employment

Figure A.5 illustrates the aggregate employment impacts for the Maritime Sector, in 2019.

Figure A.5: Employment multiplier impacts of the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

In addition to the 227,000 jobs directly provided by the Maritime Sector, a cumulative 838,000 are supported by the indirect and induced effects. Notably this means that the Maritime Sector supports over 1 million jobs, when considering the direct and multiplier effects. Additionally, for every job directly provided by the Maritime Sector in 2019, a further 3.69 jobs were

supported through its associated supply chains (indirect impacts) and wider employee spending (induced impacts) in the UK economy.

Table A.8 below shows the estimated aggregate employment impacts from the individual industries when taken in isolation. Just like the previous study, the highest employment multiplier is found in the shipping industry. However, as mentioned in the methodology section earlier in the report we have refined our input-output modelling process, resulting in a lower employment multiplier for this industry. Further detail is available in Section 1.3. The shipping and MES industry have the largest aggregate impacts, however the magnitude of the shipping industry's impact is nearly three times as much as that of MES.

Table A.8: UK Employment impact of the Maritime Sector by industry activity, thousands of jobs, 2019

Employment in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	227	584	254	1,064
Shipping	61	417	168	646
Ports	30	17	10	58
Leisure marine	32	20	10	62
Marine engineering and scientific	80	90	46	217
Maritime Business Services	24	38	19	81

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Table A.9 below presents in each year the direct employment from the Maritime Sector, alongside the domestic employment multiplier that applies to the entire sector.

Table A.9: Direct and aggregate UK employment impact of the Maritime Sector, thousands of jobs, 2019

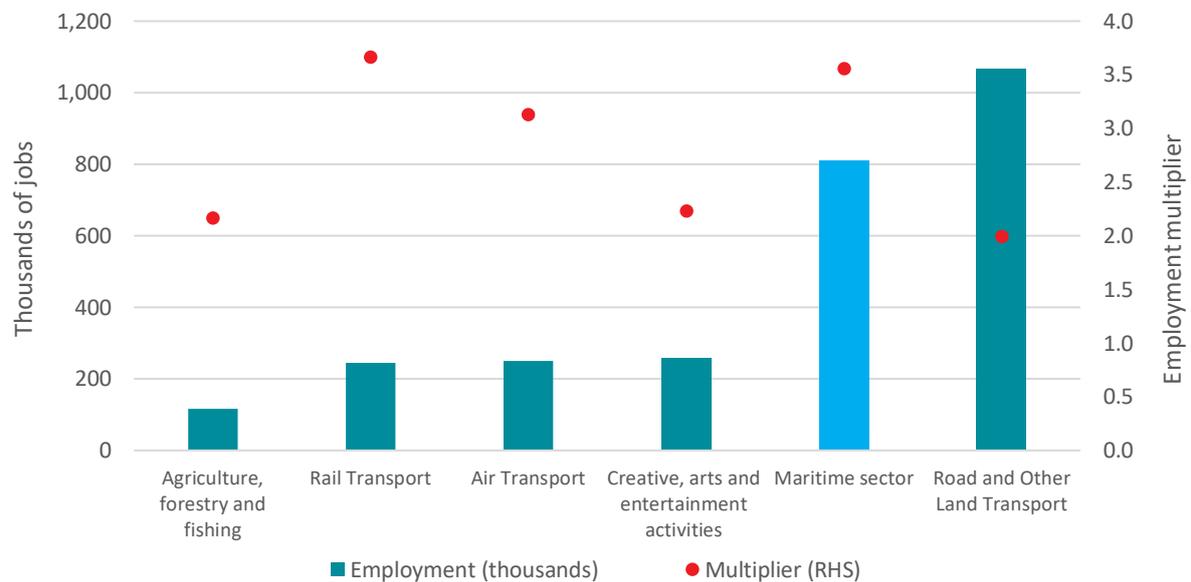
	Direct Impact	Composite Employment multiplier	Aggregate Impact
2010	192	4.69	901
2011	199		931
2012	203		953
2013	209		976
2014	211		986
2015	214		1,005
2016	217		1,021
2017	221		1,054
2018	232		1,084
2019	227		1,064

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The total employment impact has grown from around 901,000 jobs in 2010 to 1,064,000 jobs in 2019, an increase of 18%. This compares favourably to an increase in UK employment of 13% over the same period, per the ONS.

To place these results in context, Figure A.6 compares the total employment impact of the Maritime Sector in 2019 to the comparable sectors identified in the previous section. In addition, the employment multipliers associated with each activity are also presented.

Figure A.6: The aggregate employment impact and employment multiplier of the Maritime Sector against other industries, 2019



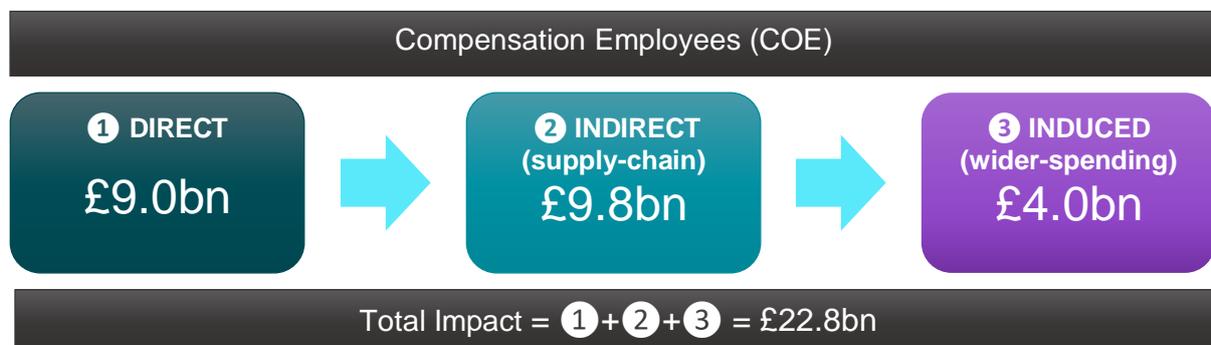
Source: ADS, ONS, Cebr analysis

In 2019 the Maritime Sector had the second largest employment impact at 809,000 jobs, behind Road and Other Land Transport which supported close to 1.07 million jobs. In terms of the employment multiplier, the Maritime Sector in 2019 again had the second highest value (3.56) across the categories mentioned, closely following that of Rail Transport (3.66).

The aggregate economic impacts through the compensation of employees

In this final subsection we consider the aggregate economic impact of the Maritime Sector through the compensation of employees. Figure A.7 illustrates the direct, indirect and induced impacts of employee compensation associated with the sector.

Figure A.7: Multiplier impacts for the compensation of employees for the UK Maritime Sector, 2019



Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

In addition to the £9 billion in direct employee compensation provided, £10.3 billion in employee compensation is supported in the supply-chains of the Maritime Sector, and £4.2 billion due to wider employee spending. Overall, the Maritime Sector supports a total of £23.4 billion in employee compensation. For every £1 directly raised in the compensation of employees in 2019, a further of £1.61 in employee compensation was supported through the associated supply chain effects and wider employee spending in the UK economy.

Table A.10 below shows the direct and aggregate impact through the compensation of employees across each industry. Of the £23.4 billion aggregate economic impact for the Maritime Sector, the largest impact (£8.6 billion) was supported by the shipping industry.

Table A.10: Impact through the compensation of employees of the Maritime Sector by industry activity, £ million, 2019

Compensation of Employees in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	8,978	10,268	4,196	23,442
Shipping	2,397	4,651	1,534	8,582
Ports	1,063	707	386	2,156
Leisure marine	1,038	743	388	2,170
Marine engineering and scientific	3,105	2,937	1,319	7,360
Maritime Business Services	1,376	1,229	569	3,174

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Finally, Table A.11 below shows the trend in the direct impact and aggregate support from the Maritime Sector, from 2010 to 2019. Our indicative estimate of the aggregate impact through the compensation of employees has grown from £17.4 billion in 2010 to £23.4 billion in 2019. This has been driven by an increasing direct impact, with the size of the composite multiplier relatively stable over the period.

Table A.11 Direct and aggregate impact through the compensation of employees of the Maritime Sector, £ million, 2010 to 2019

	Direct Impact	Composite Employee Compensation multiplier	Aggregate Impact
2010	6,616	2.61	17,452
2011	6,769		17,801
2012	7,541		19,709
2013	7,735		20,190
2014	8,155		21,216
2015	8,513		22,153
2016	8,496		22,290
2017	8,405		22,059
2018	8,701		22,838
2019	8,978		23,442

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

