



The economic contribution of the UK Shipping industry

A Cebr report for Maritime UK

June 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, June 2022

Contents

Headline findings.....	5
1. Introduction	9
1.1 About Maritime UK	9
1.2 Purpose of this report	9
1.3 Overview of the study and methodology	10
Objectives of the study	10
Mapping the UK shipping industry.....	11
Quantifying the direct economic impacts of the Shipping industry	13
Quantifying the aggregate economic impacts of the Shipping industry.....	13
Changes from 2019 Cebr study	14
1.4 Structure of the report	15
2. The Maritime Sector and the shipping industry.....	17
2.1 The definition of the Maritime Sector and its constituent industries	17
2.2 Quantifying the direct economic impacts of the Shipping industry	18
2.3 Quantifying the direct economic impacts of the industry at regional level	19
3. The direct economic impact of the Shipping industry in the UK	21
3.1 The direct economic impact through turnover	21
3.2 The direct economic impact through GVA	24
3.3 The direct economic impact through employment	26
3.4 The direct economic impact through the compensation of employees	30
3.5 The direct contribution to the UK Exchequer	31
3.6 The direct contribution to the UK's exports of services	32
4. The aggregate economic impact of the Shipping industry in the UK.....	35
4.1 The aggregate economic impacts through turnover	35
4.2 The aggregate economic impacts through GVA	36
4.3 The aggregate economic impacts through employment	38
4.4 The aggregate economic impacts through the compensation of employees	40
5. The regional economic impact of the Maritime Sector	42

5.1	The direct economic impact of the shipping industry by UK region	42
5.2	The aggregate economic impact of the Shipping industry by UK region	46
6.	The economic impact of the Tonnage Tax regime on the shipping industry	49
6.1	About Tonnage Tax	49
6.2	Quantifying the economic impact of the Tonnage Tax regime	51
	Summary of the approach	51
	The impact of Tonnage Tax on the UK-owned shipping fleet and the key macroeconomic indicators	52
6.3	The impact of Tonnage Tax on the UK-owned shipping fleet	52
6.4	The impact of Tonnage Tax on GVA	54
6.5	The impact of Tonnage Tax on UK employment	54
6.6	The impact of Tonnage Tax on the UK Exchequer Contribution and Trade	55
7.	The Shipping industry: A forward look	58
	The Shipping industry Forecast (2021-2025)	58
	Modelling approach	58
	Modelling Assumptions.....	58
	The 2021-2025 forecast.....	58
	Annex A: Full set of direct economic impacts by region	60
	Annex B: Supplementary results of aggregate economic impact analysis	62
	The aggregate economic impacts through turnover	62
	The aggregate economic impacts through GVA	64
	The aggregate economic impacts through employment	65
	The aggregate economic impacts through the compensation of employees	67
	The aggregate economic impact of the Shipping industry by UK region	69

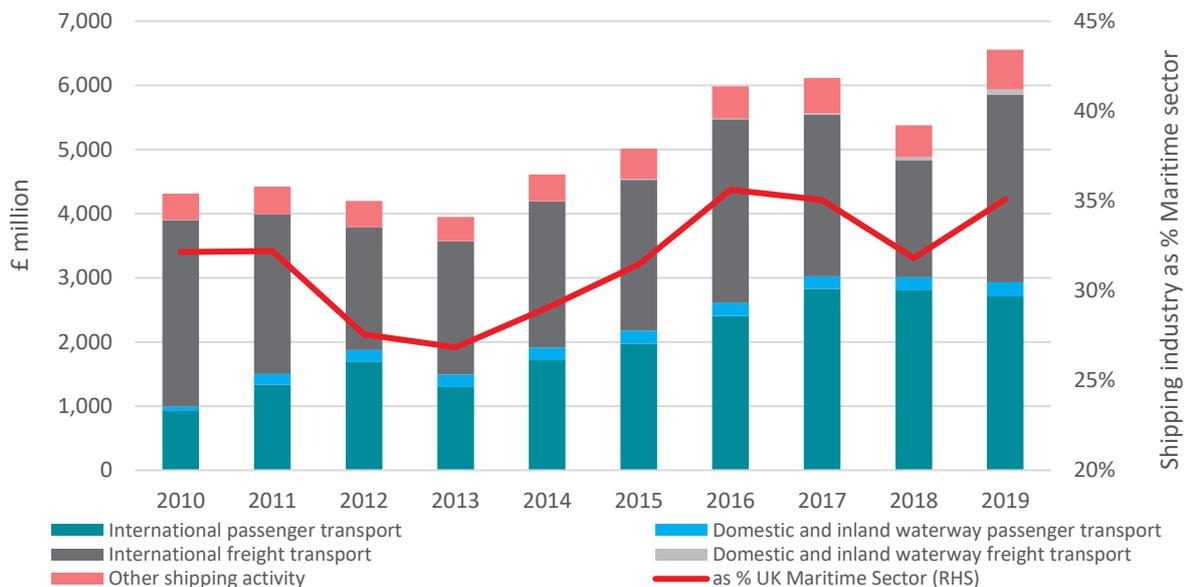
Headline findings

- The Centre for Economics and Business Research (Cebr) has been commissioned by Maritime UK to quantify the **economic contribution of the Shipping industry to the UK economy**. This report forms one of ten reports which also assess the contribution of the Maritime Sector as a whole, at an industry-level, in Scotland, Wales, the Liverpool City Region, and the Solent LEP region.
- **The Shipping industry consists of various activities, including the transportation of passengers and freight on both inland and international waters.** This report has drawn upon a combination of data sources, including the UK Chamber of Shipping (UKCoS), to quantify both the direct and aggregate economic impact of these activities in the UK economy in the years 2010 to 2019.
- The Shipping industry makes a significant macroeconomic contribution to the UK through business turnover, Gross Value Added (GVA), employment and through the compensation of employees (COE) or employee compensation. **It is estimated that the Shipping industry directly supported £26.6 billion in business turnover, £6.6 billion in GVA and 161,000 jobs (with 60,600 for UK employees) in 2019.**



- These represent 48% of turnover, 35% of GVA and 27% of UK employment directly supported by the UK Maritime Sector in 2019. **The International Transport of Freight is the largest constituent activity within the shipping industry in terms of economic activity**, directly contributing £2.9 billion in GVA and directly supporting around 26,000 jobs for UK employees.
- **The direct contribution of the shipping industry through turnover, GVA and employment have all increased significantly since 2010**, when impacts on turnover, GVA and employment were estimated to be £13.4 billion, £4.3 billion and 51,900 jobs respectively. These represent increases of 41%, 38% and 13% respectively.

Figure A: The direct contribution of the shipping industry through GVA, and the industry's share of the Maritime Sector's total direct contribution through GVA, 2010-19



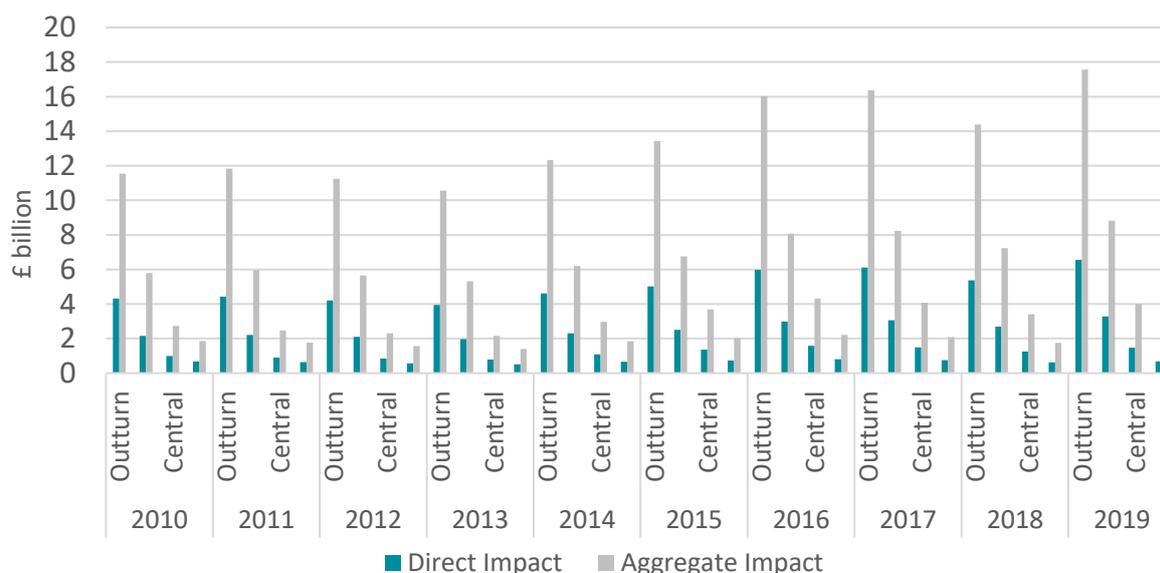
- The shipping industry helps to raise millions of pounds each year to the UK Exchequer. **The industry contributed an estimated £878 million in tax revenues in 2019**, spread across Corporation Tax, Income Tax, National Insurance Contributions (NICs) and Business Rates.
- The industry also plays a significant role in facilitating UK trade, through the exports of services.¹ **In 2019 this export contribution was valued at £6.9 billion.**
- After quantifying the aggregate economic impacts through the industry supply chains and induced effects on expenditures, **it is estimated that the shipping industry helped to support a total of £17.6 billion of GVA in 2019.** This implies that, for every £1 in GVA directly contributed by the industry, a further £1.68 is supported across the UK economy through indirect and induced impacts.
- These aggregate economic impacts associated with the shipping industry also extend to business turnover, employment and the compensation of employees. **It is estimated that the shipping industry helped to support a total of £49.6 billion in turnover, 646,000 jobs and £8.6 billion through the compensation of employees in 2019.**

¹ The shipping industry is assumed to only export services, through the international transport of freight and passengers.



- While the economic contribution of the industry is spread across all UK regions, the South East contributes the most to GVA, both directly and more widely. In 2019, it is estimated that the industry in the South East directly contributed £2.1 billion of GVA (35% of the industry) and 19,500 jobs (32% of the UK total). After indirect and induced effects are considered, the aggregate contribution from the South East rises to £5.4 billion of GVA and 72,100 jobs.
- There is strong evidence that the introduction of the Tonnage Tax regime in 2000 had a significant positive impact on the level of UK-owned shipping tonnage and the economic contribution in subsequent years. **Under a Central Scenario, Cebr estimates that without the Tonnage Tax regime, the shipping industry would have directly contributed £1.5 billion in GVA in 2019, and so £5.1 billion less than the GVA outturn of £6.6 billion.** This extends to 47,000 fewer jobs, £682 million less in tax contributions and £5.3 billion less in exports of Sea Transport services. Once the indirect and induced channels are considered, the reduction in GVA and employment rises to £13.6 billion and 165,600 jobs respectively in 2019. Figure B below shows the estimated GVA impact of the Tonnage Tax regime, comparing the outturn against three scenarios modelled.

Figure B: The direct and aggregate GVA impacts of the UK shipping industry under alternative scenarios, 2010 to 2019



Source: UKCoS, Department for Transport, ONS, Cebr analysis

- We expect the Shipping industry to experience strong growth over the five-year horizon after 2020 in real terms. Our forecast indicates that the industry's domestic output, as measured by GVA, is **set to grow at a Compounded Annual Growth rate (CAGR) of 10.7% over the considered period. This translates into a cumulative nominal growth of 50.4% for 2021-2025, in nominal terms**, which is similar to the growth experienced over the five years directly preceding the pandemic.

1. Introduction

Cebr is pleased to present this report to Maritime UK on the economic impact of the shipping industry on the UK economy. For the purposes of this study, the shipping industry is defined as comprising of the following activities: **International Passenger Transport** (Cruise and Ferry); **Domestic and Inland Waterway Passenger Transport**; **International Freight Transport** (Bulk, Container, Gas and Tanker); **Domestic and Inland Waterway Freight Transport**; and **Other Shipping Activity**. Other vessels not included in this definition – such as those engaged in activities such as oil and gas, wind, cable laying, hydrography, and surveying – are captured as part of Cebr’s separate report on the economic contribution of the Marine Engineering & Scientific industry. Some of these companies – particularly those who self-classify themselves as belonging to the SIC codes associated with shipping – are captured within this analysis, however.

This report forms one of ten reports on the economic contribution of the Maritime Sector, which is defined as comprising the following sectors: Shipping; Ports; Leisure Marine; Marine Engineering & Scientific (MES); and Maritime Business Services (MBS) industries, each comprising a wide range of component activities. The other reports focus on the economic contribution of each of the other four industries at UK level, the economic contribution of the sector in Scotland, Northern Ireland, the Solent LEP, Liverpool City Region and the contribution of the Maritime Sector at UK-level. 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 shipping industry. As such, our report is not confined to direct ongoing contributions to GDP and employment through the shipping industry’s operations and activities in the UK, but also provides assessments of the associated indirect and induced multiplier impacts.

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 Shipping industry, presenting a range of statistics and figures which demonstrate different aspects of the economic value brought by the industry to the UK economy. The intention of this is to empower Maritime UK and the Chamber of Shipping with a thorough and comprehensive knowledge and evidence base, such that they can support and advocate for the industry 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 Shipping industry at a regional level (across the International Territorial Level).

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 industry 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 Shipping industry 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 Shipping industry as well as the other four Maritime industries, the four regions included within our analysis, and for the Maritime Sector in the UK as a whole.

1.3 Overview of the study and methodology

Objectives of the study

This report provides a thorough and comprehensive examination of the role of Shipping industry 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 industry, including direct contributions to GDP and employment, indirect and induced multiplier impacts and the Shipping industry'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 industry. The key macroeconomic indicators include:

- GVA² contributions to UK and regional GDP generated by the Shipping industry, directly and through indirect and induced multiplier impacts.
- Jobs supported by the industry, including direct, indirect and induced jobs through multiplier impacts.
- The value of the turnover of the Shipping industry and, again, the turnover supported in the UK and regional economies through multiplier impacts.

² 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 $GVA + Taxes\ on\ products - Subsidies\ on\ products = GDP$.

- The value of employee compensation³ generated by the Shipping industry, representing the total remuneration of employees operating in the industry.
- The contribution of the Shipping industry through revenues raised for the Exchequer.
- The value of goods and services exported by the activities comprising the Shipping industry.

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 sub-industries Shipping.
- How the economic indicators for the Shipping industry vary across the different UK nations and regions.
- How the indicators for the Shipping industry compare with other important industries of the UK economy.

Mapping the UK shipping industry

Here we set out how the Maritime Sector and, by extension, how the Shipping industry have been defined for the purposes of the study. On a holistic level, the wider Maritime 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 using this list to identify how each of these five industries aligns 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 the Shipping industry specifically is broken down as follows:

- **International passenger transport (cruise and ferry) (Standard Industrial Classification code 50100)** – this consists of a variety of activities including: boat rental; coastal passenger transport; excursion, boat and sightseeing operations; passenger

³ 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.

ferrying; water taxis; and other activities involving the transport of passengers over water (excluding inland routes, detailed below).

- **Domestic and inland waterway passenger transport (Standard Industrial Classification code 50300)** – this consists of activities which represent the transport of passengers over inland water. Such activity cover: passenger canal carrying; the transport of passengers via rivers, lakes, ports, canals and harbours; passenger ferry transport (via inland waterways, rivers or estuaries); local authority passenger ferry services; and the rental of boats or pleasure boats with crew for inland water transport.
- **International freight transport (bulk, container, gas and tanker) (Standard Industrial Classification codes 50300 and 77342)** – this grouping combines all activities relating to the international transportation of freight and related seafaring (except on inland waterways), as well as the rent and leasing of water freight transport equipment. These activities consist of sea and coastal freight shipping/ferrying services, heavy lift and launch barge services, and the rental of vessels for sea and coastal freight transport.
- **Domestic and inland waterway freight transport (Standard Industrial Classification code 50400)** – this grouping differentiates freight transport services conducted on inland waterways from those services listed immediately above. It consists of activities such as: freight transport via lakes, estuaries, canals, ports and rivers, harbours and docks; freight transport via inland waterways; and the rental of boats (with crew) for inland waterway services.
- **Other shipping activity** – this reflects the activity of businesses whose primary SIC code is not one of the five listed above. For example, CEMEX – a large company producing aggregates and building materials – runs shipping operations in the UK but would only list shipping activities as one of its secondary SIC codes. CEMEX’s employment in shipping activities is instead captured through the UKCoS Annual Seafarer Employment Survey.⁴

The first stage of the study has involved mapping the activities of the Shipping industry against the National Accounts framework, in order to establish clarity on the precise definition of the industry as it maps against the Standard Industrial Classification (SIC) framework.⁵ In essence therefore, this involves taking each of the shipping industry’s 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 that the majority of the activities of the shipping industry do map onto the SIC framework. In fact, the major activity groupings listed above, with the exception of the last,

4 The Seafarer Employment Survey is run annually by UKCoS, collecting data from its membership of the number of seafarers they employ under contract from the Department for Transport (DfT) who use the data in the production of the National Statistics publication.

5 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.

each correspond to a particular SIC code. As a result, Cebr have 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 shipping industry. Cebr has therefore drawn upon a combination of publicly available data, desk research and industry data to quantify the economic contribution from the shipping industry.

Quantifying the direct economic impacts of the Shipping industry

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

- The major source of data used to quantify the direct economic contribution of the shipping industry is the Financial Accounts Made Easy (FAME)⁶ database, which provides business demography and financial accounts data for companies operating in the UK shipping industry. The FAME database has been used to generate estimates for the business turnover, GVA, employment, the compensation of employees and profitability of the shipping industry.
- The indicative breakdown of shipping industry revenue by vessel type has been sourced from the UKCoS Annual Sea Inquiry.⁷
- FAME data has then been used by extension to quantify the contribution that the Shipping industry makes to the UK Exchequer, and the productivity of the industry in terms of GVA per job. Data on foreign seafarer employment and an indicative breakdown of employment by type (officers, rating and shore-based staff) has been sourced from the annual UKCoS Annual Seafarer Employment Survey.
- Data for services exports from the shipping industry has been sourced from both the ONS Pink Book and the UKCoS Annual Sea Inquiry.

Quantifying the aggregate economic impacts of the Shipping industry

After collation and interrogation, the direct economic impacts for the Shipping industry 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 so 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

6 The FAME database of companies in the UK and Ireland provided by Bureau van Dijk. It contains information on company filings, SIC codes and industry descriptions, as well as accounts and documents as filed with Companies House.

7 The Annual Sea Inquiry is an annual survey run by UKCoS on its membership, with data uplifted by the ONS to account for companies which are not members of UKCoS.

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 of the Shipping industry.
- **Indirect impact:** this is the value and jobs supported in industries that supply inputs to the Shipping industry.
- **Induced impact:** this is the value and jobs supported in the wider economy when the workers directly and indirectly employed by the industry (i.e. through its supply chain) spend their wages and salaries on final goods and services.

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

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,⁸ 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 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.

Another change in our methodology is reflected within our aggregate impact analysis. Since our 2019 study, Cebr has made several changes to our input-output models, which underpin the calculation of the aggregate impacts. Firstly, we have updated the underlying supply-use data within the models, to reflect updated ONS data released over the intermediary period. This means the models now represent a more contemporaneous structure of the economy. Secondly, we have 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

⁸ PwC (2016), 'Catching the Wave: UK maritime professional services competitiveness study.'

themselves have been adjusted to remove potential double-counting and simplify the required data inputs.

Finally, 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.

1.4 Structure of the report

The remainder of the report is structured as follows:

- **Section 2** provides an overview of how the Maritime Sector has been defined, and how the shipping industry fits within this definition. Further information is also provided on how the key macroeconomic indicators have been captured or estimated.
- **Section 3** outlines the direct economic impacts of the shipping industry. We consider the direct impacts through GVA, employment, the compensation of employees, the industry's contribution to the UK Exchequer through tax revenues, and the value of exported services.
- **Section 4** considers the multiplier impacts of the shipping industry through the activities it stimulates in the local supply chain and in the wider economy when employees directly and indirectly employed by the Solent-based industry spend their wages and salaries in the local and wider economy.
- **Section 5** examines the direct and multiplier impacts of the shipping industry at regional level, as disaggregated by the 12 International Territorial Level regions (ITL).⁹
- **Section 6** provides additional analysis of the Tonnage Tax regime and how its introduction is estimated have impacted the UK shipping industry since 2000. Analysis is framed around the counterfactual situation of what would have likely happened to the UK shipping fleet and the economic contribution of the shipping industry had the Tonnage Tax regime not been introduced.

⁹ 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.

- **The Shipping industry: A forward look** Error! Reference source not found. provides forecasting analysis for the MES industry 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** contains the full set of direct economic impacts of the Shipping industry 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.

2. The Maritime Sector and the shipping industry

Here we set out how the wider 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, Marine Engineering and Scientific (MES), Leisure Marine, and Maritime Business Services (MBS) industries, which in themselves are formed of numerous individual and distinct activities, of which the Shipping industry is the focus of this report.

2.1 The definition of the Maritime Sector and its constituent industries

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.

- **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.

In this report we focus solely on the Shipping industry. The remainder of this section focuses on how the direct economic impacts of the constituent activities have been measured.

2.2 Quantifying the direct economic impacts of the Shipping industry

Here we set out in further detail the approach taken to quantify the direct economic impact of the shipping industry through its constituent activities. Table 1 below shows how activities for the shipping industry have been identified, and the data sources used to capture and quantify the associated economic activity.

Table 1: Mapping of the shipping industry by activity

SUB-INDUSTRY	ACTIVITY	MAPPING	SOURCE(S) USED
SHIPPING 1	International passenger transport (cruise and ferry)	Identified through SIC code 50100, "Sea and coastal passenger water transport".	FAME, BRES
SHIPPING 2	Domestic and inland waterway passenger transport	Identified through SIC code 50300, "Inland passenger water transport".	FAME, BRES
SHIPPING 3	International freight transport (bulk, container, gas and tanker)	Identified through SIC codes 50200 and 77342, "Sea and coastal freight water transport", and "Renting and leasing of freight water transport equipment".	FAME, BRES
SHIPPING 4	Domestic and inland waterway freight transport	Identified through SIC code 50400, "Inland freight water transport".	FAME, BRES
OTHER SHIPPING	Other shipping activity	Identified and quantified through UKCoS statistics for shipping-related employment	UKCoS Annual Seafarer Employment Survey, FAME

Source: Maritime UK, Cebr analysis

Therefore, for the majority of shipping industry activities, business demography data taken from the FAME database has been used to generate UK-level estimates for the direct economic impacts of each activity.

2.3 Quantifying the direct economic impacts of the industry at regional level

Here we set out the approach taken to disaggregate the direct and aggregate economic impacts of the shipping industry at regional level. As it is possible to quantify the economic contribution using SIC codes, by extension the approach taken involves using publicly available statistics which can be disaggregated at regional level and combining these with the UK-level direct and aggregate impacts for the shipping industry.

- The first step of this approach involved determining the regional disaggregation of employment for each industry activity. The major source of employment data by region was the Business Register and Employment Survey (BRES),¹⁰ as accessed through NOMIS. Employment data associated with each SIC code for the shipping industry were gathered and an implied regional breakdown estimated after interpolating for some missing information.
- As BRES only provides coverage for Great Britain, employment data in Northern Ireland has been estimated using a combination of BRES and the ONS Annual Business Survey (ABS),¹¹ the latter providing the proportion of employment in Northern Ireland across the nearest industrial sector category. For the other key macroeconomic indicators – turnover, GVA, and the compensation of employees – ABS has been used alongside the regional employment estimates.

Other adjustments for regional economic activity

Other adjustments have been made to the regional disaggregation of the key macroeconomic indicators which represent the direct economic impacts of the shipping industry, in order to reflect differences in economic performance across the regions. These are as follows:

- To account for regional differences in productivity (GVA per employee), the breakdown of GVA has been adjusted using the ONS GVA per employee by region statistics.¹²
- To account for regional differences in pay, wages and salaries paid to employees in the shipping industry have been adjusted using differentials taken from ASHE.¹³ For example,

10 The Business Register and Employment Survey (BRES), produced by the ONS on an annual basis, is the official source of employee and employment estimates by detailed geography and industry within Great Britain.

11 The Annual Business Survey is a census of production in the United Kingdom produced by the ONS.

12 ONS, 2019. Subregional Productivity: Labour Productivity (GVA per hour worked and GVA per filled job) indices by UK ITL1, ITL2 and ITL3 subregions.

13 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.

the average wage for an employee in the South East was 3% higher than the UK average in 2019.

- To account for regional variation in the ratio of compensation of employees to GVA in different sectors, the compensation of employees for the industry have been adjusted using regional differentials implied by the closest industry, as sourced from the Annual Business Survey.

Table 2 below shows the breakdown of employment in shipping as implied through BRES data.

Table 2: The estimated regional breakdown of UK employment in shipping as implied by BRES and ABS, 2010 to 2019

Shipping Employment	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	77.0%	73.7%	75.5%	75.9%	76.6%	77.3%	75.1%	78.7%	77.3%	80.2%
Scotland	11.8%	13.3%	13.9%	13.3%	15.2%	12.7%	13.6%	13.9%	15.2%	14.0%
Wales	6.3%	7.3%	5.4%	6.4%	4.5%	5.5%	5.6%	2.4%	2.5%	0.9%
Northern Ireland	4.9%	5.7%	5.1%	4.4%	3.6%	4.5%	5.7%	5.0%	5.0%	4.9%
East of England	6.8%	7.9%	5.3%	6.5%	7.0%	4.7%	8.7%	5.8%	7.1%	4.3%
East Midlands	1.6%	0.4%	0.3%	1.2%	5.2%	0.5%	0.9%	1.0%	0.4%	0.4%
London	22.1%	24.8%	21.5%	19.6%	23.1%	32.4%	19.6%	20.3%	18.9%	25.1%
North East	0.9%	1.0%	0.7%	0.7%	1.2%	1.7%	0.5%	0.5%	0.9%	0.9%
North West	7.3%	7.7%	6.3%	7.6%	7.7%	7.2%	8.4%	8.2%	8.9%	10.3%
South East	25.4%	24.0%	26.4%	29.0%	26.0%	21.1%	28.3%	32.9%	31.6%	32.2%
South West	5.7%	4.1%	9.1%	7.3%	3.6%	5.9%	5.3%	8.2%	4.6%	3.5%
West Midlands	3.2%	0.7%	0.4%	0.9%	2.1%	0.6%	1.4%	0.7%	2.5%	1.8%
Yorkshire & the Humber	4.0%	3.1%	5.5%	3.1%	0.8%	3.3%	2.0%	1.3%	2.4%	1.7%

Source: BRES, ABS, Cebr analysis

The results of this analysis are shown in the final section of this report. The next sections in this report set out the direct and aggregate economic impacts of the shipping industry in the UK.

3. The direct economic impact of the Shipping industry in the UK

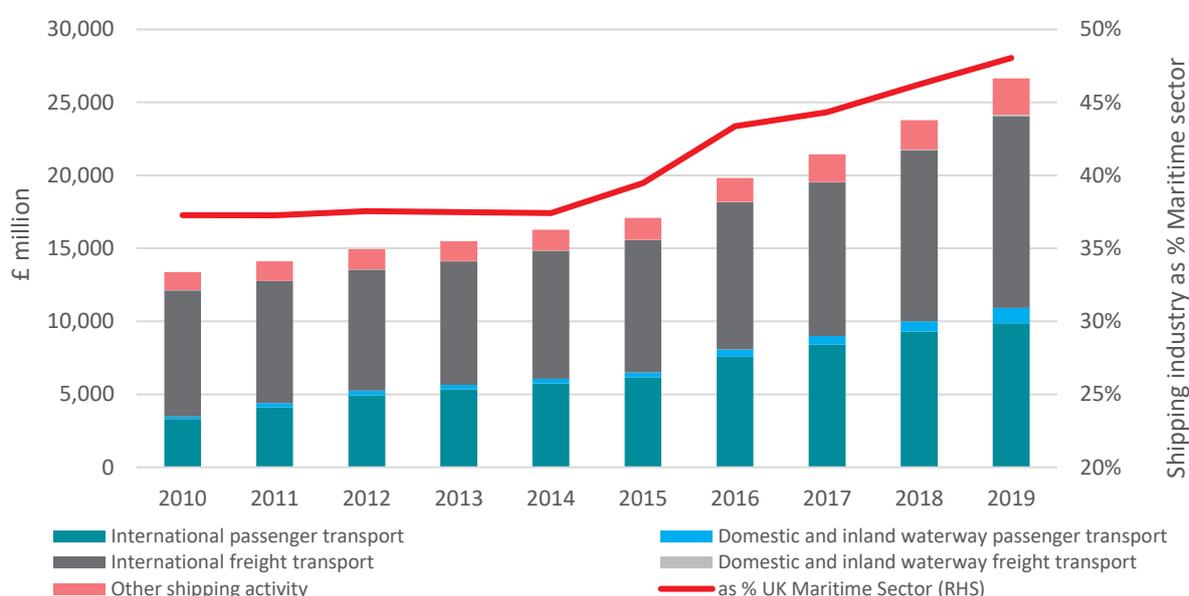
The direct contribution of the shipping industry is measured in terms of the following key macroeconomic indicators: turnover, GVA, employment, the compensation of employees, the Exchequer contribution through tax revenues raised, and exports.

3.1 The direct economic impact through turnover

Turnover by shipping activity

Figure 1 below shows the breakdown of business turnover generated by the shipping industry and its constituent activities between 2010 and 2019. Overall, the industry contributed an estimated £26.7 billion in business turnover in 2019. This is almost a £3 billion increase above the 2016 level, but a represents a significant increase of nearly 100% on the 2010 value. The most significant year-on-year increases came in 2016 when turnover increased by over 16% from the previous year. Between 2010 and 2019, the contribution that the shipping industry makes to the total level of turnover contributed by the Maritime Sector has increased quite considerably, from 37% in 2010 to 48% in 2019. Interestingly in percentage terms, this 2019 value at 48% has been the highest over the past 10 years, and has increased from 46% in 2018.

Figure 1: Estimated turnover of the shipping industry, and share of the Maritime Sector's total direct turnover contribution, 2010 to 2019



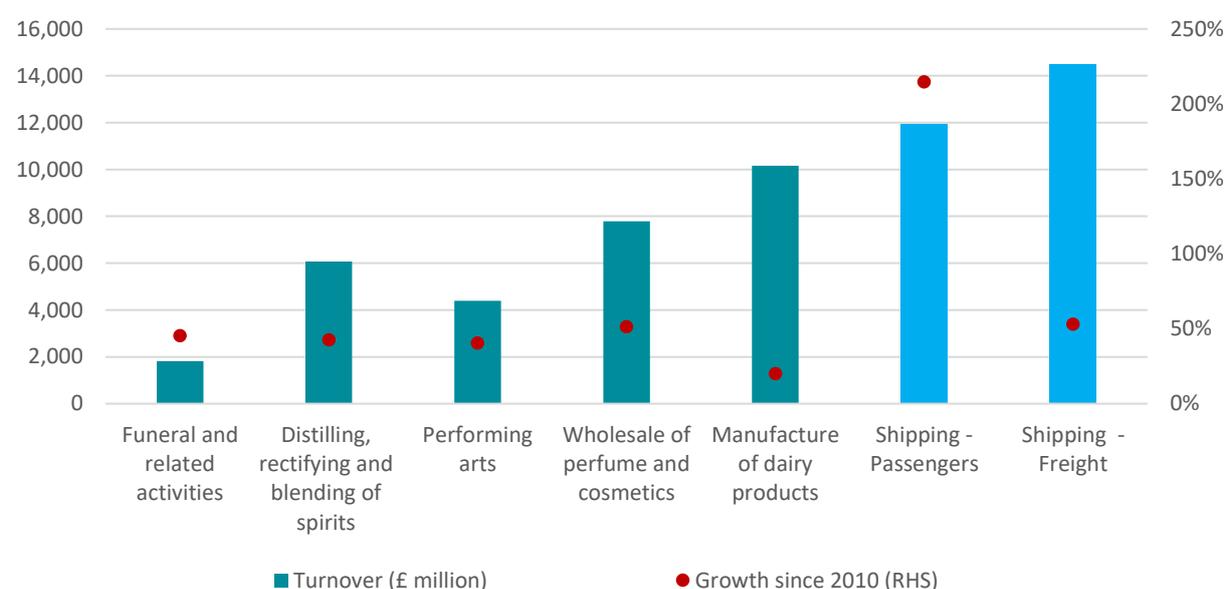
Source: FAME, UKCoS, ONS, Cebr analysis

The largest constituent activity within the shipping industry in terms of turnover directly generated is the international freight transport (bulk, container, gas and tanker) subindustry, with just over £13.2 billion of business turnover in 2019. After this activity, international passenger transport (cruise and ferry) is the second largest, with £9.9 billion of turnover in 2019. In nominal terms, this industry has grown the most, with business turnover nearly tripling

from 2010 (£3.3 billion) to 2019. Combined, international passenger transport and international freight transport contributed 86% of the shipping industry's turnover in 2019. This figure has consistently hovered between 88-89% between 2010 and 2018.

For contextualisation, Figure 2 compares turnover in the freight and passenger activities of the shipping industry with a range of comparative industries of similar size: the manufacture of dairy products; wholesale of perfume and cosmetics; performing arts; distilling, rectifying and blending of spirits; and funeral and related activities. Turnover data has been sourced from the Annual Business Survey (ABS).

Figure 2: The estimated turnover of the shipping industry against comparable industries in 2019, and growth against the 2010 level



Source: FAME, UKCoS, ONS, Cebr analysis

Turnover from domestic and international freight shipping (£14.5 billion) exceeded that from all the comparative industries, with turnover from passenger shipping at £12.0 billion following closely behind. Both are then followed by turnover from manufacture of dairy products (£10.2 billion) and that from distilling, rectifying and blending of spirits (£6 billion). Turnover generated by freight shipping is estimated to have increased by 52% since 2010. In contrast, although the direct contribution from passenger shipping was slightly less, it experienced the highest turnover growth amongst the comparative industries (200%) from 2010-19. This was driven by growth in the ferry and cruise ship sector (international passenger shipping services) since 2010.

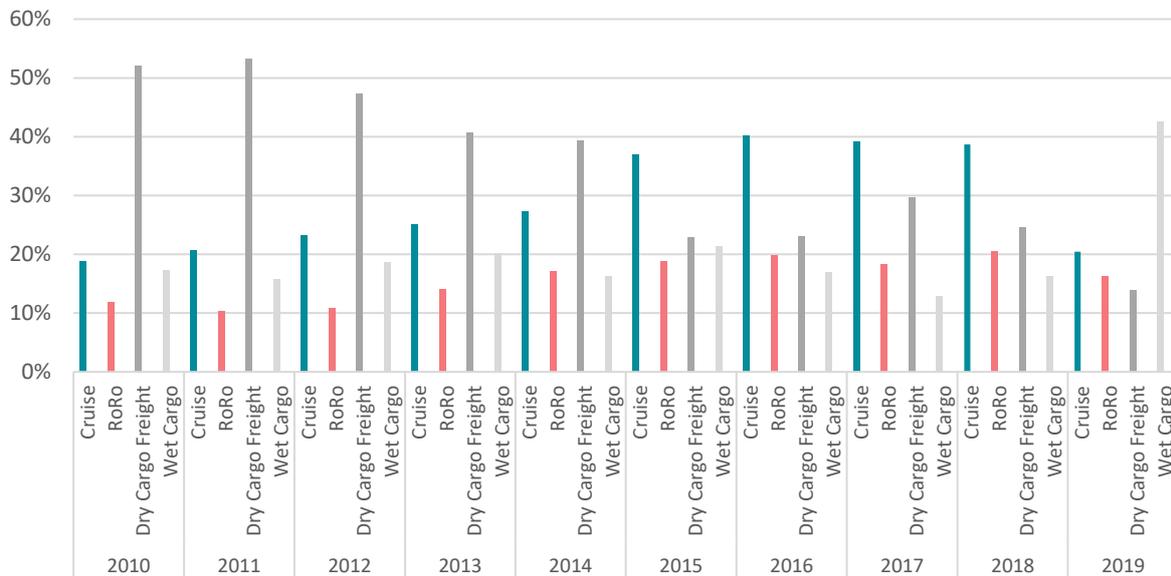
Turnover by type of vessel

Here we examine the breakdown of industry turnover by vessel, drawing upon analysis of the UK Chamber of Shipping's Annual Sea Inquiry (ASI). Figure 3 below shows the percentage share of revenue raised in the years 2010 to 2019, for the following vessel types:

- Cruise (passenger);

- RoRo¹⁴ (passenger and freight);
- Dry cargo freight (inclusive of both dry bulk and container shipping);
- Wet cargo freight services (tanker and gas).

Figure 3: Shares of shipping industry revenue by service type, 2010 to 2019



Source: UKCoS, ONS, Cebr analysis

The percentage share of revenue from dry cargo freight (dry bulk and container) fell from 52% in 2010 to only 14% in 2019, before slightly rising to 30% in 2017. Meanwhile, revenue from passenger cruise services rose from 19% in 2010 to 40% in 2016, but it dipped back to 20% in 2019. This reflects the shift in revenue patterns shown in Figure 3 above.

Industry profitability

Despite the fall and then recovery in business turnover, average profitability (as measured using the aggregated ratio of gross profits to turnover) in the shipping industry is estimated to have increased since 2010. Table 3 shows trends in profitability across each industry activity. As set out the table in Section 2.2, 'shipping 1' refers to international passenger transport (cruise and ferry); 'shipping 2' is domestic and inland waterway passenger transport; 'shipping 3' is international freight transport (bulk, container, gas and tanker); 'shipping 4' is domestic and inland waterway freight transport; and 'other shipping' refers to the other domestic shipping activities not captured through our SIC code based mapping framework.

¹⁴ RoRo, or roll-on/roll-off vessels are those designed to carry wheeled cargo (cars, trucks, trailers etc.), which can be driven on at the departure port and driven off at the destination port.

Table 3: Estimated profitability (gross profit ratio) of the shipping industry and constituent activities, 2010 to 2019

Profitability	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
UK Maritime Sector	18%	18%	20%	20%	20%	19%	21%	19%	19%	20%
UK Shipping industry	16%	17%	20%	20%	23%	24%	26%	23%	22%	25%
Shipping 1	11%	24%	28%	31%	35%	37%	40%	35%	35%	39%
Shipping 2	22%	33%	34%	35%	41%	45%	47%	45%	45%	43%
Shipping 3	18%	13%	14%	13%	15%	15%	14%	12%	10%	12%
Shipping 4	60%	68%	56%	58%	26%	78%	46%	45%	38%	34%
Other shipping	16%	17%	20%	20%	23%	24%	26%	23%	22%	25%

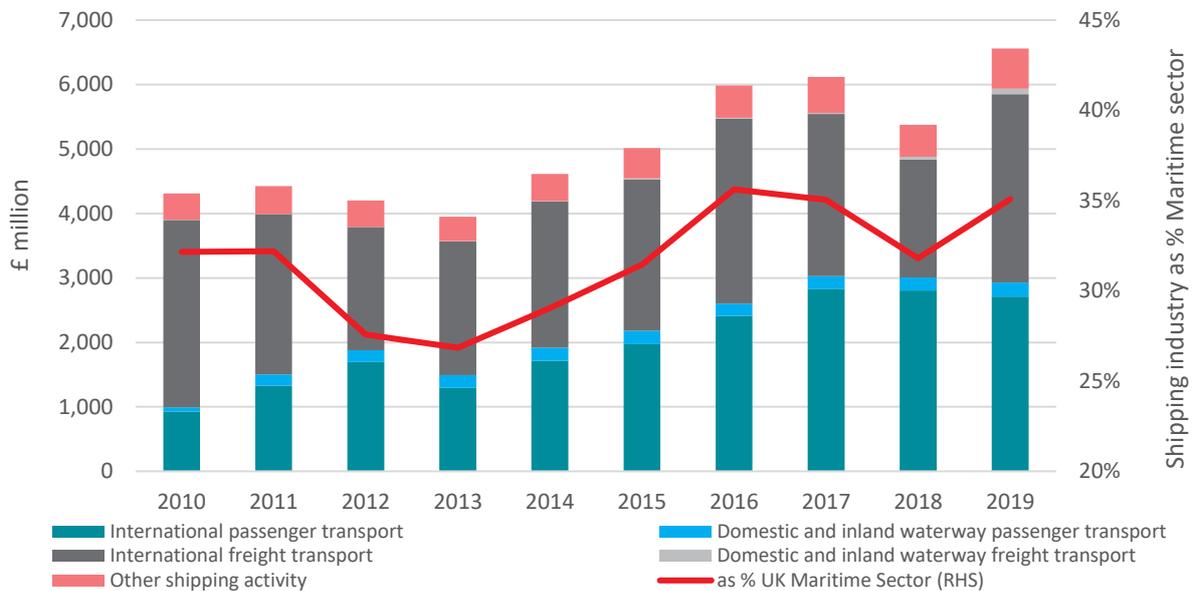
Source: FAME, UKCoS, ONS, Cebr analysis

The overall profitability of the shipping industry, which in 2010 and 2011 was slightly lower than the Maritime Sector average, has been consistently higher every year since. Between 2014 to 2019 this divergence has increased, from 3 percentage points in 2013 to almost 4.2 percentage points in 2019. This is driven by both a slight decrease in Maritime Sector profitability between 2014 to 2019, and a 1.1 percentage point increase in shipping industry profitability. Overall, the profitability in the shipping industry has increased by 8.1 percentage points (49%) from 2010 to 2019. Domestic and inland waterway passenger transport ('Shipping 2') was the most profitable activity throughout the assessed period, although the profitability of international passenger transport (cruise and ferry) grew the most, and given its much greater relative size, is arguably the most important in driving the overall shipping industry profitability.

3.2 The direct economic impact through GVA

This subsection illustrates the contributions in terms of the GVA from the shipping industry to UK GDP. Figure 4 below shows this direct impact, disaggregated by industry activities in the years 2010 to 2019, as well as the shipping industry's share of GVA directly generated by the Maritime Sector.

Figure 4: The direct contribution of the shipping industry through GVA, and the industry’s share of the Maritime Sector’s total direct contribution through GVA, 2010 to 2019

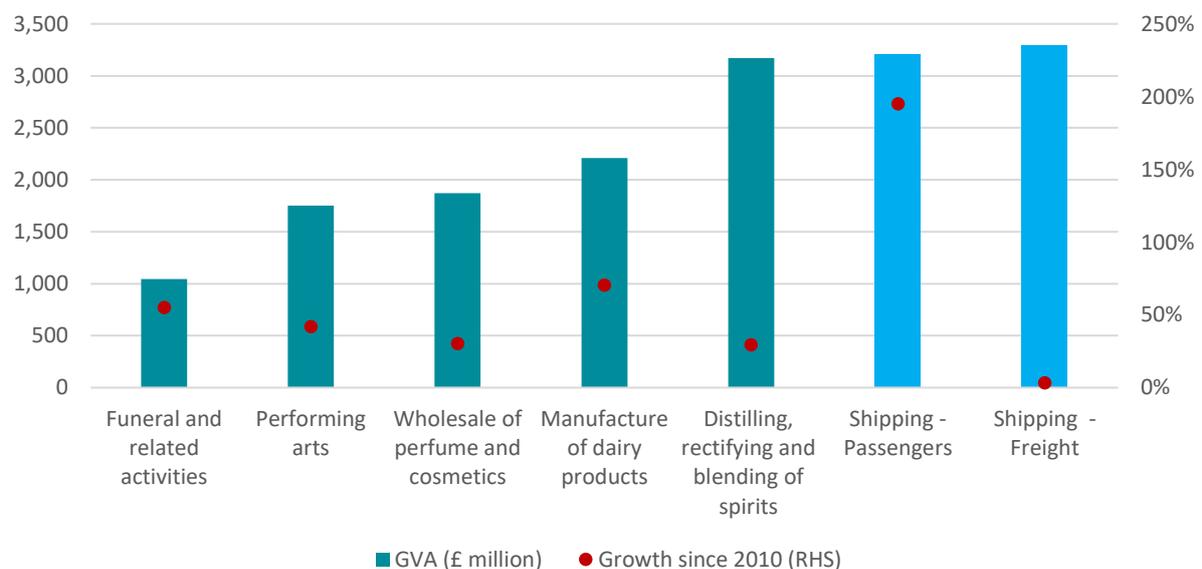


Source: FAME, UKCoS, ONS, Cebr analysis

It is estimated that the shipping industry directly contributed a total of £6.6 billion in GVA in 2019, an increase from the £4.3 billion in 2010. The majority of this increase came in the second half of the period, with GVA actually falling to below 2010 levels, from 2012 to 2013. From 2013 to 2019, GVA increased by £2.6 billion (66%). Overall, the shipping industry is estimated to have contributed 35.1% of the UK Maritime Sector’s direct contribution through GVA in 2019, compared to 32.2% in 2010.

This trend of increasing GVA contributions to the UK economy, can be seen further in Figure 5, as well as the GVA of the shipping industry in 2019 against comparable industries.

Figure 5: GVA of the shipping industry against comparable industries in 2019, and growth against the 2010 level



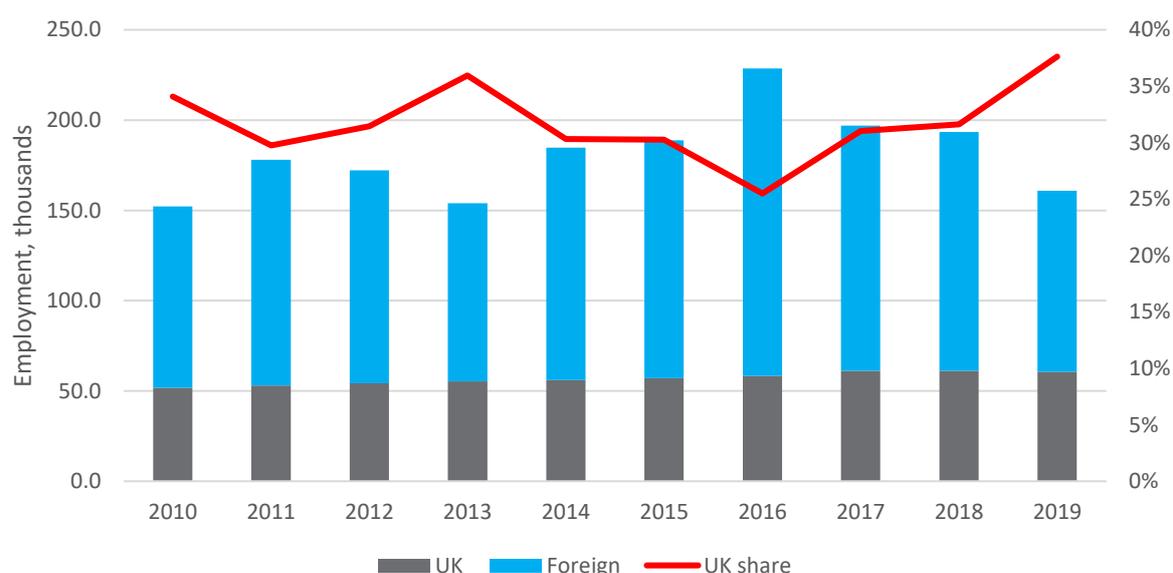
Source: FAME, UKCoS, ONS, Cebr analysis

In terms of the direct GVA contribution in 2019, the GVA contributed due to the shipping of both passengers and freight is larger than for all of the comparative industries. The domestic and international shipping of passengers contributed £3.2 billion in GVA, while this figure rises to £3.3 billion for the shipping of freight. For comparison, the closest other industry is the distilling, rectifying and blending of spirits, which also directly produced almost £3.2 billion in GVA in 2019, however closer examination shows this was £36 million less than the shipping of passengers. As for turnover, the shipping of passengers again has the highest growth in direct GVA between 2010 and 2019, with the 2019 level exceeding that of 2010 by 195%. In contrast, the GVA contribution from freight shipping had the smallest growth rate at 3%. On average, the direct GVA contribution from the non-shipping comparative industries grew by 45% from 2010 to 2019, although none came close to the growth rate of passenger shipping.

3.3 The direct economic impact through employment

In addition to its contribution through GVA, the shipping industry also directly supports a significant number of jobs, both for foreign and UK employees (seafarers and shore-based). Figure 6 below shows the total level of employment in the UK shipping industry between 2010 and 2019, broken down by the employment of foreign and UK nationals.

Figure 6: The direct contribution of the UK's shipping industry through employment, and the industry's share of the Maritime Sector's total direct contribution, 2010 to 2019



Source: FAME, UKCoS, ONS, Cebr analysis

The total level of employment increased by 5.7% from 2010 to 2019, from 152,200 to 161,100. These headline numbers however mask significant volatility over the assessed period, with employment increasing by 25,800 from 2010 to 2011, before declining back to near 2010

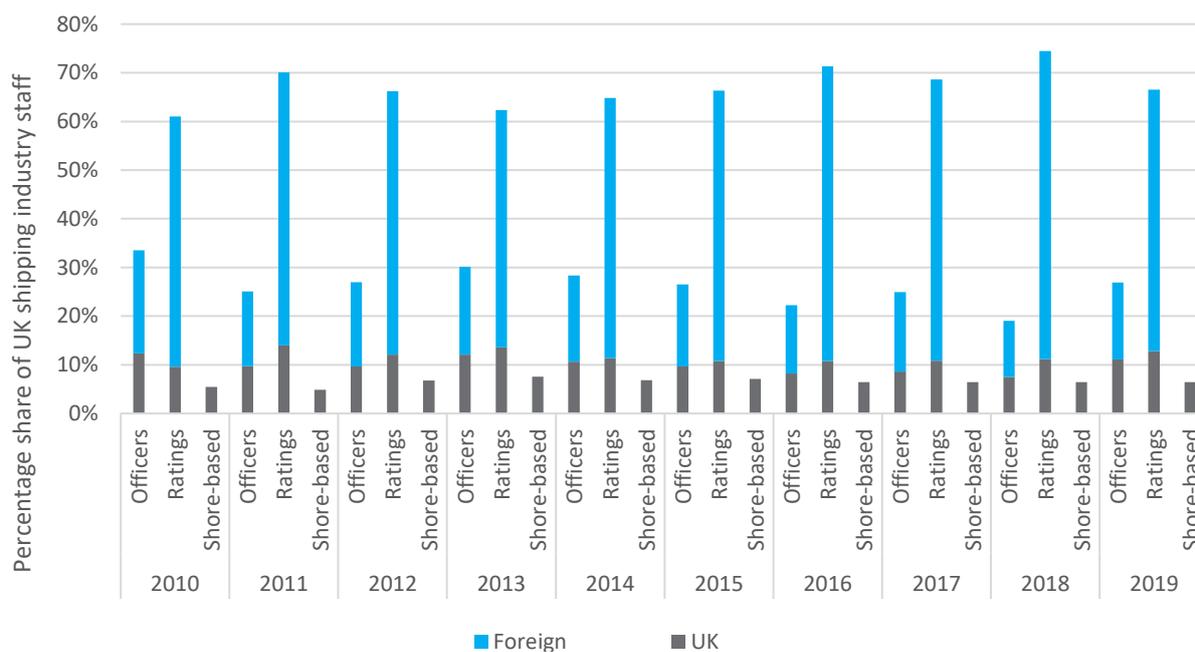
levels by 2013. From 2013 to 2016, employment then increased to the 2016 peak of 228,600,¹⁵ after which it continued to decline, and fell by nearly 1/3rd in 2019.

The share of foreign nationals employed was significantly more volatile than the UK share, with a range of 71,700 over the period, compared to just 9,300 for UK employment. A significant part of this variation is likely due to the crewing arrangements of cruise lines, which employ tens of thousands of individuals. As such, the share that is attributable to the UK actually tends to decrease when total employment increases. The peak for UK nationals was in 2018 (32%), at 61,200 jobs which fell slightly to 60,600 in 2019. Over the entire period, the share attributable to UK nationals has increased, from 34.1% to 37.6%. This pattern is reflected in in raw terms as well, since the number of jobs attributable to UK nationals between 2010 to 2019 has increased, by 16.7%.

Employment by type

Figure 7 below shows the breakdown of foreign and UK national employment by type: officers, ratings and shore-based staff, with this breakdown sourced from the UKCoS Annual Seafarer Employment Survey.

Figure 7: Foreign and UK employment share in the shipping industry by type, 2010 to 2019



Source: UKCoS, Cebr analysis

For every year bar 2013 (when they made up 49%), foreign ratings staff make up at least half of all UK shipping industry workers. Ratings staff is a general term for skilled support roles on a ship. For UK nationals, the dominant employment share changed over the period. In 2010, the share of UK officers (12.3%) exceeded that for ratings staff (9.6%), however from 2011,

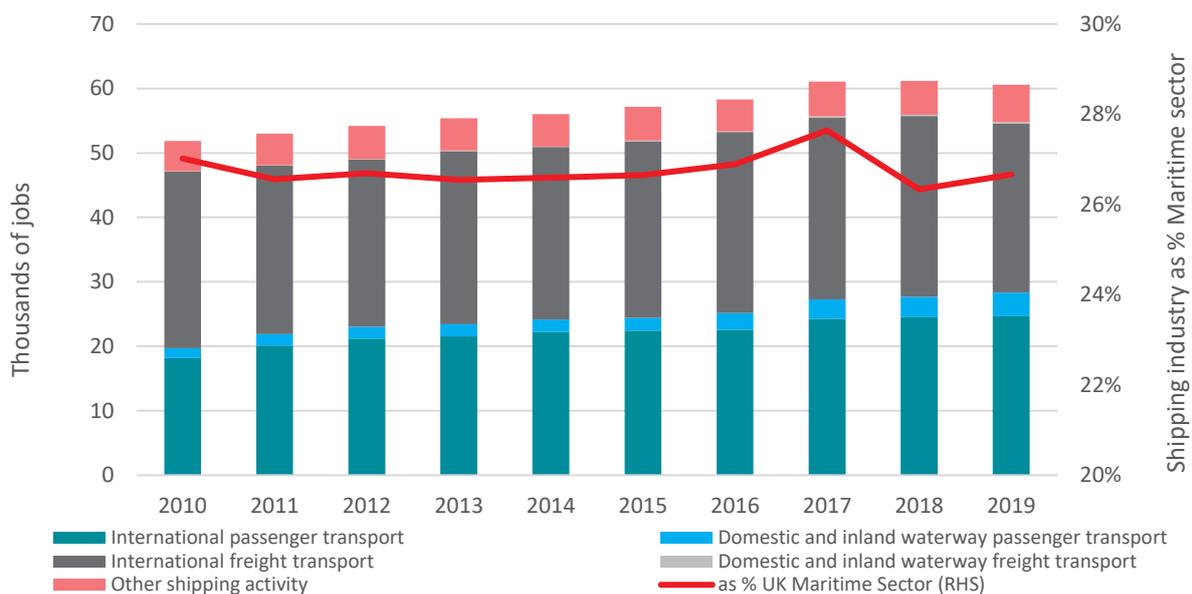
¹⁵ Note that the data in 2016 was reported in a different way to the other years, so the spike seen may also be due to this change in the way it was presented.

and in every year since, ratings staff have outnumbered officers. This split was 12.8% and 11.1% respectively for ratings staff and officers in 2019. Shore-based workers made up the lowest number of employees in each period.

UK employment by shipping activity

Figure 8 below highlights the direct contribution of the shipping industry to UK employment, disaggregated by individual industry activity. For the remainder of this section, this refers to the employment of UK-based workers.

Figure 8: The direct contribution of shipping industry through UK employment, and the industry's share of the Maritime Sector's direct UK employment contribution, disaggregated by industry activity, 2010 to 2019

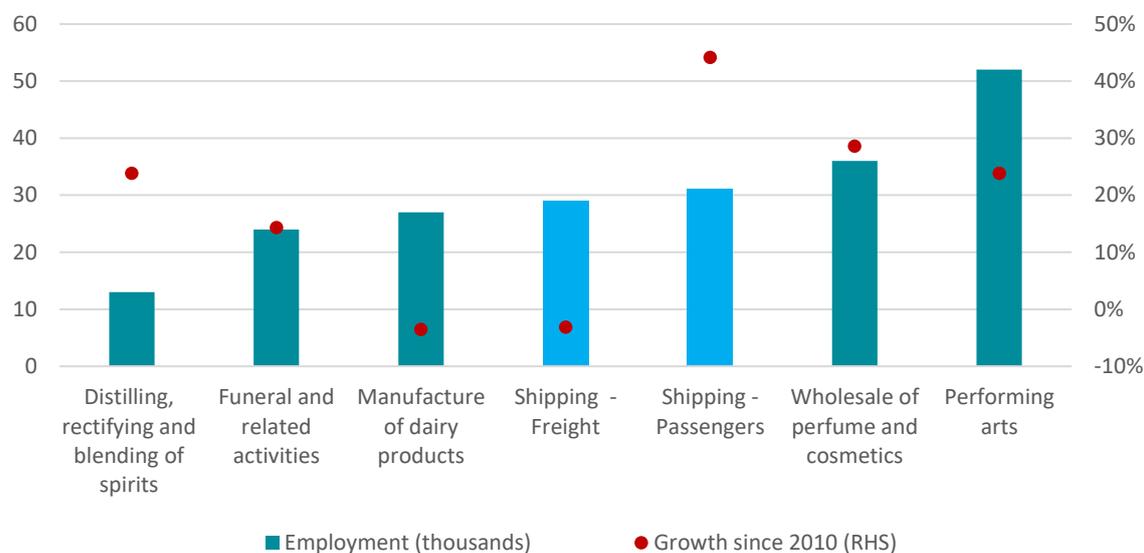


Source: FAME, UKCoS, ONS, Cebr analysis

It is estimated that the shipping industry directly supported around 60,600 jobs for UK employees in 2019, up from 51,900 jobs in 2010. As a share of total employment directly supported by the Maritime Sector, employment in the shipping industry has been relatively consistent, at around 27%. As with turnover and GVA, in each year the international transport of freight and passenger activities contributed the lion's share of employment, with 84% in 2019.

Figure 9 compares the direct contribution that the shipping industry made through UK employment in 2019 against comparable industries.

Figure 9: Employment of the shipping industry against comparable industries in 2019, and growth against the 2010 level



Source: FAME, UKCoS, ONS, Cebr analysis

Employment in passenger shipping activities in 2019 was 44% higher than in 2010, the strongest growth of any of the industries considered. For comparison, employment in freight shipping actually declined (by 3%), however this was still a better performance than the manufacture of dairy products industry which declined by 4%. As the variance in the two shipping growth rates shows, it was the strong increase in employment in passenger shipping that primarily drove the total increase in UK employment in the shipping industry seen in Figure 8.

Industry productivity

Based on trends in GVA and employment, UK-based employees operating in the shipping industry are highly productive, as measured by GVA per job. Table 4 below shows the estimated productivity of each industry activity across the years 2010 to 2019, and compared against the average productivity level of the Maritime Sector and the UK as a whole. The shipping industry as a whole is more productive than the broader Maritime Sector and the UK (on average); while the average shipping industry job generated £87,800 in GVA in 2019, the average job in the UK economy only generated £56,100. As set out the table in Quantifying the direct economic impacts of the Shipping industry, 'shipping 1' refers to international passenger transport (cruise and ferry); 'shipping 2' is domestic and inland waterway passenger transport; 'shipping 3' is international freight transport (bulk, container, gas and tanker); 'shipping 4' is domestic and inland waterway freight transport; and 'other shipping' refers to the other domestic shipping activities not captured through our SIC code based mapping framework.

Table 4: Productivity (GVA per job) in the shipping industry and constituent activities against the Maritime Sector and UK economy, 2010 to 2019

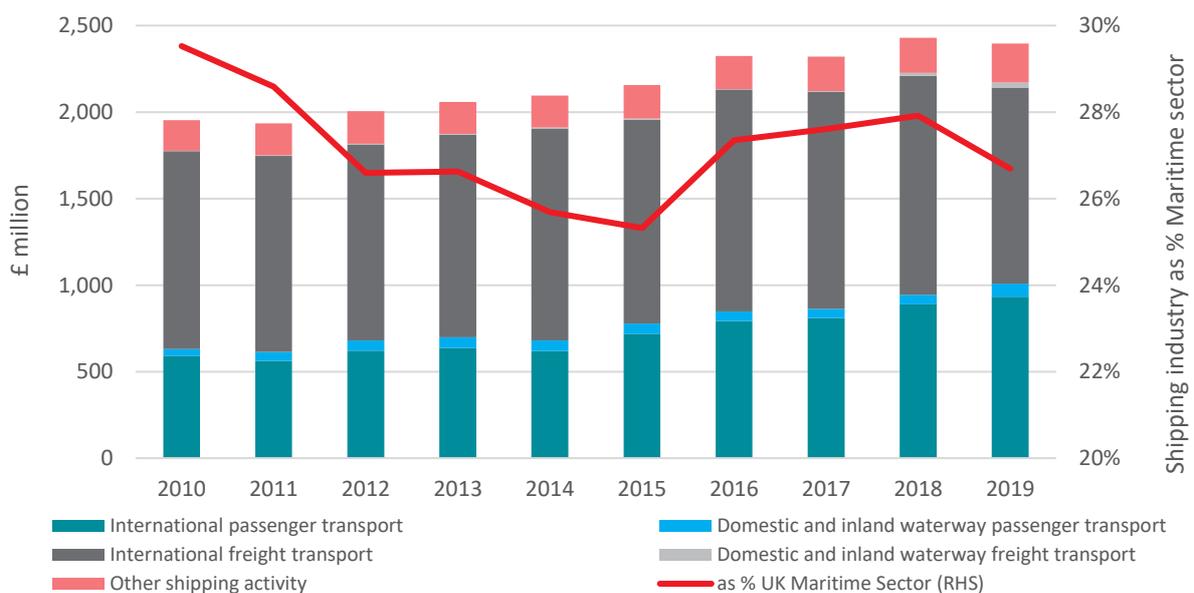
GVA per employee	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
UK economy	46,953	47,857	48,973	50,158	51,356	52,546	53,779	55,066	56,088	56,670
UK Maritime Sector	69,858	68,874	75,074	70,499	75,385	74,332	77,548	78,999	72,760	82,329
UK Shipping industry	83,139	83,492	77,540	71,293	82,339	87,729	102,726	100,142	87,888	108,327
Shipping 1	50,915	66,177	79,965	60,090	77,116	88,071	106,783	116,507	114,317	109,961
Shipping 2	42,969	95,597	99,833	105,051	104,962	103,217	74,441	65,426	64,941	59,032
Shipping 3	106,315	95,190	73,748	77,246	84,872	85,749	102,191	89,312	65,220	111,394
Shipping 4	60,246	13,128	20,506	70,779	74,939	184,720	89,830	101,627	211,315	409,779
Other shipping	86,408	88,493	79,492	74,981	83,455	89,275	102,644	102,694	94,646	108,183

Source: FAME, UKCoS, ONS, Cebr analysis

3.4 The direct economic impact through the compensation of employees

Figure 10 illustrates the employee compensation which is directly supported by the shipping industry, disaggregated by activity. It also illustrates the proportion of all direct employee compensation in the Maritime Sector which is directly supported by the industry. This analysis only considers the compensation paid to UK-based employees.

Figure 10: The direct contribution of the shipping industry to the compensation of employees, 2010 to 2019, £ million



Source: FAME, UKCoS, ONS, Cebr analysis

It is estimated that the shipping industry directly contributed £2.4 billion through the compensation of employees in 2019. Once again, the international transport of freight and passenger activities contributed the highest share (86% in 2019). The total employee compensation paid by the shipping industry increased by 23% from 2010 to 2019, despite some brief periods of minor declines. The overall peak over the assessed period was in 2018 at £2.4 billion, when the employee compensation directly paid by the shipping industry made up 28% of the total for the Maritime Sector.

3.5 The direct contribution to the UK Exchequer

This section discusses the contribution of the shipping industry to the UK Exchequer. For each activity within this industry, Cebr have calculated the contributions in terms of the tax heads listed below. It has been assumed that the shipping industry does not generate Value-Added Tax (VAT) revenues for the UK Exchequer, with zero-rating applying to shipping services provided by the industry.¹⁶

- Income Tax;
- National Insurance Contributions (NICs) – from both employees and employers;
- 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 activity; 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).

For the business taxes listed above, Corporation Tax revenues have been estimated by combining the revenues raised through the Tonnage Tax regime, with estimates for Corporation Tax raised from businesses who opt to not use the Tonnage Tax regime. As Tonnage Tax liabilities are calculated based on gross tonnage, rather than profits, the actual revenue raised from the regime is minuscule in the context of the total tax revenues raised from the Maritime Sector and in general.

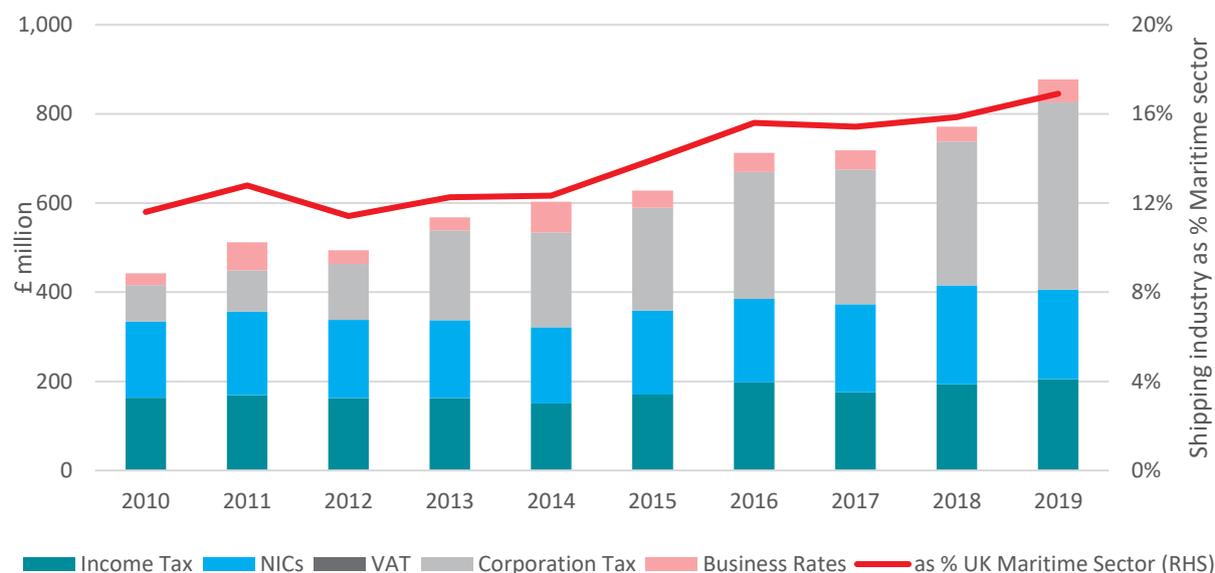
For those businesses not using the Tonnage Tax regime, Corporation Tax revenues have been estimated by applying HMRC estimates for Average Effective Tax Rates (AETRs) to the estimated gross profit of each industry activity. Business Rates have been estimated using

¹⁶ The following services are zero-rated by HMRC: Passenger transport in a vehicle, boat or aircraft that carries not less than ten passengers; International freight transport that takes place in the UK and its territorial waters; Domestic leg of freight transport to or from a place outside the EU; and Ship repairs and maintenance. Further information on the list of zero-rated and VAT-exempt goods and services can be found here: <https://www.gov.uk/guidance/rates-of-vat-on-different-goods-and-services#transport-freight-travel-and-vehicles>

the average level of Business Rates paid as a proportion of GVA, drawing upon the ONS Annual Business Survey (ABS).

Figure 11 below shows the direct contribution of the shipping industry to the UK Exchequer across the years 2010 to 2019, disaggregated by tax head.

Figure 11: The direct contribution of the shipping industry to the UK Exchequer and as a share of the Maritime Sector's total contribution to the UK Exchequer, 2010 to 2019



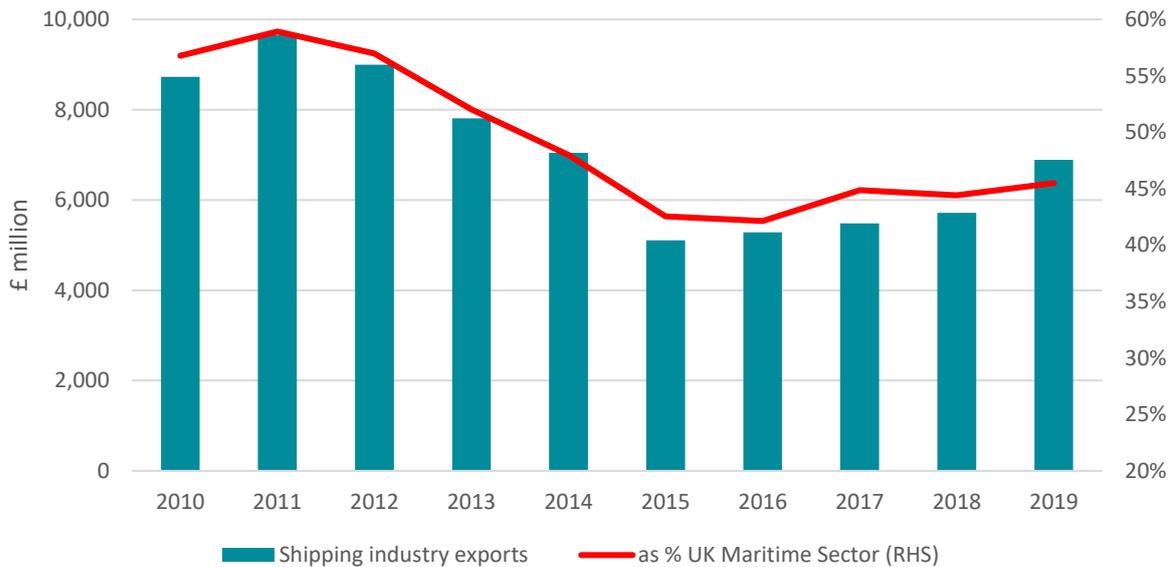
Source: FAME, UKCoS, ONS, HMRC, Cebr analysis

The shipping industry is estimated to have directly generated £878 million in tax revenues for the UK Exchequer in 2019. This increased year-on-year in every year except 2012, when a slight fall of £18 million occurred. Over the entire period, total exchequer contributions nearly doubled, registering a growth rate of 98%. The most notable factor in this was the significant increase in corporation tax paid, which increased from £82 million to £420 million over the period. By 2019, nearly half of the total exchequer contribution came from Corporation Tax, while the remaining half was almost an even split between Income Tax and NICs, with Business Rates contributing a smaller figure of £52 million. Overall, tax revenues raised from the shipping industry represented 17% of the total tax revenues directly generated by the wider UK Maritime Sector. This share has increased from 11.6% in 2010.

3.6 The direct contribution to the UK's exports of services

In this final subsection we consider the contribution that the shipping industry makes to exports from the UK. In this context, the shipping industry is assumed to only export services, through the transport of freight and passengers internationally. Figure 12 shows trends in the value of services exports from the shipping industry between 2010 and 2019, with exports then expressed as a share of the total value of Maritime Sector exports across the same period.

Figure 12: Exports of services from the shipping industry, 2010 to 2019



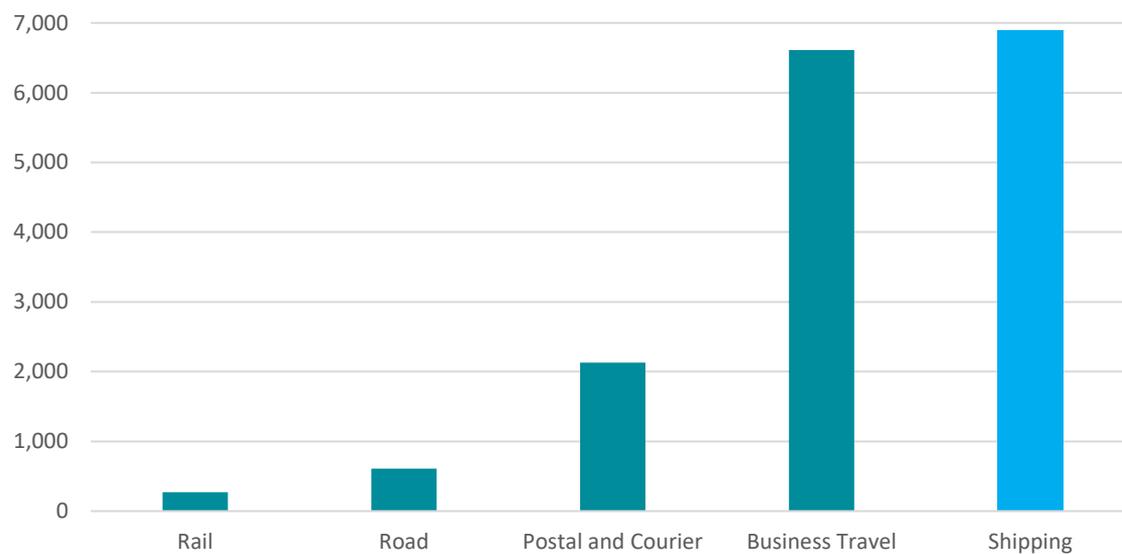
Source: UKCoS, ONS, Cebr analysis

The shipping industry's exported services were valued at £6.9 billion in 2019, in comparison to £8.7 billion in 2010. Exports have fallen in recent years as overseas income reported in the Annual Sea Inquiry has fallen; as a consequence, the proportion of Maritime Sector exports supported by the shipping industry fell from 56.8% in 2010 to 42.1% in 2016. Despite this, there has been a slight recovery since, with the value of services exports increasing by £1.6 billion, and the shipping industry's percentage contribution to total Maritime Sector exports increasing in turn to 45.5%.

Figure 13 compares exports from the shipping industry against those from other comparable transport industry activities. The value of exports of services from the shipping industry was easily larger than the value of exports from Road, Rail and Postal and Courier activities, and overtook that of Business Travel¹⁷ exports by £280 million.

¹⁷ Business Travel (ONS series FJPG) consists of expenditure by seasonal and border workers (FJCQ) , as well as exports through other business travel services (FJNO).

Figure 13: Exports of services from the shipping industry and comparable transportation activities, 2019, (£ million)



Source: ONS, Cebr analysis

4. The aggregate economic impact of the Shipping industry in the UK

The aggregate economic impacts of the shipping industry, take into account the indirect (or supply chain) and induced (employee spending) impacts that arise from the activities of firms within this industry.

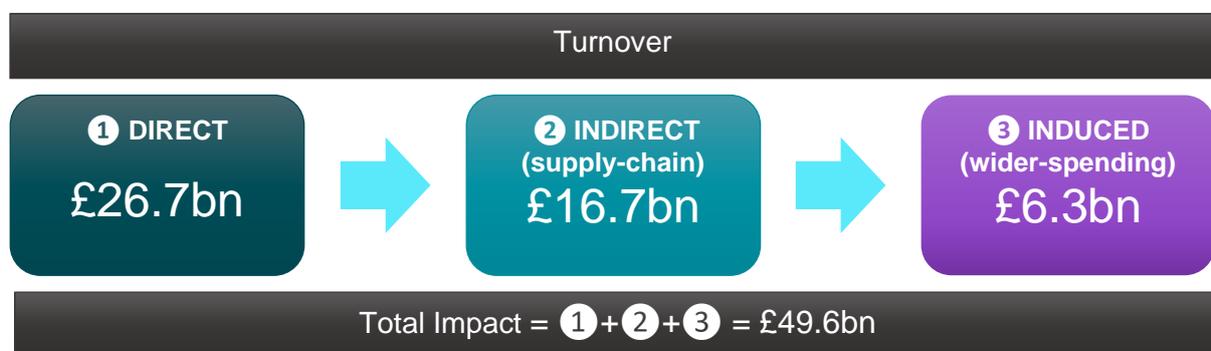
The four macroeconomic indicators for which the aggregate economic impact have been calculated are as follows: business turnover; GVA; employment; and the compensation of employees. Multipliers have been generated from Cebr's economic impact model for the UK. Note that the methodology used to generate 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.

4.1 The aggregate economic impacts through turnover

Figure 14 below illustrates the turnover multipliers for the shipping industry within the UK. An aggregate turnover footprint of £49.6 billion is supported in the UK due to the economic activity of the shipping industry.

Figure 14: Turnover multiplier impacts of the UK shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

From this, it can be deduced that for every £1 of turnover directly generated by the industry, £0.62 worth of turnover is stimulated in the supply chains and £0.24 worth of turnover in the wider economy when direct and indirect (supply chain) employees spend their earnings. Therefore, for every £1 of turnover initially generated by the shipping industry, the UK economy as a whole experiences an increase in turnover of £1.86.

There is a large disparity amongst areas within this aggregate economic contribution. International freight transport (bulk, container, gas and tanker) contributed £24.5 billion to turnover in the UK. In contrast, domestic and inland waterway freight transport – a relatively tiny proportion of the industry in terms of economic activity – supported an aggregate turnover impact of £151 million in 2019. These disaggregated impacts in their entirety can be seen in Table 5.

Table 5: Turnover impact of the shipping industry by industry activity, 2019, £ million

Turnover in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Total	26,651	16,657	6,285	49,593
International passenger transport (cruise and ferry)	9,862	6,164	2,326	18,352
Domestic and inland waterway passenger transport	1,046	654	247	1,946
International freight transport (bulk, container, gas and tanker)	13,152	8,220	3,101	24,473
Domestic and inland waterway freight transport	81	51	19	151
Other shipping activity	2,510	1,569	592	4,671

Source: UKCoS, FAME, ONS, Cebr analysis

Table 6 below presents in each year the direct contribution to turnover from the shipping industry, alongside our estimate of the composite turnover multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.¹⁸ The aggregate turnover impact has grown from £24.9 billion in 2010 to £49.6 billion in 2019.

Table 6: Direct and total turnover impact of the shipping industry, 2010 to 2019, £ million

	Direct Impact	Composite Turnover multiplier	Aggregate Support
2010	13,364	1.86	24,868
2011	14,115		26,265
2012	14,941		27,802
2013	15,486		28,817
2014	16,272		30,278
2015	17,076		31,776
2016	19,825		36,890
2017	21,432		39,881
2018	23,786		44,262
2019	26,651		49,593

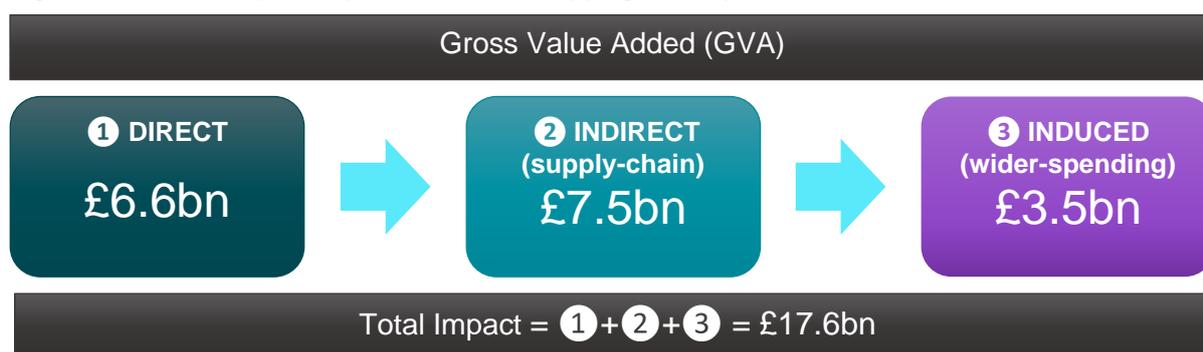
Source: UKCoS, FAME, ONS, Cebr analysis

4.2 The aggregate economic impacts through GVA

As was done for turnover, Figure 15 illustrates the aggregate GVA impact, supported by the shipping industry within the UK.

¹⁸ 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.

Figure 15: GVA multiplier impacts of the UK shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

A total aggregate GVA footprint in the UK of £17.6 billion is supported by the shipping industry. The direct impact of £6.6 billion is augmented by an indirect impact of £7.5 billion of GVA supported and a £3.5 billion induced impact. From this, it can be calculated that for every £1 of GVA initially generated by the shipping industry, the UK economy as a whole experiences an increase in GVA of £2.68.

Table 7 below shows the estimated direct and total GVA impacts from the individual industry activities when taken in isolation. The shipping industry directly contributed £6.6 billion in GVA in 2019, and provided an aggregate support of £17.6 billion in GVA. Within this aggregate economic contribution, international freight transport supported £7.8 billion of GVA in the UK, followed closely by international passenger transport (£7.3 billion).

Table 7: GVA impact of the shipping industry by industry activity, 2019, £ million

GVA in 2019 (£m)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	6,560	7,479	3,519	17,557
International passenger transport (cruise and ferry)	2,710	3,090	1,454	7,253
Domestic and inland waterway passenger transport	218	248	117	582
International freight transport (bulk, container, gas and tanker)	2,922	3,332	1,568	7,822
Domestic and inland waterway freight transport	84	96	45	225
Other shipping activity	626	713	336	1,675

Source: UKCoS, FAME, ONS, Cebr analysis

Table 8 below presents in each year the direct contribution to GVA from the shipping industry, alongside our estimate of the composite GVA multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.¹⁹ The total GVA impact has increased from £11.5 billion in 2010 to £17.6 billion in 2019.

¹⁹ 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.

Table 8: Direct and aggregate GVA impact of the shipping industry, 2010 to 2019, £ million

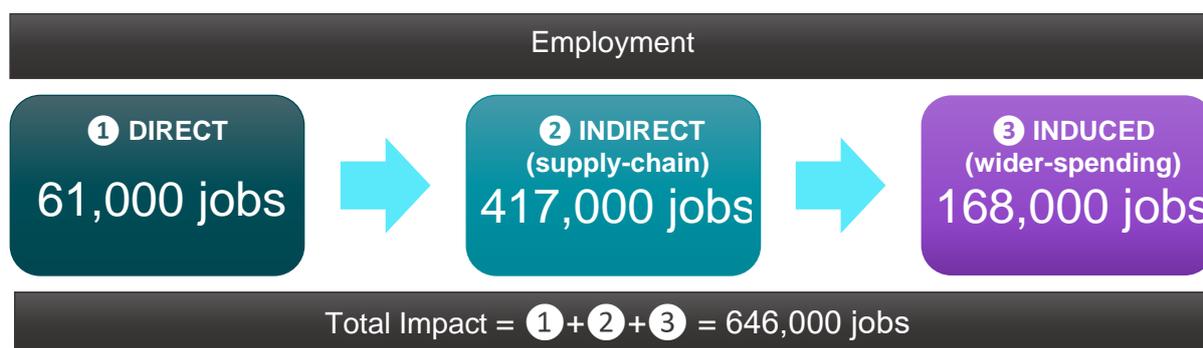
	Direct Impact	Composite GVA multiplier	Total Support
2010	4,313	2.68	11,542
2011	4,424		11,841
2012	4,201		11,243
2013	3,949		10,568
2014	4,612		12,344
2015	5,014		13,419
2016	5,987		16,025
2017	6,117		16,372
2018	5,377		14,391
2019	6,560		17,557

Source: UKCoS, FAME, ONS, Cebr analysis

4.3 The aggregate economic impacts through employment

Here we examine the aggregate economic impact of the shipping industry through the employment of UK-based workers. Figure 16 illustrates the employment multipliers for the industry within the UK. A substantial total of 646,000 jobs were supported by the shipping industry in 2019.

Figure 16: Employment multiplier impacts of the shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

Another way of conceptualising this is that for every job supported by the shipping industry, 6.89 jobs are stimulated in the industry's supply chains and a further 2.77 jobs supported in the wider economy when direct and indirect (supply chain) employees spend their earnings. For each of the major economic variables considered, this is by far the largest multiplier found. For every job initially provided by the shipping industry, a total of 10.66 jobs were supported across the UK economy.

Table 9 shows the estimated aggregate UK employment impacts from shipping industry activities when taken in isolation.

Table 9: Employment impact of the shipping industry by industry activity, 2019, thousands of jobs

Employment in 2019	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	61	417	168	646
International passenger transport (cruise and ferry)	25	170	68	263
Domestic and inland waterway passenger transport	4	25	10	39
International freight transport (bulk, container, gas and tanker)	26	181	73	280
Domestic and inland waterway freight transport	0	1	1	2
Other shipping activity	6	40	16	62

Source: UKCoS, FAME, ONS, Cebr analysis

An inspection of the intermediate consumption trends of water transport services (which in itself almost entirely captures shipping industry activities as defined in the study) within the ONS Supply Use Tables shows the extent of the shipping industry's linkages with other industries; the shipping industry predominately consumes a significant amount of economic output from industries such as employment services, construction, warehousing and storage, and legal services. As these industries are heavily labour-intensive, this is the cause of the high employment multiplier.

Table 10 presents in each year the direct contribution through employment from the shipping industry, alongside the domestic employment multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.²⁰ The aggregate employment impact has increased by 17%, from around 553,200 jobs in 2010 to 645,800 jobs in 2019.

Table 10: Direct impact and aggregate employment supported in the shipping industry, 2010 to 2019

	Direct Impact	Composite Employment multiplier	Total employment impacts
2010	51,871	10.66	553,182
2011	52,988		565,091
2012	54,177		577,769
2013	55,386		590,668
2014	56,013		597,349
2015	57,149		609,465
2016	58,284		621,574
2017	61,083		651,424
2018	61,180		652,459
2019	60,556		645,804

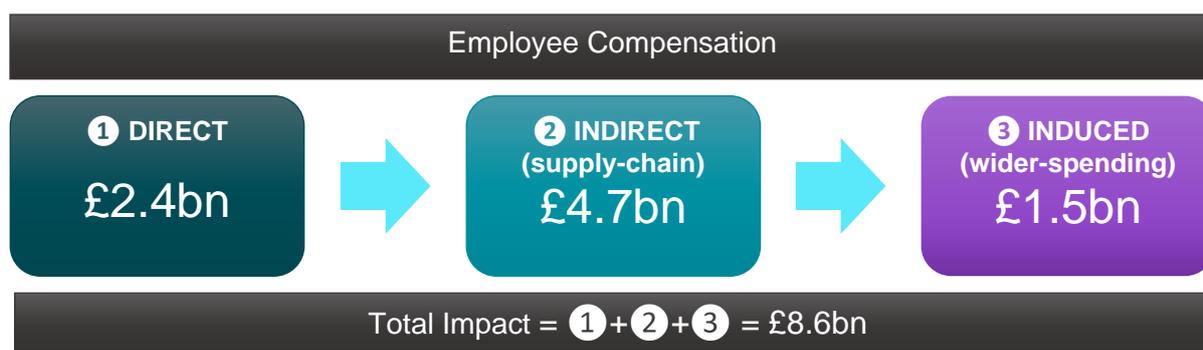
Source: UKCoS, FAME, ONS, Cebr analysis

20 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.

4.4 The aggregate economic impacts through the compensation of employees

In this final subsection we consider the aggregate economic impact of the shipping industry through the compensation of employees. As for the aggregate employment impact, this only considers the compensation paid to UK-based workers. Figure 17 illustrates the direct, indirect and induced compensation of employee impacts associated with the industry.

Figure 17: Multiplier impacts for the compensation of employees for the UK shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

Along with the £2.4 billion of employee compensation directly supported by the shipping industry, £4.7 billion of wages and other employee remuneration is supported in through supply chain (indirect) impacts and £1.5 billion through the employee spending (induced) channel. For each £1 of employee compensation in the shipping industry in 2019, £1.94 was supported through the supply chain and an additional £0.64 through the induced channel. For the shipping industry as a whole therefore, for every £1 directly raised in the compensation of employees in 2019, a total of £3.58 in employee compensation was supported overall through the UK economy.

Table 11 shows the direct and aggregate impact through the compensation of employees across each industry activity. Of the total employee compensation supported in 2019, nearly half (£4.1 billion) was supported by international freight transport. International passenger transport was the other major constituent industry, with an aggregate compensation supported of £3.3 billion.

Table 11: Impact through the compensation of employees of the shipping industry by industry activity, 2019, £ million

Employee compensation in 2019	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	2,397	4,651	1,534	8,582
International passenger transport (cruise and ferry)	934	1,812	598	3,343
Domestic and inland waterway passenger transport	74	144	48	266
International freight transport (bulk, container, gas and tanker)	1,134	2,200	726	4,059
Domestic and inland waterway freight transport	29	56	18	103
Other shipping activity	226	439	145	811

Source: UKCoS, FAME, ONS, Cebr analysis

Finally, Table 12 below shows the progression in the direct impact through the compensation of employees in the shipping industry from 2010 to 2019, alongside the domestic employment multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.²¹ Aggregate impact through the compensation of employees has grown from £7 billion in 2010 to £8.6 billion in 2019. This increase of 23% occurred steadily and consistently over the assessed period.

Table 12: Direct and aggregate impact through the compensation of employees of the shipping industry, 2010 to 2019, £ million

	Direct Impact (£m)	Composite Employee Compensation multiplier	Aggregate Support (£m)
2010	1,953	3.58	6,994
2011	1,935		6,929
2012	2,006		7,182
2013	2,059		7,373
2014	2,095		7,500
2015	2,156		7,718
2016	2,324		8,320
2017	2,320		8,309
2018	2,429		8,698
2019	2,397		8,582

Source: UKCoS, FAME, ONS, Cebr analysis

21 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.

5. The regional economic impact of the Maritime Sector

5.1 The direct economic impact of the shipping industry by UK region

Figure 18: Regional breakdown of turnover directly contributed by the shipping industry, £ million, 2019

The highest concentrations of business turnover directly generated in 2019 were in the South East (£8.6 billion, 32.4%) and London (£7.7 billion, 29.1%).

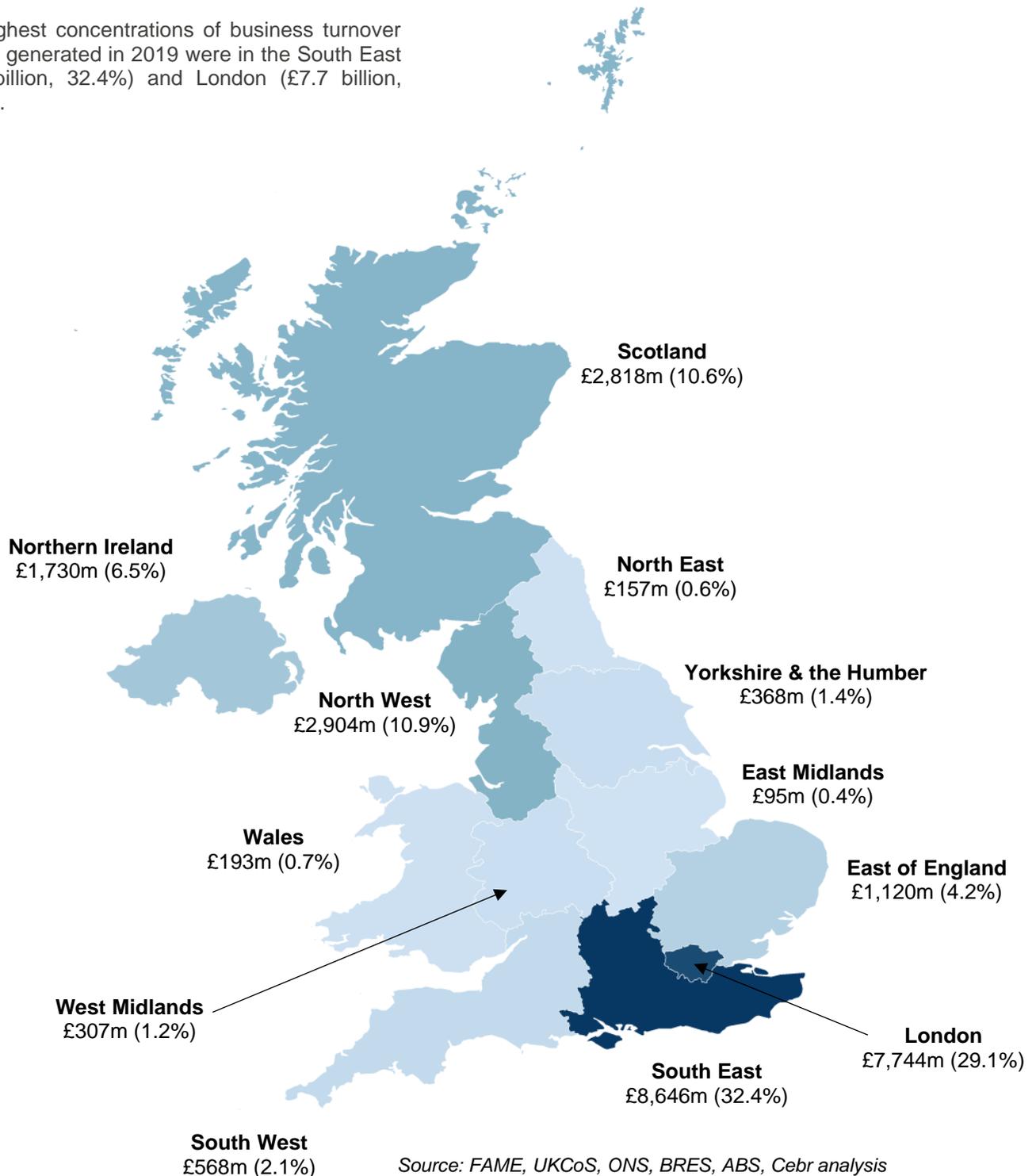
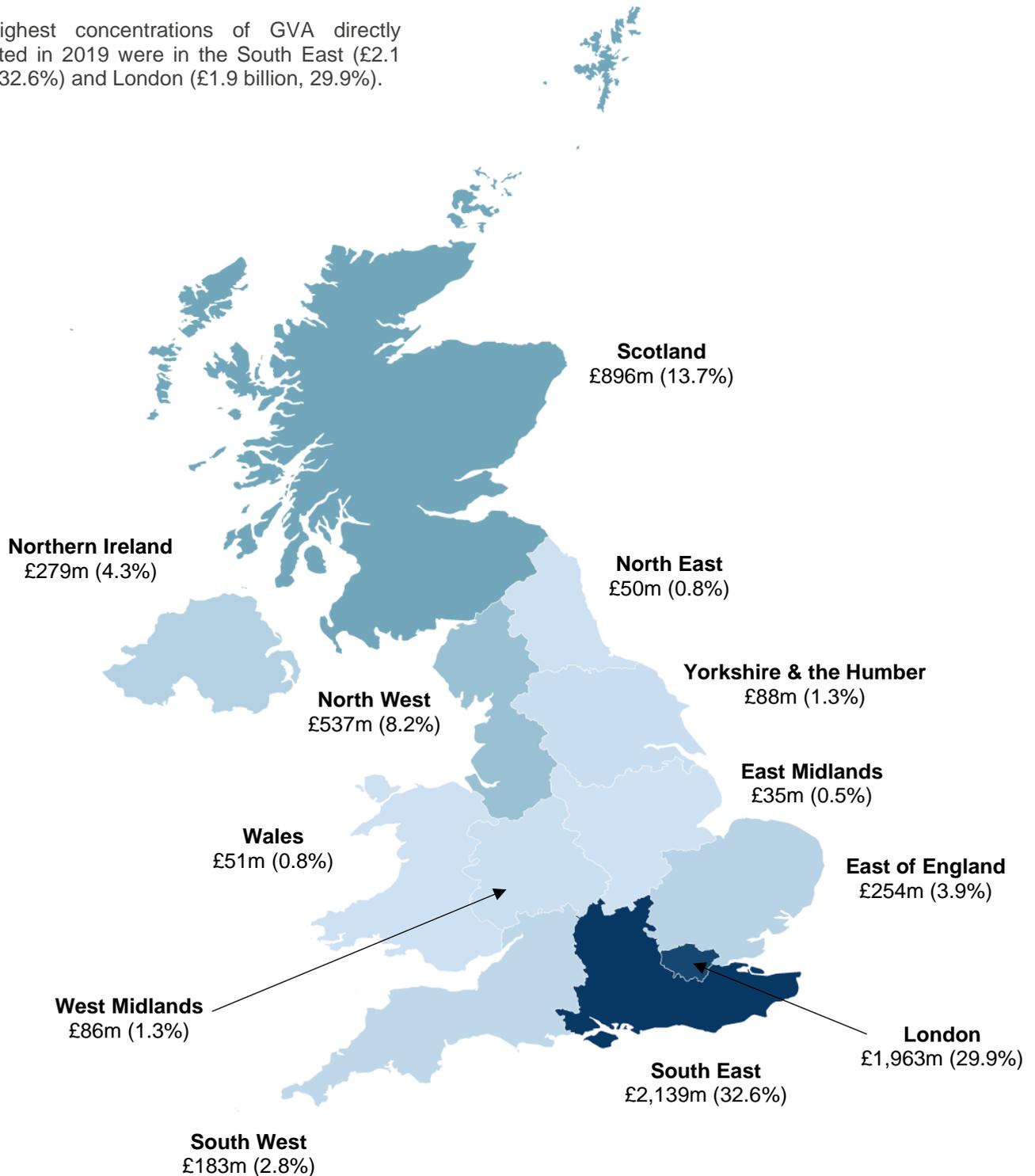


Figure 19: Regional breakdown of GVA directly contributed by the shipping industry, £ million, 2019

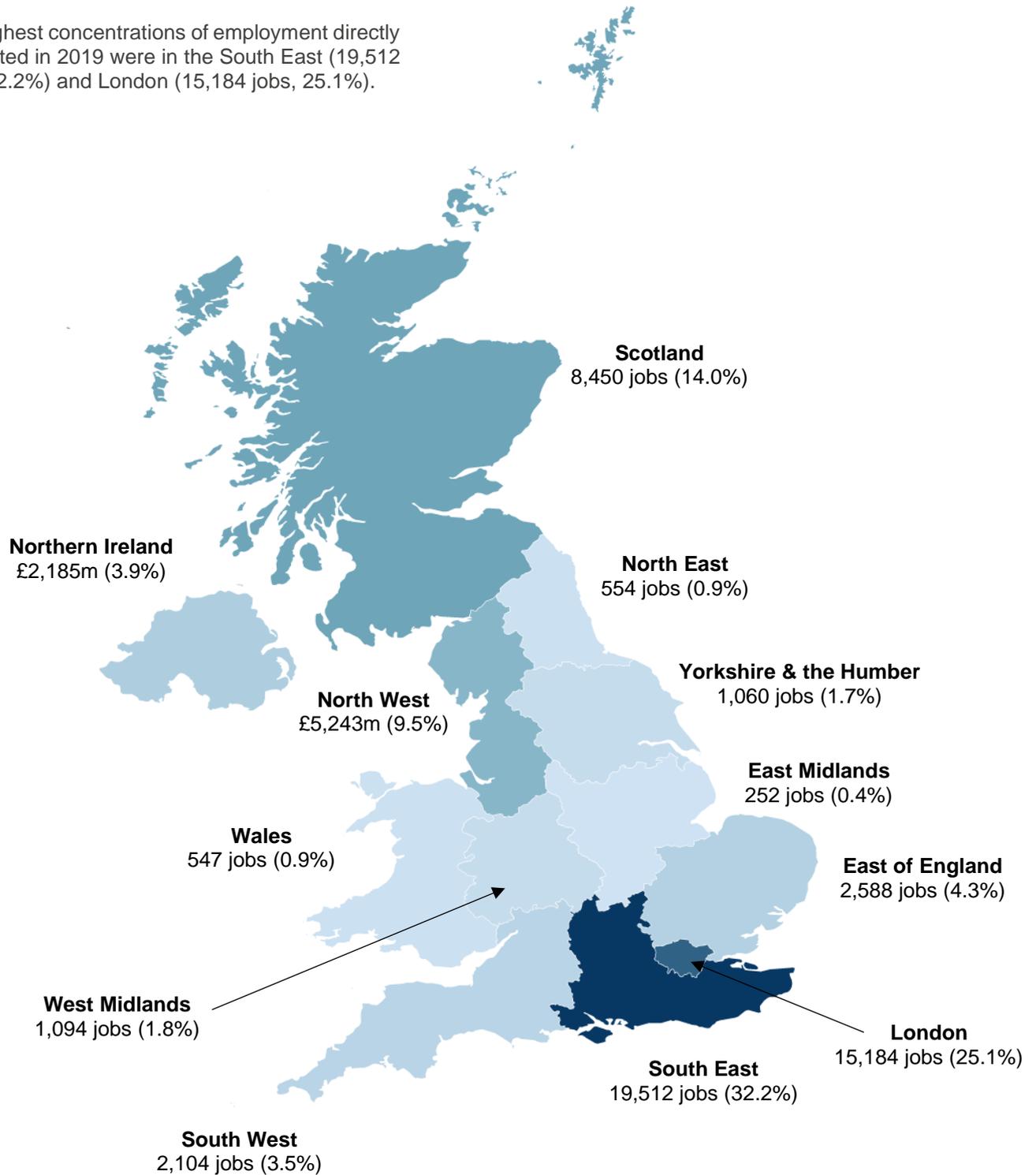
The highest concentrations of GVA directly generated in 2019 were in the South East (£2.1 billion, 32.6%) and London (£1.9 billion, 29.9%).



Source: FAME, UKCoS, ONS, BRES, ABS, Cebr analysis

Figure 20: Regional breakdown of employment directly contributed by the shipping industry, £ million, 2019

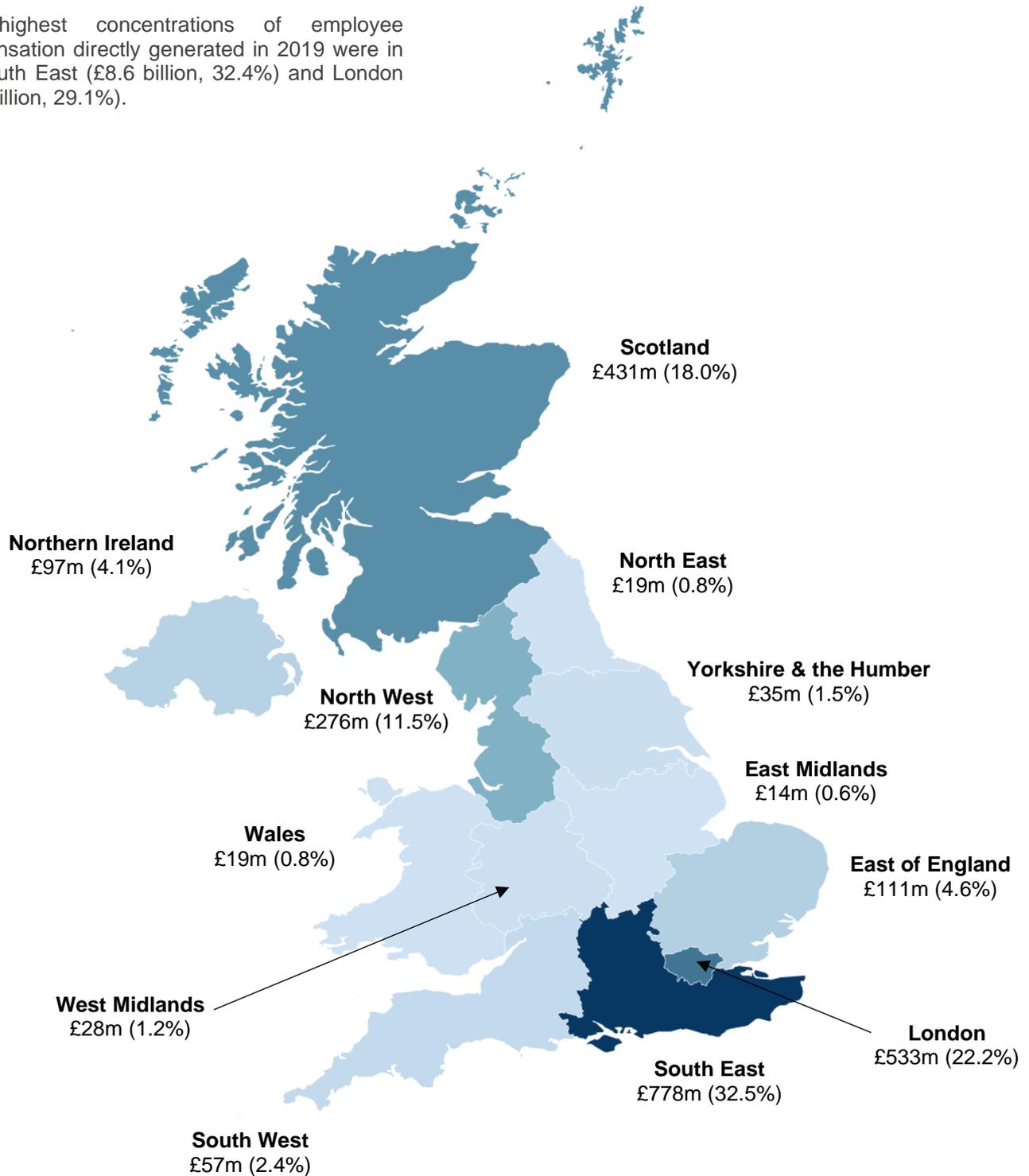
The highest concentrations of employment directly generated in 2019 were in the South East (19,512 jobs, 32.2%) and London (15,184 jobs, 25.1%).



Source: FAME, UKCoS, ONS, BRES, ABS, Cebr analysis

Figure 21: Regional breakdown of employee compensation directly contributed by the shipping industry, £ million, 2019

The highest concentrations of employee compensation directly generated in 2019 were in the South East (£8.6 billion, 32.4%) and London (£7.7 billion, 29.1%).



Source: FAME, UKCoS, ONS, BRES, ABS, Cebr analysis

5.2 The aggregate economic impact of the Shipping industry by UK region

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

In order to estimate the aggregate economic impact of the industry at regional level, the direct economic impacts as already estimated were combined with Cebr's regional economic impact models, within which the activities of the shipping industry were separately identified and isolated. 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 shipping industry, 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 A.

The aggregate economic impacts for business turnover and GVA by region

Table 13 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2019, alongside the composite industry multiplier for each region.

Table 13: Regional breakdown of aggregate business turnover and GVA supported by the shipping industry, 2019, £ million

Region:	Turnover			GVA		
	Direct Impact	Multiplier	Aggregate Support	Direct Impact	Multiplier	Aggregate Support
Scotland	2,818	1.7	4,901	896	2.5	2,238
Wales	193	1.6	317	51	2.3	119
Northern Ireland	1,730	1.7	2,901	279	2.4	671
East of England	1,120	1.7	1,898	254	2.4	619
East Midlands	95	1.7	158	35	2.4	84
London	7,744	1.7	12,927	1,963	2.5	4,812
North East	157	1.6	257	50	2.3	115
North West	2,904	1.7	4,912	537	2.4	1,305
South East	8,646	1.7	14,853	2,139	2.5	5,287
South West	568	1.8	996	183	2.5	463
West Midlands	307	1.6	490	86	2.3	194
Yorkshire and the Humber	368	1.7	614	88	2.4	208

Source: UKCoS, FAME, ONS, Cebr analysis

For both turnover and GVA, the highest aggregate level of support was associated with the London, South East and Scotland, in that order. Every £1 of direct turnover and GVA was associated with the greatest aggregate level of economic support in the South West. The

lowest levels of economic support for turnover and GVA were felt in the East Midlands and North East.

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

Finally, Table 14 shows the breakdown of direct and aggregate economic impacts for employment and the compensation of employees in 2019, alongside the shipping industry multiplier for each region.

Table 14: Regional breakdown of aggregate employment and employee compensation supported by the shipping industry, 2019

Region:	Employment (jobs)			Compensation of Employees (£ million)		
	Direct Impact	Multiplier	Aggregate Support	Direct Impact	Multiplier	Aggregate Support
Scotland	8,450	10.1	85,228	431	3.4	1,465
Wales	547	9.6	5,238	19	3.2	62
Northern Ireland	2,993	9.8	29,206	97	3.3	319
East of England	2,588	10.0	25,839	111	3.3	370
East Midlands	252	9.7	2,432	14	3.2	45
London	15,184	9.9	150,092	533	3.3	1,765
North East	554	9.5	5,259	19	3.2	60
North West	6,219	9.9	61,648	276	3.3	919
South East	19,512	10.0	195,902	778	3.4	2,629
South West	2,104	10.2	21,469	57	3.4	194
West Midlands	1,094	9.3	10,175	28	3.1	87
Yorkshire and the Humber	1,060	9.7	10,259	35	3.3	116

Source: UKCoS, FAME, ONS, Cebr analysis

For employment, the highest levels of aggregate support are enjoyed in London, South East and North West. A similar pattern is observed for compensation of employees, where London and South East are associated with the highest aggregate support, followed by Scotland. Little over half of jobs (57%) and employee compensations (55%) supported by the shipping industry are found to be concentrated in these top two areas. The highest employment and employee compensation multipliers are again in the South West, while the lowest multiplier for both is in the West Midlands. The low impacts in the East Midlands, North East and Yorkshire and the Humber (particularly with respect to previous years, as seen in Annex A) are driven by the reduced share of employment attributable to these regions, as implied by BRES.²² Within these regions, key were the declining employment in the international

²² For more methodological detail, see Section 2.3.

passenger transport (cruise and ferry) subindustry in the North East, international freight transport (bulk, container, gas and tanker) in Yorkshire and the Humber, and the domestic and inland waterway passenger transport and international freight transport subindustries in the East Midlands.

6. The economic impact of the Tonnage Tax regime on the shipping industry

This final section of the report sets out Cebr's estimates of the benefits of the Tonnage Tax regime. This system, a fully-approved EU State Aid, was introduced in 2000 as a means to support the UK shipping industry, seeking to boost the size of the declining UK fleet and to increase the levels of training imparted on UK seafarers. While the revenues raised through the Tonnage Tax regime for the UK Exchequer are minimal, Cebr estimate that the gains in terms of economic performance from introducing the regime far outweigh the associated costs of deferred Corporation Tax revenues.

As a counterfactual situation, it is ultimately impossible to determine the performance of the UK shipping industry in an environment in which the Tonnage Tax regime was not in place. However, it is clear that given the marked reversal in the performance and size of the UK shipping fleet following the introduction of the Tonnage Tax regime, and the contemporaneous macroeconomic conditions and experience of other European countries, the impact of the Tonnage Tax is unlikely to be coincidental. The analysis presented in this section therefore seeks to quantify the economic contribution that the UK would have forgone had the Tonnage Tax regime not been introduced. This economic contribution is measured through the GVA, UK employment and exports that would have been forgone and draws upon the direct economic impacts analysis presented earlier in this report. The benefits from the higher levels of seafarer training imparted, while important, are not considered here.

6.1 About Tonnage Tax

In July 2000, the UK Government introduced a new optional tax regime for the UK Shipping Sector - the Tonnage Tax regime. The Tonnage Tax regime allows shipping companies with qualifying vessels to pay Corporation Tax liabilities based upon the gross tonnage for the ships they operate, rather than paying based upon the actual profits of the company (as is normally the case). In other words, the regime provides an alternative way of calculating the taxable profits of UK shipping businesses.

For those companies which opt in to using the Tonnage Tax regime, a fixed level of 'profit' which is subject to Corporation Tax is calculated based on the net tonnage of a vessel and the number of days a year in which the vessel is in operation. A decreasing profit rate is applied for higher tonnage brackets. Therefore, in some circumstances it is possible for a company which has opted into the Tonnage Tax regime to have to pay Corporation Tax to the UK Exchequer despite making a loss. The regime is attractive for both pecuniary and planning reasons. For the former, participating companies typically face net tax liabilities far lower than they would have under the standard Corporation Tax regime, thereby increasing flexibility in company financing options. For the latter, the regime provides certainty, with companies able to determine the level of tax payable at any particular time.

Alongside supporting funding for seafarer training, the objective of the Tonnage Tax regime was to reverse the steady decline in UK-owned commercial vessels; with a strong relationship between international trade, employment and shipping, the UK's continuing prosperity is partly tied to the size of its shipping fleet. It is widely perceived that the introduction of the regime was a strong contributing factor in the marked uptick in the size of the shipping fleet and the

net value of trade in shipping services. In 2005, the House of Commons Transport Committee noted that “The tonnage tax regime has led to an increase in the number of ships on the UK register and a small increase in the UK owned fleet.”²³ In 2011, the Office for Tax Simplification (OTS)²⁴ argued for the regime to be maintained to allow the UK shipping industry to compete effectively, also noting that “If tonnage tax were to be abolished there is a danger that, in a highly mobile industry where shipping companies can migrate from the UK and register their ships in foreign jurisdictions at short notice, companies would abandon the UK.” The UK has not been alone in bringing in such a regime to support its domestic shipping industry. As identified in the paper, “Tonnage tax: is it working?”²⁵ almost all maritime EU countries now operate similar regimes, including: Greece, Netherlands, Norway, Denmark, Finland, Spain, Ireland, Belgium, and France, alongside many others globally. This is particularly relevant given the UK’s Maritime 2050 strategy report, where retaining competitive advantage in the industry is a priority,²⁶ upholding the UK as a prime location for domestic and international companies.

To further highlight the significant impact that the Tonnage Tax is likely to have had, Figure 22 shows the trend of declining deadweight tonnage²⁷ of UK-owned shipping vessels up to 1999 (just before the Tonnage Tax regime was introduced), as well as the trade balance in sea transport services as recorded in the ONS Pink Book (including disbursements in ports). UK fleet tonnage data is sourced from the Department for Transport’s shipping fleet data tables.²⁸ An important caveat to note is that only ships of 500 gross tonnes²⁹ and above are included here in the total deadweight tonnage (so some smaller vessels will be omitted) and

23 House of Commons Transport Committee. (2005). ‘Tonnage Tax: Second Report of Session 2004-05’.

24 Office for Tax Simplification. (2011). ‘Review of tax reliefs, Final Report’.

25 Leggate. H., & McConville. J. 2006. “Tonnage tax: is it working?”, *Maritime Policy & Management*

26 Department for Transport. (2019). ‘Maritime 2050’.

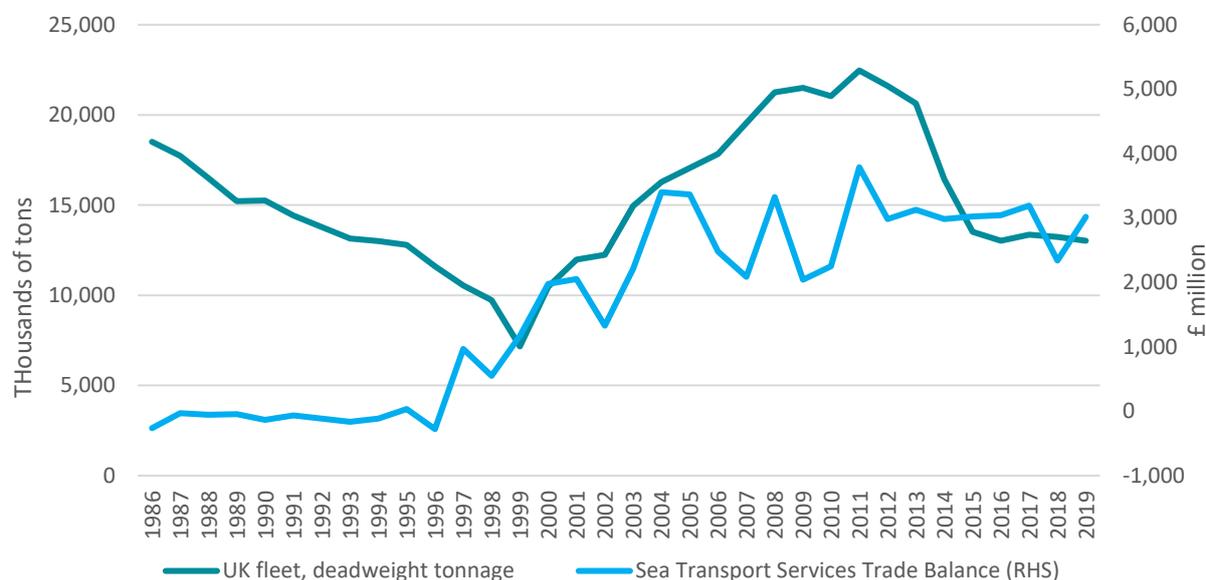
27 Deadweight tonnage is the weight, measured in tons, of all the cargo, fuel, dry provisions, and supplies carried on board a ship. In other words, it refers to the weight of the volume of water displaced by a vessel in normal seagoing condition.

28 Department for Transport. (2021). ‘UK owned trading vessels of 500gt and over by type, number and tonnage’.

29 Gross tonnage is a non-linear measure of a ship’s overall internal volume (defined by the International Maritime Organization as “the moulded volume of all enclosed spaces of the ship”), and is by definition not a measure of a ship’s weight or mass.

secondly that it only includes trading vessels, (those that carry cargo or passengers), and will therefore not include vessels such as those operating in offshore oil and gas, for instance.

Figure 22: Deadweight tonnage of UK-owned shipping vessels; UK trading balance in sea transport services, 1986 to 2019



Source: UKCoS, Department for Transport, ONS, Cebr analysis

From 1986 and prior to 2000, the total deadweight tonnage of UK-owned vessels was declining year-on-year by an average of 6.8% per annum; this decline accelerated in 1999 to 26.3%. Similarly, the UK trade balance in sea transport services was marginally in deficit in every year up to 1994, where 1995 had a surplus of £33 million, falling to a deficit of £278 million in 1996. Sea Transport Service Trade Balance from 1997 to 2019 has been in surplus with it peaking in 2011 at a £3,787 million surplus.

We observe a marked reversal in trend for total deadweight tonnage of UK-owned vessels after 2000. The total level of deadweight tonnage immediately recovered to 10.5 million tonnes. Year-on-year growth since then has averaged at 5.1%, although there has once again been a decline following 2011. However, 2016 and 2017 have begun to show an end in the decline.

6.2 Quantifying the economic impact of the Tonnage Tax regime

Summary of the approach

The objective of this section is to compare what has happened to the shipping industry in the current circumstances (i.e. following the introduction of the Tonnage Tax regime) against scenarios in which the Tonnage Tax regime had not been introduced.

The first step involves estimating the size of the UK shipping fleet in these counterfactual scenarios in the years following 2000, as measured through deadweight tonnage. After determining the likely path of the UK shipping fleet after 2000 without the Tonnage Tax, the relationship between the key macroeconomic indicators of interest – GVA, employment, tax revenues and exports – and this level of deadweight tonnage is then determined, drawing upon the direct economic impacts outlined earlier in this report. The difference between

deadweight tonnage outturns and deadweight tonnage in the counterfactual can then be translated into the direct and aggregate economic contribution that would have been forgone had the Tonnage Tax regime not been introduced.

The impact of Tonnage Tax on the UK-owned shipping fleet and the key macroeconomic indicators

In order to determine the likely path of the UK shipping fleet in an environment where the Tonnage Tax regime had not been introduced, Cebr has presented the following three scenarios alongside the actual path of the size of the UK-owned shipping fleet:

- **Outturn** – this is the deadweight tonnage of the UK shipping fleet (comprising vessels of 500 gross tons or above) under the current regime – in other words, what has actually happened to the total deadweight tonnage of the UK-owned shipping fleet between 1986 and 2019.
- **Low Scenario** – this scenario assumes that the size of the UK shipping fleet would be half that as under the current regime. For example, in 2019 the deadweight tonnage of the UK-owned shipping fleet was just over 13 million tonnes; under the Low Scenario deadweight tonnage is assumed to have fallen to 6.5 million tonnes.
- **Central Scenario** – this scenario assumes that deadweight tonnage followed a declining fitted exponential trend between 1986 and 1999, with this trend assumed to continue after 2000. The Central Scenario reflects the persistent fall in the size of the UK-owned shipping fleet prior to 2000.
- **Upper Scenario** – this scenario utilises a fitted econometric model which attempts to control for other factors which are likely to have influenced growth (or decline) in the size of the UK-owned shipping fleet. These other factors, expressed in growth terms include growth in world trade and the oil price; a dummy variable to represent the introduction of the Tonnage Tax regime in 2000 has been included.

After quantifying the impact on the total level of deadweight tonnage under the three scenarios described above, it is assumed that there is a proportional relationship between the direct contribution that the shipping industry makes through GVA, UK employment, the contribution to the UK Exchequer (tax revenues) and exports.

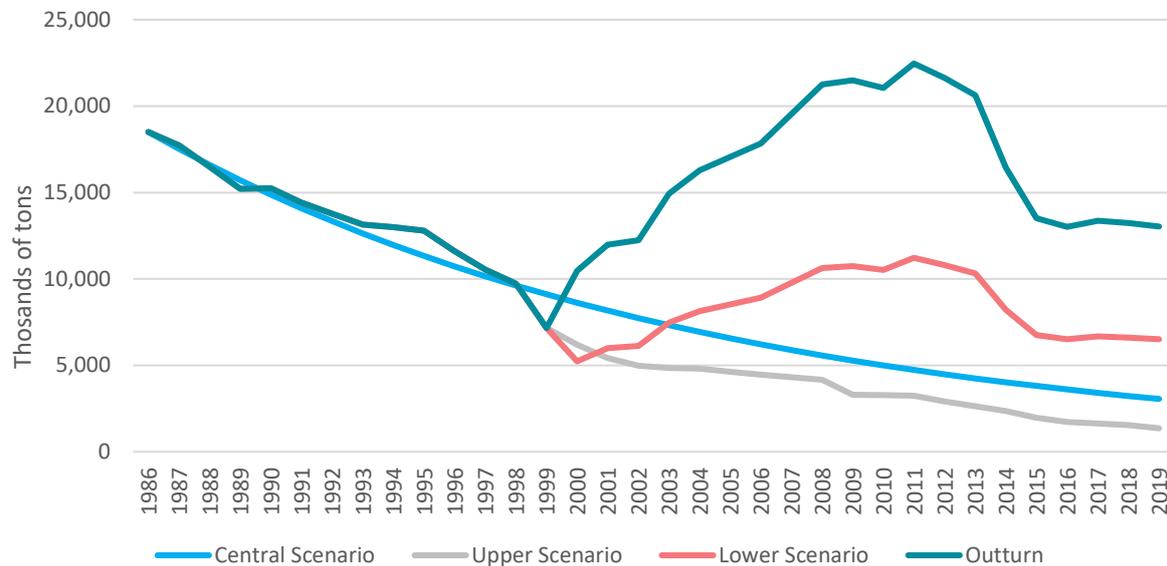
The impact of Tonnage Tax on the aggregate economic impact of the shipping industry has been estimated by assuming that, with the sole exception of the Ports industry, all other industries in the shipping industry's supply chain would have been negatively affected by the reduction in shipping activity. We assume that the ports industry would not have been affected by the reduction in economic activity from the UK shipping industry, as UK ports could have continued to provide their services to foreign-owned ships; the aggregate economic impact of the shipping industry relating to Ports has therefore been maintained.

6.3 The impact of Tonnage Tax on the UK-owned shipping fleet

Figure 23 below shows the path of total deadweight tonnage for the UK-owned shipping fleet under three different scenarios since 2000, alongside the outturn since 1986. As a fitted trend based on data from 1986 to 1999, the Central Scenario necessarily does not map neatly onto

the outturn values prior to 2000. Under the Lower Scenario, total deadweight tonnage would have fallen as low as 6.5 million tonnes by 2019; under the Central and Upper Scenarios the levels of deadweight would have been 3.1 million and 1.4 million tonnes respectively.

Figure 23: Total level of deadweight tonnage for UK-owned shipping fleet, outturn versus Lower, Central and Upper Scenarios



Source: UKCoS, Department for Transport, ONS, Cebr analysis

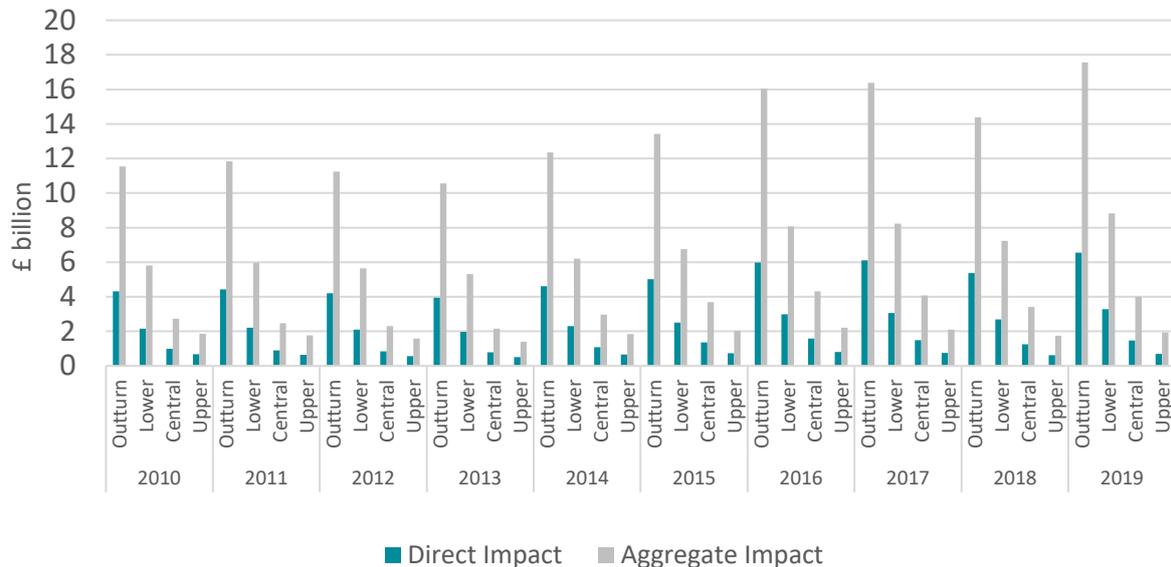
Under all three scenarios,³⁰ deadweight tonnage would have been markedly lower than under the outturn; in 2019 total deadweight tonnage had fallen but was still recorded at 13.0 million tonnes, in comparison to 7.2 million tonnes in 1999. Given the large discrepancies in deadweight tonnage, it is clear therefore that there is a good deal of evidence to suggest that the economic contribution of the shipping industry would have been considerably lower without the introduction of the Tonnage Tax regime.

³⁰ Note that for the purposes of the analysis in this section, the scenarios are framed around the counterfactual of what would have happened had the tonnage tax regime not been implemented. So, for example, the lower scenario is the most 'conservative' in the sense that it is the conservative estimate for how much worse off the industry would be without tonnage tax, and the upper scenario is the 'extreme' case of where the industry would be without tonnage tax.

6.4 The impact of Tonnage Tax on GVA

Figure 24 shows the projected impact across the years 2010 to 2019 under the three scenarios described earlier in this section.

Figure 24: The direct and aggregate GVA impacts of the UK shipping industry under alternative scenarios



Source: UKCoS, Department for Transport, ONS, Cebr analysis

Under the most conservative (Lower) scenario, the direct impact through GVA in 2019 would have been £3.3 billion, and thus £3.3 billion less than the outturn of £6.6 billion. Under the Upper Scenario, the direct GVA impact in 2019 would have been £0.7 billion, and so £5.9 billion (90%) less than the outturn.

To place the 2019 Lower Scenario direct impact in context, this is equivalent to a loss of 0.15% of UK GDP in 2019; expressed in terms of the contribution of a sector, this would be comparable to the UK economy losing the entire direct GVA contribution from the dairy manufacturing (£2.2 billion) or distilling, rectifying and blending of spirits (£3.1 billion) industries.

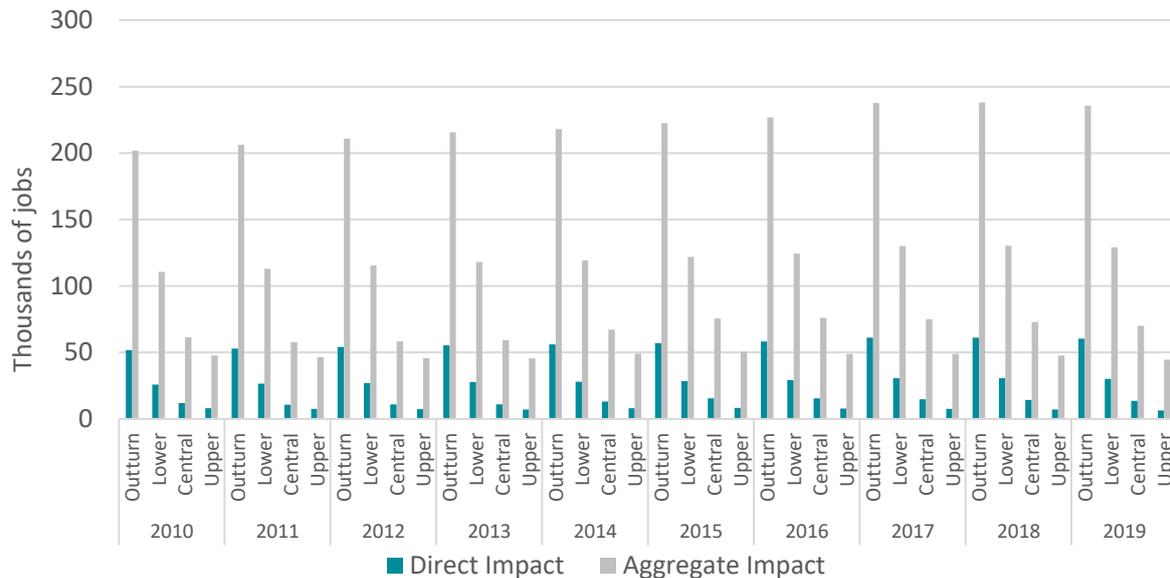
After the indirect and induced impacts are considered, the difference in the GVA contribution is accentuated under the three different scenarios. Under the Central Scenario, the loss of indirect and induced impacts means that the shipping industry would have only had a total GVA impact of £4.0 billion in 2019, and so £13.6 billion less than the outturn total impact of £17.6 billion.

6.5 The impact of Tonnage Tax on UK employment

Here we examine the impact of Tonnage Tax on the direct and aggregate impact on UK employment from the shipping industry.

Figure 25 below shows the projected impact across the years 2010 to 2019 under the three scenarios against the outturn.

Figure 25: The direct and aggregate employment impacts of the UK shipping industry under alternative scenarios



Source: UKCoS, Department for Transport, ONS, Cebr analysis

In 2019 the shipping industry directly supported 60,600 jobs, but under the Central Scenario this direct employment contribution would have only been 13,500 jobs; this is equivalent to a reduction of 77.6%. Even under the more conservative Lower Scenario, there would be 30,300 fewer jobs for UK employees in the shipping industry in 2019 had the Tonnage Tax regime not been introduced.

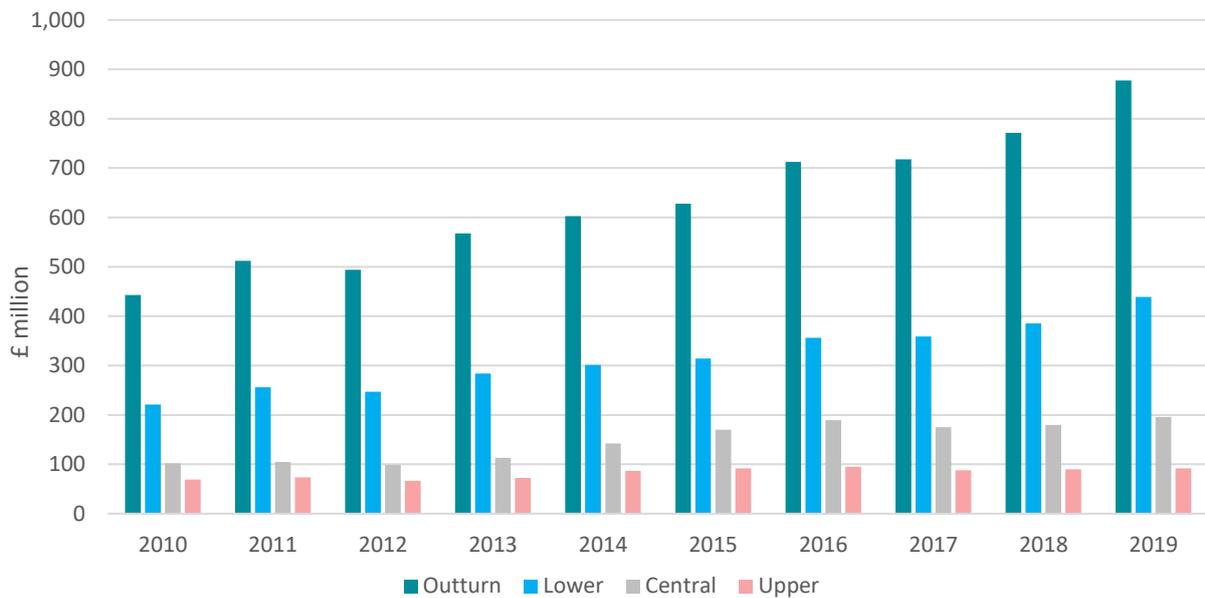
To place the 2019 Lower Scenario direct employment impact of 30,300 jobs in context, this is equivalent to a loss of 0.09% of total UK employment; expressed in terms of the contribution of a sector, this would be more significant to the UK economy than losing the entire direct employment contribution from the clothing manufacturing industry (26,000 jobs) or the combined radio and television broadcasting activities (24,000 jobs).

Once the indirect and induced impacts are considered as part of the Central Scenario, without the Tonnage Tax regime, only a total of 70,000 jobs would have been supported by the shipping industry across the UK economy in 2019, in comparison to the outturn of 235,700 jobs.

6.6 The impact of Tonnage Tax on the UK Exchequer Contribution and Trade

After considering GVA and employment impacts, Figure 26 below shows the contribution of the shipping industry to the UK Exchequer under each of the scenarios against the outturn. A total of £878 million in tax revenues was raised from the industry in 2019; under the Central scenario, this contribution would have fallen to £196 million, the Lower scenario to £439 million and with the most pessimistic (Upper) scenario projecting a yield of only £92 million in the same year.

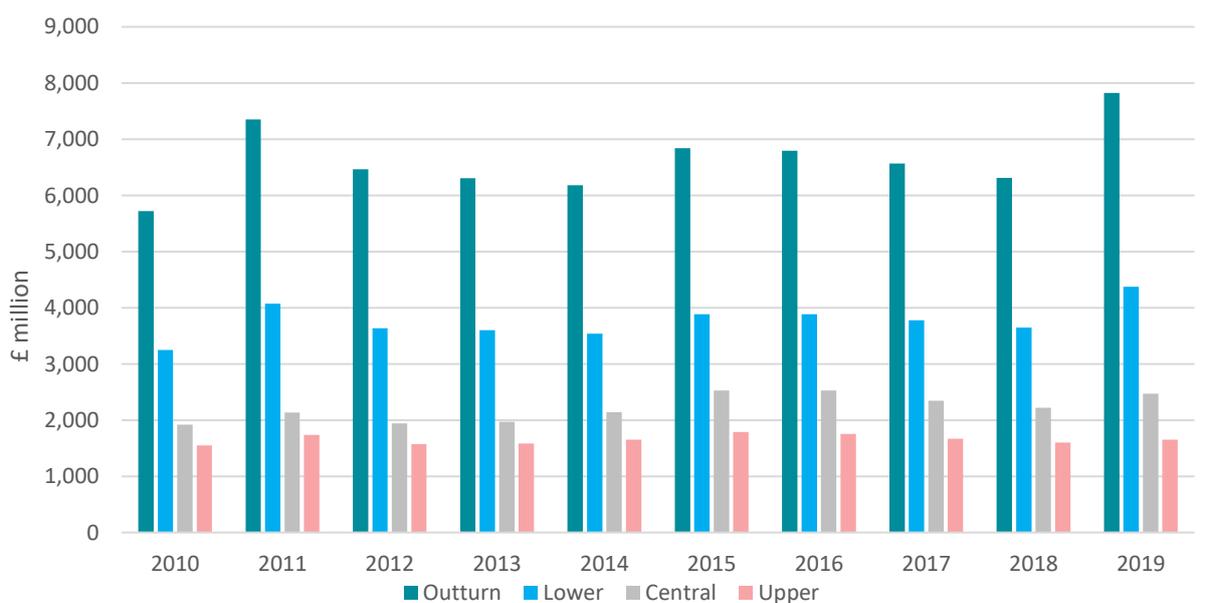
Figure 26: The contribution of the UK shipping industry to the UK Exchequer under alternative scenarios



Source: UKCoS, Department for Transport, ONS, Cebr analysis

Figure 27 shows the contribution of the shipping industry through the exports of services under each of the scenarios against the outturn. It is assumed that exports of disbursement services would not have been affected by the introduction of the Tonnage Tax regime (on the assumption that UK ports would continue to export disbursements services to foreign ships); however, all other exports of services are linked to the tonnage of the UK shipping fleet. Conversely, it is assumed that imports of shipping services, aside from disbursements, would have been unaffected if the Tonnage Tax regime had not been introduced; however, imports of disbursement services would have been reduced in line with the reductions in the size of the UK-owned shipping fleet.

Figure 27: The contribution of the UK shipping industry to service exports under alternative scenarios

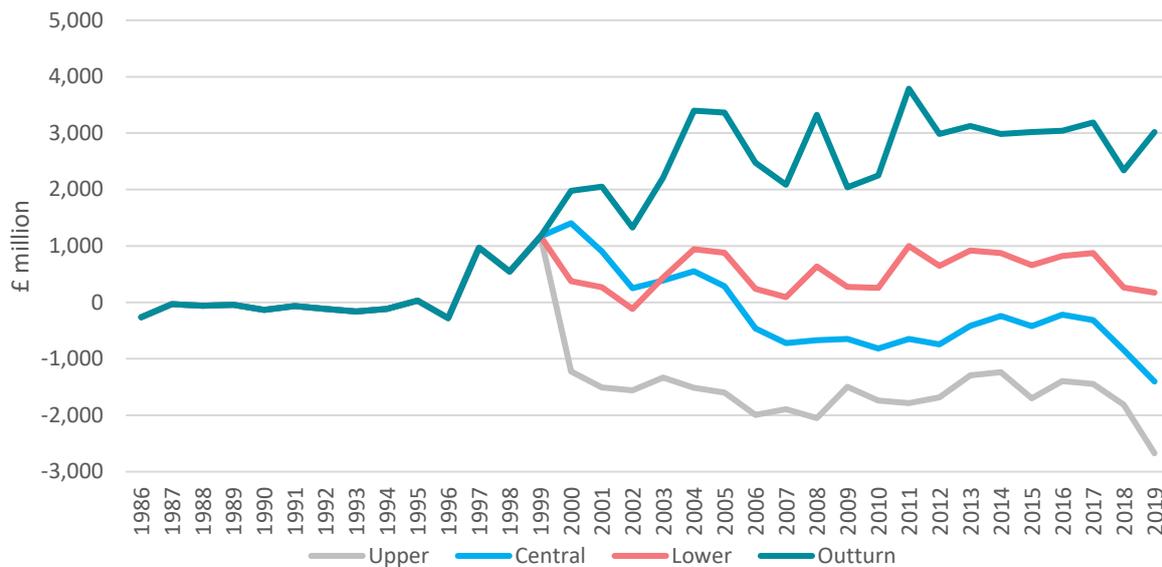


Source: UKCoS, Department for Transport, ONS, Cebr analysis

Under the Central Scenario, it is estimated that the value of exports from the shipping industry and exports of disbursements from Ports would have been £2.5 billion in 2019, in comparison to the outturn of £7.8 billion. Even under the optimistic Lower Scenario, service exports would have fallen to £4.4 billion.

Finally, following Figure 22 earlier in this section, Figure 28 shows the projected trend in the trade balance of Sea Transport service exports after 2000 based on the three different scenarios against the outturn.

Figure 28: The Sea Transport exports trade balance under alternative scenarios



Source: UKCoS, Department for Transport, ONS, Cebr analysis

Under the Central and Upper scenarios, the trade balance would have turned negative (i.e. the value of sea transport imports would have exceeded that of exports) throughout the whole period 2000 to 2019. Under the Central Scenario, the trade balance would have been £1.4 billion in deficit in 2019, in contrast to the outturn value of £3.0 billion surplus. The Lower scenario post 2002 would have remained positive for the entire period, peaking at £1.0 billion in 2011.

7. The Shipping industry: A forward look

In this final section of the report, we present projections of the Shipping industry for the period 2021-2025. The section starts off by discussing the conceptual approach that we have developed to produce projections of the direct economic impacts after 2019 and then presents our 2020 nowcast as well as our forecasts of the turnover and GVA over the period 2021-2025.

The Shipping industry Forecast (2021-2025)

Modelling approach

We investigate the relationship between the Shipping industry and a number of economic variables through an econometric approach. Unsurprisingly, our findings show that the performance of the Shipping industry is primarily explained by trends in the UK transportation and storage sector as well as other variables such as port freight traffic or the number of UK sea passengers, though this relationship is more significant with regards to the general transportation and storage sector in the UK. By modelling growth in turnover over growth in the UK transportation and storage sector, we find that a 1% increase in this sector is associated with a 1.4% increase in the Shipping industry economic performance, as measured by business turnover.

Modelling Assumptions

Growth rate of port freight traffic, transportation and storage

Cebr's Forecasting and Thought Leadership team produces regular forecasts of key economic indicators for the UK national and regional economies which directly inform our analysis. We therefore rely on our own forecast of the UK transportation and storage sector. After a moderate recovery in 2021-22, Cebr expects growth in the sector to slow down thereafter. This is slightly less optimistic than what is reflected in our view of the GDP trajectory, which is expected to grow at a stronger Compounded Annual Growth rate (CAGR) of 2.4% over 2021-2025 in real terms.

Despite the so far successful vaccine rollouts across most of the developed world, and the weakened link between vaccination rates and economic disruption as a result of the Omicron variant – which was previously thought to risk global supply chains being halted due to the low vaccination rates in much of the developing world – there is still a certain level of uncertainty which characterises the forecast.

The 2021-2025 forecast

Figure 29 shows the Shipping industry experiencing a high initial rate of growth given the rebound over 2020, and then gradually having a slower rate of increase over the five-year horizon. Using macroeconomic indicators,³¹ such as the manufacturing sector GVA, we were

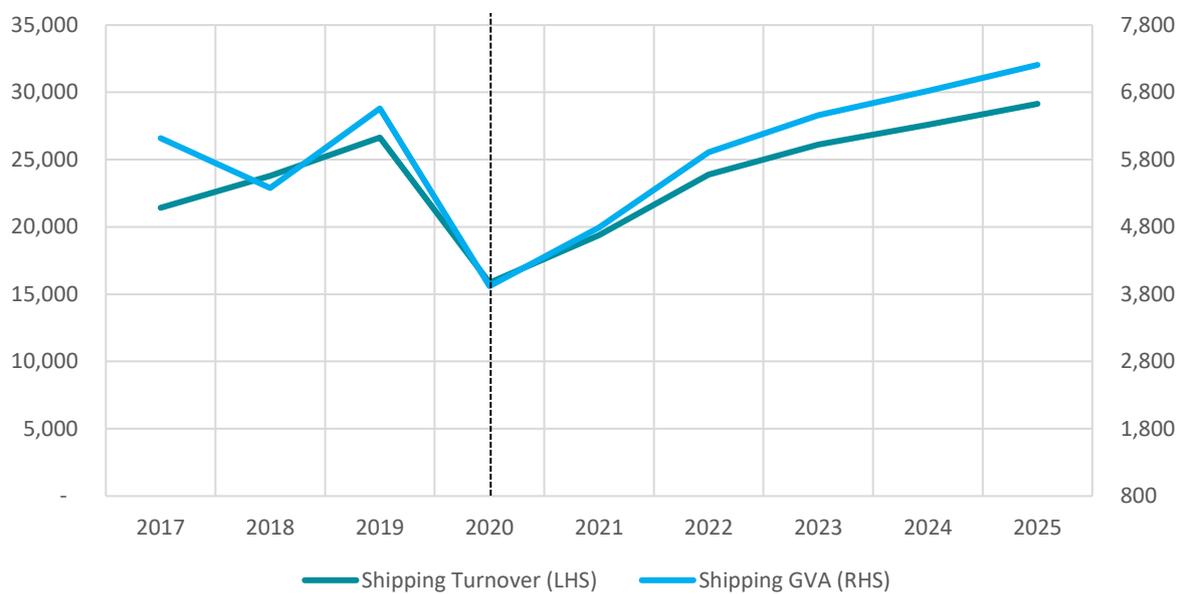
³¹ These are published with more frequency than most of the other data sources used within our study, which for the most part operate on a two-year data lag.

able to produce a nowcast for the Shipping industry in 2020. Cebr estimates that, as measured by GVA, the industry suffered a significant contraction in the range of 20% in 2020 as a result of the pandemic.

Our forecast indicates that turnover and GVA are set to grow at a Compounded Annual Growth rate (CAGR) of 10.7% over the considered period. This translates into cumulative nominal growth of 50.4% for 2021-2025, which is stronger growth than that of the years before the pandemic hit. Despite the substantial contraction suffered in 2020, we expect the industry to reach its 2019 levels until 2024.

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, real cumulative growth over the 2021-2025 period is 38%.

Figure 29: Shipping industry's turnover and GVA trends and projections, 2017 to 2025, £ million



Source: UKCoS, FAME, ONS, 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	11,019	10,841	11,877	11,894	12,696	13,432	15,480	17,145	18,730	21,911
Scotland	961	1,575	1,674	2,169	2,590	1,993	2,330	2,397	3,164	2,818
Wales	638	947	730	809	350	762	593	448	504	193
Northern Ireland	745	752	660	615	636	890	1,423	1,442	1,389	1,730
East of England	480	1,057	833	892	873	704	1,464	1,088	1,544	1,120
East Midlands	74	30	32	73	689	48	82	97	78	95
London	1,451	4,260	4,009	3,643	3,887	6,646	4,985	5,476	5,391	7,744
North East	38	120	87	103	164	211	53	73	176	157
North West	426	1,108	1,056	1,148	1,304	1,091	1,568	1,545	2,499	2,904
South East	3,455	3,404	4,402	4,643	4,951	3,687	6,261	7,478	7,078	8,646
South West	4,783	471	795	893	446	654	638	1,045	992	568
West Midlands	137	77	30	122	293	69	204	105	528	307
Yorkshire and the Humber	176	314	633	378	88	321	226	238	443	368

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	3,528	3,448	3,246	3,120	3,630	3,963	4,603	4,842	4,143	5,333
Scotland	432	527	574	487	672	625	805	872	862	896
Wales	175	235	194	191	164	228	279	137	136	51
Northern Ireland	177	214	186	151	146	197	301	265	236	279
East of England	262	299	194	224	278	198	450	302	312	254
East Midlands	57	14	10	48	198	24	37	37	20	35
London	1,451	1,521	1,126	1,071	1,382	1,941	1,473	1,398	1,011	1,963
North East	36	38	24	23	45	66	22	28	43	50
North West	291	297	216	262	295	275	417	382	358	537
South East	990	996	1,153	1,126	1,188	1,071	1,783	2,187	1,991	2,139
South West	189	146	328	236	135	240	261	409	210	183
West Midlands	109	29	16	32	80	24	66	31	92	86
Yorkshire and the Humber	145	109	179	99	29	124	94	69	105	88

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	39,950	39,069	40,921	42,038	42,918	44,185	43,767	48,101	47,270	48,566
Scotland	6,132	7,055	7,550	7,371	8,529	7,273	7,950	8,464	9,300	8,450
Wales	3,250	3,858	2,938	3,536	2,534	3,117	3,236	1,473	1,528	547
Northern Ireland	2,540	3,006	2,767	2,441	2,032	2,572	3,331	3,044	3,082	2,993
East of England	3,551	4,174	2,859	3,590	3,922	2,676	5,088	3,548	4,315	2,588
East Midlands	824	213	165	680	2,910	310	542	587	219	252
London	11,456	13,132	11,623	10,857	12,919	18,542	11,434	12,393	11,565	15,184
North East	475	536	406	382	697	951	266	328	566	554
North West	3,800	4,092	3,394	4,202	4,291	4,086	4,922	4,981	5,475	6,219
South East	13,157	12,725	14,324	16,089	14,540	12,050	16,489	20,071	19,352	19,512
South West	2,982	2,155	4,940	4,041	2,021	3,384	3,078	4,979	2,799	2,104
West Midlands	1,639	396	210	474	1,182	326	807	431	1,506	1,094
Yorkshire and the Humber	2,064	1,647	3,001	1,722	437	1,861	1,140	784	1,474	1,060

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	1,501	1,367	1,571	1,553	1,472	1,585	1,655	1,762	1,748	1,850
Scotland	221	229	250	324	511	372	407	411	529	431
Wales	86	219	89	122	55	100	104	42	47	19
Northern Ireland	146	119	95	61	56	98	158	106	106	97
East of England	122	181	140	151	145	106	229	132	184	111
East Midlands	16	4	5	23	97	11	9	8	7	14
London	313	466	416	387	395	687	439	523	397	533
North East	12	25	23	19	25	44	8	9	18	19
North West	123	186	169	176	181	204	218	225	283	276
South East	767	394	605	599	533	366	623	722	693	778
South West	63	46	108	118	39	113	79	106	64	57
West Midlands	37	13	5	20	46	13	27	15	55	28
Yorkshire and the Humber	48	52	100	60	10	40	23	23	46	35

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 **Error! Reference source not found.** relates to the multipliers and the underlying input-output modelling.

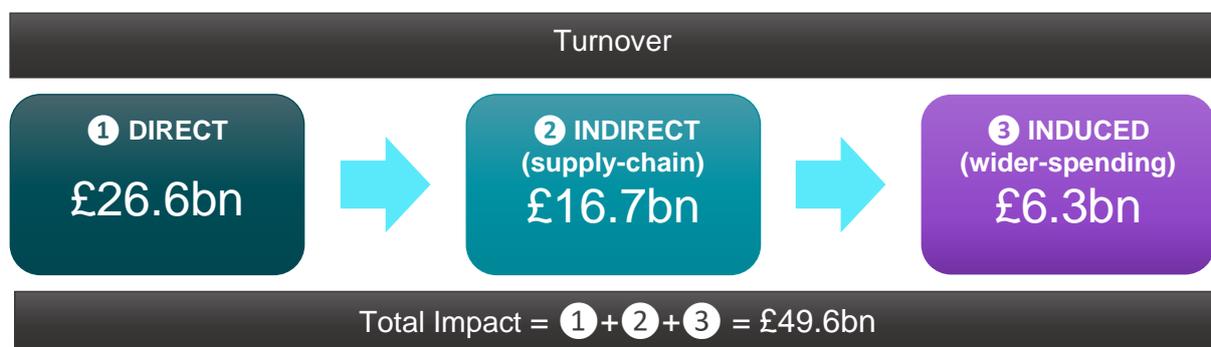
Since our 2019 study, we have adjusted our modelling for the shipping industry specifically. Due to the methodology underpinning the calculation of the direct impact of the shipping industry, the ONS' input-output analytical tables provide data for SIC 50 (Water Transport, which constitutes the shipping 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 shipping industry within the UK. An aggregate turnover footprint of £49.6 billion is supported in the UK due to the economic activity of the shipping industry.

Figure A.1: Turnover multiplier impacts of the UK shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

From this, it can be deduced that for every £1 of turnover directly generated by the industry, £0.62 worth of turnover is stimulated in the supply chains and £0.24 worth of turnover in the wider economy when direct and indirect (supply chain) employees spend their earnings.

Therefore, for every £1 of turnover initially generated by the shipping industry, the UK economy as a whole experiences an increase in turnover of £1.87.

There is a large disparity amongst areas within this aggregate economic contribution. International freight transport (bulk, container, gas and tanker) contributed £24.5 billion to turnover in the UK. In contrast, domestic and inland waterway freight transport – a relatively tiny proportion of the industry in terms of economic activity – supported an aggregate turnover impact of £151 million in 2019. These disaggregated impacts in their entirety can be seen in Table A.5.

Table A.15: Turnover impact of the shipping industry by industry activity, 2019, £ million

Turnover in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Total	26,651	16,657	6,285	49,593
International passenger transport (cruise and ferry)	9,862	6,164	2,326	18,352
Domestic and inland waterway passenger transport	1,046	654	247	1,946
International freight transport (bulk, container, gas & tanker)	13,152	8,220	3,101	24,473
Domestic and inland waterway freight transport	81	51	19	151
Other shipping activity	2,510	1,569	592	4,671

Source: UKCoS, FAME, ONS, Cebr analysis

Table A.6 below presents in each year the direct contribution to turnover from the shipping industry, alongside our estimate of the composite turnover multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.³² The aggregate turnover impact has grown from £24.9 billion in 2010 to £49.6 billion in 2019.

Table A.16: Direct and total turnover impact of the shipping industry, 2010 to 2019, £ million

	Direct Impact	Composite Turnover multiplier	Aggregate Impact
2010	13,364	1.86	24,868
2011	14,115		26,265
2012	14,941		27,802
2013	15,486		28,817
2014	16,272		30,278
2015	17,076		31,776
2016	19,825		36,890
2017	21,432		39,881
2018	23,786		44,262
2019	26,651		49,593

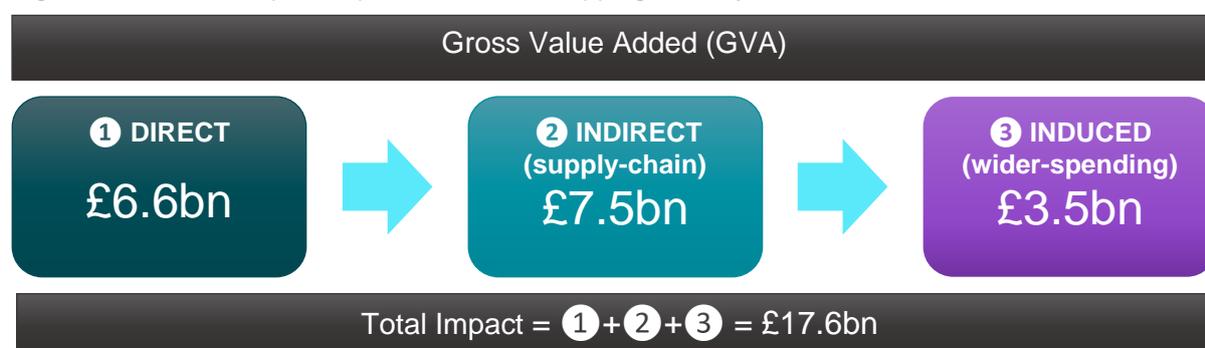
Source: UKCoS, FAME, ONS, Cebr analysis

³² 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.

The aggregate economic impacts through GVA

As was done for turnover, Figure A.2 illustrates the aggregate GVA impact, supported by the shipping industry within the UK.

Figure A.2: GVA multiplier impacts of the UK shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

A total aggregate GVA footprint in the UK of £17.6 billion is supported by the shipping industry. The direct impact of £6.6 billion is augmented by an indirect impact of £7.5 billion of GVA supported and a £3.5 billion induced impact. From this, it can be calculated that for every £1 of GVA initially generated by the shipping industry, the UK economy as a whole experiences an increase in GVA of £2.68.

Table A.7 below shows the estimated direct and total GVA impacts from the individual industry activities when taken in isolation. The shipping industry directly contributed £6.6 billion in GVA in 2019, and provided an aggregate support of £17.6 billion in GVA. Within this aggregate economic contribution, international freight transport supported £7.8 billion of GVA in the UK, followed closely by international passenger transport (£7.3 billion).

Table A.17: GVA impact of the shipping industry by industry activity, 2019, £ million

GVA in 2019 (£m)	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Total	6,560	7,479	3,519	17,557
International passenger transport (cruise and ferry)	2,710	3,090	1,454	7,253
Domestic and inland waterway passenger transport	218	248	117	582
International freight transport (bulk, container, gas & tanker)	2,922	3,332	1,568	7,822
Domestic and inland waterway freight transport	84	96	45	225
Other shipping activity	626	713	336	1,675

Source: UKCoS, FAME, ONS, Cebr analysis

Table A.8 below presents in each year the direct contribution to GVA from the shipping industry, alongside our estimate of the composite GVA multiplier that applies to the entire

industry, together with some indicative estimates for the aggregate impact.³³ The total GVA impact has increased from £11.5 billion in 2010 to £17.6 billion in 2019.

Table A.18: Direct and aggregate GVA impact of the shipping industry, 2010 to 2019, £ million

	Direct Impact	Composite GVA multiplier	Aggregate Impact
2010	4,313	2.68	11,542
2011	4,424		11,841
2012	4,201		11,243
2013	3,949		10,568
2014	4,612		12,344
2015	5,014		13,419
2016	5,987		16,025
2017	6,117		16,372
2018	5,377		14,391
2019	6,560		17,557

Source: UKCoS, FAME, ONS, Cebr analysis

The aggregate economic impacts through employment

Here we examine the aggregate economic impact of the shipping industry through the employment of UK-based workers. Figure A.3 illustrates the employment multipliers for the industry within the UK. A substantial total of 236,000 jobs were supported by the shipping industry in 2019.

Figure A.3: Employment multiplier impacts of the shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

Another way of conceptualising this is that for every job supported by the shipping industry, 2.1 jobs are stimulated in the industry's supply chains and a further 0.8 jobs supported in the wider economy when direct and indirect (supply chain) employees spend their earnings. For each of the major economic variables considered, this is by far the largest multiplier found.

³³ 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.

For every job initially provided by the shipping industry, a total of 3.89 jobs were supported across the UK economy.

Table A.9 shows the estimated aggregate UK employment impacts from shipping industry activities when taken in isolation.

Table A.19: Employment impact of the shipping industry by industry activity, 2019, thousands of jobs

Employment in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Total	61	125	50	236
International passenger transport (cruise and ferry)	25	51	20	96
Domestic and inland waterway passenger transport	4	8	3	14
International freight transport (bulk, container, gas & tanker)	26	54	22	102
Domestic and inland waterway freight transport	0	0	0	1
Other shipping activity	6	12	5	23

Source: UKCoS, FAME, ONS, Cebr analysis

An inspection of the intermediate consumption trends of water transport services (which in itself almost entirely captures shipping industry activities as defined in the study) within the ONS Supply Use Tables shows the extent of the shipping industry's linkages with other industries; the shipping industry predominately consumes a significant amount of economic output from industries such as employment services, construction, warehousing and storage, and legal services. As these industries are heavily labour-intensive, this is the cause of the high employment multiplier.

Table A.10 presents in each year the direct contribution through employment from the shipping industry, alongside the domestic employment multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.³⁴ The aggregate employment impact has increased by 17%, from around 202,000 jobs in 2010 to 235,000 jobs in 2019.

³⁴ 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.

Table A.20: Direct impact and aggregate employment supported in the shipping industry, 2010 to 2019

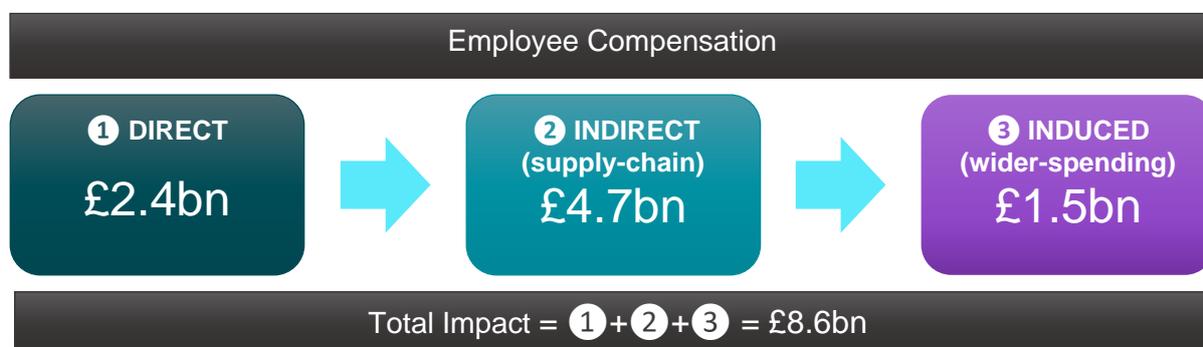
	Direct Impact	Composite Employment multiplier	Aggregate Impact
2010	51,871	3.89	201,925
2011	52,988		206,272
2012	54,177		210,900
2013	55,386		215,608
2014	56,013		218,047
2015	57,149		222,470
2016	58,284		226,889
2017	61,083		237,785
2018	61,180		238,163
2019	60,556		235,734

Source: UKCoS, FAME, ONS, Cebr analysis

The aggregate economic impacts through the compensation of employees

In this final subsection we consider the aggregate economic impact of the shipping industry through the compensation of employees. As for the aggregate employment impact, this only considers the compensation paid to UK-based workers. Figure A.4 illustrates the direct, indirect and induced compensation of employee impacts associated with the industry.

Figure A.4: Multiplier impacts for the compensation of employees for the UK shipping industry, 2019



Source: UKCoS, FAME, ONS, Cebr analysis

Along with the £2.4 billion of employee compensation directly supported by the shipping industry, £4.7 billion of wages and other employee remuneration is supported in through supply chain (indirect) impacts and £1.5 billion through the employee spending (induced) channel. For each £1 of employee compensation in the shipping industry in 2019, £1.94 was supported through the supply chain and an additional £0.64 through the induced channel. For the shipping industry as a whole therefore, for every £1 directly raised in the compensation of employees in 2019, a total of £3.6 in employee compensation was supported overall through the UK economy.

Table A.11 shows the direct and aggregate impact through the compensation of employees across each industry activity. Of the total employee compensation supported in 2019, nearly half (£4.1 billion) was supported by international freight transport. International passenger

transport was the other major constituent industry, with an aggregate compensation supported of £3.3 billion.

Table A.21: Impact through the compensation of employees of the shipping industry by industry activity, 2019, £ million

Employee compensation in 2019	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Total	2,397	4,651	1,534	8,582
International passenger transport (cruise and ferry)	934	1,812	598	3,343
Domestic and inland waterway passenger transport	74	144	48	266
International freight transport (bulk, container, gas & tanker)	1,134	2,200	726	4,059
Domestic and inland waterway freight transport	29	56	18	103
Other shipping activity	226	439	145	811

Source: UKCoS, FAME, ONS, Cebr analysis

Finally, Table A.12 below shows the progression in the direct impact through the compensation of employees in the shipping industry from 2010 to 2019, alongside the domestic employment multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.³⁵ Aggregate impact through the compensation of employees has grown from £7 billion in 2010 to £8.6 billion in 2019. This increase of 23% occurred steadily and fairly consistently over the assessed period.

Table A.22: Direct and aggregate impact through the compensation of employees of the shipping industry, 2010 to 2019, £ million

	Direct Impact	Composite Employee Compensation multiplier	Aggregate Impact
2010	1,953	3.58	6,994
2011	1,935		6,929
2012	2,006		7,182
2013	2,059		7,373
2014	2,095		7,500
2015	2,156		7,718
2016	2,324		8,320
2017	2,320		8,309
2018	2,429		8,698
2019	2,397		8,582

Source: UKCoS, FAME, ONS, Cebr analysis

³⁵ 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.

The aggregate economic impact of the Shipping industry by UK region

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

In order to estimate the aggregate economic impact of the industry at regional level, the direct economic impacts as already estimated were combined with Cebr's regional economic impact models, within which the activities of the shipping industry were separately identified and isolated.

The aggregate economic impacts for business turnover and GVA by region

Table A.13 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2019, alongside the composite industry multiplier for each region.

Table A.23: Regional breakdown of aggregate business turnover and GVA supported by the shipping industry, 2019, £ million

Region	Turnover			GVA		
	Direct Impact	Multiplier	Aggregate Support	Direct Impact	Multiplier	Aggregate Support
Scotland	2,818	1.7	4,901	896	2.5	2,238
Wales	193	1.6	317	51	2.3	119
Northern Ireland	1,730	1.7	2,901	279	2.4	671
East of England	1,120	1.7	1,898	254	2.4	619
East Midlands	95	1.7	158	35	2.4	84
London	7,744	1.7	12,927	1,963	2.5	4,812
North East	157	1.6	257	50	2.3	115
North West	2,904	1.7	4,912	537	2.4	1,305
South East	8,646	1.7	14,853	2,139	2.5	5,287
South West	568	1.8	996	183	2.5	463
West Midlands	307	1.6	490	86	2.3	194
Yorkshire and the Humber	368	1.7	614	88	2.4	208

Source: UKCoS, FAME, ONS, Cebr analysis

For both turnover and GVA, the highest aggregate level of support was associated with the London, South East and Scotland, in that order. Every £1 of direct turnover and GVA was associated with the greatest aggregate level of economic support in the South West. The lowest levels of economic support for turnover and GVA were felt in the East Midlands and North East.

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

Finally, Table A.14 shows the breakdown of direct and aggregate economic impacts for employment and the compensation of employees in 2019, alongside the shipping industry multiplier for each region.

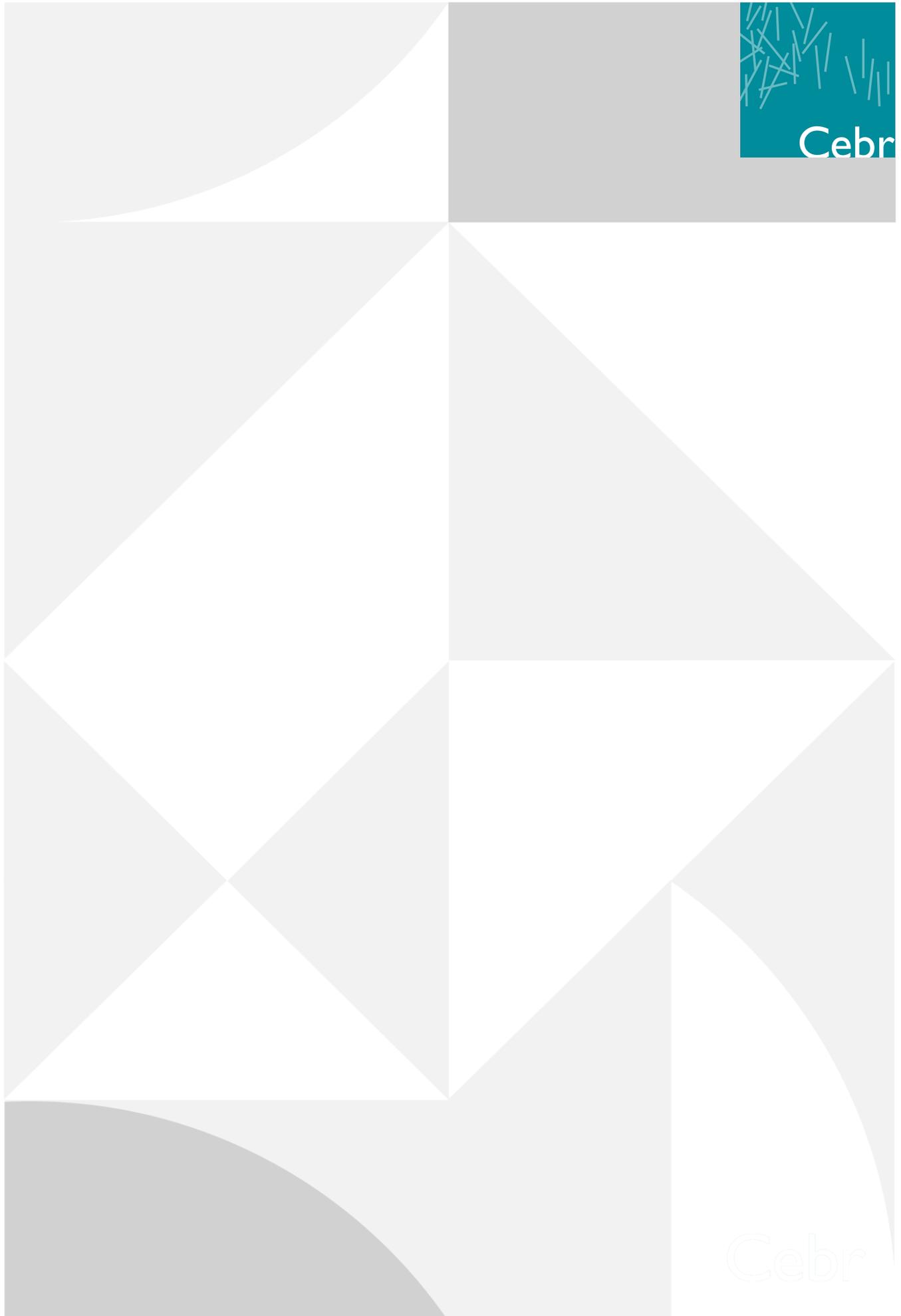
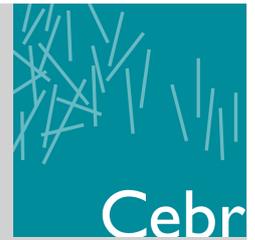
Table A.24: Regional breakdown of aggregate employment and employee compensation supported by the shipping industry, 2019

Region	Employment (jobs)			Compensation of Employees (£ million)		
	Direct Impact	Multiplier	Aggregate Support	Direct Impact	Multiplier	Aggregate Support
Scotland	8,450	3.7	31,378	431	3.4	1,473
Wales	547	3.5	1,929	19	3.2	62
Northern Ireland	2,993	3.6	10,754	97	3.3	321
East of England	2,588	3.7	9,518	111	3.4	373
East Midlands	252	3.6	896	14	3.3	45
London	15,184	3.6	55,279	533	3.3	1,775
North East	554	3.5	1,937	19	3.2	60
North West	6,219	3.7	22,700	276	3.3	924
South East	19,512	3.7	72,115	778	3.4	2,643
South West	2,104	3.8	7,903	57	3.4	195
West Midlands	1,094	3.4	3,745	28	3.2	87
Yorkshire and the Humber	1,060	3.6	3,779	35	3.3	117

Source: UKCoS, FAME, ONS, Cebr analysis

For employment, the highest levels of aggregate support are enjoyed in London, South East and North West. A similar pattern is observed for compensation of employees, where London and South East are associated with the highest aggregate support, followed by Scotland. Little over half of jobs (57%) and employee compensations (55%) supported by the shipping industry are found to be concentrated in these top two areas. The highest employment and employee compensation multipliers are again in the South West, while the lowest multiplier for both is in the West Midlands. The low impacts in the East Midlands, North East and Yorkshire and the Humber (particularly with respect to previous years, as seen in Annex A) are driven by the reduced share of employment attributable to these regions, as implied by BRES.³⁶ Within these regions, key were the declining employment in the international passenger transport (cruise and ferry) subindustry in the North East, international freight transport (bulk, container, gas and tanker) in Yorkshire and the Humber, and the domestic and inland waterway passenger transport and international freight transport subindustries in the East Midlands.

³⁶ For more methodological detail, see Section 2.3.



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