The Value of the UK Shipping Industry

A Cebr report for the UK Chamber of Shipping

June 2025

Authorship and acknowledgements

This report has been produced by Cebr, an independent economics and business research consultancy established in 1992. The views expressed herein are those of the authors only and are based upon independent research by them.

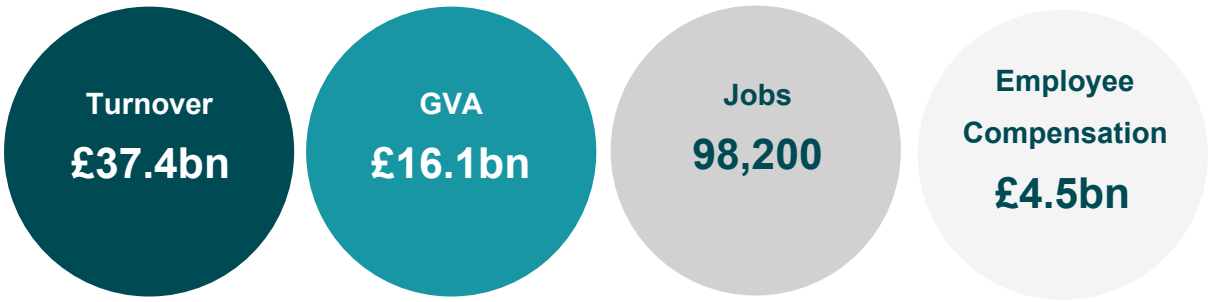
The report does not necessarily reflect the views of the UK Chamber of Shipping.

London, June 2025

Contents

Headline findings

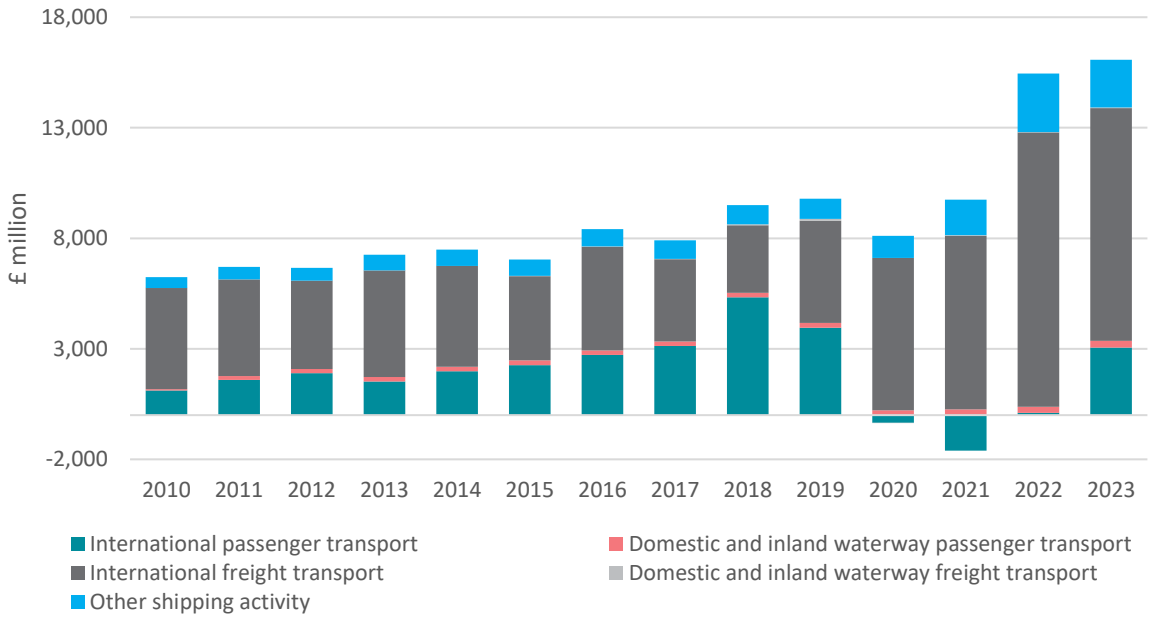
- The Centre for Economics and Business Research (Cebr) has been commissioned by the UK Chamber of Shipping (UKCoS) to quantify the **economic contribution of the shipping industry to the UK economy**.
- **The shipping industry consists of various activities, including the transportation of passengers and freight on both domestic/inland and international waters**.[1] This report has drawn upon a combination of data sources to quantify both the direct and aggregate economic impact of these activities in the UK economy in the years 2010 to 2023.
- The shipping industry makes a significant macroeconomic contribution to the UK through business turnover, Gross Value Added (GVA), employment and compensation of employees (COE). **It is estimated that the shipping industry directly supported £37.4 billion in business turnover, £16.1 billion in GVA, and 98,200 jobs in 2023.**



- **The International Transport of Freight is the largest constituent activity within the shipping industry in terms of economic activity**, directly contributing £10.5 billion in GVA (65% of total) and directly supporting around 49,000 jobs for UK employees (50%). It is followed by International Passenger Transport, with £3.1 billion in GVA (19%) and 35,000 jobs (35%).
- **The COVID-19 pandemic triggered a sharp but uneven contraction in the UK shipping industry's direct GVA**, which fell by 21% in 2020. This headline figure masks significant variation across activities. While international passenger transport collapsed into negative GVA (-£1.6 billion) due to travel restrictions, international freight transport defied the broader downturn, recording a near 50% increase in 2020 and continuing to grow into 2021 and 2022.

1 For the purposes of this study, the shipping industry is defined as consisting 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 (businesses which do not belong to any of the other four categories, but are still clearly part of the shipping industry).

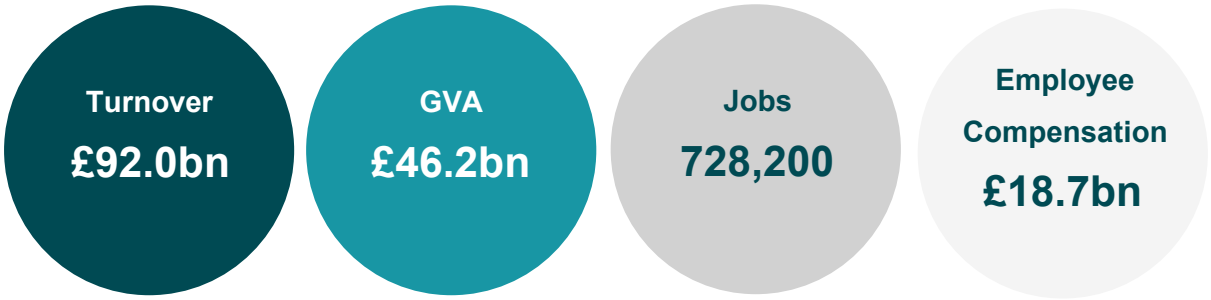
Figure A: The direct contribution of the shipping industry through GVA, 2010-23



Source: FAME, UKCoS, ONS, Cebr analysis

- **The shipping industry's recovery was led by exceptional performance in the freight segment**, supported by strong operating profits amid disrupted supply chains, shifting global trade flows, and sharply higher freight rates, driven in part by the Russo-Ukrainian war. This was especially evident in 2022, when earnings across key tanker classes surged, as corroborated by both market data and the financial disclosures of leading freight operators.
- **By 2023, the shipping industry's direct GVA had reached £16.1 billion, up 64% from the pre-pandemic level in 2019**. However, it should be noted that these figures are in nominal terms, and a significant part of the increase reflects general price inflation rather than purely real growth, as discussed in Section 3.2, where we examine the share of GVA growth attributable to price increases relative to real activity.
- **Looking at a broader time horizon, since 2010, the direct economic contribution of the UK shipping industry has increased in both GVA and employment terms.** Direct GVA increased at an average annual rate of 7.0%, a notably faster pace than that of peer sectors such as air transport, which grew by just 2.1% per year over the same period. Direct employment also rose, though more gradually, with an average annual growth rate of 0.3%.
- The shipping industry helps to raise over a billion pounds per year to the UK Exchequer. **The industry contributed an estimated £1.3 billion in tax revenues in 2023**, 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.[2] **In 2023 this export contribution was valued at £7.6 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 support a total of £46.2 billion of GVA in 2023**. This implies that for every £1 in GVA directly contributed by the industry, a further £1.87 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 £92.0 billion in turnover, 728,200 jobs and £18.7 billion through the compensation of employees in 2023**.



- Passenger transport in the shipping industry can be disaggregated into the cruise and ferry segments, both of which were significantly affected by the COVID-19 pandemic. **Cruise activity experienced a sharper initial decline but has since rebounded across turnover, GVA, and employment**. **Ferry services were less severely impacted but showed a more gradual recovery in economic output**, while employment trends have remained more subdued over the period.
- **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, followed by London**. This is consistent with the findings of our previous 2022 study. In 2023, it is estimated that the shipping industry in the South East directly contributed £4.9 billion of GVA (30% of the industry) and 33,000 jobs (34%). After indirect and induced effects are considered, the aggregate contribution from the South East rises to £11.7 billion of GVA and 198,300 jobs. The full regional breakdown can be found in Section 6.
- **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**. Even under an optimistic scenario—i.e., assuming a favourable responsiveness of UK-owned deadweight tonnage to macroeconomic conditions since 2000—Cebr estimates that without the Tonnage Tax

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

regime, the GVA contribution of the shipping industry would have been reduced by £10.1 billion to just £6.0 billion, with 61,600 fewer jobs, £790 million reduction in tax contributions and £4.8 billion less in exports of Sea Transport Services.[3]

3 Sea Transport Services exports are defined as the overseas revenues earned by UK operators from the carriage of goods and passengers by sea, comprising freight and passenger transport services.

1. Introduction

Cebr is pleased to produce this report for the UK Chamber of Shipping on the economic impact of the shipping industry on the UK economy. For the purposes of this study, the shipping industry is defined as consisting 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**
- **Other Shipping Activity** (businesses which do not belong to any of the other four categories, but are still clearly part of the shipping industry).

Not all vessel types are included in the Transport definition of the shipping industry; most of those engaged in activities such as oil and gas, wind, cable laying, hydrography, and surveying are excluded, for example. However, some of these companies—particularly those who self-classify themselves as belonging to the SIC codes associated with shipping—are captured within this analysis, mostly under Other Shipping Activity.

Our examination spans the period from 2010 to 2023 (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 includes direct ongoing contributions to GDP and employment through the shipping industry's operations and activities in the UK, alongside assessments of the associated indirect and induced multiplier impacts.

1.1 About the UK Chamber of Shipping

The UK Chamber of Shipping is the trade association of the UK shipping industry, representing shipping companies of all sizes, sectors, and flags. It acts as the collective voice of the industry to promote shipping's relevance, influence policy development 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 the UKCoS with a thorough and comprehensive knowledge and evidence base so that they can support and advocate for the industry across the UK. In developing this report, Cebr engaged regularly through an advisory group comprising the UKCoS and the Department for Transport (DfT) Maritime Economics department.

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 the exports of services.

The study also seeks to identify the contribution of the shipping industry at a regional level (across the International Territorial Levels).

1.3 Overview of the study and methodology

Objectives of the study

This report provides a thorough and comprehensive examination of the role of the 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. The report also provides an analysis of the economic impact of the Tonnage Tax regime on the shipping industry under different counterfactual scenarios.

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:

- GVA[4] contributions to UK and regional GDP generated by the shipping industry, both 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.
- The value of employee compensation[5] 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 services exported by the activities comprising the shipping industry.

In addition to the core modelling and analysis, we carry out a series of comparative assessments to place the findings in broader context. These include:

4 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.

5 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.

- An examination of how key economic indicators have evolved over the period 2010 to 2023.
- A breakdown of economic performance across the various activities within the shipping industry.
- A regional comparison, highlighting variations in the shipping industry's economic contribution across the UK's nations and regions.
- A benchmarking exercise to compare the shipping industry's economic footprint against other major sectors of the UK economy.
- A breakdown of economic performance across the cruise and ferry segments of passenger transport.

Mapping the UK shipping industry

Here we set out how the shipping industry has been defined for the purposes of the study. On a holistic level, the shipping industry sits within the wider maritime sector, which 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, Cebr has undertaken a mapping exercise to identify how the shipping industry 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 shipping industry has remained the same as in the 2022 Cebr study for Maritime UK, which used 2019 data, and 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 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 activities 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 50200 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.[6] Similarly, Fletcher Group, a vessel management company in the offshore sector, and Tarmac Marine, an aggregate dredging fleet operator, do not have SIC codes corresponding to those listed above, but are nonetheless included in the study as they belong to the shipping industry.

Quantifying the direct economic impacts of the shipping industry

To estimate the direct economic contribution of the UK shipping industry, we adopt a bottom-up approach using company-level data from the Financial Accounts Made Easy (FAME)[7] 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.

Our methodology comprises several steps. First, we extract all companies reporting a shipping-related primary SIC code and validate this list in collaboration with the Advisory Group. A relevance filter, applied by the UKCoS, is then used to exclude a small number of companies that are not considered part of the core industry despite their SIC classification. In a second step, we add companies not reporting a shipping SIC code but which the UKCoS has confirmed are active in the industry. These firms are captured under the 'Other Shipping' category as described above. We use employment data from the UKCoS Annual Seafarer

6 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.

7 The FAME database of companies in the UK and Ireland provided by Moody's (formerly 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.

Employment Survey, undertaken under contract for DfT, and apply financial-to-employment ratios derived from FAME to estimate their direct impacts.

UK and foreign employment

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 UKCoS Annual Seafarer Employment Survey.

To estimate foreign-based seafarer employment, an adjustment was made to the UK share of total employment sourced from the UKCoS. Whereas the survey-based UK share saw a decline from 2020 onwards, a look at industry trends confirmed that this mostly reflected the increase in international passenger transport activity. Hence, the UKCoS share as such was applied only to that portion of UK employment, with a more robust ten-year rolling average used for the other four categories in order to estimate total foreign employment. This modification produced more conservative and reasonable estimates for foreign employment.

The employment figures presented in this report differ in scope and methodology from those published by the DfT in its *Seafarers in the UK Shipping Industry* statistical series. The DfT's official statistics focus on UK nationals working as seafarers and are derived from two main sources: the Maritime and Coastguard Agency (MCA) certification database, which provides counts of valid certificates held, and the UKCoS Annual Seafarer Employment Survey, which covers seafarers employed by UKCoS member companies. These sources are adjusted to account for survey non-response and used to estimate the number of UK nationals actively working in merchant navy roles at sea. Importantly, these estimates exclude shore-based roles and foreign nationals working in the UK, which can result in an undercount of total employment within the broader UK shipping industry.

By contrast, the employment estimates in this report are based on a bottom-up approach using company-level financial and employment data from the FAME database. FAME includes employment figures reported in the statutory accounts of UK-based companies, including multinational shipping groups operating within the UK. For firms with global operations, UK-specific employment shares were derived to isolate the domestic component. Our approach captures the total employment footprint of all relevant UK shipping companies including both seagoing and shore-based staff, and covers the full range of shipping activities, from freight and passenger services to support and logistics functions.

Data sources

In terms of other indicators, the indicative breakdown of shipping industry revenue by vessel type has been sourced from the UKCoS Annual Sea Inquiry,[8] undertaken on behalf of the

8 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.

ONS, while data for services exports from the shipping industry has been sourced from both the ONS Pink Book and the UKCoS Annual Sea Inquiry.

To estimate Exchequer contributions, 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 2023. Wages and salaries for employees have been sourced from FAME and the Annual Survey for Hours and Earnings (ASHE).

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 not to 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 small in the context of the total tax revenues raised from the shipping industry 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 the average level of Business Rates paid as a proportion of GVA, drawing upon the ONS Annual Business Survey (ABS).

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 impact 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 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 2022 Cebr study

The main change to the methodology, compared to the 2022 Cebr study, is the expanded scope of companies included. Following discussions with the UKCoS, and to ensure that we capture the shipping industry as accurately as possible, we have incorporated a number of shipping firms that were not part of the previous iteration.

These newly included companies fall into three main categories:

- entities that began trading in the UK after 2019;
- large multinationals previously excluded due to difficulties in isolating UK-specific operations, which are now included with deflated figures to reflect the proportion of activity attributable to the UK; and
- companies that form part of the shipping industry but were not previously captured and now included in the "Other Shipping" category, as identified by the UKCoS. For example, RB Shipping, a vessel management company with a non-shipping SIC code, is now included in the scope.

The extended scope has been used to re-calculate the economic impact of the shipping industry for years 2010 to 2019 in this report, and hence **it is important to note that these figures are not directly comparable to the previous iteration of this study in 2022**.

A further methodological update affects our aggregate impact analysis. Since the 2022 study, Cebr has revised its input-output models, which underpin these calculations. In particular, we have updated the underlying supply-use tables using the most recent data published by the ONS, ensuring that the models better reflect the current structure of the UK economy.

Finally, we have also refined our approach to calculating employment multipliers. This issue was initially raised in our previous report from 2022, where we presented alternative indirect and induced employment figures in the Appendix, highlighting concerns about inconsistencies between data sources. In this iteration, the inconsistency between BRES and FAME employment estimates has become more pronounced as BRES data did not reflect the growth in employment that was evident in the FAME dataset. While the rest of the inputs underpinning our input-output model are derived from FAME, our previous approach for estimating indirect and induced employment relied on BRES data. To address this, we have recalibrated our input-output model using an average of the two sources. This adjustment has resulted in more credible and reasonable multiplier estimates.

1.4 Structure of the report

The remainder of the report is structured as follows:

- **Section 2** provides an overview of how the shipping industry has been defined for the purposes of this study. 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 chains and in the wider economy when employees directly and indirectly employed by the shipping industry spend their wages and salaries in the local and wider economy.
- **Section 5** analyses the disaggregated direct economic impacts of passenger transport, segmented by cruise and ferry services, and by international versus domestic activity.
- **Section 6** examines the direct and multiplier impacts of the shipping industry at regional level, as disaggregated by the 12 International Territorial Level regions (ITL 1).[9]
- **Section 7** provides additional analysis of the Tonnage Tax regime and how its introduction is estimated to have impacted the UK shipping industry since 2000. The 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.
- **Annex A** contains the full set of direct economic impacts of the shipping industry by region.
- **Annex B** contains technical notes on the econometric methodology used in Section 7.

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.

2. Defining the shipping industry

Here we set out how the shipping industry has been defined for the purposes of the study. On a holistic level, the shipping industry sits within the wider maritime sector, which 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.

2.1 The definition of the shipping industry and its constituent activities

Building on the experience gained through previous studies, Cebr has undertaken a mapping exercise to identify how the shipping industry 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 shipping industry consists of:**
    - → 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; and
    - → Other shipping activity.

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

Table 1 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: UKCoS, 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

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) provided by the ONS,[10] as accessed through the National Online Manpower Information System (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

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.

(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, the average wage for an employee in London was 49% higher than the UK average in 2023.
- 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 shows the breakdown of employment in shipping as implied through BRES data.

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

12 ONS, 2024. Subregional Productivity: Labour Productivity (GVA per hour worked and GVA per filled job) indices by UK 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.

Table 2: The estimated regional breakdown of UK employment in shipping as implied by BRES and ABS, 2010 to 2023

Shipping Employment	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
England	79.5%	77.7%	78.2%	78.6%	79.1%	79.6%	76.3%	79.8%	78.3%	80.7%	78.0%	83.1%	82.9%	82.0%
Scotland	10.6%	11.3%	12.6%	11.9%	13.9%	11.4%	12.9%	13.0%	14.5%	13.4%	17.5%	9.3%	10.8%	12.7%
Wales	5.1%	5.5%	4.1%	5.1%	3.3%	4.6%	5.0%	2.1%	2.2%	0.8%	3.0%	4.4%	4.6%	3.7%
Northern Ireland	4.8%	5.6%	5.0%	4.4%	3.7%	4.5%	5.7%	5.0%	5.0%	5.0%	1.6%	3.2%	1.7%	1.5%
East of England	7.0%	8.0%	5.3%	6.9%	7.3%	4.7%	9.3%	6.0%	7.4%	4.4%	7.9%	5.1%	5.4%	11.8%
East Midlands	1.7%	0.3%	0.3%	0.8%	5.5%	0.4%	0.7%	0.7%	0.3%	0.4%	0.3%	0.7%	0.2%	0.2%
London	25.8%	30.4%	26.5%	23.9%	27.8%	36.7%	22.0%	22.7%	21.6%	27.2%	15.8%	17.9%	20.5%	15.6%
North East	1.1%	1.2%	0.9%	0.8%	1.2%	1.6%	0.4%	0.5%	0.9%	0.9%	1.7%	0.8%	0.4%	0.5%
North West	8.1%	8.6%	7.2%	8.8%	8.8%	8.2%	9.3%	9.1%	9.8%	11.1%	5.8%	16.7%	12.9%	10.0%
South East	23.2%	21.1%	23.4%	26.8%	22.2%	18.7%	26.2%	31.1%	29.3%	30.0%	32.3%	30.7%	33.9%	33.6%
South West	5.4%	4.0%	8.1%	6.7%	3.4%	5.6%	5.2%	7.9%	4.3%	3.3%	9.5%	3.1%	4.9%	5.5%
West Midlands	3.2%	0.6%	0.2%	0.7%	2.3%	0.5%	1.5%	0.7%	2.5%	1.8%	3.3%	2.5%	2.7%	3.0%
Yorkshire & the Humber	4.3%	3.4%	6.2%	3.3%	0.6%	3.3%	1.8%	1.2%	2.3%	1.7%	1.3%	5.5%	1.8%	1.6%

Source: BRES, ABS, Cebr analysis

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

In 2023, the UK shipping industry is estimated to have contributed **£37.4 billion in business turnover**, reflecting a compound annual growth rate (CAGR) of 4.5% over the period 2010 to 2023.

Figure 1 illustrates the evolution of turnover across the industry's constituent activities over this period. The impact of the COVID-19 pandemic is clearly reflected in the sharp 34% decline in overall turnover across 2020 and 2021. While industry-wide turnover had recovered by 2023 to 99% of 2019 levels, this aggregate figure conceals considerable variation across activities.

International passenger transport was the hardest hit by lockdowns and travel restrictions, with turnover falling by 56% in 2020 and a further 30% in 2021. Although the activity saw a strong recovery in 2022 and 2023, its nominal turnover in 2023 remained 13% below pre-pandemic levels. To illustrate the magnitude of the contraction and the subsequent recovery, total UK international sea passengers stood at 20.7 million in 2019, contracting to just 7 million in 2020 and 5.6 million in 2021, before increasing to 14.3 million in 2022 and finally 18.1 million in 2023—still 12% below the 2019 levels, corroborating the turnover data.[14]

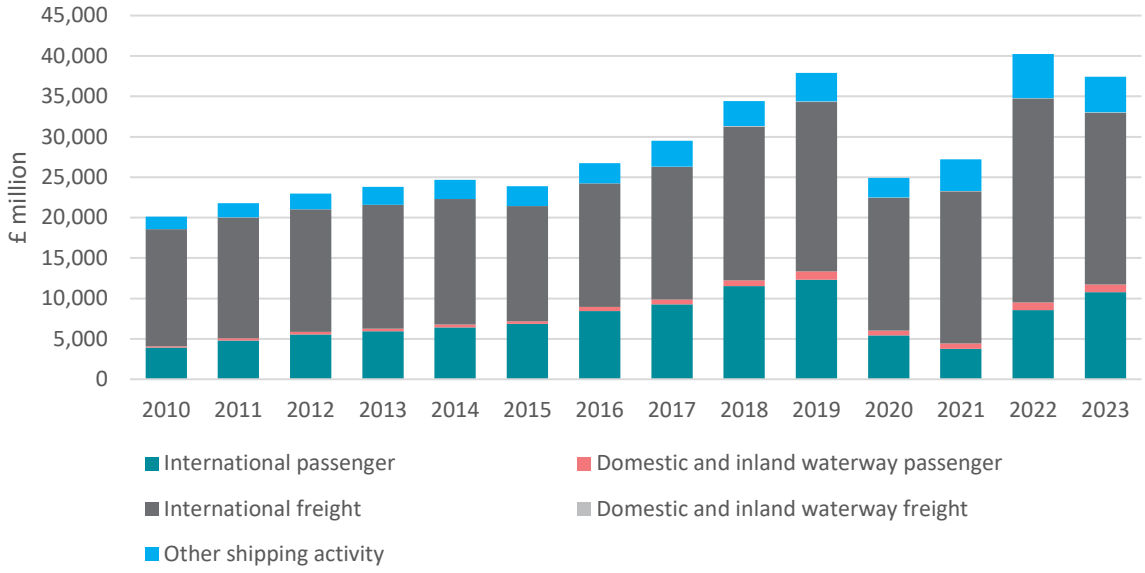
The performance of passenger transport over the last few years, as described above, is mainly driven by international passenger transport and masks significant variation both between domestic and international activity as well as between the cruise and ferry segments. Section 5 provides a disaggregated analysis of these respective segments.

In contrast, international freight transport followed a more resilient trajectory. After contracting by 22% in 2020, it rebounded with year-on-year growth of 15% in 2021 and a further 34% in 2022. However, this momentum softened in 2023, when turnover declined by 16%. Despite this, the activity's 2023 turnover remained 1.5% above its 2019 level.

It should be noted, though, that the above refers to nominal turnover. Given the significant price increases observed in 2022 and 2023 which are discussed in the next section, real growth would have been more subdued.

14 Department for Transport (2025). Sea passenger statistics: International sea passengers 2023.

Figure 1: The direct contribution of the shipping industry through turnover, 2010 to 2023

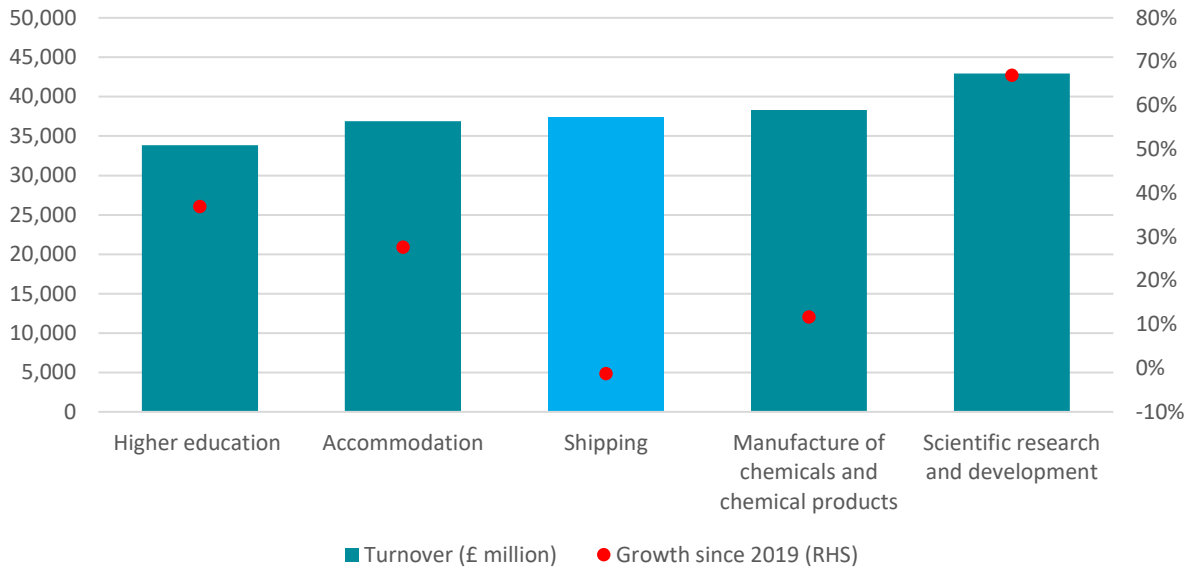


Source: FAME, UKCoS, ONS, Cebr analysis

The largest constituent activity within the shipping industry in terms of turnover directly generated was international freight transport (bulk, container, gas and tanker), with £21.2 billion of business turnover in 2023. International passenger transport (cruise and ferry) was the second largest, with £10.8 billion of turnover in 2023. In relative as well as nominal terms, the latter industry has grown the most, with business turnover increasing by 174% from 2010 (£3.9 billion) to 2023. Combined, international passenger transport and international freight transport contributed 85% of the shipping industry's turnover in 2023. This share has hovered in the range of 83-91% between 2010 and 2023.

For contextualisation, Figure 2 compares the turnover of the shipping industry with a range of comparative industries of similar size. Turnover data has been sourced from the Annual Business Survey (ABS).

Figure 2: The estimated turnover of the shipping industry against comparable industries in 2023, and growth against the 2019 level



Source: FAME, UKCoS, ONS, Cebr analysis

In 2023, turnover in the shipping industry was £37.4 billion. For context, this was broadly comparable to the accommodation industry (£36.9 billion) and the manufacture of chemicals and chemical products (£38.3 billion), and somewhat above the higher education sector (£33.8 billion).[15] As discussed above, the slight contraction in shipping (-1%) reflects the (at the time) ongoing recovery in international passenger shipping, which had not yet fully rebounded from the COVID-induced downturn. The other sectors, by contrast, experienced a less pronounced impact from the pandemic.

Turnover by type of vessel

Here we examine the breakdown of industry turnover by vessel type, drawing upon analysis of the UKCoS' Annual Sea Inquiry (ASI). Figure 3 shows the percentage share of revenue raised in the years 2020 to 2023, for the following vessel types:

- Cruise (passenger);
- RoRo[16] (passenger and freight);

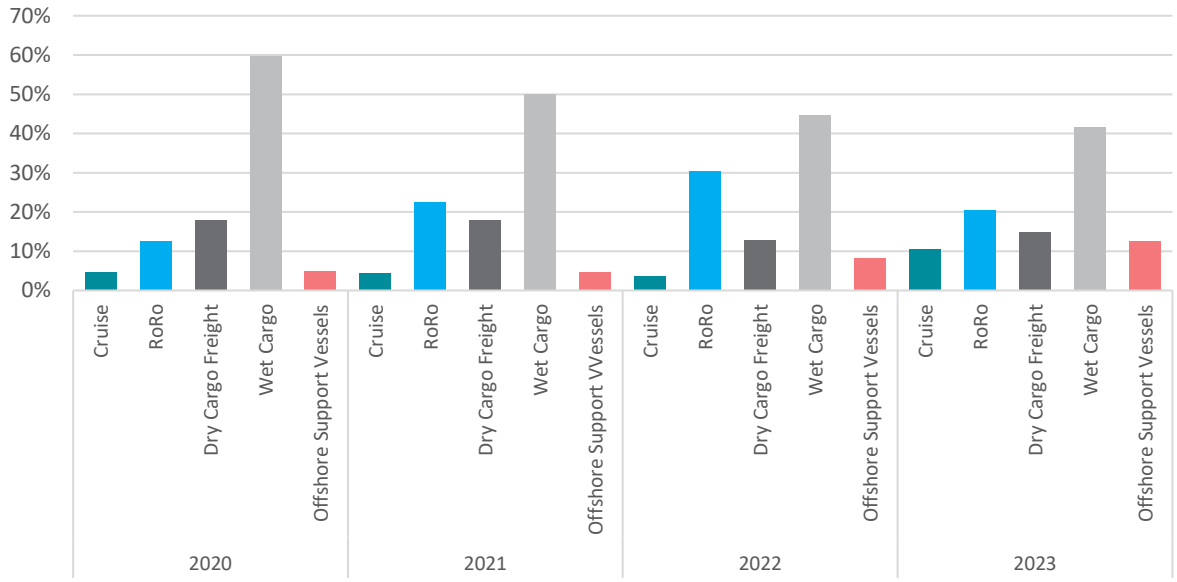
15 Higher education comprises Post-secondary non-tertiary education; Tertiary education; First-degree level higher education; and Post-graduate level higher education. Accommodation comprises Hotels and similar accommodation; Holiday and other short-stay accommodation; Camping grounds, recreational vehicle parks and trailer parks; and Other accommodation.

16 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.

- Dry cargo freight (inclusive of both dry bulk and container shipping);
- Wet cargo freight services (tanker and gas); and
- Offshore Support Vessels (e.g., Seismic Survey Ships, Platform Supply Vessels (PSVs), Anchor Handling Tug Supply Vessels (AHTs), Construction Support Vessels, Diving Support Vessels, Inspection, Maintenance, and Repair Vessels (IMRs), and ROV Support Vessels).

It should be noted that a structural break happened between 2019 and 2020 with a new category, Offshore Support Vessels, added. Hence, we are presenting a shorter time series as relative shares from previous years would not be directly comparable.

Figure 3: Shares of shipping industry revenue by service type, 2020 to 2023



Source: UKCoS, ONS, Cebr analysis

The percentage share of revenue from cruise ships, at only 11% of total industry revenue in 2023, is low by historical standards and stems partly from the downturn in international passenger transports discussed in Section 3.1—for reference, back in 2016, its share was over 40%. In contrast, the share of wet cargo, at 42% in 2023, only experienced a vast increase in 2019, before which its share was steadily below 20%.

Industry profitability

Average profitability (as measured using the aggregated ratio of gross profits to turnover) in the shipping industry saw a marked decline between 2020-21. However, the industry has since recovered, experiencing a strong rise in profitability and overtaking its earlier level in 2023. This is also reflected in GVA figures, as will be discussed in the following section. The contraction was driven by a collapse from 31% to –3% (2020) and then –25% (2021) in international passenger transport, with profitability in inland waterway passenger transport and the 'Other Shipping' category also declining noticeably.

Table 3 shows the trends in profitability across each industry activity. As discussed in Section 2, 'Other shipping' refers to the other domestic shipping activities not captured through our SIC code-based mapping framework.

Table 3: Estimated profitability (gross profit ratio) of the shipping industry and constituent activities, 2010 to 2023

Profitability	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
UK Shipping industry	**14%**	**14%**	**15%**	**16%**	**19%**	**22%**	**22%**	**20%**	**18%**	**19%**	**9%**	**10%**	**15%**	**20%**
Int. Passenger	9%	21%	25%	27%	31%	33%	36%	32%	28%	31%	-3%	-25%	16%	32%
Domestic Passenger	22%	33%	34%	35%	41%	45%	47%	45%	45%	43%	13%	13%	16%	14%
Int. Freight	15%	11%	12%	11%	13%	16%	14%	12%	11%	11%	12%	16%	15%	14%
Domestic Freight	60%	68%	56%	58%	26%	78%	46%	45%	38%	34%	55%	36%	83%	88%
Other shipping	14%	14%	15%	16%	19%	22%	22%	20%	18%	19%	9%	10%	15%	20%

Source: FAME, UKCoS, ONS, Cebr analysis

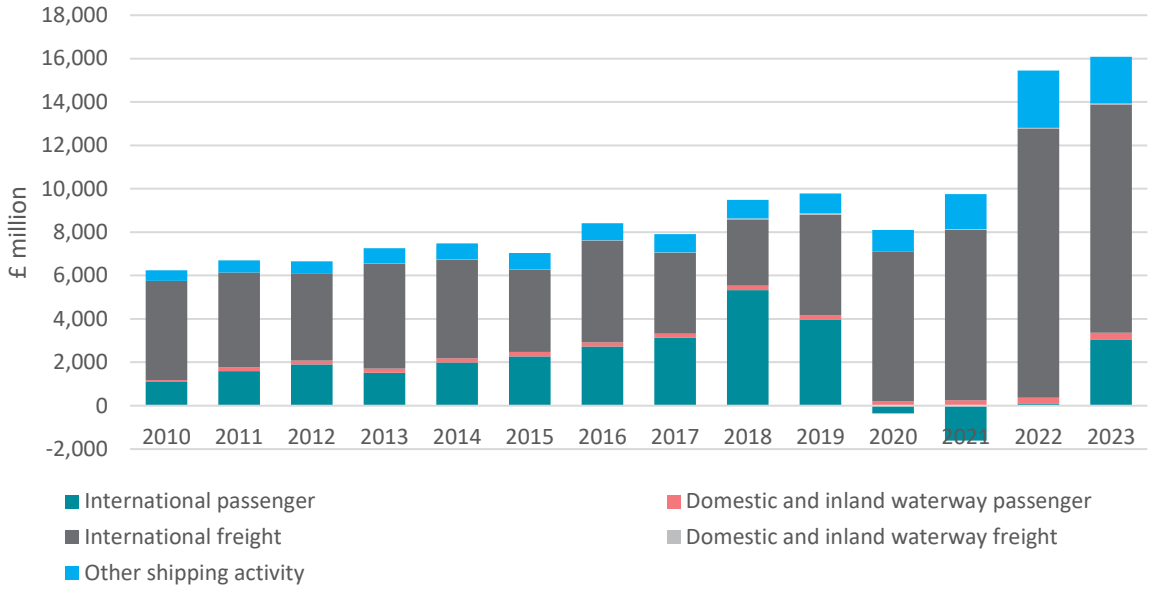
Overall, the profitability in the shipping industry has increased by 6.5 percentage points from 2010 to 2023. Domestic and inland waterway freight transport ('Shipping 4') was the most profitable activity throughout the assessed period, although it should be noted that (a) the category is small relative to the other four and (b) the data available for Shipping 4 is relatively weak, so large changes in a few companies' profitability can have an outsized impact on the whole category's results.

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 shows this direct impact, disaggregated by industry activities in the years 2010 to 2023.

The COVID-19 pandemic triggered a sharp but uneven contraction in the UK shipping industry's direct GVA, which fell by 21% in 2020. This aggregate figure conceals substantial variation across activities. International passenger transport collapsed into negative GVA due to widespread travel restrictions, while international freight transport proved more resilient, recording a near 50% increase in 2020 and continuing to expand through 2021 and 2022.

Figure 4: The direct contribution of the shipping industry through GVA, 2010 to 2023



Source: FAME, UKCoS, ONS, Cebr analysis

This exceptional growth in the international freight activity was driven by strong operating profits amid disrupted supply chains, shifting global trade flows, and sharply elevated freight rates. In 2022, tighter supply and shifting trade patterns drove a sharp increase in freight rates and, consequently, tanker earnings. According to Clarksons Research, average daily earnings for Tankers increased from $7,217 in 2021 to $40,766 in 2022, a 472% year-on-year rise. Very Large Crude Carriers (VLCCs) saw earnings grow from $3,218 to $23,885 per day (642%), while Medium-Range (MR) product tankers rose from $6,740 to $31,775 (371%).[17]

These gains were driven by geopolitical tensions, redirected Russian exports, increased European imports, and sanctions affecting vessel availability. The above was also corroborated by the annual reports of the highest-earning companies in the international freight transport activity, which cited the strong increase in freight rates as the key contributing factor to that year's financial results.

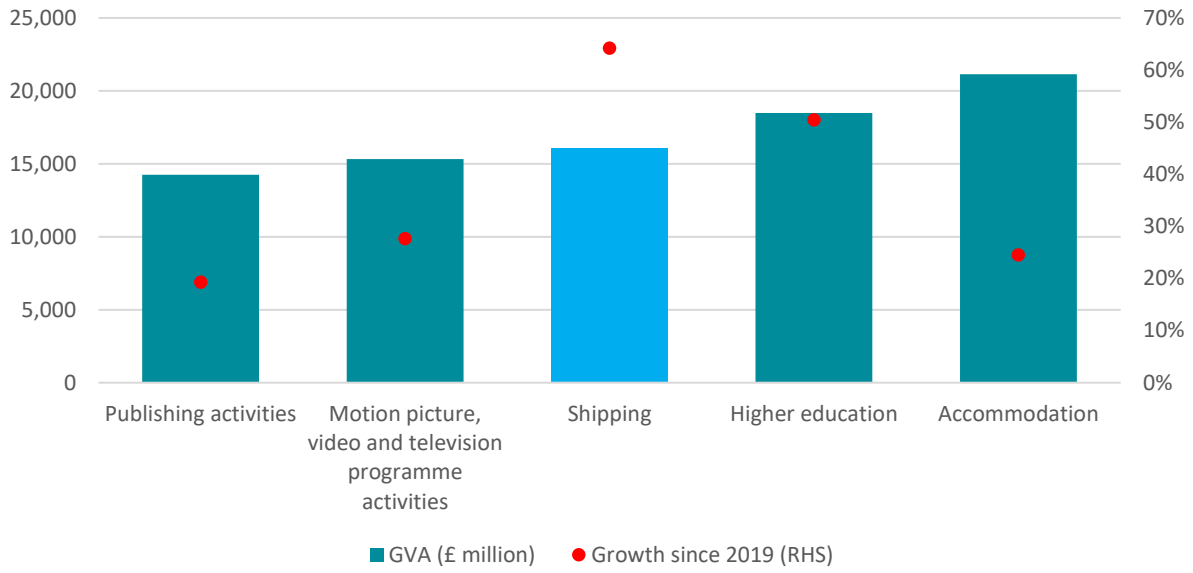
As a result, the shipping industry's direct **GVA reached an estimated £16.1 billion** in 2023—up 64% from £9.8 billion in 2019 and translating to a CAGR of 7.0% since 2010. The bulk of this increase occurred in 2022, led by the international freight activity's outperformance.

It is important to note that these figures are in nominal terms, and broader price growth during this period means that real-terms gains were more modest. This is reflected in ONS GDP data for the Water Transport sector (SIC 50), which, though based on a different business population, recorded a 50% increase in nominal GVA in 2022. However, once adjusted for inflation, real GVA growth stood at just 29%, implying a price increase of 16% over the year.

17 Clarksons Research (2023)

This trend of increasing GVA contributions to the UK economy can be seen further in Figure 5 which plots GVA of the shipping industry in 2023 against comparable industries. GVA data has been sourced from the Annual Business Survey (ABS).

Figure 5: GVA of the shipping industry against comparable industries in 2023, and growth against the 2019 level



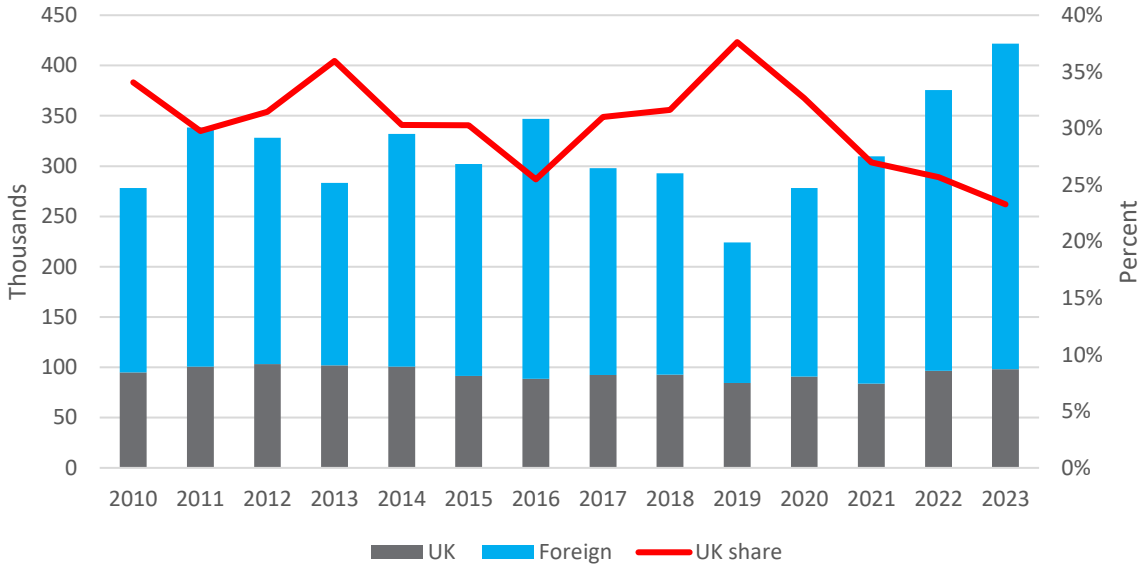
Source: FAME, UKCoS, ONS, Cebr analysis

In 2023, the shipping industry's direct GVA contribution was £16.1 billion. For context, this was broadly in line with the motion picture, video, and television programme activities industry (£15.3 billion) and the publishing sector (£14.3 billion). Between 2019 and 2023, the shipping industry's GVA increased by 64%, reflecting relatively strong growth over the period compared with the reference industries, for reasons discussed above.

3.3 The direct economic impact through employment

In addition to its contribution through GVA, the shipping industry also supports a substantial number of direct jobs, both for UK-based and foreign-based employees, including seafarers and shore-based staff. Figure 6 shows the total level of employment in the UK shipping industry between 2010 and 2023, broken down by place of work.

Figure 6: The direct contribution of the UK's shipping industry through employment, 2010 to 2023



Source: FAME, UKCoS, ONS, Cebr analysis

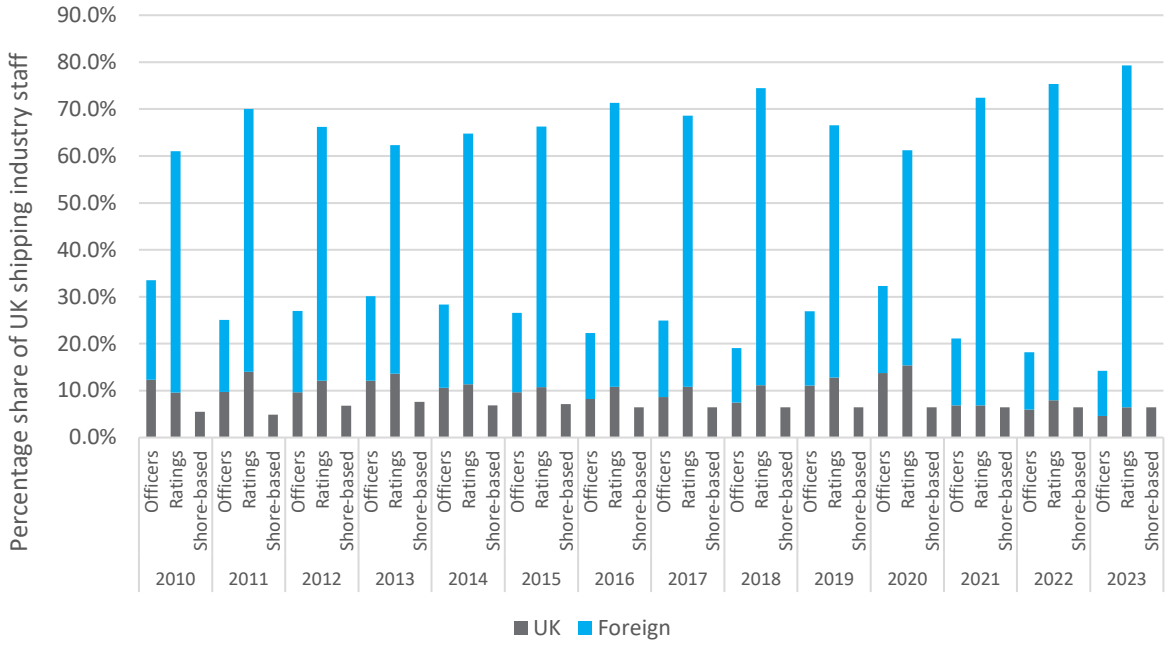
The total global level of employment increased by 52% from 2010 to 2023, from 278,100 to 421,700. These headline numbers, however, mask significant volatility over the assessed period, with employment decreasing markedly during, e.g., the 2019-20 period. The share of foreign-based employees was significantly more volatile than UK-based employment, with a range of 197,500 over the period, compared to just 19,600 for the latter.

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 tends to decrease when total employment increases. From 2019 to 2023, UK-based nominal employment has actually grown by almost 14,000; therefore, the decrease in relative share is due to a stronger increase in the number of foreign-based employment.

Employment by type

Figure 7 shows the breakdown of foreign and UK based 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 2023



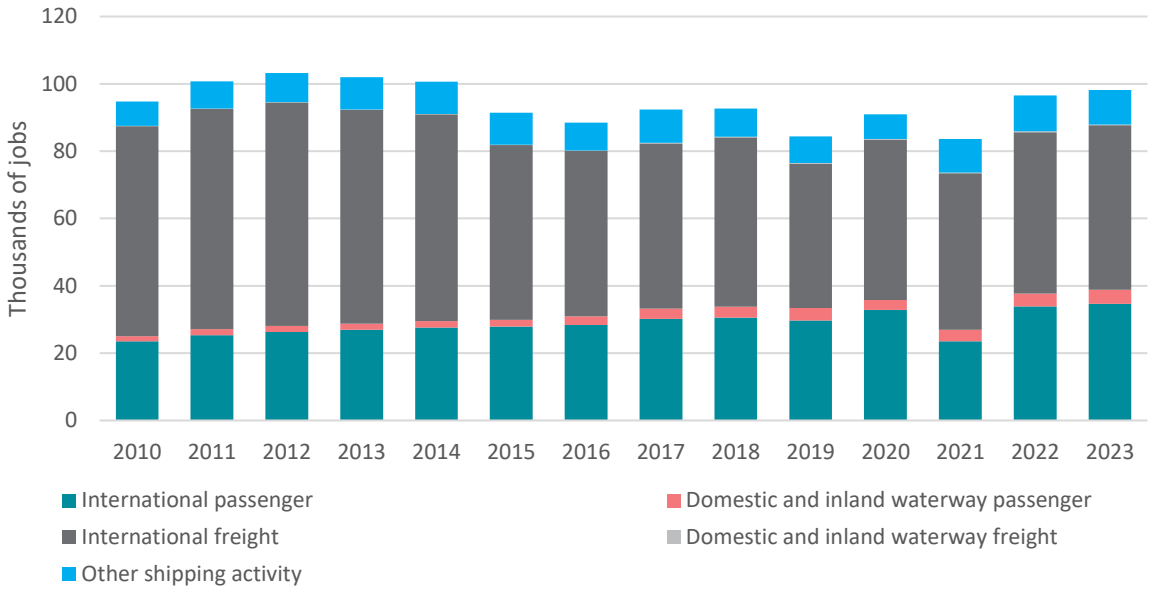
Source: UKCoS, Cebr analysis

Ratings staff is a general term for skilled support roles on a ship. For every year except 2013 and 2020 (when they made up 49% and 46%, respectively), foreign-based ratings staff made up at least half of all UK shipping industry workers. For UK based workers, the dominant employment category between ratings and officers changed over the period. In 2010, the number of officers (12.3%) exceeded that of ratings staff (9.6%), however from 2011, and in every year since except in 2020, when each amounted to 6.8%, ratings staff have outnumbered officers. In 2023, this split was 6.4% and 4.6%, respectively. It should be noted that the UKCoS Annual Seafarer Employment Survey may not represent a complete picture of industry employment, as it only captures those companies in membership of the UKCoS, and so any trends should be treated with caution.

UK employment by shipping activity

Figure 8 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 the shipping industry through UK employment disaggregated by industry activity, 2010 to 2023



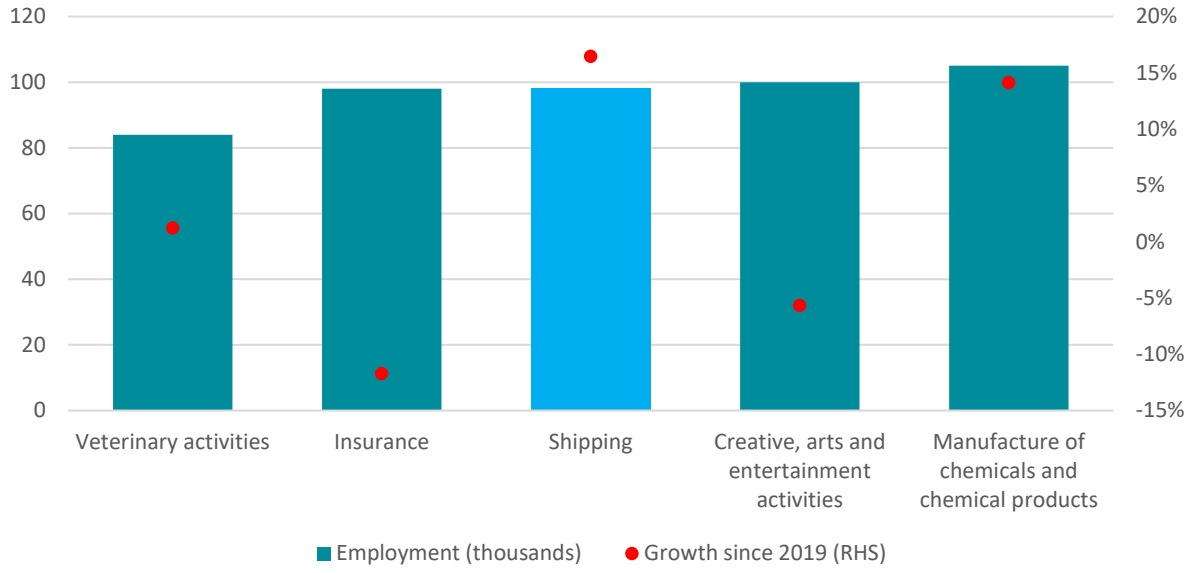
Source: FAME, UKCoS, ONS, Cebr analysis

It is estimated that the shipping industry directly supported around **98,200 jobs** for employees in the UK in 2023, up from 94,800 jobs in 2010 and reflecting a CAGR of 0.3%. As with turnover and GVA, in each year the international transport of freight (48,800 in 2023) and passenger (34,700) activities contributed the vast majority of employment, with a combined share of 85% in 2023.

It should be noted that employment in international passenger transport experienced a COVID-19-induced fall, whereas international freight transport employment remained relatively stable. Looking at the entire period, though, the former's employment has steadily trended upwards while the latter has actually somewhat decreased. This reflects diverging labour intensities of the respective activities: international passenger transport directly contributes 35% of industry employment but only 19% of GVA; conversely, international freight transport amounts to 50% of industry employment but 65% of total GVA.

Figure 9 compares the direct contribution that the shipping industry made through employment in the UK in 2023 against comparable industries. Employment data has been sourced from the Business Register and Employment Survey (BRES).

Figure 9: Employment of the shipping industry against comparable industries in 2023, and growth against the 2019 level



Source: FAME, UKCoS, ONS, Cebr analysis

In 2023, employment in the shipping industry stood at 98,200. For context, this was broadly comparable to the insurance industry (98,000) and the creative, arts, and entertainment industries (100,000). Between 2019 and 2023, employment in the shipping industry increased by 16%, representing the most notable growth rate among the reference industries over the period.

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.

This headline figure, however, masks significant heterogeneity. While the productivity of the passenger transport activities, both international and domestic, was broadly aligned with the UK average, that of the shipping of freight was significantly higher, pushing the productivity figures of the whole industry upwards. It should also be noted that the 2022 and 2023 GVA per employee figures are skewed to the upside due to the exceptional profits posted by companies in international freight transport, which led to abnormally high GVA figures for the whole industry, as discussed in Section 3.2.

Table 4 shows the estimated productivity of each industry activity across the years 2010 to 2023. The shipping industry as a whole is, on average, significantly more productive than the UK; while the average shipping industry job generated £163,706 in GVA in 2023, the average job in the UK economy generated £73,816.

This headline figure, however, masks significant heterogeneity. While the productivity of the passenger transport activities, both international and domestic, was broadly aligned with the UK average, that of the shipping of freight was significantly higher, pushing the productivity figures of the whole industry upwards. It should also be noted that the 2022 and 2023 GVA per employee figures are skewed to the upside due to the exceptional profits posted by

companies in international freight transport, which led to abnormally high GVA figures for the whole industry, as discussed in Section 3.2.

Table 4: Productivity (GVA per job) in the shipping industry and constituent activities against the UK economy, 2019 to 2023

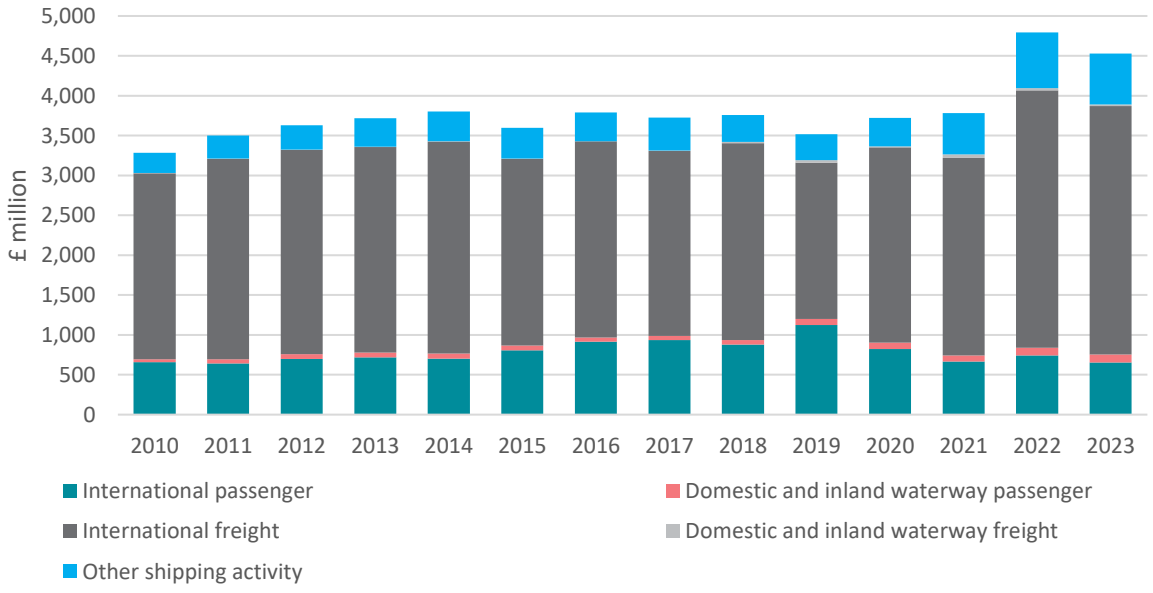
GVA per employee	2019	2020	2021	2022	2023
UK Economy	60,260	58,273	62,915	68,768	73,816
UK Shipping Industry	116,067	85,253	97,342	160,125	163,706
International Passenger	132,941	-10,669	-68,229	2,840	88,239
Domestic Passenger	59,032	71,510	75,492	72,825	71,717
International Freight	107,760	145,037	168,920	258,923	215,539
Domestic Freight	409,779	-18,412	138,867	99,697	156,537
Other shipping	116,631	135,722	160,392	249,222	209,505

Source: FAME, UKCoS, ONS, Cebr analysis

3.4 The direct economic impact through the compensation of employees

Figure 10 illustrates the employee compensation that is directly supported by the shipping industry, disaggregated by activity. This analysis only considers the compensation paid to UK-based employees.

Figure 10: The direct contribution of the shipping industry through the compensation of employees, 2010 to 2023



Source: FAME, UKCoS, ONS, Cebr analysis

It is estimated that the shipping industry directly contributed **£4.5 billion through the compensation of employees (COE)** in 2023, reflecting a CAGR of 2.3% over the period from 2010 to 2023, despite some brief periods of slight declines. The overall peak over the assessed period was in 2022 at £4.8 billion. Once again, the international transport of freight and passenger activities was the largest constituent activity at £3.1 billion (69%), followed by international passenger transport at £653 million, in 2023.

The effect of COVID-19 on employee compensation is particularly notable for international passenger transport, which saw a contraction of over 25% from 2019 to 2020, and had by 2023 still not recovered to its pre-pandemic levels. International freight transport proved again more resilient, with total COE in the segment actually increasing from 2019 until 2022, before seeing a slight reduction in 2023. Thanks to the robustness of international freight transport as well as that of the smaller segments, the total employee compensation of the shipping industry exceeded its 2019 levels by 29% in 2023.

3.5 The direct contribution to the UK Exchequer

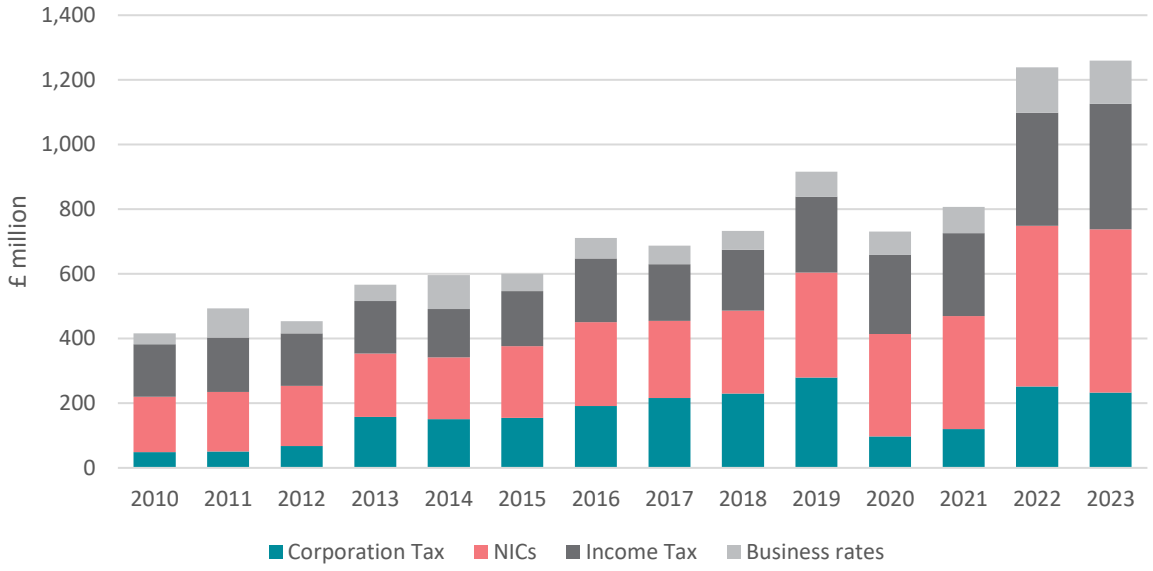
This section discusses the contribution of the shipping industry to the UK Exchequer. For each activity within this industry, Cebr have calculated the contributions in terms of the tax heads listed below. It has been assumed that the shipping industry does not generate Value-Added Tax (VAT) revenues for the UK Exchequer, with zero-rating applying to shipping services provided by the industry.[18]

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

Figure 11 shows the direct contribution of the shipping industry to the UK Exchequer across the years 2010 to 2023, disaggregated by tax head.

18 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.

Figure 11: The direct contribution of the shipping industry to the UK Exchequer, 2010 to 2023



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

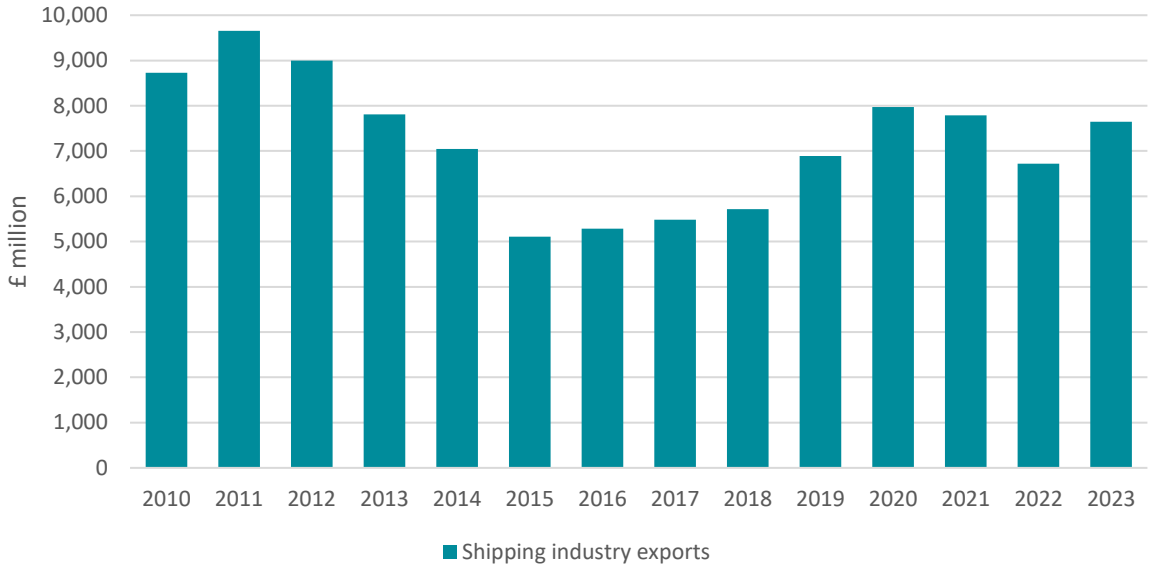
The shipping industry is estimated to have directly generated **£1.3 billion in tax revenues** for the UK Exchequer in 2023, translating to a CAGR of 8.2% since 2010. Since 2019, total Exchequer contributions have increased by 38%, although the COVID-19-induced contraction in between is clearly discernible, with Corporation Tax receipts significantly decreasing by 65% from 2019 to 2020. While Corporation Tax revenues have recovered since, they were still at only 83% of their pre-pandemic levels in 2023. Conversely, the receipts from the other three tax categories increased strongly. The largest increase occurred from 2021 to 2022, with an estimated increase of 53% year on year in total tax contribution. In 2023, 40% of the estimated total Exchequer contribution came from NICs, followed by Income Tax (31%), Corporation Tax (18%), and Business Rates (11%).

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

In this context, the shipping industry is assumed to only export services, through the transport of freight and passengers internationally.[19] Figure 12 shows how the value of services exports from the shipping industry developed between 2010 and 2023.

19 Sea Transport Services exports are defined as the overseas revenues earned by UK operators from the carriage of goods and passengers by sea, comprising freight and passenger transport services.

Figure 12: Exports of services from the shipping industry, 2010 to 2023



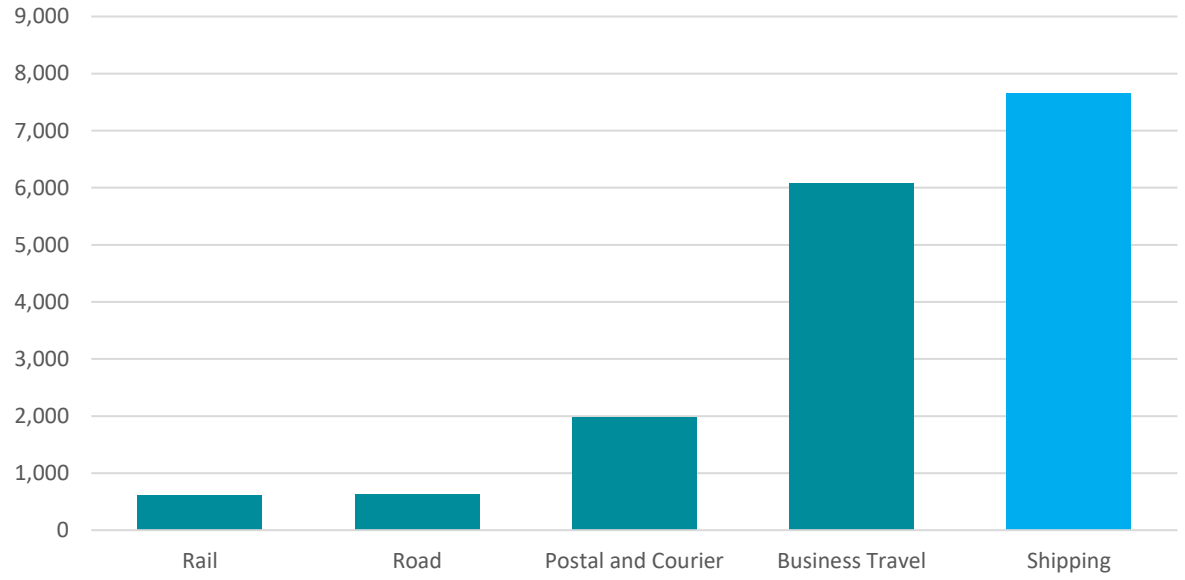
Source: UKCoS, ONS, Cebr analysis

The shipping industry's **exported services were valued at £7.6 billion** in 2023, in comparison to £8.7 billion in 2010. The industry's exports saw many years of consecutive decline after a peak of £9.7 billion in 2011, followed by a period of successive growth before fluctuating around current levels.

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 considerably larger than the value of exports from Road, Rail, and Postal and Courier activities, exceeding that of Business Travel[20] exports by £1.6 billion.

20 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, 2023, (£ million)



Source: ONS, Cebr analysis

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

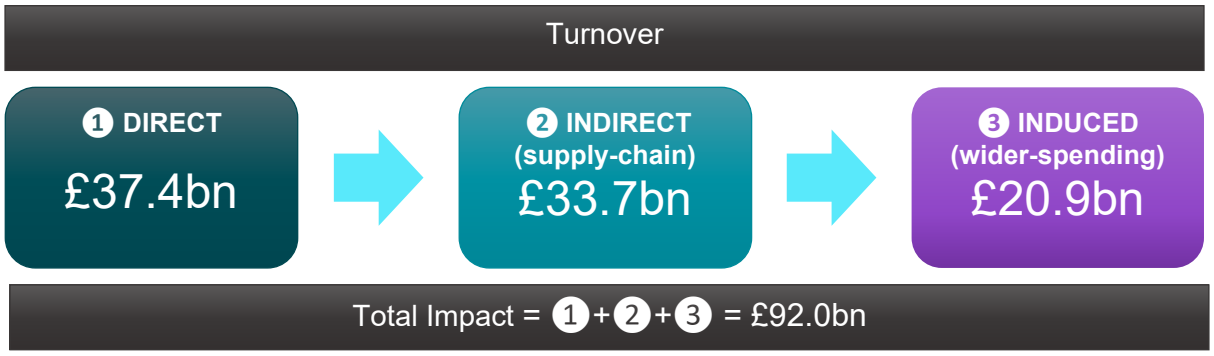
The aggregate economic impacts of the shipping industry take into account the indirect (or supply chain) and induced (employee spending) impacts that arise from the activities of firms within this industry.

The four macroeconomic indicators for which the aggregate economic impact has 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 with that employed in our 2022 study, except for employment, as discussed in Section 1.3.

4.1 The aggregate economic impacts through turnover

Figure 14 illustrates the turnover multipliers for the shipping industry within the UK. An aggregate turnover footprint of £92.0 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, 2023



Source: UKCoS, FAME, ONS, Cebr analysis

From this, it can be deduced that for every £1 of turnover directly generated by the industry, £0.90 worth of turnover is stimulated in the supply chains and £0.56 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 wider UK economy as a whole experiences a further increase in turnover of £1.46.

There is considerable variation across the industry's activities. International freight transport (bulk, container, gas and tanker) generated the largest turnover impact at £52.2 billion in 2023, while domestic and inland waterway freight (representing a much smaller segment) contributed just £191 million. Full figures by activity are shown in Table 5.

Table 5: Turnover impact of the shipping industry by industry activity, 2023, £ million

Turnover in 2023	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Total	**37,433**	**33,718**	**20,882**	**92,034**
International passenger transport (cruise and ferry)	10,760	9,692	6,002	26,454
Domestic and inland waterway passenger transport	961	866	536	2,363
International freight transport (bulk, container, gas and tanker)	21,241	19,133	11,849	52,222
Domestic and inland waterway freight transport	78	70	43	191
Other shipping activity	4,394	3,958	2,451	10,803

Source: UKCoS, FAME, ONS, Cebr analysis

Table 6 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.[21] The aggregate turnover impact has grown by 30% from £70.5 billion in 2019 to £92.0 billion in 2023.

Table 6: Direct and total turnover impact of the shipping industry, 2019 to 2023, £ million

	Direct Impact	Composite Turnover multiplier	Aggregate Support
2019	37,909	1.86	70,541
2020	24,903	2.54	63,360
2021	27,224	2.66	72,488
2022	40,257	2.46	98,977
2023	37,433	2.46	92,034

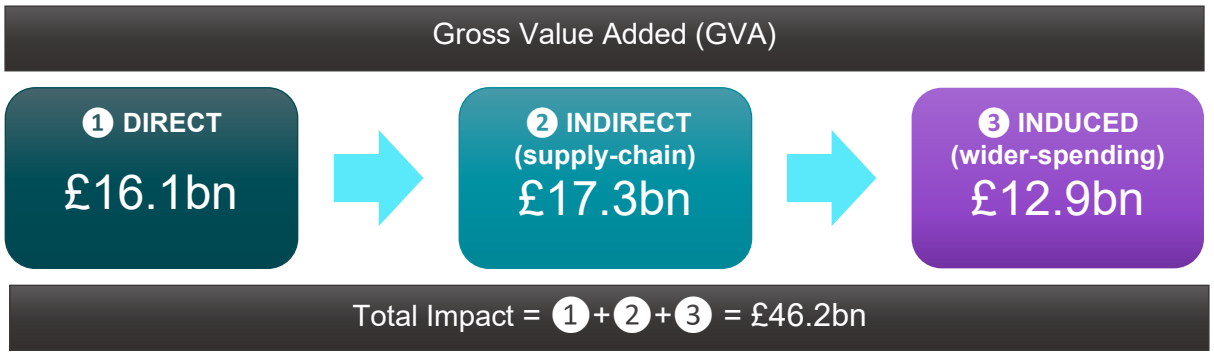
Source: UKCoS, FAME, ONS, Cebr analysis

21 Note that the direct impacts in 2019 have been recalculated using the expanded scope of companies, and are thus larger than the figures presented in 2022.

4.2 The aggregate economic impacts through GVA

Figure 15 illustrates the aggregate GVA impact supported by the shipping industry within the UK.

Figure 15: GVA multiplier impacts of the UK shipping industry, 2023



Source: UKCoS, FAME, ONS, Cebr analysis

A total aggregate GVA footprint in the UK of £46.2 billion is supported by the shipping industry. The direct impact of £16.1 billion is augmented by an indirect impact of £17.3 billion of GVA supported and a £12.9 billion induced impact. From this, it can be calculated that for every £1 of GVA initially generated by the shipping industry, the wider UK economy experiences a further increase in GVA of £1.87.

Table 7 shows the estimated direct and total GVA impacts from the individual industry activities when taken in isolation. The shipping industry directly contributed £16.1 billion in GVA in 2023, and provided an aggregate support of £46.2 billion in GVA. Within this aggregate economic contribution, international freight transport supported £30.2 billion (65% of industry total) of GVA in the UK, followed by international passenger transport at £8.8 billion (19%).

Table 7: GVA impact of the shipping industry by industry activity, 2023, £ million

GVA in 2023 (£m)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	**16,079**	**17,258**	**12,860**	**46,197**
International passenger transport (cruise and ferry)	3,058	3,282	2,445	8,785
Domestic and inland waterway passenger transport	300	322	240	863
International freight transport (bulk, container, gas and tanker)	10,525	11,297	8,418	30,240
Domestic and inland waterway freight transport	41	44	33	117
Other shipping activity	2,155	2,313	1,723	6,191

Source: UKCoS, FAME, ONS, Cebr analysis

Table 8 presents the evolution of the different components of aggregate GVA since 2019.[22] The total GVA impact has increased from £26.2 billion in 2019 to £46.2 billion in 2023.

Table 8: Direct and aggregate GVA impact of the shipping industry, 2019 to 2023, £ million

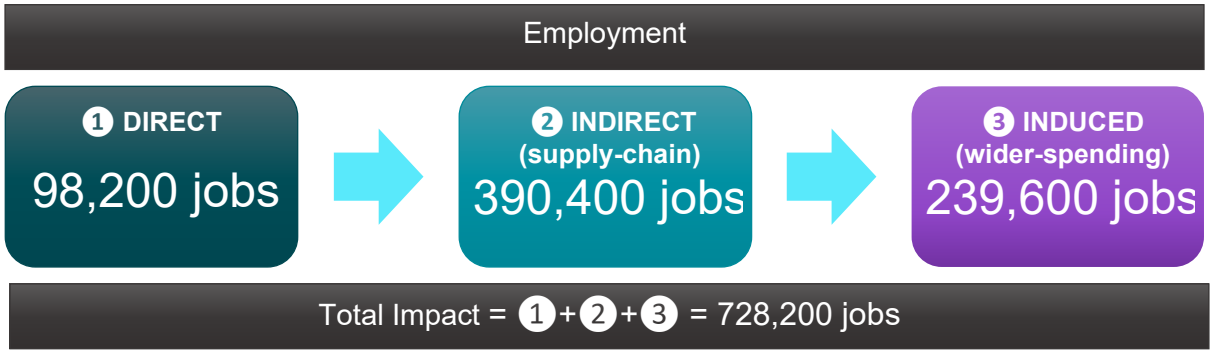
	Direct Impact	Composite GVA multiplier	Total Support
2019	9,790	2.68	26,202
2020	7,750	3.67	28,429
2021	8,144	4.00	32,609
2022	15,456	2.87	44,405
2023	16,079	2.87	46,197

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. A substantial total of 728,200 jobs were supported by the shipping industry in 2023.

Figure 16: Employment multiplier impacts of the shipping industry, 2023



Source: UKCoS, FAME, ONS, Cebr analysis

Therefore for every job supported by the shipping industry, 3.97 jobs are stimulated in the industry's supply chains and a further 2.44 jobs supported in the wider economy when direct and indirect (supply chain) employees spend their earnings. That is, for every job initially provided by the shipping industry, a further 6.41 jobs were supported across the UK economy.

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

22 Note that the direct impacts in 2019 have been recalculated using the expanded scope of companies, and are thus larger than the figures presented in 2022.

Table 9: Employment impact of the shipping industry by industry activity, 2023, thousands of jobs

Employment in 2023	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	**98**	**390**	**240**	**728**
International passenger transport (cruise and ferry)	35	138	85	257
Domestic and inland waterway passenger transport	4	17	10	31
International freight transport (bulk, container, gas and tanker)	49	194	119	362
Domestic and inland waterway freight transport	0.3	1.0	0.6	1.9
Other shipping activity	10	41	25	76

Source: UKCoS, FAME, ONS, Cebr analysis

The relatively high employment multiplier, especially when compared to turnover or GVA multipliers, can be attributed to the structure of the industries supplying goods and services to the shipping industry. 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. While shipping itself is relatively capital-intensive, with high GVA per employee, many of its upstream suppliers (such as employment services, construction, warehousing and storage, and legal services) are relatively more labour-intensive. Additionally, induced effects from employee spending fall mostly in sectors like retail and hospitality, which also have high employment-to-output ratios. This results in a disproportionately large number of jobs being supported across the economy for each direct job in the shipping industry as compared to some other industries.

Table 10 presents the evolution of aggregate employment by the shipping industry, alongside the domestic employment multiplier that applies to the entire industry.[23] The aggregate employment impact has increased from around 488,033 jobs in 2019 to 728,200 jobs in 2023.

Table 10: Direct impact and aggregate employment supported in the shipping industry, 2019 to 2023

	Direct Impact	Composite Employment multiplier	Total employment impacts
2019	84,346	5.79	488,033
2020	90,910	6.72	611,335
2021	83,660	7.62	637,401
2022	96,523	7.41	715,630
2023	98,220	7.41	728,216

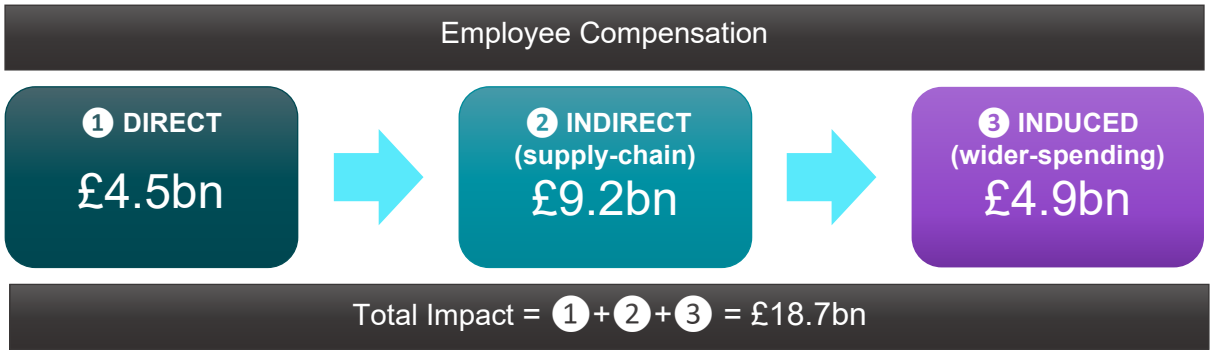
Source: UKCoS, FAME, ONS, Cebr analysis

23 Note that the direct impacts in 2019 have been recalculated using the expanded scope of companies, and are thus larger than the figures presented in 2022. Note also that the methodological adjustment for the employment multiplier has here been retroactively applied to 2019 as well; for further detail, see Section 1.3.

4.4 The aggregate economic impacts through the compensation of employees

Similarly to 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 shipping industry.

Figure 17: Multiplier impacts for the compensation of employees for the UK shipping industry, 2023



Source: UKCoS, FAME, ONS, Cebr analysis

Along with the £4.5 billion of employee compensation directly supported by the shipping industry, £9.2 billion of wages and other employee remuneration is supported through supply chain (indirect) impacts and £4.9 billion through the employee spending (induced) channel. For each £1 of employee compensation in the shipping industry in 2023, £2.03 was supported through the supply chain and an additional £1.09 through the induced channel. For the shipping industry as a whole therefore, for every £1 directly raised in the compensation of employees in 2023, a further £3.12 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 2023, over two thirds (£12.8 billion) was supported by International freight transport. International passenger transport and the Other shipping activity were the other major constituent activities, with aggregate compensations supported of £2.7 and £2.6 billion, respectively.

Table 11: Impact through the compensation of employees of the shipping industry by industry activity, 2023, £ million

Employee compensation in 2023	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	**4,528**	**9,197**	**4,942**	**18,667**
International passenger transport (cruise and ferry)	653	1,327	713	2,693
Domestic and inland waterway passenger transport	102	208	112	421
International freight transport (bulk, container, gas and tanker)	3,114	6,324	3,399	12,837
Domestic and inland waterway freight transport	21	43	23	88
Other shipping activity	637	1,295	696	2,628

Source: UKCoS, FAME, ONS, Cebr analysis

Finally, Table 12 shows the progression in the direct impact through the compensation of employees in the shipping industry from 2019 to 2023, alongside the domestic employment

multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.[24] The aggregate impact through the compensation of employees has grown by 48% from £12.6 billion in 2019 to £18.7 billion in 2023.

Table 12: Direct and aggregate impact through the compensation of employees of the shipping industry, 2019 to 2023, £ million

	Direct Impact (£m)	Composite Employee Compensation multiplier	Aggregate Support (£m)
2019	3,517	3.58	12,592
2020	3,723	4.24	15,798
2021	3,781	4.42	16,731
2022	4,792	4.12	19,755
2023	4,528	4.12	18,667

Source: UKCoS, FAME, ONS, Cebr analysis

24 Note that the direct impacts in 2019 have been recalculated using the expanded scope of companies, and are thus larger than the figures presented in 2022.

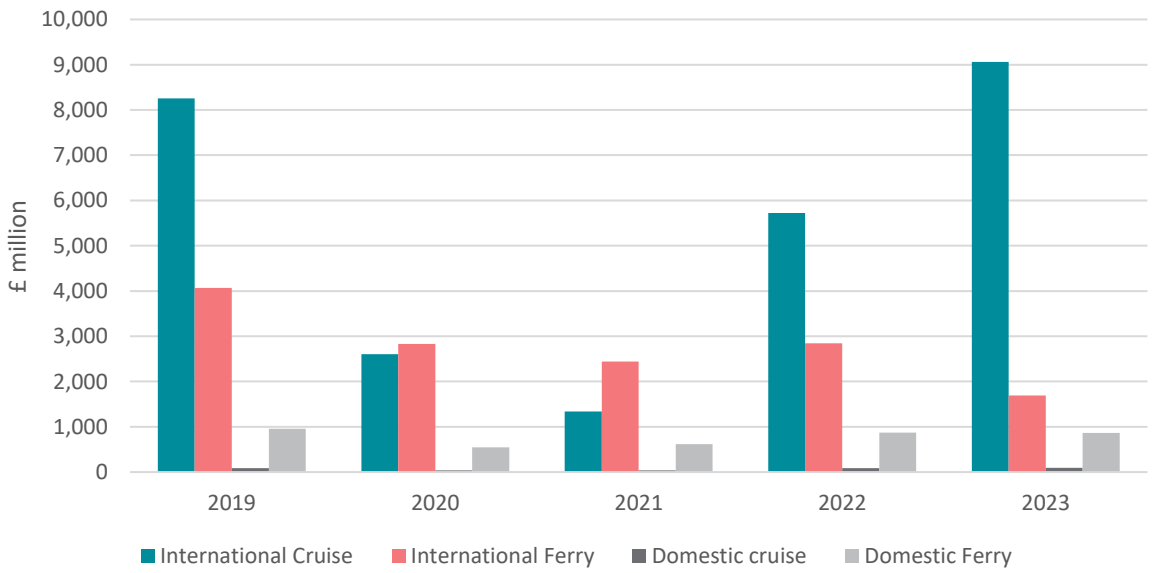
5. The economic impact of the cruise and ferry segments

The passenger transport activity of the shipping industry can be further disaggregated into the cruise and ferry segments. For the purposes of this analysis, we define ferries as those vessels which primarily serve as transportation between two (or more) points, carrying passengers and vehicles (whether private cars or freight trailers) along a fixed route, while a cruise ship is a leisure destination itself, offering a vacation experience with various amenities and activities. As touched upon in Section 3.1, the development of the segments within passenger transport through the period from 2019 to 2023 exhibited notable variation. The companies belonging to the respective segments were identified in the FAME data by the UKCoS.

5.1 The economic impact of the cruise and ferry segments through turnover

Figure 18 illustrates the turnover of the international cruise, international ferry, domestic cruise, and domestic ferry activities from 2019 to 2023, respectively. Turnover in the international cruise segment experienced a significant decline of 68% from 2019 to 2020 before halving again from 2020 to 2021, driven by the COVID-19 pandemic and associated travel restrictions. However, it subsequently staged a notable recovery, standing at £9.1 billion in 2023 and thus exceeding pre-pandemic levels by over £800 million.

Figure 18: Estimated turnover of passenger transport by segment, 2019 to 2023



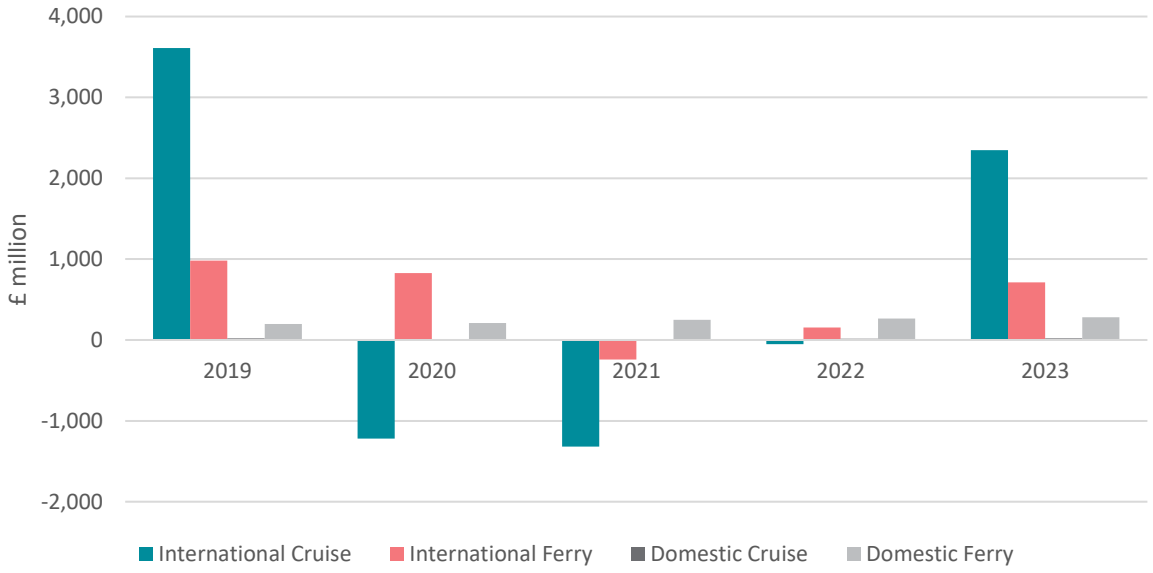
Source: FAME, UKCoS, ONS, Cebr analysis

International ferry activity followed a similar, though less drastic, trajectory, first declining by a total of 40% in between 2019 and 2021 before increasing by 16% from 2021 to 2022.[25] Domestic ferry activity was consistently the lowest contributor to turnover, over the period. It was also hit by COVID-19 disruptions in 2020 and 2021. By 2023, turnover had recovered to £846 million, still 10% below its 2019 level.

5.2 The economic impact of the cruise and ferry segments through GVA

Figure 19 illustrates the GVA of the international cruise, international ferry, domestic cruise, and domestic ferry segments from 2019 to 2023, respectively. The trends in international cruise transport GVA were broadly in line with those exhibited by its turnover; a steep decline (into negative territory) in 2020 and a further fall in 2021, followed by a recovery. However, unlike its turnover, which already exceeded pre-pandemic levels in 2023, the GVA of the international cruise activity had only reached 65% of its 2019 level in 2023 at £2.3 billion.

Figure 19: Estimated GVA of passenger transport by segment, 2019 to 2023



Source: FAME, UKCoS, ONS, Cebr analysis

The GVA associated with international ferry activity fell in 2020 and declined again in 2021, before rebounding in 2022 and increasing to £711 million in 2023 (72% of its 2019 level). Domestic ferry activity was more robust in terms of GVA, recording successive year-on-year

25 Due to incomplete financial reporting at the time of analysis, 2023 estimates do not yet include data for one of the largest international ferry providers. Data for this firm are included in the estimates for prior years: if available, per historic trends it is likely that the total figure for international ferry transport in 2023 would have been similar to 2022 levels.

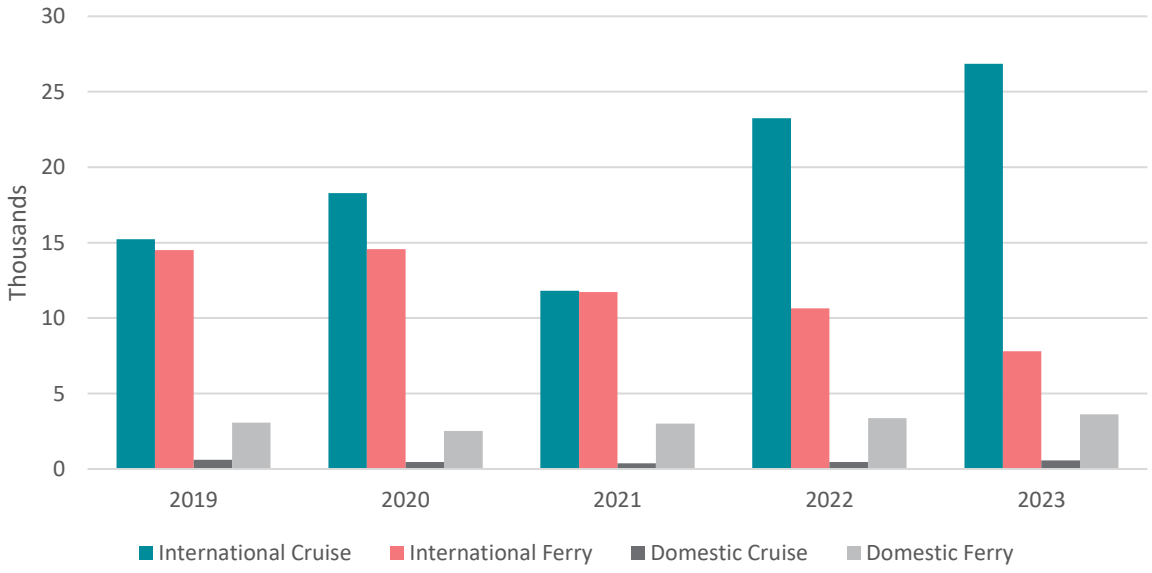
increases throughout the period. In 2023, its GVA stood at £282 million, exceeding pre-pandemic levels by 43%.

5.3 The economic impact of the cruise and ferry segments through employment

Figure 20 illustrates the employment of companies belonging to the international cruise, international ferry, domestic cruise, and domestic ferry segments from 2019 to 2023, respectively. After a COVID-19-induced decline from 2020 to 2021, international cruise transport has seen strong growth in headcount since 2022, driven by the largest cruise operators.

International ferry transport saw a decline from around 14,500 employees in 2019 and 2020 to around 12,000 in 2021 and 11,000 in 2022. It should be noted, however, that most of the decrease from 2020 to 2022 is attributable to a single company.[26] Domestic ferry transport, on the other hand, decreased by 18% from around 3,100 employees in 2019 to 2,500 in 2020, but increased steadily in the subsequent years, reaching 3,600 employees in 2023.

Figure 20: Estimated employment of passenger transport by segment, 2019 to 2023



Source: FAME, UKCoS, ONS, Cebr analysis

26 Due to incomplete financial reporting at the time of analysis, 2023 estimates do not yet include data for one of the largest international ferry providers. Data for this firm are included in the estimates for prior years: if available, per historic trends it is likely that the total figure for international ferry transport in 2023 would have been similar to 2022 levels.

6. The regional economic impact of the shipping industry

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

Table 13 shows the regional breakdown of direct economic impacts in 2023 for turnover, GVA, employment, and the compensation of employees. The South East directly supported the highest level of economic activity for each variable (32% of total turnover, 30% of GVA, 34% of employment, and 30% of COE). This is to be expected, as the region contains both Dover and Southampton, two major UK ports. The Port of Dover, for example, handled the most international sea passengers travelling to and from the UK (50%) in 2023, with the Port of Southampton second at 15%. In terms of freight in the UK, Dover handled the 7th largest volume, whilst Southampton handled the 4th largest volume.[27]

Table 13: Regional breakdown of turnover, GVA, employment, and compensation of employees directly contributed by the shipping industry, £ million, 2023

Region:	Turnover (£m)	GVA (£m)	Employment (jobs)	COE (£m)
Scotland	3,238	1,846	12,480	692
Wales	1,016	425	3,655	169
Northern Ireland	468	224	1,517	62
East of England	4,771	1,960	11,638	826
East Midlands	55	31	242	7
London	9,173	3,657	15,365	636
North East	146	76	473	23
North West	4,224	1,629	9,845	527
South East	11,964	4,891	33,034	1,336
South West	1,093	671	5,435	92
West Midlands	823	459	2,917	115
Yorkshire and the Humber	463	209	1,619	45

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

London directly generated the second-highest amount of economic activity after the South East for turnover (25%), GVA (23%), and employment (16%), and third-highest for compensation of employees (14%), following Scotland (15%). London's strong contribution can, on the one hand, be explained by the Port of London, which handled the highest amount

27 Department for Transport (2023). Maritime statistics.

of tonnage traffic out of all UK ports in 2023.[28] However, while much of the Port of London lies within Greater London, key terminals such as Tilbury and London Gateway are located in the East of England, meaning that part of the port's economic activity is attributed to that region. On the other hand, London is home to the headquarters of many international shipping companies, boosting the region's economic footprint further.

The South East and London also illustrate the varying labour intensities of shipping industry activities, as touched upon in Section 3.3. Whereas the South East's percentage share of the industry total is lower for GVA than for employment, the opposite is true for London, by some margin.

Out of the other regions, the East of England and the North West also generated significant economic activity. For example, in terms of turnover, these two regions contributed 13% and 11%, respectively. This is again partly due to these regions containing major ports, i.e., the Port of Felixstowe as well as key parts of the Port of London in the East of England, and the Port of Liverpool in the North West. The West Midlands' contribution, in turn, was more limited due to it being a landlocked region, and thus having direct activity pertaining to inland waterways only.

It should be noted that the methodological approach to estimate the regional breakdowns for each indicator relies on data from Business Register and Employment Survey (BRES), which provides a regional mapping of employment based on SIC codes. This can lead to the shares of certain regions, especially those with lower employment to begin with, to fluctuate over time which also translates onto the allocation of impacts. For instance, the measured employment in regions such as the East Midlands and the North East have exhibited year-on-year variance, meaning that any snapshot of the regional breakdown should be treated with appropriate caution.[29]

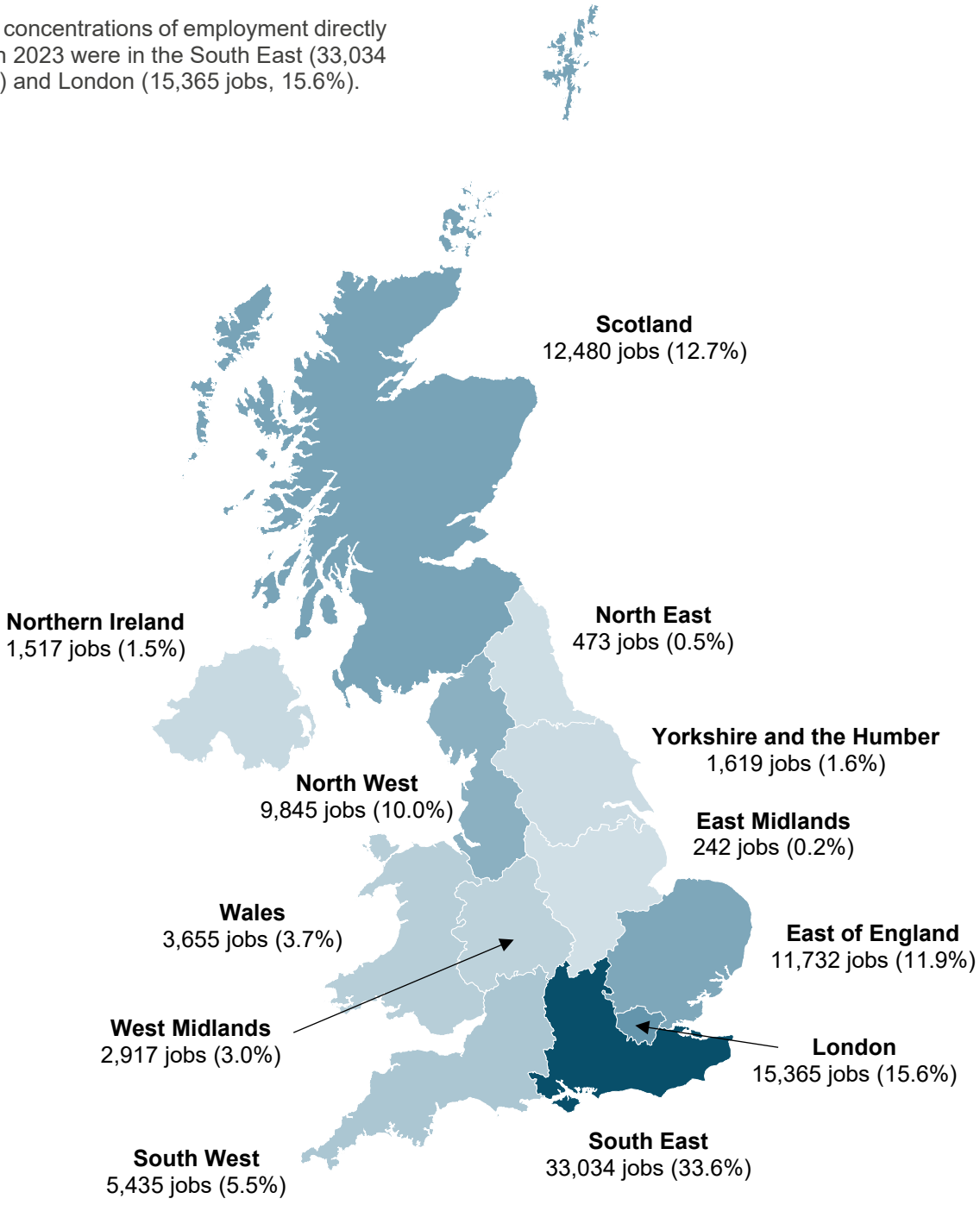
Figure 21 illustrates the regional breakdown for employment.

28 Department for Transport (2024). Port freight annual statistics 2023: Overview of port freight statistics and useful information.

29 Yorkshire and the Humber's share was adjusted slightly upwards to ensure consistency with its historical average and alignment with the region's other key indicators within the shipping industry, such as gross value added (GVA). The adjustment reflects the region's established role in the industry, with the originally reported figure appearing understated relative to its broader economic contribution.

Figure 21: Regional breakdown of employment directly contributed by the shipping industry, 2023

The highest concentrations of employment directly generated in 2023 were in the South East (33,034 jobs, 33.6%) and London (15,365 jobs, 15.6%).



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

6.2 The aggregate economic impact of the shipping industry by UK region

This 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 were combined with Cebr's regional economic impact models, within which the activities of the shipping industry were separately identified and isolated. It should be noted that the methodology used to generate these multipliers differs from our 2022 study for the employment multiplier, as discussed in Section 1.3.

The aggregate economic impact for business turnover and GVA by region

Table 14 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2023, alongside the composite industry multiplier for each region.

Table 14: Regional breakdown of aggregate business turnover and GVA supported by the shipping industry, 2023, £ million

	Turnover			GVA		
Region:	Direct Impact	Multiplier	Aggregate Support	Direct Impact	Multiplier	Aggregate Support
Scotland	3,238	2.2	7,003	1,846	2.5	4,650
Wales	1,016	2.3	2,374	425	2.8	1,173
Northern Ireland	468	2.3	1,088	224	2.7	611
East of England	4,771	2.4	11,655	1,960	2.9	5,711
East Midlands	55	2.4	134	31	2.9	90
London	9,173	1.9	17,834	3,657	2.3	8,418
North East	146	2.3	341	76	2.7	208
North West	4,224	2.1	8,829	1,629	2.4	3,955
South East	11,964	2.1	24,527	4,891	2.4	11,701
South West	1,093	2.5	2,766	671	3.0	2,031
West Midlands	823	2.2	1,830	459	2.6	1,184
Yorkshire and the Humber	463	2.5	1,160	209	3.0	624

Source: UKCoS, FAME, ONS, Cebr analysis

For both turnover and GVA, the highest aggregate level of support was associated with the South East, London, and the East of England, in that order. Every £1 of direct turnover and GVA was associated with the greatest aggregate level of economic support in the South West and in Yorkshire and the Humber (£2.5 and £3.0 for turnover and GVA, respectively). The lowest levels of aggregate support for turnover and GVA were felt in the East Midlands and the North East.

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

Finally, Table 15 shows the breakdown of direct and aggregate economic impacts for employment and the compensation of employees in 2023, alongside the shipping industry multiplier for each region.

Table 15: Regional breakdown of aggregate employment and employee compensation supported by the shipping industry, 2023

	Employment (jobs)			Compensation of Employees (£ million)		
Region:	Direct Impact	Multiplier	Aggregate Support	Direct Impact	Multiplier	Aggregate Support
Scotland	12,480	6.4	80,324	692	3.5	2,429
Wales	3,655	7.2	26,279	169	3.8	647
Northern Ireland	1,517	7.4	11,174	62	3.9	241
East of England	11,638	8.1	93,972	826	4.2	3,478
East Midlands	242	7.9	1,917	7	4.1	28
London	15,365	5.5	84,201	636	3.1	1,968
North East	473	7.4	3,520	23	4.0	90
North West	9,845	6.2	60,654	527	3.4	1,772
South East	33,034	6.0	198,348	1,336	3.3	4,393
South West	5,435	8.4	45,489	92	4.4	401
West Midlands	2,917	7.0	20,408	115	3.7	431
Yorkshire and the Humber	1,619	8.2	13,265	45	4.3	191

Source: UKCoS, FAME, ONS, Cebr analysis

For employment, the highest levels of aggregate support are seen in the South East, the East of England, and London. A similar pattern is observed for compensation of employees, where the South East and the East of England are associated with the highest aggregate support. Almost half of the aggregate jobs (46%) and employee compensation (49%) 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 London.

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

This final section of the report sets out Cebr's updated estimates of the benefits of the Tonnage Tax regime. This system, a fully-approved EU State Aid at the time, was introduced in 2000 as a means to support the UK shipping industry, seeking to boost the size of the declining UK owned fleet and to increase the levels of training imparted on UK seafarers. While the revenues directly raised through the Tonnage Tax regime for the UK Exchequer are small, Cebr estimates that the gains in terms of economic performance to the UK 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 experiences of other European countries, the impact of the Tonnage Tax is highly 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 through the Core Training Commitment (CTC),[30] while important, are not considered here.

It should be noted that two key methodological refinements have been made to the modelling since our previous study, with updated scenarios. First, the explanatory variables in the econometric model underpinning the Baseline counterfactual have been adjusted, allowing for a more robust estimation of structural relationships. Second, the 'Optimistic' counterfactual is now based on a quantile regression, offering a more optimistic yet statistically grounded benchmark. Finally, as elsewhere in the report, results for 2010–2019 reflect an expanded company scope and are not directly comparable to figures presented in the 2022 study.

7.1 About Tonnage Tax

In July 2000, the UK Government introduced a new optional tax regime for the UK Shipping industry—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

30 As a condition of acceptance to the UK Tonnage Tax Scheme companies have to agree to provide training for seafarers. They must find or fund places for an agreed number of trainees according to the size of its fleet and the number of seafarers employed.

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 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 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, with the proviso that they are profitable, 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.

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, and the objective of the Tonnage Tax regime was therefore to reverse the steady decline in UK-owned commercial vessels, alongside supporting funding for seafarer training. 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."[31] In 2011, the Office for Tax Simplification (OTS)[32] 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."

Tonnage Tax Reform

Following the UK's exit from the EU, at the Autumn Budget 2021, the UK Government announced that it would reform the UK's Tonnage Tax regime "to ensure that the UK shipping industry remains highly competitive in the global market[33]". The reforms intended to have a positive impact on the UK shipping industry, through changes to make it easier to join the regime and incentivise use of the UK flag.

The UK Government implemented these reforms in various stages, starting with the Finance Act 2022. The first set of reforms, which took effect on 1 April 2022, reduced the lock-in period for tonnage tax participants from ten to eight years and removed the vessel registration rules

31 House of Commons Transport Committee. (2005). 'Tonnage Tax: Second Report of Session 2004-05'.

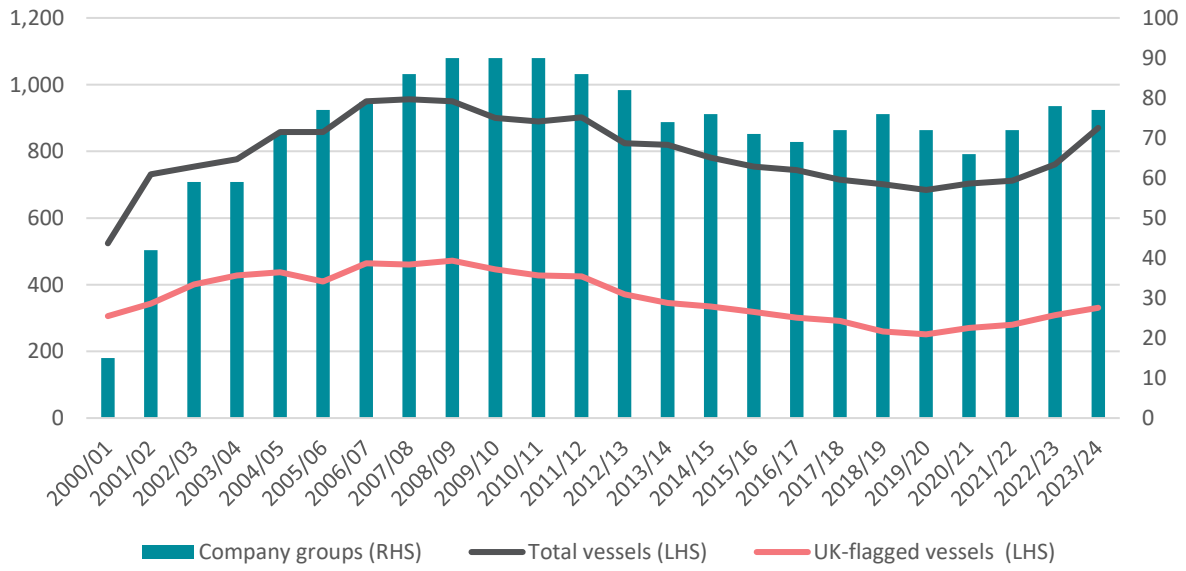
32 Office for Tax Simplification. (2011). 'Review of tax reliefs, Final Report'.

33 HM Revenue & Customs. (2021). Tonnage Tax reform. https://www.gov.uk/government/publications/tonnage-tax-reform/tonnage-tax-reform

regarding the number of EU/EEA flagged vessels within Tonnage Tax companies/groups, whilst explicitly recognising vessels being flagged to the UK as an optional but influential indicator within the Tonnage Tax regime's 'strategic and commercial management' test. Investment in research and development on clean energy and green technologies in the UK were also recognised as a material consideration for the 'strategic and commercial management' test.

In 2023, the UK government opened an 'election' window for the first time in 18 years, making it possible for shipping companies who had not previously elected to join the Tonnage Tax regime to enter. The window was open for 18 months from 1 June 2023, enabling companies to take advantage of reforms made to the regime which took effect the previous year (e.g., increased administrative flexibility and the withdrawal of the registration and flagging rules introduced in 2005 as an EU/EEA requirement). Moreover, from 1 April 2024, the UK government permitted third-party ship management companies to join the regime and raised the limit on capital allowances to £200 million for lessors of ships into the regime.[34] Figure 22 shows the annual number of company groups, vessels, and UK-flagged vessels in the regime since its inception.

Figure 22: Number of company groups, vessels, and UK-flagged vessels in the Tonnage Tax regime, 2000 to 2023



Source: DfT

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?",[35] almost all maritime EU countries now operate similar regimes, including: Greece, the Netherlands, Norway, Denmark,

34 HM Treasury. (2023). 'Spring Budget'.

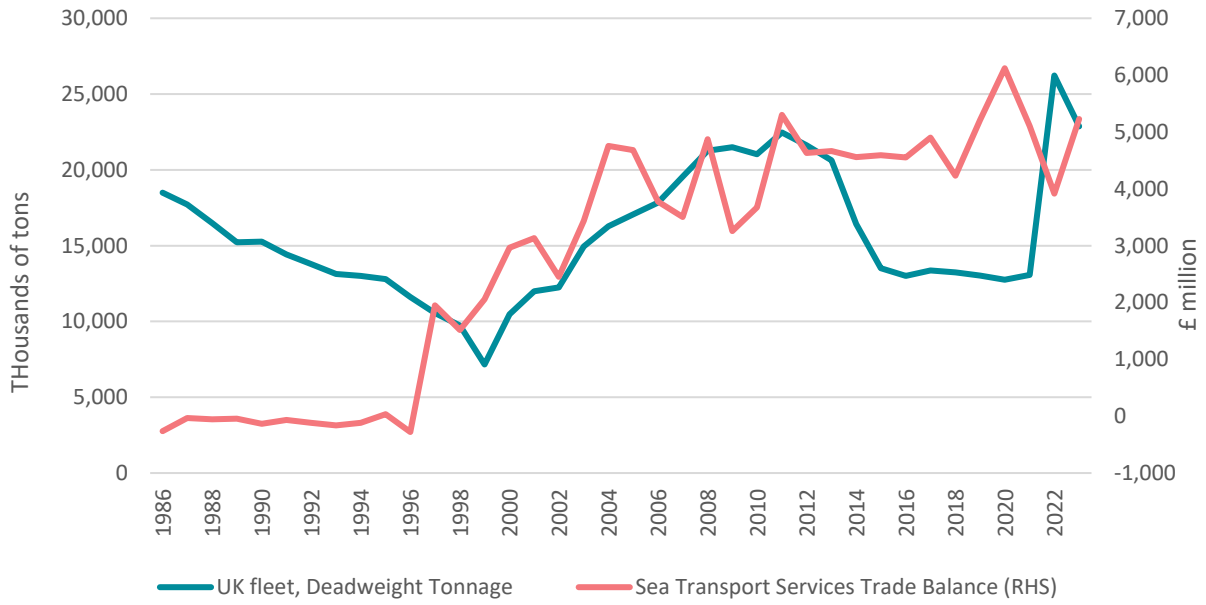
35 Leggate. H., & McConville. J. 2006. "Tonnage tax: is it working?", Maritime Policy & Management.

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,[36] 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 23 shows the trend of declining deadweight tonnage 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 are sourced from the Department for Transport's shipping fleet data tables.

An important caveat to note is that only ships of 500 gross tonnes and above are included here in the total deadweight tonnage (so some smaller vessels will be omitted). While the eligibility criteria of the regime is set at 100 gross tonnes, the chosen approach is necessary to ensure a sufficiently long time series of deadweight tonnage growth, enabling us to credibly identify the effect of the tax regime post-2000. Secondly, the analysis only includes trading vessels (those that carry cargo or passengers), and will therefore not comprise vessels such as those operating in offshore oil and gas.

Figure 23: Deadweight tonnage of UK-owned shipping vessels; UK trading balance in Sea Transport Services, 1986 to 2023



Source: UKCoS, DfT FLE0204 data tables, 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

36 Department for Transport. (2019). 'Maritime 2050'.

million in 1996. However, the trade balance has been in surplus from 1997 to 2023, peaking in 2020 at a £6.1 billion surplus.

We observe a marked reversal in the trend of UK-owned vessels' total deadweight tonnage following the introduction of the Tonnage Tax regime. In 2000, the total deadweight tonnage rose sharply from 7.2 to 10.5 million tonnes. Between 2000 and 2021, it increased by 25% overall. The tonnage peaked at 22.5 million tonnes in 2011 but declined steadily thereafter. Since 2015, it has plateaued, averaging around 13 million tonnes. It should be noted that data from 2022 onwards is not directly comparable due to a change in the underlying data sources used by the DfT.

7.2 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, updating our previous study from 2022 which considered the situation until 2019.

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 two scenarios alongside the actual path of the size of the UK-owned shipping fleet. For a more detailed treatment of the methodology, please refer to Annex B.

- **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 2023.
- **Baseline scenario** – this scenario is estimated with an 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, all expressed in growth terms, include total UK trade; the Baltic Dry Index (a proxy for freight rates); and lagged oil prices. To evaluate the structural shift post-2000, the model contains a Tonnage Tax dummy variable, taking value 0 for years until 1999 and 1 for years from 2000 onward.

- **Optimistic scenario** – this scenario is derived from a quantile regression model estimating the 75th percentile of fleet growth conditional on key economic drivers. The approach captures the structural relationship as observed in years where fleet growth was relatively high, allowing the scenario to reflect more favourable responsiveness to trade volumes, freight rates, and oil prices. It provides a statistically grounded upper-bound counterfactual, representing a plausible but relatively optimistic outcome. The model comprises the same explanatory variables as the 'Baseline' specification.[37]

After quantifying the impact on the total level of deadweight tonnage under the two 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 posit 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.

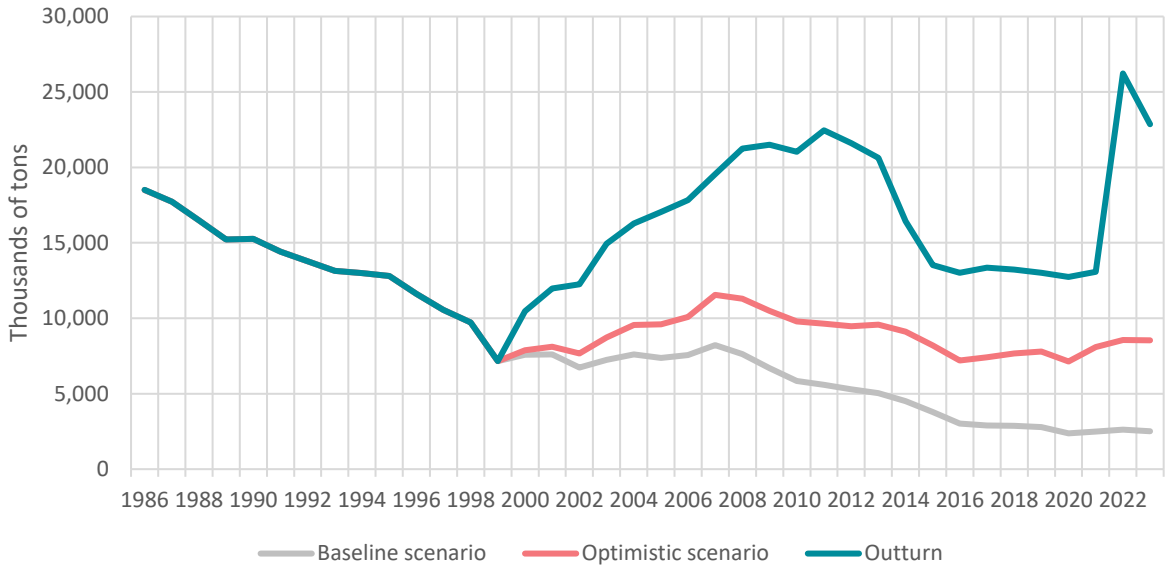
7.3 The impact of Tonnage Tax on the UK-owned shipping fleet

Figure 24 shows the path of total deadweight tonnage for the UK-owned shipping fleet under two different scenarios since 2000, alongside the outturn since 1986. Under the Baseline scenario, total deadweight tonnage would have fallen as low as 2.5 million tonnes by 2023; under the more Optimistic upper-bound scenario the level of deadweight tonnage would have been 8.5 million.

Under both scenarios, deadweight tonnage would have been markedly lower than under the outturn; in 2023 total deadweight tonnage had fallen year-on-year but was still recorded at 22.9 million tonnes, its second highest value over the entire period; in comparison, it stood at 7.2 million tonnes in 1999. Given the substantial gap between the outturn and even the Optimistic, upper-bound, scenario, the evidence strongly suggests that, without the introduction of the Tonnage Tax regime, the economic contribution of the UK shipping industry would have been significantly lower.

37 Note that this scenario does not represent the average expected outcome, but rather illustrates how fleet growth could have evolved under relatively beneficial conditions.

Figure 24: Total level of deadweight tonnage for UK-owned shipping fleet, outturn versus Baseline and Optimistic scenarios

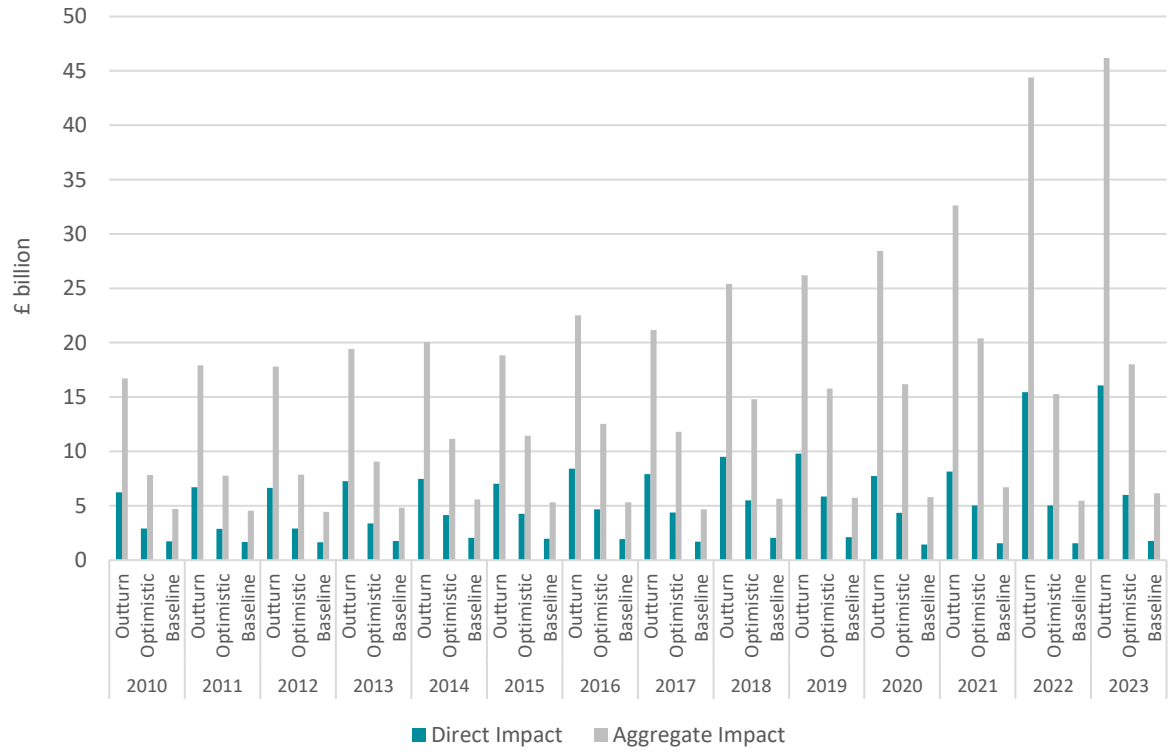


Source: UKCoS, Department for Transport, ONS, Cebr analysis

7.4 The impact of Tonnage Tax on GVA

Figure 25 shows the projected impact across the years 2010 to 2023 under the two scenarios described earlier in this section against the outturn.

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



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

Under the Baseline scenario, the direct impact through GVA in 2023 would have been £1.8 billion, and thus £14.3 billion less than the actual outturn of £16.1 billion. Under the Optimistic scenario, the direct GVA impact in 2023 would have been £6.0 billion, and so £10.1 billion (63%) less than the outturn.

To place the 2023 difference between the Optimistic scenario and the outturn in terms of direct impact in context, this is equivalent to a loss of 0.37% of UK GDP in 2023; 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 manufacture of plastic products (£9.0 billion) or the wholesale of information and communication equipment (£8.9 billion).

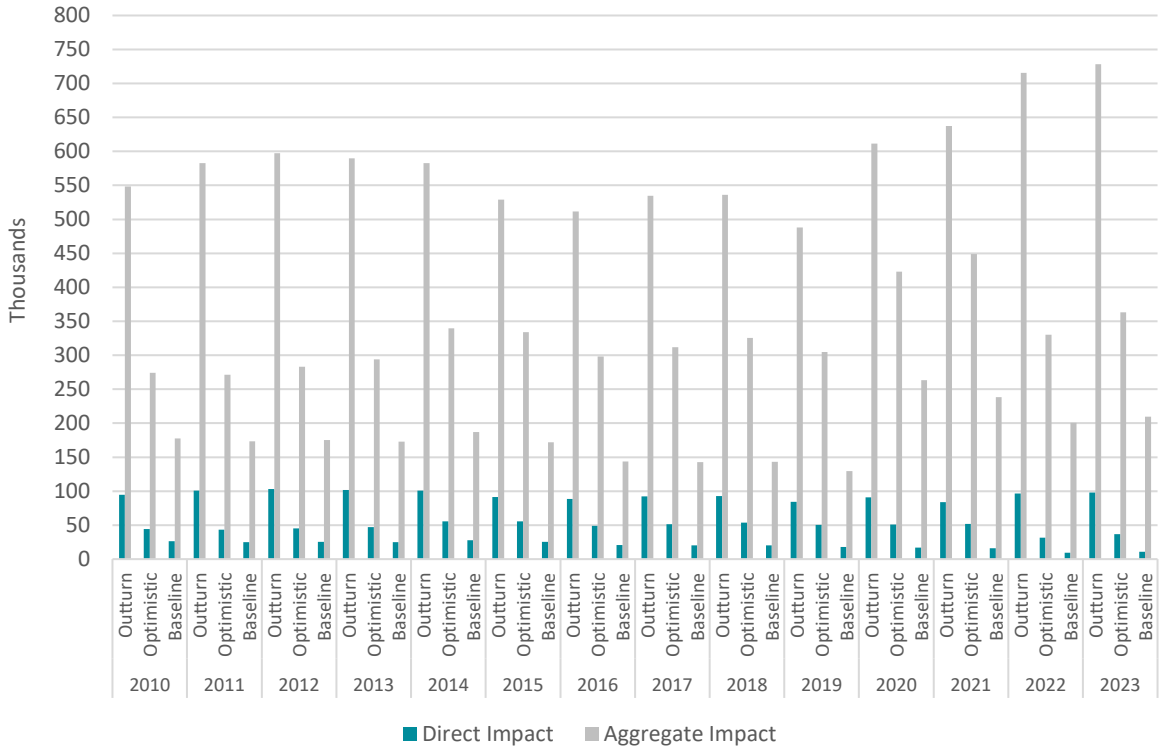
After the indirect and induced impacts are considered, the difference in the GVA contribution is accentuated under the two different scenarios. Under the Baseline scenario, we estimate that due to the decrease in indirect and induced impacts, the shipping industry would only have had a total GVA impact of £6.2 billion in 2023 without the Tonnage Tax regime—£40 billion (87%) less than the outturn total impact of £46.2 billion.

7.5 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 26 shows the projected impact across the years 2010 to 2023 under the two scenarios against the outturn.

Figure 26: The direct and aggregate employment impacts of the UK shipping industry under alternative scenarios



Source: UKCoS, DfT, ONS, Cebr analysis

In 2023 the shipping industry directly supported 98,200 jobs, but under the Baseline scenario this direct employment contribution would have been only 10,800 jobs; this is equivalent to a reduction of 89%. Even under the Optimistic scenario, there would only have been 36,700 jobs—61,600 (63%) fewer than the outturn—for UK employees in the shipping industry in 2023 had the Tonnage Tax regime not been introduced.

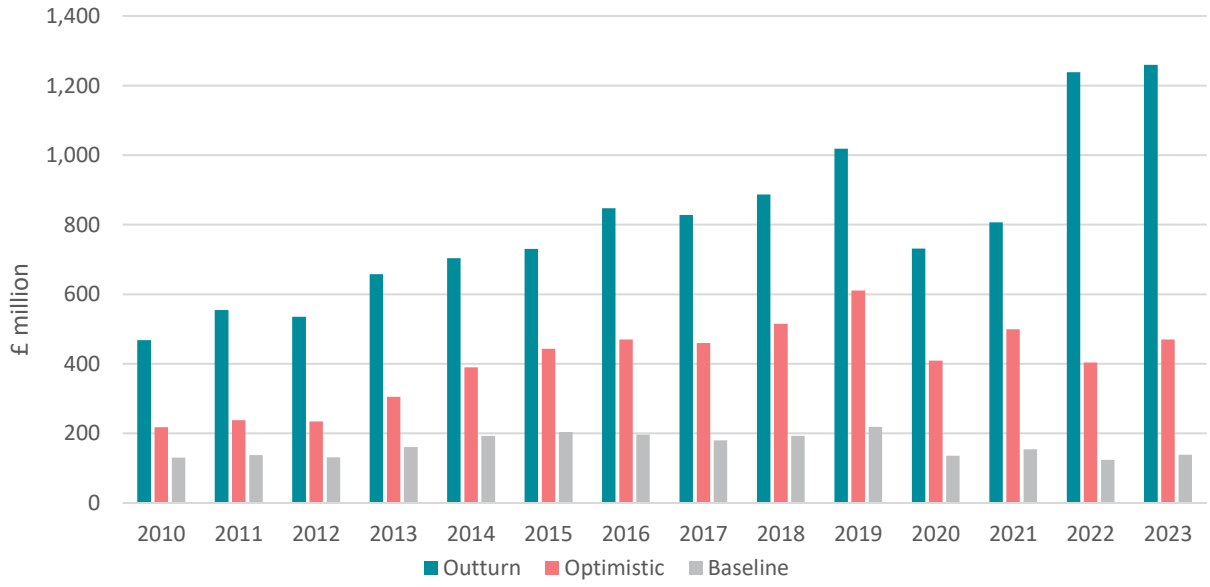
To place the 2023 difference in direct employment impact between the Optimistic scenario and the outturn in context, this is equivalent to a loss of 0.18% of total UK employment; expressed in terms of the contribution of a sector, this would be more significant to the UK economy than losing the entire direct employment contribution from the textile manufacturing industry (48,000 jobs) or the programming and broadcasting activities (50,000 jobs).

Once the indirect and induced impacts are considered as part of the Optimistic scenario, we estimate that without the Tonnage Tax regime, a total of 363,300 jobs would have been supported by the shipping industry across the UK economy in 2023, 50% fewer than the outturn of 728,200 jobs.

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

After considering GVA and employment impacts, Figure 27 shows the contribution of the shipping industry to the UK Exchequer under each of the scenarios against the outturn. A total of £1.3 billion in tax revenues was raised from the industry in 2023; under the Baseline scenario, this contribution would have fallen to £138 million (89% less than the outturn); under the Optimistic scenario, it would have been £470 million (63% less).

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

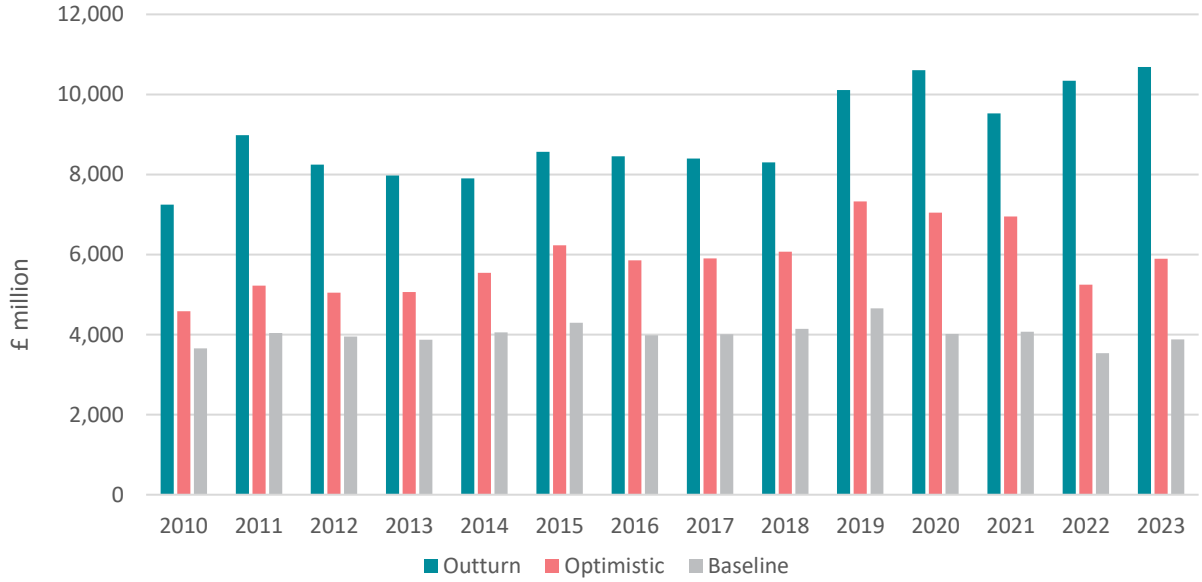


Source: UKCoS, DfT, ONS, Cebr analysis

Figure 28 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 28: The contribution of the UK shipping industry to service exports under alternative scenarios

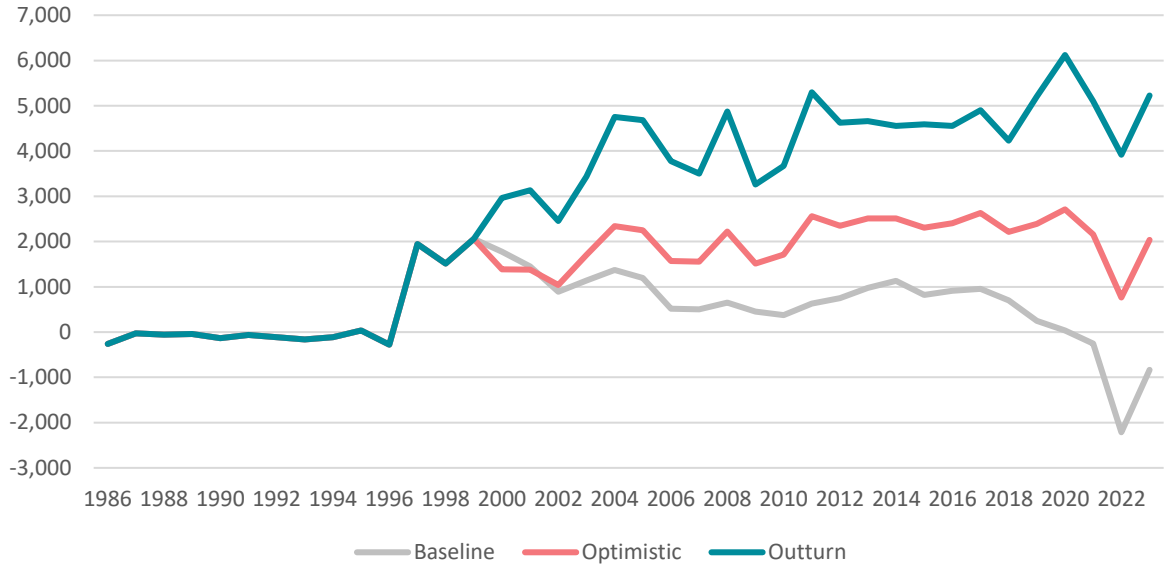


Source: UKCoS, DfT, ONS, Cebr analysis

Under the 'Baseline' scenario, it is estimated that the value of exports from the shipping industry and exports of disbursements from Ports would have been £3.9 billion in 2023, in comparison to the outturn of £10.7 billion. Even under the Optimistic upper scenario, service exports would have been £5.9 billion, £4.8 billion lower than the outturn.

Finally, following Figure 23 earlier in this section, Figure 29 shows the projected trend in the trade balance of Sea Transport Services exports since 2000 based on the two different scenarios against the outturn.

Figure 29: Sea Transport exports trade balance under alternative scenarios



Source: UKCoS, DfT, ONS, Cebr analysis

Under the Baseline scenario, the trade balance would have been markedly lower throughout the whole period, and turned negative (i.e. the value of Sea Transport imports would have exceeded that of exports) in 2021-2023. Under the Baseline scenario, the trade balance would have been £833 million in deficit in 2023, in contrast to the outturn value of £5.2 billion surplus. Under the Optimistic scenario, the trade balance would have remained positive throughout the entire period, peaking at £2.7 billion in 2020.

Annex A: Full set of direct economic impact by region

Table A.1: Direct economic impact of the shipping industry through turnover, £ million, 2010 to 2023

TURNOVER	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
England	16,894	17,209	18,481	18,706	19,501	19,176	21,085	23,779	27,267	31,206	20,971	24,294	35,317	32,712
Scotland	1,357	2,185	2,470	3,038	3,746	2,536	3,011	3,134	4,472	3,973	3,194	1,613	3,031	3,238
Wales	810	1,191	963	1,063	432	920	741	529	650	249	423	710	1,345	1,016
Northern Ireland	1,062	1,196	1,042	999	1,007	1,261	1,919	2,066	2,034	2,481	314	608	565	468
East of England	656	1,657	1,292	1,411	1,406	977	2,062	1,520	2,302	1,616	2,088	1,370	2,240	4,771
East Midlands	103	36	55	77	1,095	52	87	107	102	128	58	151	53	55
London	2,211	7,282	6,941	6,417	6,764	10,224	7,441	8,457	8,620	11,646	8,436	8,899	13,232	9,173
North East	58	208	153	172	238	280	71	93	246	219	319	164	143	146
North West	619	1,814	1,741	1,939	2,216	1,693	2,285	2,343	3,783	4,431	1,764	5,495	5,987	4,224
South East	4,908	4,832	6,085	6,691	6,565	4,561	7,717	9,435	9,542	11,459	6,029	6,146	11,235	11,964
South West	7,884	749	1,114	1,228	635	853	840	1,377	1,312	765	1,308	380	1,036	1,093
West Midlands	199	114	34	159	466	82	291	155	743	440	668	541	854	823
Yorkshire and the Humber	256	516	1,067	612	115	454	292	293	619	503	300	1,149	537	463

Source: UKCoS, FAME, ONS, Cebr analysis

Table A.2: Direct economic impact of the shipping industry through GVA, £ million, 2010 to 2023

GVA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
England	5,173	5,359	5,287	5,905	6,040	5,683	6,580	6,338	7,265	7,967	6,376	7,251	13,375	13,584
Scotland	591	722	833	799	1,006	799	1,062	1,064	1,559	1,330	1,134	479	1,366	1,846
Wales	227	298	244	278	201	276	349	158	251	73	139	175	471	425
Northern Ireland	255	321	291	275	239	274	424	344	419	420	102	238	244	224
East of England	379	452	303	430	460	276	673	400	532	377	718	471	877	1,960
East Midlands	83	16	18	53	327	25	39	40	30	43	19	68	25	31
London	2,226	2,556	2,144	2,343	2,623	3,006	2,349	2,028	1,690	3,001	2,371	2,628	5,465	3,657
North East	55	63	44	46	70	88	30	34	75	71	141	74	76	76
North West	436	468	380	545	535	430	647	542	620	823	516	1,676	2,234	1,629
South East	1,360	1,381	1,613	1,868	1,646	1,342	2,264	2,659	3,628	3,134	1,671	1,538	3,469	4,891
South West	263	215	460	387	206	315	357	512	363	267	563	121	552	671
West Midlands	156	37	17	45	135	29	99	42	143	124	309	238	459	459
Yorkshire and the Humber	215	171	309	189	38	171	122	82	184	127	67	436	219	209

Source: UKCoS, FAME, ONS, Cebr analysis

Table A.3: Direct economic impact of the shipping industry through employment, jobs, 2010 to 2023

EMPLOYMENT	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
England	75,340	78,235	80,700	80,101	79,612	72,717	67,490	73,776	72,590	68,103	70,877	69,506	80,044	80,569
Scotland	10,019	11,338	13,040	12,147	14,042	10,427	11,449	12,055	13,404	11,341	15,911	7,808	10,426	12,480
Wales	4,843	5,525	4,274	5,226	3,339	4,180	4,433	1,944	2,007	687	2,713	3,668	4,418	3,655
Northern Ireland	4,586	5,621	5,197	4,473	3,697	4,081	5,076	4,638	4,651	4,215	1,410	2,678	1,636	1,517
East of England	6,601	8,094	5,465	7,008	7,333	4,324	8,221	5,537	6,836	3,688	7,217	4,304	5,258	11,638
East Midlands	1,577	279	361	785	5,505	346	586	656	300	332	300	609	217	242
London	24,424	30,613	27,366	24,402	28,033	33,534	19,419	20,958	20,031	22,939	14,396	14,967	19,815	15,365
North East	1,003	1,245	927	790	1,200	1,462	393	460	823	756	1,562	704	423	473
North West	7,652	8,639	7,389	8,951	8,872	7,477	8,213	8,369	9,059	9,390	5,229	13,973	12,439	9,845
South East	21,946	21,286	24,182	27,274	22,305	17,075	23,156	28,745	27,120	25,290	29,361	25,683	32,744	33,034
South West	5,090	4,043	8,358	6,814	3,462	5,085	4,592	7,277	3,976	2,767	8,637	2,610	4,746	5,435
West Midlands	2,998	648	247	714	2,270	431	1,300	680	2,272	1,527	3,017	2,066	2,628	2,917
Yorkshire and the Humber	4,050	3,387	6,405	3,363	631	2,983	1,609	1,094	2,175	1,414	1,158	4,589	1,774	1,619

Source: UKCoS, FAME, ONS, Cebr analysis

Table A.4: Direct economic impact of the shipping industry through the compensation of employees, £ million, 2010 to 2023

COE	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
England	2,620	2,626	2,890	2,879	2,776	2,733	2,747	2,871	2,736	2,715	2,784	3,165	3,874	3,606
Scotland	334	361	432	522	848	546	633	622	782	619	797	397	631	692
Wales	115	287	128	196	75	143	146	55	55	25	97	151	219	169
Northern Ireland	216	226	179	122	105	174	264	177	185	159	45	69	68	62
East of England	199	358	269	295	296	185	412	221	314	167	401	210	392	826
East Midlands	28	6	11	26	188	13	11	10	9	18	9	25	7	7
London	579	971	853	813	834	1,303	817	957	742	843	521	592	931	636
North East	24	53	49	38	48	70	13	13	28	27	62	25	23	23
North West	225	380	342	359	380	395	402	408	495	449	321	862	844	527
South East	1,321	654	992	1,033	861	528	895	1,050	903	1,046	1,082	1,156	1,368	1,336
South West	87	77	157	168	63	154	112	153	81	73	166	51	101	92
West Midlands	67	23	6	31	91	17	49	26	96	42	171	77	141	115
Yorkshire and the Humber	89	105	211	116	16	68	37	34	69	50	51	166	67	45

Source: UKCoS, FAME, ONS, Cebr analysis

Annex B: Technical notes

This annex sets out the methodology underpinning the analysis in Section 7. The purpose of the modelling is to estimate the structural relationship between UK shipping fleet growth and key macroeconomic drivers, and to simulate counterfactual scenarios in the absence of the Tonnage Tax regime. The models are not intended for short-term forecasting, but for understanding longer-run shifts in deadweight tonnage (DWT) growth under different policy scenarios.

Baseline specification

After exploring and interrogating potential independent variables as suggested by economic theory and statistical fit, the following set of variables was selected for the main regression specification:

Dependent variable:

- Annual growth in UK-owned shipping fleet deadweight tonnage, sourced from the Department for Transport (DfT).

Independent variables:

- Growth in total UK trade (imports + exports), sourced from UNCTADstat.
- Growth in the Baltic Dry Index (BDI), serving as a proxy for bulk freight rates (Macrobond).
- Lagged growth in oil prices (UK Brent), from UNCTADstat.
- A Tonnage Tax dummy set to 0 for years up to 1999 and 1 from 2000 onward.

The model is estimated using annual data for 1987–2019, excluding the COVID-19 period due to the presence of extreme outliers and structural anomalies.

All variables are expressed in first differences (i.e. growth rates) to address non-stationarity and allow the model to capture dynamic responses to shocks. While formal stationarity tests (ADF) suggest some differenced variables may still exhibit unit root properties, this does not materially affect the model's role in structural policy evaluation.

The inclusion of lagged oil price growth is empirically justified and statistically significant in the Baseline model. While one might expect oil price increases to suppress shipping activity due to higher fuel costs, we observed a positive coefficient, which likely reflects broader macroeconomic conditions. Oil price increases often coincide with global demand expansions, which also drive higher trade volumes and investment in shipping capacity. The one-year lag structure supports this interpretation, suggesting that oil prices serve as a proxy for global economic momentum that influences fleet decisions with a delay.

A key specification decision was the exclusion of explicit time trends or post-2000 trend breaks. This methodological choice was made because tonnage growth was on a steeply declining path pre-2000. Hence, including time trends would have absorbed much of the structural shift associated with the introduction of the Tonnage Tax regime, creating an overcontrol problem. Instead, the Tonnage Tax dummy is interpreted as capturing a discrete post-policy level shift, conditional on macroeconomic factors. Alternative specifications including time trends were

tested but ultimately rejected, as the trend variables absorbed nearly all the variation in deadweight tonnage growth. This resulted in flat and uninformative counterfactual scenarios, limiting the model's usefulness for assessing the impact of the Tonnage Tax regime conditional on observed macroeconomic drivers.

The Tonnage Tax dummy reflects a policy regime shift rather than a direct causal estimate. It captures the average uplift in DWT growth post-2000, net of macroeconomic conditions. This allows a credible simulation of a counterfactual scenario in which the tonnage tax regime was not introduced.

Optimistic scenario

To complement the baseline model, a quantile regression was estimated at the 75th percentile ($\tau = 0.75$) of the conditional DWT growth distribution. This retains the same covariates as the baseline model but focuses on years in which fleet growth was relatively high, conditional on fundamentals.

Quantile models estimate relationships across different parts of the distribution rather than the mean by minimising a weighted sum of absolute residuals, with weights reflecting the chosen quantile (for example, at $\tau = 0.75$, underpredictions are penalised more heavily than overpredictions). This makes them particularly useful for understanding best-case or high-performing scenarios. They are also robust to outliers and heteroskedasticity, while avoiding strong distributional assumptions about the error term.

The 75th percentile specification serves as an Optimistic benchmark, representing how DWT growth may have responded more strongly to the same underlying macroeconomic conditions, that is, assuming a more favourable elasticity of response to factors such as trade growth, freight rates, and oil price dynamics, rather than stronger structural conditions themselves.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