



The economic contribution of the Maritime sector in Scotland

A report for Maritime UK

September 2017

Cebr

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Executive Summary

- The Centre for Economics and Business Research (Cebr) has been commissioned by Maritime UK to quantify the economic contribution of the Maritime sector in Scotland. This report forms one of seven reports which also assess the contribution of the Maritime sector, as a whole, at industry-level and in the Solent Local Enterprise Partnership (LEP).
- **In this context, the Maritime sector has been defined as consisting of the Shipping, Ports, Marine and Maritime Business Services industries.** Each of these entities comprises a multitude of different activities, data for which has been aligned against the national accounts framework. However, further work may be necessary to define in greater detail the Maritime sector and its constituent industry activities, in order to fully capture the associated (and substantive) economic activity.
- The Maritime sector in Scotland makes a substantive macroeconomic contribution to the Scottish and UK economies through business turnover, Gross Value Added (GVA), employment and through the compensation of employees. **It is estimated that the Maritime sector directly supported just under £9.3 billion in turnover, £3.6 billion in GVA and 39,300 jobs in Scotland in 2015.** This respectively equates to approximately 23% of turnover, 25% of GVA and 21% of employment directly supported by the UK-wide Maritime sector in 2015. Scotland therefore accounted for approximately one-fifth of the UK Maritime sector by these measures of economic activity (and one-quarter in the case of GVA).
- With a large proportion of employment in the Marine Oil and Gas activities concentrated in Scotland, **the Marine industry is the largest constituent industry within the Scottish Maritime sector in terms of economic activity, directly contributing £2.9 billion in GVA and directly supporting around 30,900 jobs in 2015.** This compares to £440 million and £200 million in GVA directly contributed by the Shipping and Ports industries respectively in Scotland.
- **Not only this, employees in the Scottish Maritime sector are found to be highly productive in the six years considered in this study.** The average job is estimated to have contributed around £91,600 in GVA in 2015; this compares favourably to productivity in the UK Maritime sector of £77,900 and £48,971 across Scotland in general. There is thus a large proportion of high value jobs in the Scottish Maritime sector.
- By extension of its significant direct contributions to GVA and employment, the Maritime sector in Scotland also helps to raise a significant amount of tax revenue each year for the UK Exchequer. **The Maritime sector contributed an estimated total of £1.1 billion in tax revenues in 2015, spread across VAT, Corporation Tax, Income Tax, National Insurance Contributions (NICs) and Business Rates,** an increase from just under £850 million in 2010.
- After quantifying the aggregate economic impacts through the industry supply chains and induced effects on expenditures, **it is estimated that the Maritime sector in Scotland helped to support a total of £7 billion of GVA in 2015,** an increase from £6.5 billion in 2010. This implies that, for every £1 in GVA directly contributed by the Maritime sector in 2015, a total of £1.94 in GVA is generated across the wider Scottish and UK economies.
- These aggregate economic impacts associated with the Scottish Maritime sector also extend to business turnover, employment and the compensation of employees. **It is estimated that the Maritime sector in Scotland helped to support a total of £17.1 billion in turnover (through business turnover), 130,000 jobs and £6.7 billion through the compensation of employees in 2015.**

1 Introduction

Cebr is pleased to present this report to Maritime UK and Scottish Enterprise on the economic impact of the Maritime sector in Scotland. In this context and henceforth, the “Maritime sector” is defined as comprising the Shipping, Ports, Marine and Maritime Business Services industries.

This report forms one of seven reports focusing on the economic contribution of the UK Maritime sector, with the other reports focusing on the economic contribution of each of the four industries at UK level, the economic contribution of the sector in Scotland, and the sector at UK-level. It is therefore important to consider this report as part of the wider framework set out in the six reports, which set out the impact of the Maritime sector both at a national and regional level. Our examination spans the period from 2010 to 2015 inclusive, with the latter being the latest year for which full data are available, and endeavours to capture the full economic ‘footprint’ of the Maritime sector in Scotland. As such, our report is not confined to direct ongoing contributions to GDP and employment through operations and activity in Scotland, but also provides assessments of the associated indirect and induced multiplier impacts.

1.1 About Maritime UK

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

1.2 Purpose of this report

This report provides an in-depth assessment of the economic contribution that the Maritime sector makes to Scotland’s economy. As such, our analysis combines Cebr’s estimates for the economic contribution of the Maritime sector at UK-level with regional analysis and insights in order to produce estimates for Scotland. Scotland is a leading region for the UK Maritime sector, hosting a number of both major and minor ports, in addition to substantial marine activity supporting the Oil and Gas industry in the North Sea.

This study seeks to equip Maritime UK and Scottish Enterprise with statistics and figures on the value of the Maritime sector to the Scottish economy. As such, Cebr has focused on the following key economic indicators: employment; Gross Value Added (GVA); the compensation of employees and the Exchequer contribution (through tax revenues raised).

1.3 Overview of the study and methodology

Purpose of the study

This report provides a thorough and comprehensive examination of the role of the Maritime sector in the Scotland. It presents a range of analyses demonstrating different aspects of the value contributed by the Maritime sector, including direct contributions to GDP and employment, indirect and induced multiplier impacts and the Maritime sector’s contribution to the Exchequer through tax revenues raised.

An important task has been to develop an in-depth understanding of the Maritime sector both in the UK and in Scotland. To produce a robust study, it is necessary to interrogate the available data to ensure that it captures the full range of activities that should be included in establishing the aggregate economic ‘footprint’ of the Maritime sector in Scotland. Following the collation of the necessary data capturing these activities, the values of key economic indicators were established to demonstrate the impact of the Maritime sector in Scotland. The key macroeconomic indicators include:

- GVA¹ contributions to Scottish and UK GDP generated by the Maritime sector in Scotland, directly and through indirect and induced multiplier impacts.
- Jobs supported by the Scottish Maritime sector, including direct, indirect and induced jobs through regional multiplier impacts.
- The value of employee compensation² generated by the Scottish Maritime sector, representing the total remuneration of employees.
- The Exchequer contribution of Scotland's Maritime sector through tax revenues raised.
- The direct contribution made by the Maritime sector through Scottish exports of goods and services.

Mapping the UK Maritime sector in the UK and Scotland

The first stage of the study has involved mapping the activities of the Maritime sector against the national accounts framework, in order to establish clarity on the precise definition of the Maritime sector as it maps against the Standard Industrial Classification (SIC) framework.³ For most activities, particularly those of the Shipping industry, economic activity can be captured through a particular 3, 4 or 5-digit SIC code.

In essence therefore, this involves taking each of the four Maritime industries and their constituent activities, and mapping these to the most relevant Standard Industrial Classification (SIC) code in order to identify the activity's economic data. For example, "Transport of Passengers and International Sea Faring", identified as an activity of the Shipping industry, can be identified through SIC code 50100 within the National Accounts framework. However, some Maritime sector activities do not map neatly onto the SIC framework; this has required Cebr to draw upon government or industry sources to quantify the contributions made through these activities.

Data Sources

After completing the mapping of Maritime sector activities, data for the macroeconomic indicators listed above have been obtained and collated by firstly interrogating the indicators gathered at UK level for the Maritime sector, and disaggregating this at Scottish-level using a combination of publicly-available data sources, industry sources and local estimates.

For those Maritime sector activities which are in alignment with the SIC framework and are available on a disaggregated basis, the main source of information used in this study is Bureau van Dijk's Financial Accounts Made Easy (*FAME*) database. *FAME* provides detailed information on UK and Irish companies as taken from annual reports and other sources up to the latest available year. *FAME* has been used to establish the aggregated contribution of businesses in the Maritime sector to the UK economy in terms of turnover, employee numbers and GVA. We also evaluate the breakdown of these business contributions by SIC industrial sector, using the primary and secondary five-digit UK SIC (2007) codes associated with for each company in *FAME*.

¹ GVA, or gross value added, is a measure of the value from production in the national accounts and can be thought of as the value of industrial output less intermediate consumption. That is, the value of what is produced less the value of the intermediate goods and services used as inputs to produce it. GVA is also commonly known as income from production and is distributed in three directions – to employees, to shareholders and to government. GVA is linked as a measurement to GDP – both being a measure of economic output. That relationship is $(GVA + \text{Tax on products} - \text{Subsidies on products}) = \text{GDP}$. Because taxes and subsidies on individual product categories are only available at the whole economy level (rather than at the sectoral or regional level), GVA tends to be used for measuring things like gross regional domestic product and other measures of economic output of entities that are smaller than the whole economy.

² Compensation of employees is the total remuneration, in cash or in kind, payable by an employer to an employee in return for employers' social contributions, mainly consisting of employers' actual social contributions (excluding apprentices), employers' imputed social contributions (excluding apprentices) and employers' social contributions for apprentices.

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

To capture the contribution of those Maritime sector activities which do not map neatly across the SIC framework, and in order to disaggregate the economic contribution of the sector in Scotland, a variety of other sources have been used. For the former, the study draws upon insight from sector bodies included (but not limited to) British Marine, the Society of Maritime Industries (SMI), BEIS and the UK Chamber of Shipping. A full list of identified Maritime sector activities and sources is set out in Section 2 of the report.

Quantifying the aggregate economic impacts

After collation and interrogation, the resulting Scottish direct economic impacts have then been embedded within Cebr's regional economic impacts models of the UK economy that we use to assess the kinds of impacts that can be associated with an entity such as the Scottish Maritime sector.

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, the compensation of employees, and employment. The three types of impact are:

- **Direct impact:** this is the value generated and jobs supported directly by the economic activities of the Maritime sector in Scotland.
- **Indirect impact:** this is the value generated and jobs supported in industries that supply inputs to Scotland's Maritime sector.
- **Induced:** this is the value generated and jobs supported in the wider economy when the direct and indirect employees of the Maritime sector in Scotland spend their wages and salaries on final goods and services.

These three impacts are then combined to convey the aggregate impact associated with each Maritime industry in terms of business turnover, GVA, employment and the compensation of employees. Cebr has broadly taken a 'top-down' approach to estimate the direct impacts of the four Maritime industries within the Scotland. In effect, this involves taking the UK direct impacts of each defined Maritime industry and applying relevant ratios from publicly-available data sources such as the UK Business Register and Employment Survey (BRES) – as well as private data sources such as Bureau Van Dijk's *Financial Accounts Made Easy* (FAME) database – in order to attribute the contribution from the Maritime sector in Scotland.

For each of the four Maritime industries, the direct impacts are then combined with the regional economic multipliers provided by Cebr's suite of regional input-output models for Scotland, in order to then generate indirect, induced and subsequently aggregate impacts.

1.4 Structure of the report

The remainder of the report is structured as follows:

- Section 2 sets out how the Maritime sector have been defined and identified within Scotland for the purposes of this study.
- Section 3 outlines the direct economic impacts of the Maritime sector within Scotland. We consider the direct impacts through GVA, employment, the compensation of employees, and contribution to the UK Exchequer through tax revenues contributed by the sector.
- Section 4 considers the multiplier impacts of the Maritime sector in Scotland through the activities it stimulates in the local supply chain and in the wider economy when employees directly and indirectly employed by the Scottish Maritime sector spend their wages and salaries in the local and wider economy.

2 The Maritime sector in Scotland

Here we set out how the Maritime sector has been defined for the purposes of the study. On a holistic level, the Maritime sector can be disaggregated into the Shipping, Ports, Marine and Maritime Business Services industries, which in themselves are formed of numerous individual and distinct activities.

2.1 The definition of the Maritime sector and its constituent industries

Maritime UK have provided a list of activities which fall under the auspices of the Maritime sector; Cebr has subsequently undertaken a mapping exercise using this list to identify how each of these four industries aligns with the national accounts. For most Maritime sector 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 Maritime sector in Scotland has therefore be identified as consisting of the following activities. Each of the sub-sectors have been mapped to their sector by Cebr, in order to attribute Standard Industrial Classification (SIC) codes to the activity to allow their direct impacts to be measured.

- **Shipping industry**
 - International transport of passengers;
 - Transport of passengers on inland waterways;
 - International transport of freight;
 - Transport of freight on inland waterways.
- **Ports industry**
 - Warehousing and storage;
 - Port activities and management;
 - Stevedores, cargo and passenger handling;
 - Border agency, HMRC and public sector employees operating in ports.
- **Marine industry**
 - Shipbuilding;
 - Boatbuilding (marine leisure vessels);
 - Marine renewable energy;
 - Marine support activities for offshore oil and gas, engineering and mining;
 - Recreational marine activities, marine finance and legal activities and general marine services;
 - Marine science and academic activities, including government vessels and technical consulting;
- **Maritime Business Services industry**
 - Shipbroking;
 - Maritime insurance, finance and legal services;⁴
 - Ship surveying and classification;
 - Maritime Education (including university courses and cadet training);
 - Maritime consultancy and accountancy.

⁴ These activities are distinct from those Insurance, Financial and Legal activities taking place within the Marine industry, and the contribution of these activities are treated and quantified separately as a result.

There are some well-known examples for each industry. Shipping includes Calmac Ferries Limited and Caledonian Maritime Assets Limited, both on the West coast of Scotland. Ports includes Aberdeen Harbour, the Port of Dundee and the Port of Leith. Next, companies such as BAE Systems and DOF Group (UK) would fall under Marine. Finally, The Clyde Group would be an example of Maritime Business Services.

2.2 Mapping the Maritime sector against the National Accounts framework

Here we set out how the direct economic contribution of the industries and activities listed in the previous subsection have been mapped against the national accounts framework. For activities which do not map neatly against this framework – i.e. when SIC codes cannot be used to accurately reflect or capture a particular Maritime sector-related activity – we outline the industry-level sources to separately quantify the economic contribution. It should be stressed that the Maritime industries as defined here are unlikely to be exhaustive, and that further work may be necessary to fully capture the fullest extent of activities taking place in the Maritime sector, several of which are often difficult to define within the existing National Accounts framework. There may therefore be a greater role for the UK Government to expand the existing definition of the Maritime sector, such that the true value of economic activity supported is then measured.

The Shipping and Ports industries

Table 1 below shows how activities for the Shipping and Ports industries have been identified, and the data sources used to capture and quantify the associated economic activity.

Table 1: Mapping of Maritime sector activities: Shipping and Ports industries

INDUSTRY	ACTIVITY	MAPPING	SOURCE(S) USED
SHIPPING	Transport of Passengers International / Sea Faring	Identified through SIC code 50100, "Sea and Coastal Passenger Water Transport".	FAME, BRES
	Transport of Passengers on Inland Waterways	Identified through SIC code 50300, "Inland Passenger Water Transport".	FAME, BRES
	Transport of Freight International/ Sea Faring	Identified through SIC codes 50200 and 77342, "Sea and coastal freight water transport", and "Renting and Leasing of Freight Water Transport Equipment".	FAME, BRES
	Transport of Freight on Inland Waterways	Identified through SIC code 50400, "Inland Freight Water Transport".	FAME, BRES
	Other Shipping activity not captured through SIC codes 50100 - 50400	Identified through Chamber of Shipping statistics for shipping-related employment	Chamber of Shipping Manpower Survey
PORTS	Warehousing and Storage	Identified through SIC code 52101, "Operation of Warehousing and Storage Facilities for Water Transport activities". Activities are then mapped to council wards containing major and minor UK ports.	FAME, BRES
	Port Authority Management, Security and Marshals, Marine and Vessel Management Services, Marine Pilots, Harbour Support, Engineering and Maintenance	Identified through SIC code 52220, "Service activities incidental to water transportation". Activities are then mapped to council wards containing major and minor UK ports.	FAME, BRES
	Stevedores, cargo and passenger handling including crane/vehicle/plant drivers/operators	Identified through SIC code 52241, "Cargo Handling for Water Transport Activities". Activities are then mapped to council wards containing major and minor UK ports.	FAME, BRES
	Border Agency, Home Office and HMRC staff operating in Ports	Identified as public sector employees operating in UK ports. Activities are then mapped to council wards containing major and minor UK ports.	Institute for Government, Port Freight Statistics, Cebr analysis

Source: Maritime UK, Cebr analysis

For the majority of Shipping and Ports 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. Data taken from the ONS Business Register of Employment Survey (BRES) has then been used to disaggregate national level data at Scotland-level. In the case of activities for the Ports industry, only activity taking place in council wards in Scotland which contain a major or minor UK port has been captured, on the assumption that warehousing and storage and other activities taking place in these locations relate to the associated port.

The Marine and Maritime Business Services industries

Table 2 below shows how activities for the Marine industry have been identified, and the data sources used to capture and quantify the associated economic activity.

Table 2: Mapping of Maritime sector activities: Marine industry

INDUSTRY	ACTIVITY	MAPPING	SOURCE(S) USED
MARINE	Boatbuilding (marine leisure vessels)	Identified through SIC codes 3012 ("Building of pleasure and sporting boats") as well as the British Marine "Key Performance Indicators for the Leisure, Superyacht and Small Commercial Marine Industry"	British Marine, Cebr analysis
	Marine renewable energy offshore installation, servicing, operation, maintenance and decommissioning	Marine renewable energy activities do not map neatly across the SIC framework. Cebr have therefore drawn upon the BIS report, "The size and performance of the UK-low carbon economy" BIS report (2013) to derive employment, turnover and GVA estimates.	BIS, Cebr analysis
	Marine support activities for offshore oil and gas, engineering and mining	Identified through SIC code 91, "Support activities for petroleum and natural gas extraction".	FAME, Cebr analysis
	Recreational marine activities, marine finance and legal activities and general customer and business marine services	Leisure marine activities do not map neatly across the SIC framework, as they are typically bundled together with others within the leisure industries; this precludes the effective use of FAME to gather economic impact data. Cebr have therefore drawn upon the British Marine "Key Performance Indicators for the Leisure, Superyacht and Small Commercial Marine Industry" to derive employment, turnover and GVA estimates.	British Marine, Cebr analysis
	Marine science and academic activities, including government vessels and technical consulting	Marine scientific activities do not map neatly across the SIC framework, as they are typically bundled together with other activities within the Manufacturing and "Other Scientific and Professional" sectors; this precludes the effective use of FAME to gather economic impact data. Cebr have therefore drawn upon the Society of Maritime Industries (SMI) "Annual Review of UK Marine Scientific Industries reports to gather data.	SMI, Cebr analysis

Source: Maritime UK, Cebr analysis

The Marine sector is defined as encompassing a wide range of activities, ranging from leisure boat manufacturing to renewable energy generation and marine scientific activities. A key source of information used by Cebr to capture marine leisure activities is the Key Performance Indicators (KPI) analysis produced by British Marine. The KPI analysis is produced each year, drawing upon information supplied to British Marine by its membership, such as company turnover and statistics declarations.

KPI analysis covering the years 2010 to 2015 (inclusive) has therefore been used as a major source of information for capturing and quantifying leisure boatbuilding as well as business and customer marine activities.

Table 3 below shows how activities for the Maritime Business Services industry have been identified, and the data sources used to capture and quantify the associated economic activity.

Table 3: Mapping of Maritime sector activities: Maritime Business Services industry

INDUSTRY	ACTIVITY	MAPPING	SOURCE(S) USED
MARITIME BUSINESS SERVICES	Shipbroking	Shipbroking cannot be separately identified from within SIC code 52290 "Other transportation support activities"; the same issue is encountered when attempting to separately identify the Maritime-related share of the wider Financial, Insurance, Legal, Education, Consultancy and Accountancy services. Cebr therefore have drawn upon "The UK's Global Maritime Professional Services: Contribution and Trends" (2016) report to capture UK-level data for these activities.	PwC, Cebr analysis
	Maritime insurance, finance and legal services		
	Maritime Education		
	Maritime consultancy and accountancy		
	Ship surveying and classification	Cebr have identified employment in shipping classification societies by contacting UK-based members of the International Association of Classification Societies (IACS)	IACS, FAME

Source: Maritime UK, Cebr analysis

2.3 Quantifying the direct economic impacts of the industry in Scotland

In this final subsection we set out the approach taken to disaggregate the direct economic impacts at regional level for each Maritime industry. For the majority of Maritime sector activities, the approach taken to disaggregate the direct economic impacts of sector has involved combining the direct economic impacts at UK-level with publicly-available statistics which can be disaggregated at regional level. However, this approach is not always possible, as a result of the difficulties in mapping some activities against the national accounts framework. In these instances, industry-level information has been used to estimate the Scottish proportion of economic activity.

Shipping

In order to disaggregate the economic activity of the Shipping industry, it is firstly necessary to identify the proportion of employment in the Shipping industry across each UK region.

The major source of employment was the Business Register and Employment Survey (BRES)⁵, as accessed through NOMIS. Employment data associated with each Standard Industrial Classification code for the Shipping industry were gathered and an implied regional breakdown estimated after interpolating for some missing information. Shipping employment in Northern Ireland has been estimated using a combination of BRES and the Annual Business Survey, the latter providing the proportion of employment in Northern Ireland across the broader industrial sector categories.

⁵ 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.

Table 4: The breakdown of UK employment in Shipping as implied by BRES and ABS, 2010 to 2015

Ports Employment	2010	2011	2012	2013	2014	2015
England	77.1%	73.6%	76.5%	76.2%	77.8%	79.8%
Scotland	13.0%	14.5%	14.3%	14.0%	15.2%	12.5%
Wales	7.3%	8.3%	5.9%	7.1%	4.6%	5.4%
Northern Ireland	2.6%	3.6%	3.2%	2.8%	2.4%	2.2%
East of England	7.2%	8.3%	5.7%	6.4%	7.3%	4.5%
East Midlands	1.7%	0.6%	0.3%	2.4%	6.6%	3.0%
London	18.8%	21.8%	19.3%	16.9%	21.6%	31.8%
North East	0.9%	1.0%	0.8%	0.7%	1.4%	1.8%
North West	6.9%	7.8%	6.2%	7.1%	7.6%	6.4%
South East	27.6%	25.6%	27.3%	30.2%	26.3%	20.9%
South West	6.7%	4.4%	10.2%	8.0%	3.7%	6.7%
West Midlands	3.5%	1.1%	0.8%	1.3%	2.3%	1.2%
Yorkshire and the Humber	3.8%	3.0%	5.8%	3.1%	1.1%	3.5%

Source: ONS, Cebr analysis

Ports

The first step in disaggregating the economic activity of the Ports industry has been to identify the proportion of employment within council wards which contain a major or minor UK port. It is assumed that employment in Ports-related activities (as set out in Table 4 above) within a council ward containing a UK port directly relates to the port. The major source of employment in council wards used was BRES.

A full list of Scottish ports considered as part of this report is provided in the Annex. As with Shipping employment, Ports employment in Northern Ireland has been estimated using a combination of BRES and the Annual Business Survey, the latter providing the proportion of employment in Northern Ireland across the broader industrial sector categories. Table 5 below shows the proportion of employment in the UK Ports industry which applies to Scotland, as estimated using the approach described above.

Table 5: The breakdown of UK employment in Ports as implied by BRES and ABS, 2010 to 2015

Ports Employment	2010	2011	2012	2013	2014	2015
England	77.6%	77.7%	73.7%	74.4%	73.8%	74.0%
Scotland	15.3%	14.7%	19.8%	19.1%	18.2%	18.2%
Wales	6.1%	6.3%	5.4%	5.4%	6.9%	6.9%
Northern Ireland	1.1%	1.3%	1.1%	1.1%	1.1%	0.9%
East of England	31.5%	34.9%	32.2%	26.2%	27.4%	27.5%
East Midlands	0.3%	0.3%	0.2%	0.2%	0.3%	0.3%
London	0.8%	0.8%	0.8%	0.8%	1.5%	1.5%
North East	6.0%	4.4%	6.4%	10.2%	9.3%	9.3%
North West	5.1%	5.8%	5.3%	7.1%	5.5%	5.5%
South East	9.5%	9.1%	7.4%	8.3%	6.9%	6.9%
South West	5.7%	4.6%	5.2%	5.2%	4.5%	4.5%
West Midlands	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yorkshire and the Humber	18.6%	17.9%	16.1%	16.3%	18.4%	18.4%

Source: ONS, Cebr analysis

The Scottish proportion has then been applied to the UK-level estimates for Ports employment, with the other key macroeconomic indicators (GVA, Business Turnover and Compensation of Employees) estimated using the implied ratios to employment at UK-level.

Marine

A key source informing the regional disaggregation of the economic activity of the Marine industry is the British Marine Key Performance Indicators, providing the share of leisure marine industry revenue, employment, exports and business numbers across each UK region between 2010 and 2015. GVA for the leisure marine industry in each region has then been estimated using GVA-to-employment ratios.

Following the approach taken for the Shipping and Ports industries (see above), a combination of data sourced from BRES and the Annual Business Survey have been used to estimate the proportion of employment in Shipbuilding and Marine Offshore Oil and Gas support activities across each UK region. These are set out in Tables 6 and 7 respectively below.

Table 6: The breakdown of UK employment in Shipbuilding activities as implied by BRES and ABS, 2010 to 2015

Ports Employment	2010	2011	2012	2013	2014	2015
England	68.8%	68.8%	67.6%	67.5%	64.7%	69.4%
Scotland	26.4%	26.0%	28.0%	27.4%	30.4%	25.1%
Wales	1.5%	1.7%	1.2%	1.4%	0.7%	1.3%
Northern Ireland	3.2%	3.5%	3.2%	3.7%	4.2%	4.2%
East of England	3.1%	1.3%	1.0%	2.1%	1.3%	1.9%
East Midlands	0.4%	0.7%	0.9%	0.7%	0.9%	0.2%
London	0.1%	0.1%	0.8%	0.0%	0.3%	0.2%
North East	4.4%	3.0%	2.3%	1.4%	1.0%	0.8%
North West	26.4%	26.0%	28.0%	27.4%	30.4%	37.7%
South East	11.0%	8.7%	10.5%	8.0%	3.9%	2.9%
South West	22.0%	26.0%	23.3%	27.4%	26.1%	25.1%
West Midlands	0.7%	0.4%	0.5%	0.2%	0.2%	0.2%
Yorkshire and the Humber	0.7%	2.6%	0.2%	0.2%	0.7%	0.4%

Source: ONS, Cebr analysis

Table 7: The breakdown of UK employment in Marine Offshore Oil and Gas activities as implied by BRES and ABS, 2010 to 2015

Ports Employment	2010	2011	2012	2013	2014	2015
England	8.1%	12.0%	16.2%	13.7%	11.1%	7.4%
Scotland	91.4%	87.5%	83.4%	85.8%	88.5%	91.9%
Wales	0.5%	0.5%	0.4%	0.5%	0.4%	0.7%
Northern Ireland	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
East of England	1.9%	2.2%	2.6%	2.1%	1.6%	2.0%
East Midlands	1.4%	1.5%	1.8%	1.2%	1.0%	1.5%
London	1.0%	1.5%	2.6%	1.4%	0.7%	1.0%
North East	1.4%	1.7%	0.7%	0.2%	0.2%	0.1%
North West	0.5%	0.2%	0.1%	0.0%	0.3%	0.2%
South East	0.4%	2.4%	5.5%	6.0%	3.6%	0.5%
South West	0.5%	1.0%	1.8%	0.8%	0.8%	0.7%
West Midlands	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%
Yorkshire and the Humber	1.0%	1.5%	1.1%	1.9%	2.8%	1.3%

Source: ONS, Cebr analysis

For the Marine renewable energy activities, the proportion of employment in Scotland has been sourced from the BIS report released in 2015, "The Size and Performance of the UK Low Carbon Economy".⁶ Previous analysis by BIS suggested that approximately 18% of employment in the Offshore Wind and Marine renewable energy activities in the UK can be found in Scotland.

Maritime Business Services

⁶ BIS, 2015. "The size and performance of the UK Carbon Economy, Report for 2010 to 2013."

Following discussions with the authors of PwC's 2016 report, "The UK's Global Maritime Professional Services: Contribution and Trends" it has been indicated to Cebr that approximately 80% of the economic activity of the Maritime Business Services industry is concentrated in London.⁷ Therefore, 80% of UK employment and GVA directly supported by the Maritime Business Services industry has been attributed to the London region across all the years considered. The remaining 20% of industry activity has been allocated based on the economic activity of the Ports industry in each region, including Scotland.

For further information on the regional disaggregation of Ports industry activities, please refer to Cebr's separate report on the economic activity of the UK Ports industry.

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 Maritime sector in Scotland, in order to reflect differences in aggregate economic performance between Scotland and the other UK regions. These are as follows:

- To account for regional differences in productivity (GVA per employee), GVA in Scotland has been adjusted using the ONS GVA per employee by region statistics.⁸ For example, the average employee in Scotland in 2015 was 4% less productive than the average UK employee, but was 6% more productive than a worker in the North West.
- To account for regional differences in wages and salaries, estimated wages and salaries paid to employees in the Maritime Business Services industry have been adjusted using differentials taken from ASHE.⁹ For example, the average wage for an employee in Scotland was 4% lower than the national average in 2015.
- 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.

The next sections in this report set out the direct and aggregate economic impacts of the Maritime sector in Scotland, broken down by Maritime industry.

⁷ PwC estimate, 2017.

⁸ ONS, 2017. Subregional Productivity: Labour Productivity (GVA per hour worked and GVA per filled job) indices by UK NUTS2, NUTS3 subregions and City regions.

⁹ Ibid.

3 The direct economic impact of the Maritime sector in Scotland

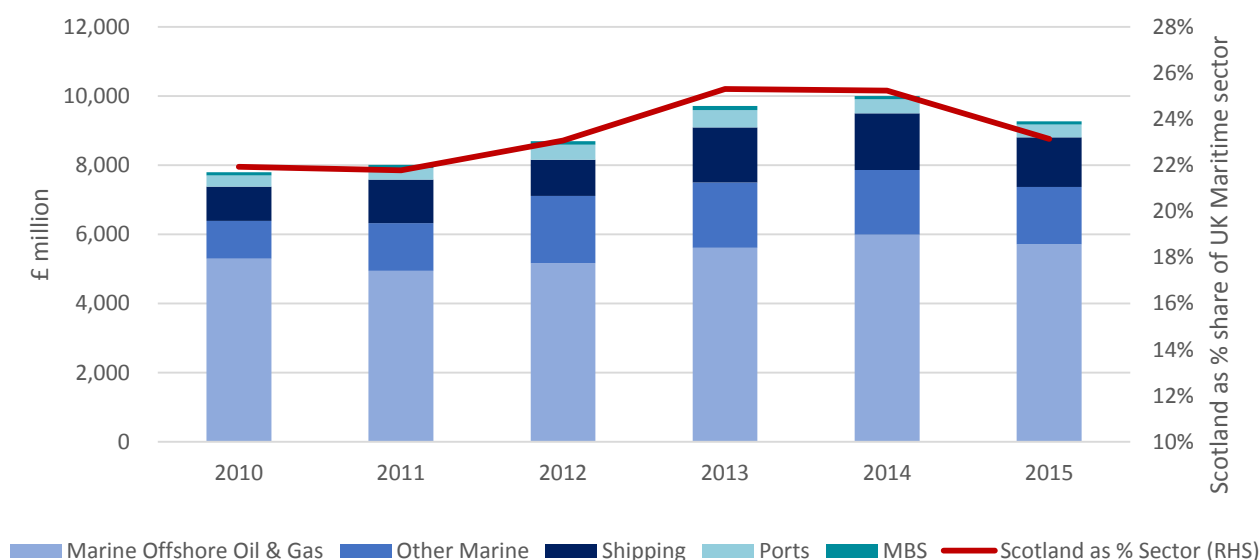
In this section we set out estimates for the direct contribution of the Maritime sector in Scotland across the following key macroeconomic indicators: Business Turnover (turnover), GVA, employment, the compensation of employees, the Exchequer contribution through tax revenues raised, and exports of goods and services. After quantifying the direct contributions made through the first four of these activities, the aggregate contribution that the Scottish-based Maritime sector makes to the Scottish and UK economies is then examined in the following section of this report.

The direct economic impacts of the Maritime sector in Scotland are separated by those contributed by each Maritime industry (Shipping, Ports, Marine and Maritime Business Services). Due to the disproportionately large contribution from Marine Offshore support activities for Oil and Gas extraction in Scotland, this activity is separated from the other activities of the Marine industry (leisure marine, shipbuilding, marine renewable energy and marine scientific activities).

3.1 The direct impact through turnover

We firstly consider the total amount of turnover directly supported by the Maritime sector in Scotland through turnover generated by businesses. Figure 1 below shows the breakdown of business turnover generated by the Maritime sector and its constituent industries in Scotland between 2010 and 2015. Overall, the sector in Scotland generated an estimated £9.3 billion in business turnover in 2015, a fall of 7.3% from the 2014 level but above the period average of £8.9 billion and 2010 level of £7.8 billion.

Figure 1: The estimated turnover of the Maritime Sector in Scotland, and the share of the Maritime sector's aggregate turnover



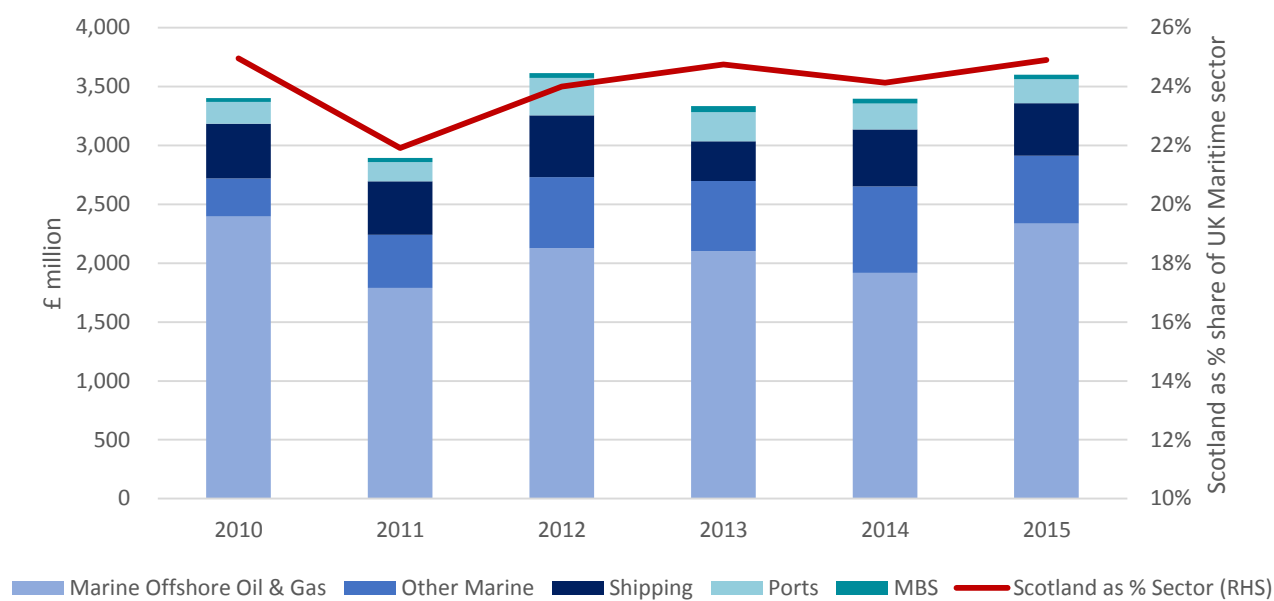
Source: FAME, ONS, Cebr analysis

The Marine industry dominates the business turnover generated by the sector, with 79.5% of the total in 2015 – this is consistent with the other macroeconomic indicators of the Scottish Maritime sector (discussed further below). From within this industry, Marine Offshore Oil and Gas activities directly contributed £5.7 billion of business turnover in 2015; this is unsurprising when the high concentration of this activity's employment is concentrated in Scotland (discussed later in this section). After the Marine industry, Shipping makes the largest contribution to turnover, with £1.4 billion generated in 2015.

3.2 The direct impact through GVA

Following turnover, this subsection illustrates the contributions in terms of the GVA from the Maritime sector in Scotland to Scottish and UK GDP. Figure 2 below shows this direct impact, disaggregated by industry in the years 2010 to 2015 inclusive.

Figure 2: The direct contribution of the Maritime sector in Scotland through GVA, and the Scotland's share of the Maritime sector's total direct contribution through GVA



Source: ONS, FAME, Cebr analysis

It is estimated that the Maritime sector in Scotland directly contributed just over £3.6 billion of GVA in 2015. With steady growth in GVA since a nadir in 2011 – driven largely by a fall in GVA generated by the Marine Offshore Oil and Gas industry – the Scottish sector's GVA now stands above the level seen in 2010 of £3.4 billion.

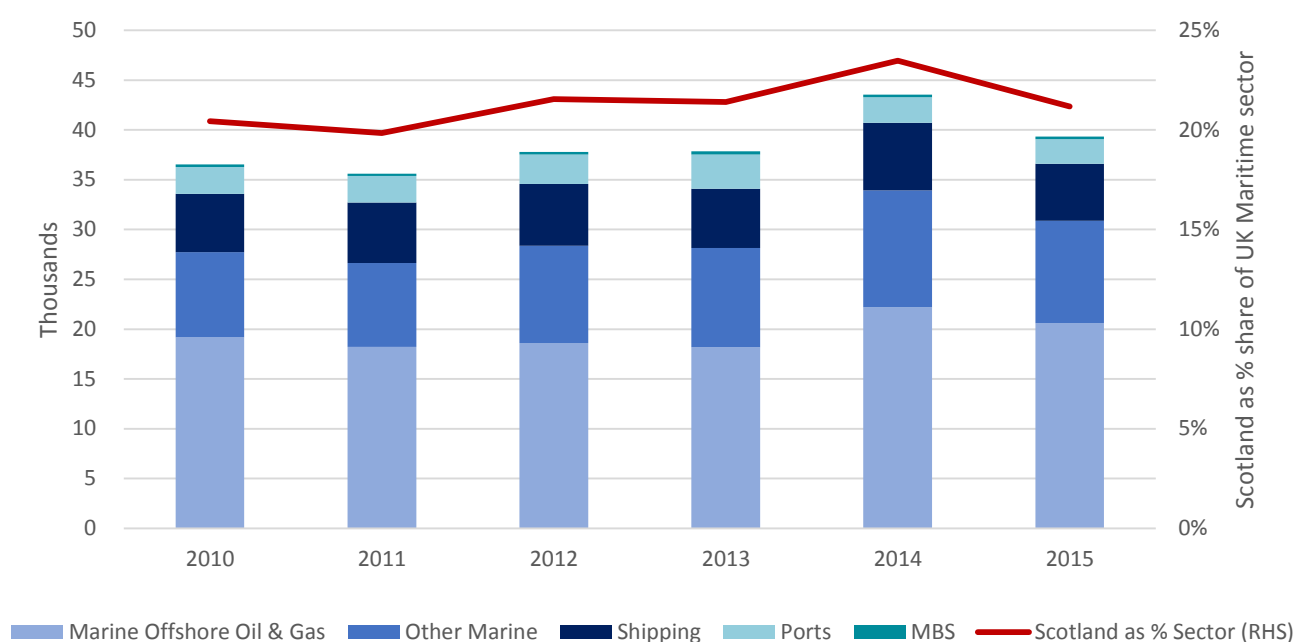
After combining the contribution from each of the Shipping, Ports, Marine and Maritime Business Services industries, it is estimated that the Maritime sector in Scotland represented 24.9% of the direct GVA impact of the entire UK sector in 2015. This share of the direct GVA contribution has remained broadly consistent across the six years considered. As Scotland boasts the majority of economic activity associated with Marine Offshore Oil and Gas – a highly productive sector in terms of GVA generated per job (see further below) – it holds a disproportionately higher share of Maritime sector GVA when compared to the rest of the UK.

As with business turnover, the Marine industry contributed the largest share of GVA in all of the years considered, on average at 79% across the years considered – around 2.9 billion of GVA was directly contributed by the Marine industry in Scotland in 2015. In contrast, Maritime Business Services make a minor contribution to GVA in Scotland, with approximately £40 million in GVA (1.1%).

3.3 The direct impact through employment

This subsection outlines the direct employment impact from the Maritime sector in Scotland. Figure 3 below shows the estimated direct employment impact from the Shipping, Ports, Marine and Maritime Business Services industries in Scotland, in the years 2010 to 2015.

Figure 3: The direct contribution of the Maritime sector in Scotland through employment, and the Scotland's share of the Maritime sector's total direct contribution through employment



Source: ONS, FAME, Cebr analysis

It is estimated that the Maritime sector in Scotland directly contributed 39,300 jobs in 2015, with the total level of employment rising steadily since 2010. Across all industries, the share of UK Maritime sector employment directly contributed in Scotland is estimated to be 21.2% in 2015, with this share rising from 20.4% in 2010 and higher than the period average of 21.3%. Once again, the largest contributions came from Marine Offshore and Gas activities (20,600 jobs in 2015) and the other activities of the Marine industries (10,300 jobs in 2015).

After combining the direct economic impacts of the Scottish Maritime sector through GVA and employment, it is observed that jobs across the sector and each industry are highly productive. Table 8 below shows the levels of productivity across each industry within the Scottish Maritime sector across the years 2010 to 2015. High productivity levels concentrated in Oil and Gas activities helps boost the overall productivity of the Scottish Maritime sector in excess of the UK level.

Table 8: Productivity (GVA per employee) in the Scottish Maritime sector and constituent industries

GVA per employee	2010	2011	2012	2013	2014	2015
UK Maritime sector	£76,273	£73,557	£85,822	£76,130	£75,917	£77,897
Scotland Maritime sector	£93,168	£81,238	£95,602	£88,068	£78,003	£91,550
Shipping	£79,145	£75,117	£84,902	£56,477	£71,696	£77,729
Ports	£68,147	£60,564	£107,235	£71,713	£84,835	£81,634
Marine Offshore Oil & Gas	£124,840	£98,292	£114,459	£115,525	£86,315	£113,414
Other Marine	£37,897	£53,506	£61,481	£59,969	£62,543	£56,162
Maritime Business Services	£154,609	£152,094	£154,498	£165,701	£163,240	£164,740

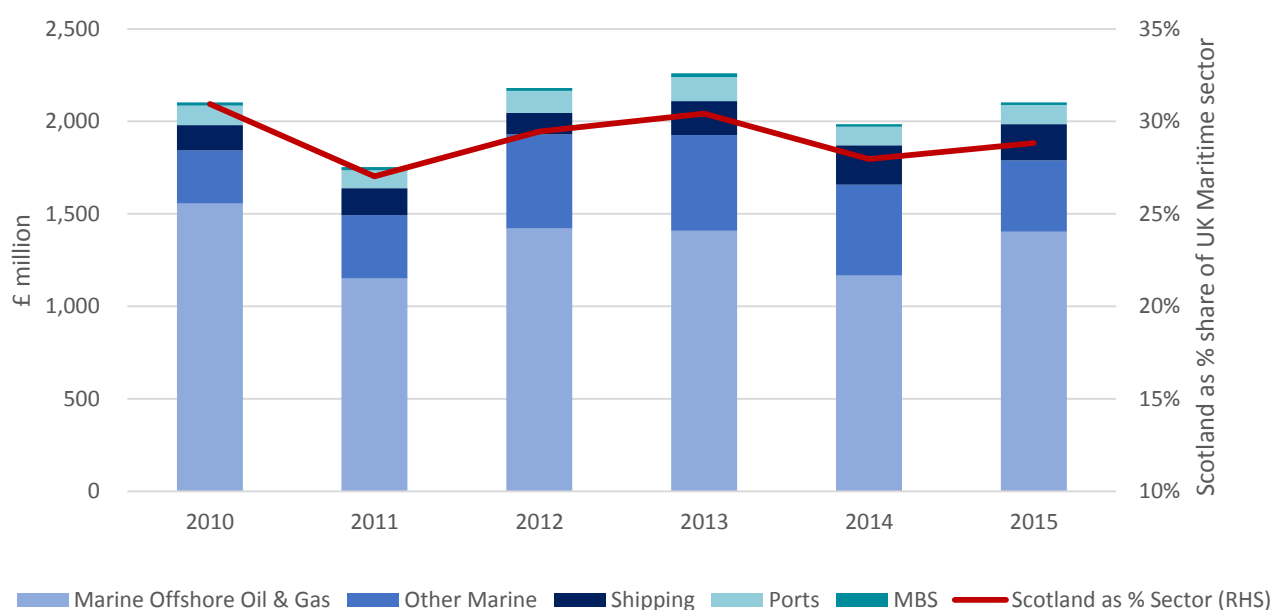
Source: ONS, Cebr analysis

3.4 The direct impact through the compensation of employees

This section considers the compensation of employees which is directly supported by the Maritime sector in Scotland. As noted in Footnote 1 earlier in this report, GVA is commonly known as income from production and that the principal recipients of this income is labour (through employee compensation), capital (shareholders, financiers, depreciation etc.) and government (through taxes on production, chiefly Business Rates). The principal beneficiary in most businesses and in most sectors of the economy are typically employees.

Figure 4 below shows the direct impact through the compensation of employees in the years 2010 to 2015, disaggregated by each Maritime industry in Scotland.

Figure 4: The direct contribution of the Maritime industries in Scotland to the compensation of employees, and the combined industries' share of the total contribution from the UK Maritime sector, 2010 to 2015



Source: ONS, FAME, Cebr analysis

The direct contribution of the Maritime sector to the compensation of employees was £2.1 billion in 2015; this represented approximately 29% of the direct contribution of the Maritime sector as a whole in that year. The 2015 level just exceeded that in 2010, but was 20% larger than the 2011 level of £1.7 billion.

Consistent with its relatively large direct contribution in GVA, the Marine industry contributed 85.1% of the Scottish sector's direct contribution to the compensation of employees in 2015. In absolute terms, the direct contribution to the compensation of employees of the Marine industry remained broadly stable between 2010 and 2015, averaging at around £1.8 billion over the period.

3.5 The direct Exchequer contribution in Scotland

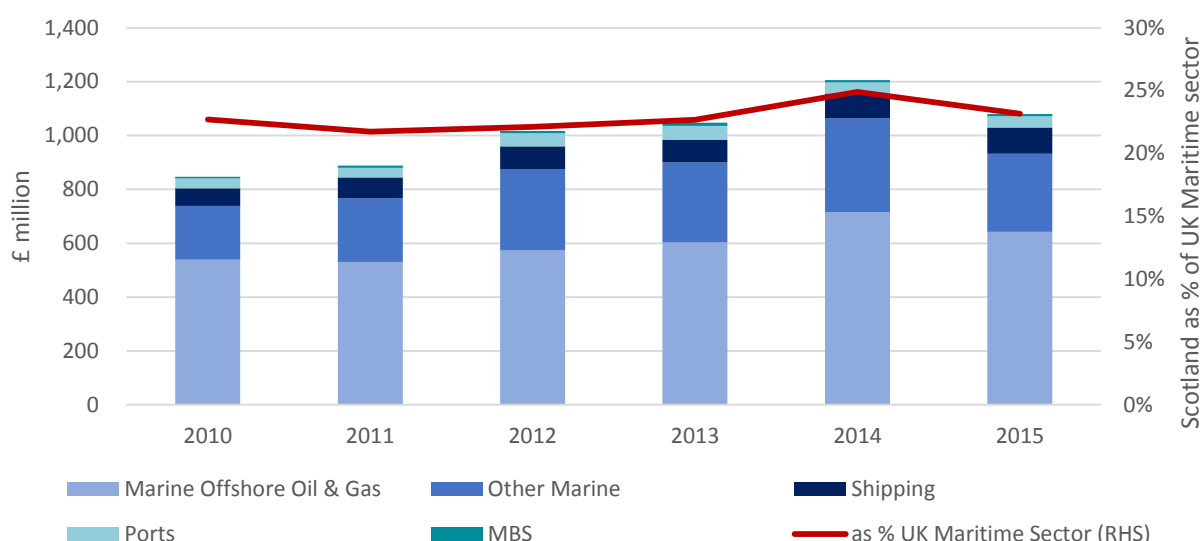
Here we examine the contribution of the Maritime sector in Scotland to the UK Exchequer, through tax revenues raised from Maritime-related activities. In order to capture the incidence of taxation on the direct activities of the sector, Cebr has measured the contribution through revenues raised from the tax heads listed below:

- Income Tax;
- National Insurance Contributions (NICs) – from both Employer and Employee contributions;
- Value-Added Tax (VAT) as paid by businesses operating in the Maritime sector;
- Corporation Tax;
- National Non-Domestic Rates (Business Rates).

For the personal taxes listed above, Income Tax and NICs revenues have been calculated by applying tax rates to the estimated wages and salaries paid to employees operating in the Scottish Maritime sector; rates and thresholds have been sourced from HMRC for the years 2010 to 2015. Wages and salaries for employees have been sourced from the Annual Survey for Hours and Earnings (ASHE)¹⁰ and adjusted for wage differentials in Scotland. For the business taxes listed above, Corporation Tax revenues have been estimated by applying HMRC estimates for Average Effective Tax Rates (AETRs) to the estimated Gross Profit of each Maritime industry. Business Rates have been estimated using the average level of Business Rates paid as a proportion of Maritime sector GVA, taken from the ONS Annual Business Survey.

Figure 5 below shows the direct contribution of the Maritime sector in Scotland to the UK Exchequer in the years 2010 to 2015, and expressed as a share of the total Exchequer contribution from the UK-wide Maritime sector.

Figure 5: The direct UK Exchequer contribution of the Maritime industries in Scotland, 2010 to 2015



Source: ONS, FAME, Cebr analysis

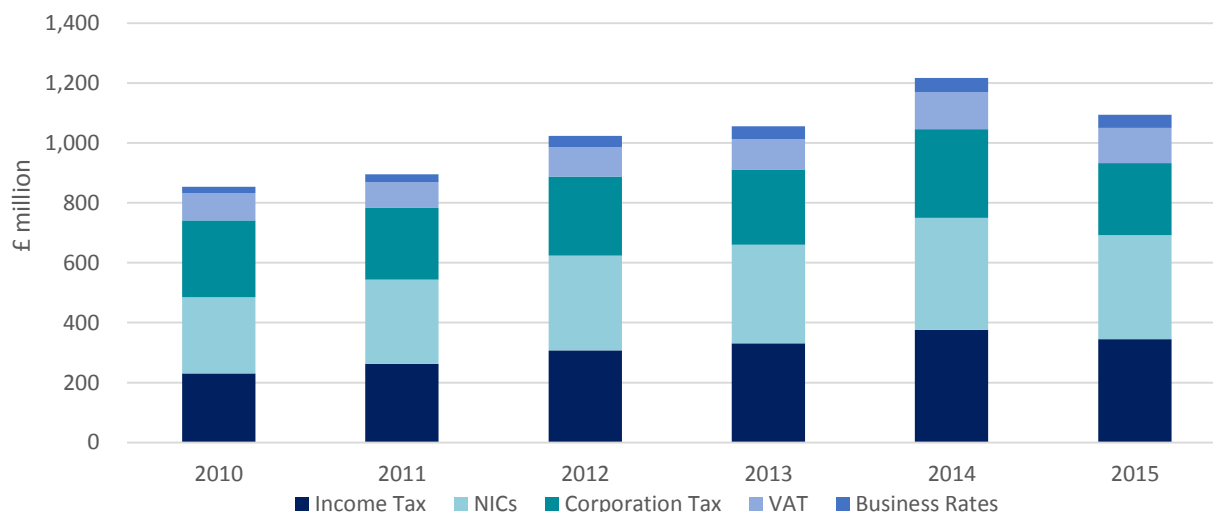
The total Exchequer contribution is estimated to have been just under £1.1 billion in 2015; this direct contribution is estimated to have peaked in 2014 at £1.2 billion. On average, this equates to 22.8% of revenues raised from the entire UK Maritime sector. This relatively large Exchequer contribution is largely driven by the substantial revenues raised from the Marine Offshore Oil and Gas industry; this is mainly due

¹⁰ 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.

to the high concentration of this activity's employment being based in Scotland, and the high proportion of Income Tax and NICs revenues yielded as a result.

Figure 6 below disaggregates the direct contribution by tax head across the years 2010 to 2015. For the years 2010 to 2013, a majority of this direct Exchequer contribution was derived from the Personal Taxes: Income Taxes and NICs.

Figure 6: The direct contribution of the Maritime sector in Scotland to the UK Exchequer by tax head, 2010 to 2015



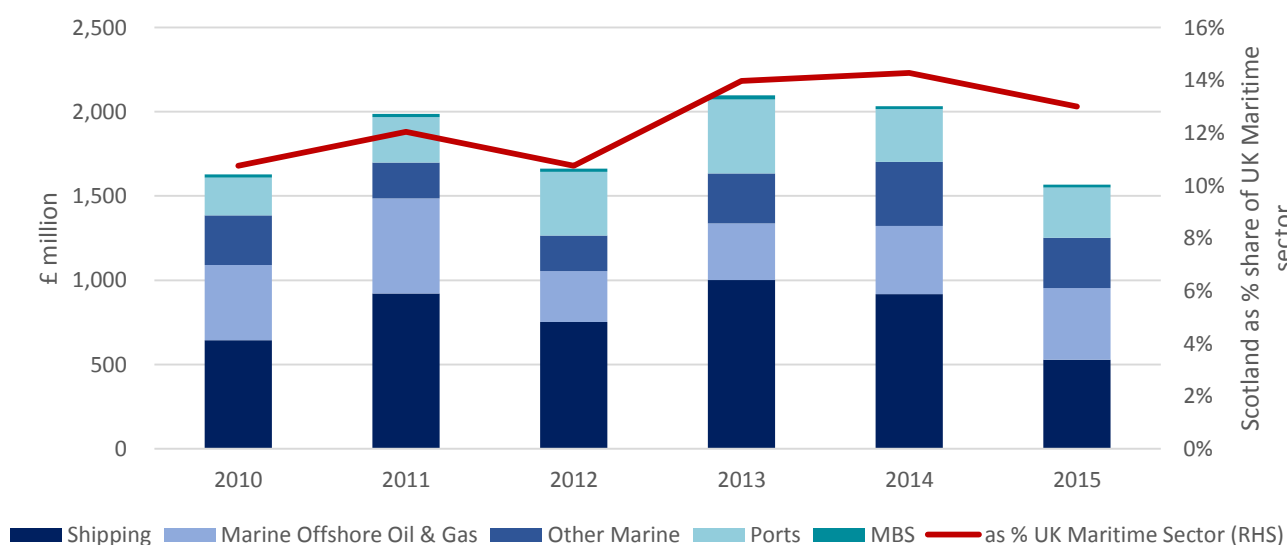
Source: ONS, FAME, Cebr analysis

VAT, Corporation Tax and Business Rates are estimated to have jointly contributed around 52% of the total Exchequer contribution in 2015, an increase from 45% in 2010. Within this VAT represented the largest source of tax revenues, contributing £290 million in 2015.

3.6 The direct contribution through exports

Finally, the Maritime sector in Scotland is also estimated to make a substantive contribution to UK economic activity through the exports of goods and services. Figure 7 below shows the total estimated value of exports between 2010 and 2015; a total value of £1.6 billion of goods and services were exported in 2015, equating to 12.4% of the UK Maritime sector total.

Figure 7: The direct contribution of the Maritime sector in Scotland through exports of goods and services



Source: ONS, FAME, Cebr analysis

4 The aggregate economic impact of the Maritime sector in Scotland

This final section sets out the aggregate economic impacts of the Maritime sector in Scotland, taking into account the indirect (or supply chain) and induced (employee spending) impacts that arise from the activities of firms operating within the sector.

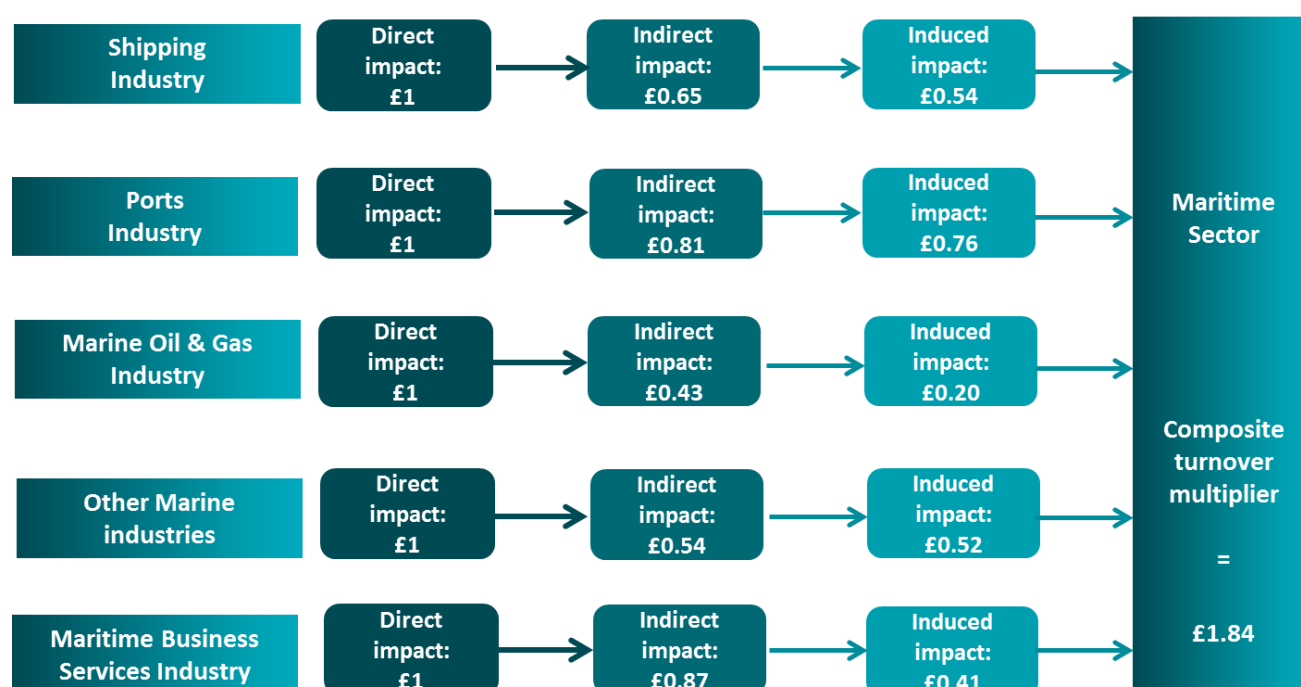
The macroeconomic indicators for which the aggregate economic impact have been calculated are: turnover (through business turnover); GVA; employment; and the compensation of employees. Multipliers have been generated from Cebr's regional economic impact model.

4.1 The aggregate economic impacts through turnover

Figure 8 below illustrates the turnover multipliers for the Maritime sector in Scotland, separated by industry activity. The interpretation is that, for example, for every £1 of direct turnover (generated through business turnover) generated by the Offshore Oil and Gas support activities of the Marine industry, £0.43 worth of GVA is stimulated in the supply chains and £0.20 worth of turnover in the wider economy when direct and indirect (supply chain) employees spend their earnings.

Therefore after combining each industry activity, for every £1 of turnover initially generated by the Maritime sector in Scotland, the Scottish and UK economies as a whole experience an increase in turnover of £1.84.

Figure 8: Turnover multiplier impacts of the Maritime sector in Scotland, 2015



Source: ONS, FAME, Cebr analysis

In general, differences in the magnitude of indirect multipliers reflect differences in the relative complexity of supply chains (with activities that have more complex supply chains usually having higher multipliers); whilst differences in induced multipliers reflect differences in how the spending of those associated with the direct and indirect impacts propagates through the economy.

Table 9 below shows the estimated aggregate turnover impacts from the individual Maritime industries when taken in isolation. The Maritime sector directly contributed just under £9.3 billion in turnover in

Scotland in 2015; once the indirect and induced economic channels are taken into consideration the industries contributed just under £17.1 billion in turnover.

Table 9: Turnover impact by each Maritime industry in Scotland in 2015, £ million

Turnover in 2015	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	9,265	4,698	3,095	17,058
Shipping	1,441	943	782	3,165
Ports	370	298	282	950
Marine Offshore Oil & Gas	5,715	2,481	1,142	9,338
Other Marine	1,649	898	853	3,400
Maritime Business Services	89	78	38	204

Source: ONS, FAME, Cebr analysis

Table 8 below shows the estimated direct and aggregate economic impacts of the Maritime sector in Scotland across the years 2010 and 2015. As illustrated, both the direct and aggregate impacts increased year-on-year. The composite turnover multiplier remained relative stable from 2011 onwards.

Table 10: Direct and Aggregate turnover impact of the Maritime sector in Scotland, 2010 to 2015, £ million

Year	Direct Impact	Composite turnover multiplier	Aggregate impact on turnover
2010	7,796	1.80	14,067
2011	8,010	1.84	14,746
2012	8,689	1.86	16,142
2013	9,714	1.87	18,141
2014	9,995	1.85	18,539
2015	9,265	1.84	17,058

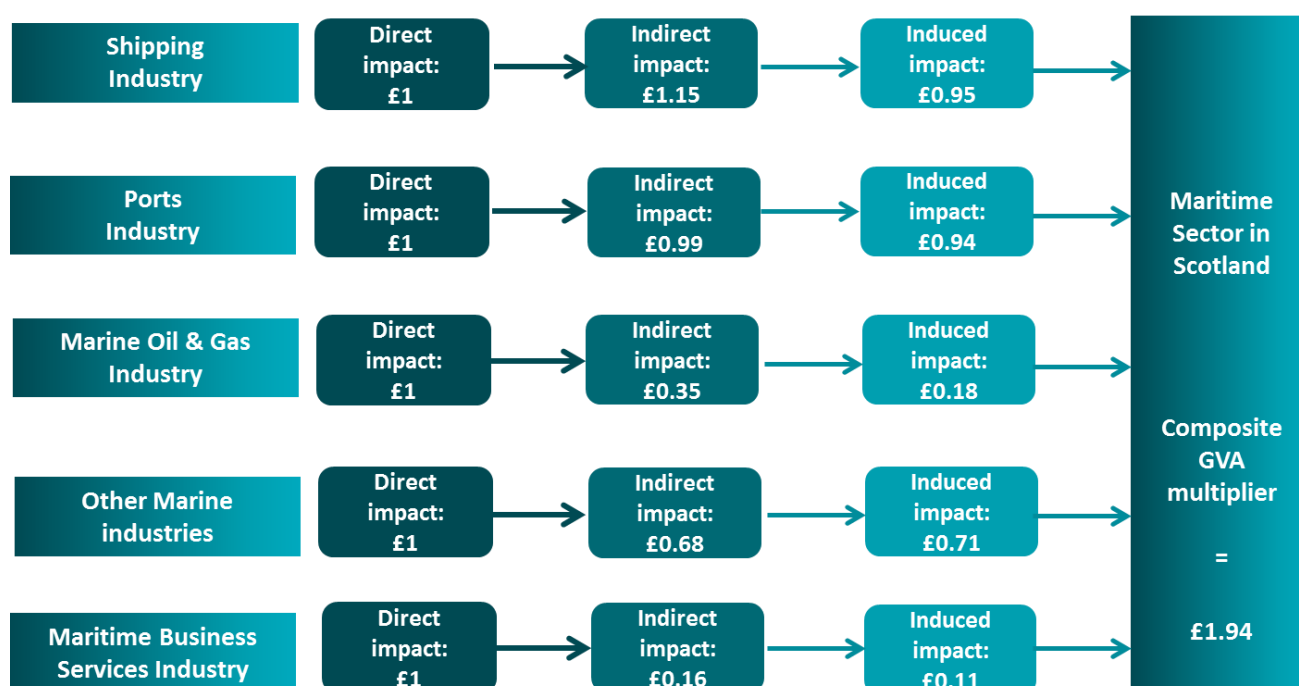
Source: ONS, FAME, Cebr analysis

4.2 The aggregate economic impacts through GVA

Figure 9 below illustrates the GVA multipliers for the Maritime sector in Scotland, disaggregated by industry. The interpretation is that, for every £1 of direct GVA generated by the Shipping industry, £1.15 worth of GVA is stimulated in the supply chains and £0.95 worth of GVA in the wider economy when direct and indirect (supply chain) employees spend their earnings.

Combining each Maritime industry, **therefore for every £1 of GVA initially contributed by these entities in 2015, the Scottish economy as a whole experienced an increase in GVA of £1.94.**

Figure 9: GVA multiplier impacts of the Maritime sector in Scotland, 2015



Source: ONS, FAME, Cebr analysis

Table 11 below shows the estimated aggregate GVA impacts from the individual Maritime industries. Collectively, the four Maritime industries directly contributed just over £3.6 billion towards Scottish GDP in 2015; once the indirect and induced economic channels are taken into consideration the industries contributed just under £7.0 billion to the economy.

Table 11: GVA impacts by each Maritime industry in Scotland in 2015

GVA in 2015	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	3,601	1,935	1,442	6,978
Shipping	444	512	422	1,378
Ports	204	201	193	598
Marine Offshore Oil & Gas	2,335	821	414	3,570
Other Marine	578	394	409	1,381
Maritime Business Services	40	7	5	52

Source: ONS, FAME, Cebr analysis

Table 12 below shows the estimated direct and aggregate economic impacts of the Maritime sector in Scotland across the years 2010 and 2015. With the relative direct contributions from each industry and the base fluctuating slightly from year-to-year, the composite GVA multiplier (reflecting the overall ratio of direct to aggregate impacts) was higher in 2015 than in 2010, but lower than (or equal to) the levels in 2011-2014.

Table 12: Direct and Aggregate GVA impact of the Maritime sector in Scotland, 2010 to 2015, £ million

Year	Direct Impact	Composite GVA multiplier	Aggregate impact on GVA
2010	3,403	1.90	6,455
2011	2,894	1.98	5,737
2012	3,613	2.02	7,313
2013	3,334	1.94	6,468
2014	3,396	2.03	6,900
2015	3,601	1.94	6,978

Source: ONS, FAME, Cebr analysis

It is estimated that the Maritime sector in Scotland directly supported £3.4 in GVA in 2010; after indirect and induced impacts are considered, this contribution increases to £6.5 billion. Following a temporary peak in 2012 – the aggregate impact reached £6.9 billion in 2015.

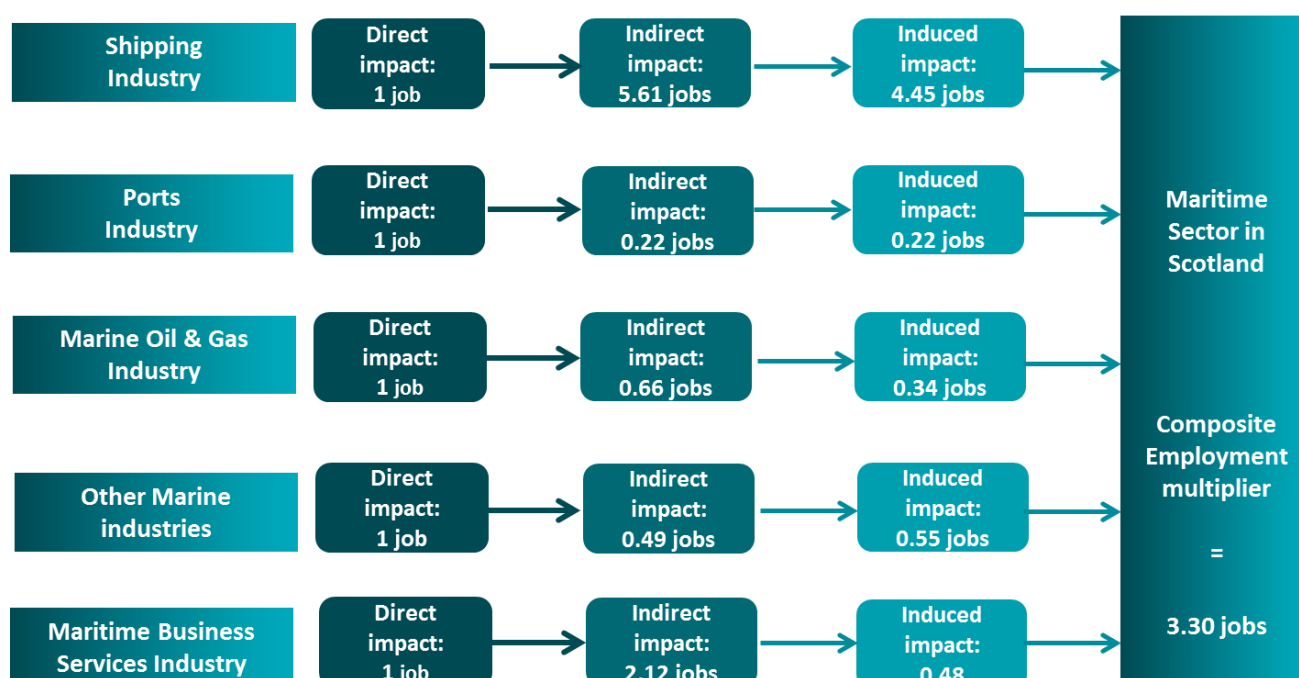
4.3 The aggregate economic impacts through employment

In this section, we consider the aggregate economic impact that the Maritime sector in Scotland makes through employment. As set out earlier in this report, the Maritime sector is already estimated to make a significant direct contribution to employment, with 39,300 jobs directly supported in 2015.

Figure 10 illustrates the direct, indirect and induced employment impacts associated with the Maritime sector in Scotland, disaggregated by industry. The interpretation is that, for every 1 job directly supported in the Maritime sector in Scotland, 'X' jobs are supported through the stimulated supply chain (indirect impact) and 'X' jobs through employees' spending (induced impact). For example, for every job directly supported by the Scottish Ports industry in 2015, a further 0.22 jobs were supported through the supply chain and 0.22 through employees' spending.

Combining each Maritime industry, for every 1 job initially supported by these entities in 2015, a total of 3.30 jobs were therefore supported in the wider Scottish and UK economies.

Figure 10: Employment multiplier impacts of the Maritime sector in Scotland, 2015



Source: ONS, FAME, Cebr analysis

Table 13 below shows the estimated aggregate GVA impacts from the Scottish Maritime industries taken in isolation. Collectively, the four Maritime industries directly contributed around 39,300 jobs in Scotland in 2015; once the indirect and induced economic channels are taken into consideration the industries directly and indirectly supported 130,000 jobs. Due to the high economic multipliers associated with the Shipping industry, the Shipping industry in Scotland sector makes the largest aggregate economic impact through employment in 2015, with around 63,200 jobs directly and indirectly supported.

Table 13: Employment impact by each Maritime industry in Scotland in 2015, thousands of jobs

Employment in 2015	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	39.3	51.7	38.8	129.8
Shipping	5.7	32.0	25.4	63.2
Ports	2.5	0.5	0.6	3.6
Marine Offshore Oil & Gas	20.6	13.6	7.1	41.3
Other Marine	10.3	5.0	5.6	20.9
Maritime Business Services	0.2	0.5	0.1	0.9

Source: ONS, FAME, Cebr analysis

Table 14 shows how the aggregate employment impact of the Maritime sector in Scotland is estimated to have evolved since 2010. The aggregate employment impact in 2015, 130,000 jobs, stood higher than the 2010 level of 125,400 jobs.

Table 14: Direct and Aggregate employment impact of the Maritime sector in Scotland, 2010 to 2015, thousands of jobs

Year	Direct Impact	Composite Employment multiplier	Aggregate impact
2010	36.5	3.43	125.4
2011	35.6	3.51	125.2
2012	37.8	3.46	130.6
2013	37.9	3.38	128.0
2014	43.5	3.40	148.0
2015	39.3	3.30	129.8

Source: ONS, FAME, Cebr analysis

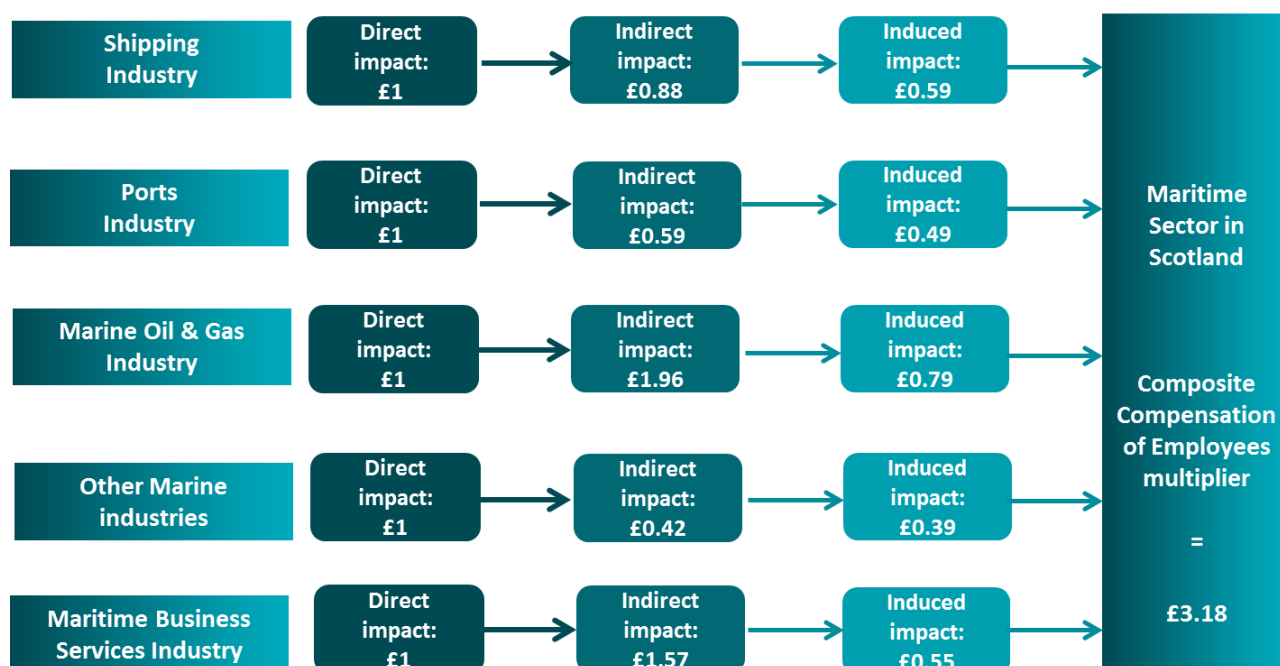
4.4 The aggregate economic impacts through the compensation of employees

This final subsection sets out the economic impact of the Maritime sector in Scotland through the compensation of employees.

Figure 11 below illustrates the direct, indirect and induced compensation of employee impacts associated with the Maritime sector in Scotland, disaggregated by industry. Here the interpretation is that, for every £1 of employee compensation directly supported by the sector, '£X' of wages and salaries and other employee remunerations is supported in total throughout the economy through supply chain (indirect) and employee spending (induced) channels. For example, for each £1 of employee compensation in the Scottish-based Maritime Business Services sector, £1.57 is supported through the supply chain and an additional £0.55 is supported through employee expenditures – yielding an aggregate impact of £3.11.

Combining each Maritime industry, **for every £1 initially contributed by these entities in 2015, a total of £3.18 in employee compensation was supported in the Scottish economy.**

Figure 11: Employee compensation multiplier impacts of the Maritime sector in Scotland, 2015



Source: ONS, FAME, Cebr analysis

Table 15 below disaggregates the direct, indirect, induced and aggregate impacts on the compensation of employees by the Maritime industry in Scotland.

Table 15: Impact through the compensation of employees by each Maritime industry in Scotland in 2015, £ million

Compensation of Employees in 2015	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
TOTAL	2,103	3,164	1,424	6,690
Shipping	196	173	116	485
Ports	103	61	50	214
Marine Offshore Oil & Gas	1,403	2,745	1,105	5,253
Other Marine	387	162	145	694
Maritime Business Services	14	22	8	44

Source: ONS, FAME, Cebr analysis

We estimate that the Maritime sector in Scotland directly and indirectly supported a total of £6.7 billion in employee compensation in 2015, with the majority of this total contribution sourced from the Marine Offshore Oil and Gas industry and other Marine industries. The relatively high multiplier for the compensation of employees associated with the Marine Offshore Oil and Gas industry further bolsters the relatively large direct impact from this industry activity.

Table 16 details the aggregate impact through the compensation of employees in each year since 2010, which has remained broadly stable (on average around £6.5 billion). Despite an increase in the aggregate impact on employment – as shown earlier in this section – the aggregate impact on the compensation of employees is estimated to be slightly lower (by around £200 million) in 2015 in comparison to 2010. This is due to a slight shift in the proportion of total employee compensation away from the Marine industry and into Shipping, the latter of which has a lower multiplier impact.

Table 16: Direct and Aggregate impact through the compensation of employees of the Maritime sector in Scotland, 2010 to 2015, £ million

Year	Direct Impact through the Compensation of Employees	Composite sector multiplier	Aggregate impact through the Compensation of Employees
2010	2,103	3.30	6,945
2011	1,753	3.15	5,522
2012	2,181	3.12	6,796
2013	2,260	3.08	6,963
2014	1,985	3.03	6,025
2015	2,103	3.18	6,690

Source: ONS, FAME, Cebr analysis

5 Annex: List of Scottish ports

Table A.1: List of major and minor ports in Scotland considered as part of the study

Port	Council Ward	Postcode
Aberdeen	George St / Harbour	AB11 5SS
Ardishaig	Mid Argyll	PA30 8DZ
Ayr	Ayr North	KA8 8AH
Barra Castlebay	Barraigh, Bhatarsaigh, Eirisgeigh agus Uibhist a Deas	HS9 5XD
Buckie	Buckie	AB56 1UN
Burghead	Heldon and Laich	IV30 5UA
Burntisland	Rosyth	KY11 2XP
Cairnryan	Wigtown West	DG9 8RF
Castlebay	Barraigh, Bhatarsaigh, Eirisgeigh agus Uibhist a Deas	HS9 5XD
Clyde	Anderston/City	G2 8DS
Corpach	Caol and Mallaig	PH33 7NN
Craignure	Oban South and the Isles	PA34 4PF
Cromarty Firth	Cromarty Firth	IV18 0HD
Cullivoe (Yell)	Shetland North	ZE2 9QR
Dundee	Maryfield	DD1 3HW
Fairlie Quay	North Coast and Cumbraes	KA29 0AS
Forth	-	-
Fraserburgh Harbour	Fraserburgh and District	AB43 9BR
Gairloch	Wester Ross, Strathpeffer and Lochalsh	IV21 2BQ
Garlieston	Mid Galloway	DG8 8BQ
Gill's Bay Scotland	Landward Caithness	KW1 4YB
Girvan	Ayr West	KA7 1EA
Glensanda	Oban North and Lorn	PA37 1SL
Grangemouth	Grangemouth	FK3 8UE
Helmsdale	East Sutherland and Edderton	KW8 6JZ
Inverkeithing	Dunfermline Central	KY11 1HR
Inverness	Inverness Millburn	IV1 1SU
Irvine	Irvine West	KA12 8PZ
Isle of Whithorn	Mid Galloway	DG8 8LL
Kinlochbervie	North, West and Central Sutherland	IV27 4RR
Kirkcaldy	Kirkcaldy East	KY1 2TD
Kirkcudbright	Dee	DG6 4HY
Kishorn Quay	Caol and Mallaig	PH33 7NN
Kyle of Lochalsh	Wester Ross, Strathpeffer and Lochalsh	IV40 8AQ
Leith	Leith	EH6 7DX
Lerwick	Lerwick North	ZE1 0LL
Lochaline	Oban South and the Isles	PA65 6BA

Table A.1: List of Scottish ports considered as part of the study (cont.)

Port	Council Ward	Postcode
Lochboisdale	Barraigh, Bhatarsaigh, Eirisgeigh agus Uibhist a Deas	HS8 5TP
Lochinver	North, West and Central Sutherland	IV27 4JP
Lochmaddy	Beinn na Foghla agus Uibhist a Tuath	HS7 5LA
Lossiemouth	Heldon and Laich	IV31 6TW
Macduff	Troup	AB44 1TX
Marine Resource Centre	Oban North and Lorn	PA37 1SE
Methil	Buckhaven, Methil and Wemyss Villages	KY8 3RE
Montrose	Montrose and District	DD10 9SL
Oban	Oban South and the Isles	PA3 LS
Orkney Islands Council	Kirkwall West and Orphir	KW15 1SD
Perth Harbour	Perth City Centre	PH2 8BB
Peterhead	Peterhead North and Rattray	AB42 1DX
Port Askaig	Mid Argyll	PA31 8RT
Port William	Wigtown West	DG8 9SE
Portree	Eilean a' Chèo	IV51 9DE
Rosyth	Rosyth	KY11 2XP
Scalloway	Shetland Central	ZE1 0TQ
Scrabster	Thurso	KW14 7UJ
Stornoway	Steòrnabhagh a Deas	HS1 2XS
Stranraer West Pier	Dumfries and Galloway	DG9 8RA
Sullom Voe	Shetland North	ZE2 9QR
Tarbert	Na Hearadh agus Ceann a Deas nan Loch	HS3 3DF
Tayport	Tay Bridgehead	DD6 9AJ
Troon	Troon	KA10 6DX
Uig	Eilean a' Chèo	IV51 9XX
Whitehills Harbour	Banff and District	AB45 2NQ
Wick	Wick	KW1 5HB

Source: Department for Transport, Cebr analysis