



The economic contribution of the Maritime sector in Wales

A report for Maritime UK and the Welsh Ports Group

October 2017

Cebr

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Authorship and acknowledgements

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Cebr was eager to produce a consistent set of estimates across a six-year period. This revealed differences between Cebr's estimates for the back years and those previously produced by Oxford Economics. Marine has also been included for the first time, which has impacted other industries due to shared activities.

The industry figures making up the broad Maritime sector are however not always additive because some of the reports have been customised to cater for the overlap between certain industries. Simply adding together the industries would therefore produce a degree of double counting. Nonetheless, the broad Maritime report has had this double counting stripped out. Cebr believes fundamentally in the thoroughness and robustness of its approach and, as such, we stand by our own unbiased and fresh examination of the role of the Maritime sector and its constituent industries in the UK.

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

London, October 2017

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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 Wales. This report is complementary with seven other reports that 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 Ports, Shipping, 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 Wales makes an important macroeconomic contribution to the Welsh and UK economies through business turnover, Gross Value Added (GVA), employment and through the compensation of employees. **It is estimated that the Welsh Maritime sector directly supported just under £940 million in domestic output (through business turnover), £330 million in GVA and 5,962 jobs in Wales in 2015.**
- The **productivity of workers in the Welsh Maritime sector substantially exceeds productivity across Wales as a whole:** for example in 2015 the productivity of the Welsh Maritime sector was estimated to be £55,781, as compared with £41,962 across Wales.
- Furthermore, **the Maritime sector in Wales compares favourably with other Welsh industries: it significantly outperforms the Manufacture of Machinery and Equipment industry** across the key economic indicators of turnover, GVA and compensation of employees.
- The Shipping industry is the largest constituent industry within the Welsh Maritime sector in terms of economic activity, directly contributing £518 million in domestic output, £141 million in GVA, and directly supporting approximately 2,251 jobs in 2015.
- **It is estimated that the Maritime sector in Wales contributed £118 million to the UK Exchequer in 2015, spread across VAT, Corporation Tax, Income Tax, National Insurance Contributions (NICs) and Business Rates.** Further, the contribution of the Welsh Maritime sector to the Exchequer in 2015 represents a £17 million increase relative to the 2010 level.
- After quantifying the wider economic impacts through the industry supply chains and induced effects on expenditures, **it is estimated that the Maritime sector in Wales helped to support a total of almost £900 million of GVA in 2015,** an increase from £716 million in 2014. This implies that, for every £1 in GVA directly contributed by the Welsh Maritime sector in 2015, a total of £2.70 in GVA is supported across the wider Welsh and UK economies.
- These wider economic impacts associated with the Welsh Maritime sector also extend to business turnover, employment and the compensation of employees. **It is estimated that the Maritime sector in Wales helped to support a total of approximately £2 billion in domestic output (through business turnover), 31,000 jobs and £460 million through the compensation of employees in 2015.**

1 Introduction

This is a report by the Centre for Economics and Business Research (Cebr) on behalf of Maritime UK on the economic impact of the Maritime sector in Wales. In this context and henceforth, the “Maritime sector” is defined as comprising the Ports, Shipping, Marine and Maritime Business Services industries.

This report is complementary with seven other reports that focus on the economic contribution of the UK Maritime sector, with these 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 seven other 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 Wales. As such, our report is not confined to direct ongoing contributions to GDP and employment through operations and activity in Wales, 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 About the Welsh Ports Group

The Welsh Ports Group includes all the main cargo handling ports in Wales as well as a wide range of smaller ports focussed on marine leisure, recreation and fishing activity. The Group meets regularly with the Welsh Government and considers a wide range of agenda items from transport and economic issues to marine and environmental topics. The current chairman of the Group is ABP’s Port Manager of Cardiff and Barry, Callum Couper, and he helps to drive forward the Group’s agenda and represents the industry at a number of forums and levels.

1.3 Background on the facilitating role of the Maritime Sector in Wales

Some qualitative examples serve to provide background on the importance of the Maritime sector to Wales, and in turn the UK economy.

- *Ports and Steel.* The Ports sector in Wales is of paramount importance to the UK steel sector. Port Talbot is the largest integrated steelworks in the UK, and its continued operations are dependent on the ability to bring in raw materials from Brazil and Australia, and to ship the high-quality output around the world. Without access to efficient ports, the UK steel sector would be unlikely to compete economically against continental and global steel companies.
- *Marine renewable energy production.* There is significant potential for marine renewable energy production in Wales. For example, there is evidence of substantial economic benefits that would arise from a concentration of tidal lagoon power in Wales¹ (with projects at Colywn Bay; Newport; Cardiff and Swansea Bay).

¹ See, for example, http://www.tidallagoonpower.com/wp-content/uploads/2016/08/The-Economic-Case-for-a-Tidal-Lagoon-Industry-in-the-UK_final.pdf

- *Maritime and Tourism.* The Welsh coastline naturally lends itself to a range of tourism activities within the Maritime sector; for example in the form of sailing.

1.4 Purpose of this report

This report provides an in-depth assessment of the economic contribution that the Maritime sector, including Ports, makes to the Welsh 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 Wales. Wales is an important region for the UK Maritime sector, hosting a number of both major and minor ports.

This study seeks to equip Maritime UK with statistics and figures on the value of the Maritime sector to the Welsh 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).

1.5 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 Wales. 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 Wales. 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 total economic 'footprint' of the Maritime sector in Wales. 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 Wales. The key macroeconomic indicators include:

- GVA² contributions to Welsh and UK GDP generated by the Maritime sector in Wales, directly and through indirect and induced multiplier impacts.
- Jobs supported by the Welsh Maritime sector, including direct, indirect and induced jobs through regional multiplier impacts.
- The value of employee compensation³ generated by the Welsh Maritime sector, representing the total remuneration of employees.
- The Exchequer contribution of the Welsh Maritime sector through tax revenues raised.

² 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 + Taxes on products - Subsidies on products = 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.

³ 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.

- The direct contribution made by the Maritime sector through Welsh exports of goods and services.

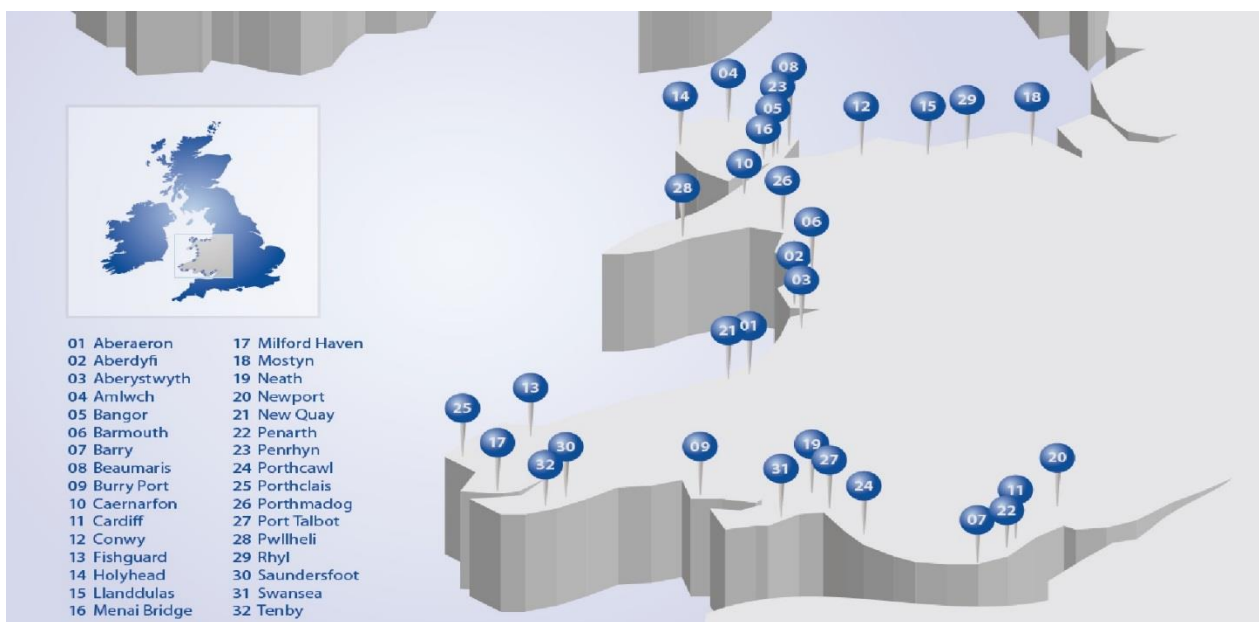
Mapping the UK Maritime sector in the UK and Wales

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.⁴ 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.

Figure 1 graphically illustrates key locations of Maritime activity in Wales.

Figure 1: Ports in Wales



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 Welsh-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

⁴ 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.

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*.

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 Wales, 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 wider economic impacts

After collation and interrogation, the resulting Welsh 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 Welsh 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 – gross output (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 Wales.
- *Indirect impact*: this is the value generated and jobs supported in industries that supply inputs to Wales's Maritime sector.
- *Induced impact*: this is the value generated and jobs supported in the wider economy when the direct and indirect employees of the Maritime sector in Wales spend their wages and salaries on final goods and services.

These three impacts are then combined to convey the total 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 Wales. 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 Wales.

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 Wales, in order to then generate indirect, induced and subsequently wider impacts.

1.6 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 Wales for the purposes of this study.

- Section 3 outlines the direct economic impacts of the Maritime sector within Wales. We consider the direct impacts through domestic output, 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 Wales through the activities it stimulates in the local supply chain and in the wider economy when employees directly and indirectly employed by the Welsh Maritime sector spend their wages and salaries in the local and wider economy.

2 The Maritime sector in Wales

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 Ports, Shipping, 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 Wales has therefore been 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.

- **Ports industry**
 - Port activities and management;
 - Warehousing and storage;
 - Stevedores, cargo and passenger handling;
 - Border agency, HMRC and public sector employees operating in ports.
- **Shipping industry**
 - International transport of passengers;
 - Transport of passengers on inland waterways;
 - International transport of freight;
 - Transport of freight on inland waterways.
- **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;⁵
 - Ship surveying and classification;

⁵ 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.

- Maritime Education (including university courses and cadet training);
- Maritime consultancy and accountancy.

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 – in other words, 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, in order that the true value of economic activity supported is then measured.

The Ports and Shipping industries

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

INDUSTRY	ACTIVITY	MAPPING	SOURCE(S) USED
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
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

Source: Maritime UK, Cebr analysis

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

For the majority of Ports and 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. Data taken from the ONS Business Register of Employment Survey (BRES) has then been used to disaggregate national level data at Wales-level. In the case of activities for the Ports industry, only activity taking place in council wards in Wales 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.	PwC, Cebr analysis
	Maritime insurance, finance and legal services		
	Maritime Education	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.	
	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 Wales

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 Welsh proportion of economic activity.

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 1) 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 the Welsh ports considered as part of this report is provided in the Annex.⁶ Table 4 below shows the proportion of employment in the UK Ports industry which applies to Wales, as estimated using the approach described above.

Table 4: 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 Welsh 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.

The total tonnage at major and minor Welsh Ports in 2016 was just over 53.5 million tonnes. Of this, total inward traffic was 37.5 million tonnes, whilst total outward traffic was 16 million tonnes.⁷

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)⁸, 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.⁹

⁶ 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.

⁷ See DfT (2017) 'Port freight statistics: 2016 final figures' port0101.

⁸ 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.

⁹ 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.

Table 5: 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

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 Table 6 and Table 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 Wales has been sourced from the BIS report released in 2015, "The Size and Performance of the UK Low Carbon Economy".¹⁰

Maritime Business Services

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.¹¹ 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 Wales.

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 Wales, in order to reflect differences in wider economic performance between Wider and the other UK regions. These are as follows:

- To account for regional differences in productivity (GVA per employee), GVA in Wales has been adjusted using the ONS GVA per employee by region statistics.¹² For example, the average employee in Wales in 2015 was 21% less productive than the average UK employee, but was 4% higher than workers in Cornwall and the Isles of Scilly.

¹⁰ BIS, 2015. "The size and performance of the UK Carbon Economy, Report for 2010 to 2013."

¹¹ PwC estimate, 2017.

¹² ONS, 2017. Subregional Productivity: Labour Productivity (GVA per hour worked and GVA per filled job) indices by UK NUTS2, NUTS3 subregions and City regions.

- 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.¹³
- 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 wider economic impacts of the Maritime sector in Wales, broken down by Maritime industry.

¹³ Ibid.

3 The direct economic impact of the Maritime sector in Wales

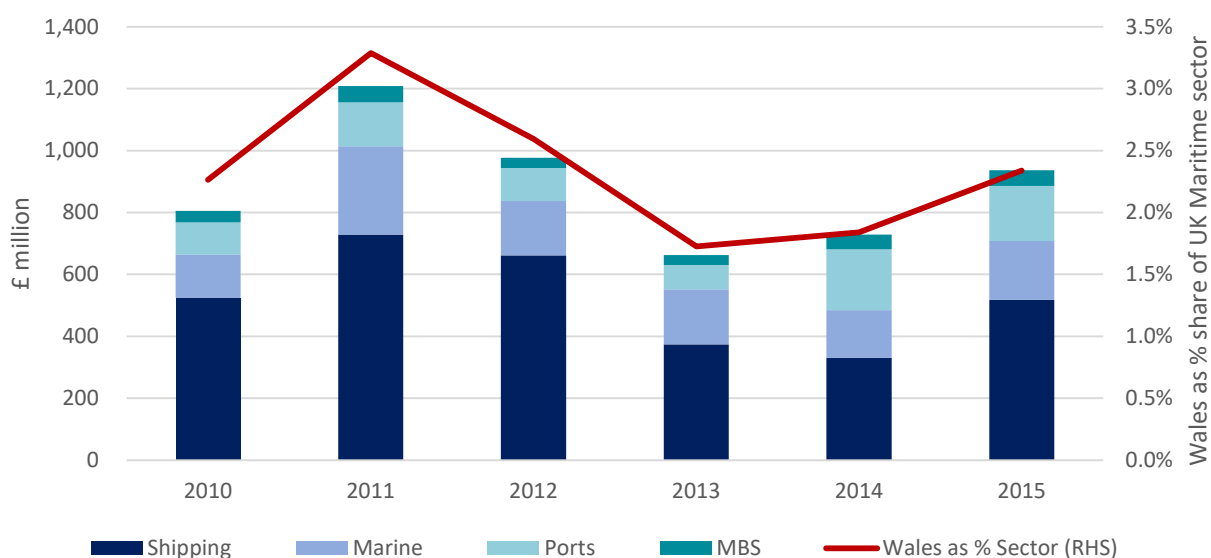
In this section we set out estimates for the direct contribution of the Maritime sector in Wales across the following key macroeconomic indicators: Business Turnover (domestic output), GVA, employment, the compensation of employees, the Exchequer contribution through tax revenues raised, and exports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

The direct economic impacts of the Maritime sector in Wales are separated based on those contributed by each Maritime industry (Shipping, Ports, Marine and Maritime Business Services).

3.1 The direct impact through domestic output

This subsection considers the total amount of domestic output directly supported by the Maritime sector in Wales through turnover generated by businesses. Figure 2 below shows the breakdown of business turnover generated by the Maritime sector and its constituent industries in Wales between 2010 and 2015; and this turnover as a percentage of the Maritime sector as a whole.

Figure 2. The estimated turnover of the Maritime Sector in Wales, and the share of the Maritime sector's total turnover



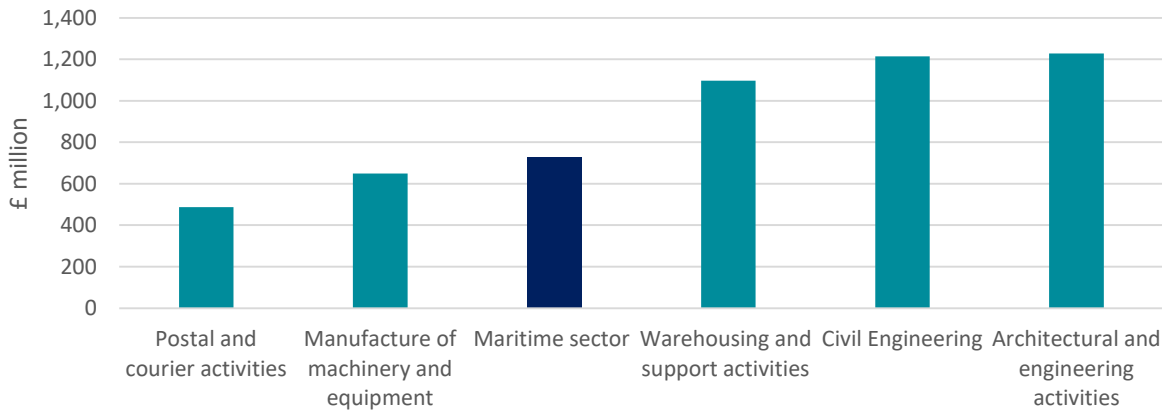
Source: FAME, ONS, Cebr analysis

In 2015 the direct turnover contribution of the Maritime sector in Wales was £936 million. This constituted 2.3% of the overall UK Maritime sector turnover contribution. Further, the 2015 direct turnover impact of the Welsh Maritime sector was over £200 million higher than in 2014, which then accounted for 1.8% of the UK Maritime sector contribution as a whole. The direct turnover contribution peaked in 2011, at £1.2 billion and 3.3% of the UK Maritime sector total.

For each year Figure 2 illustrates how each industry within the Welsh Maritime sector contributed to the direct turnover impact. In 2015 Shipping accounted for approximately 55% of the contribution; followed by the Marine industry at 20%; the Ports industry at 19% and Maritime Business Services at 5%. This *ordering* of contributions is largely consistent across each of the years considered (though the numbers of course change).

To place the Welsh Maritime sector’s direct contribution through turnover in context, Figure 3 below compares the direct turnover of the Maritime sector in 2014 with that of postal and courier activities; manufacture of machinery and equipment; warehousing and support activities; civil engineering; and architectural and engineering activities. Turnover data for the comparable industries has been sourced from the Annual Business Survey (ABS).

Figure 3: The direct contribution through turnover of the Maritime sector in Wales against comparable Welsh sectors in 2014



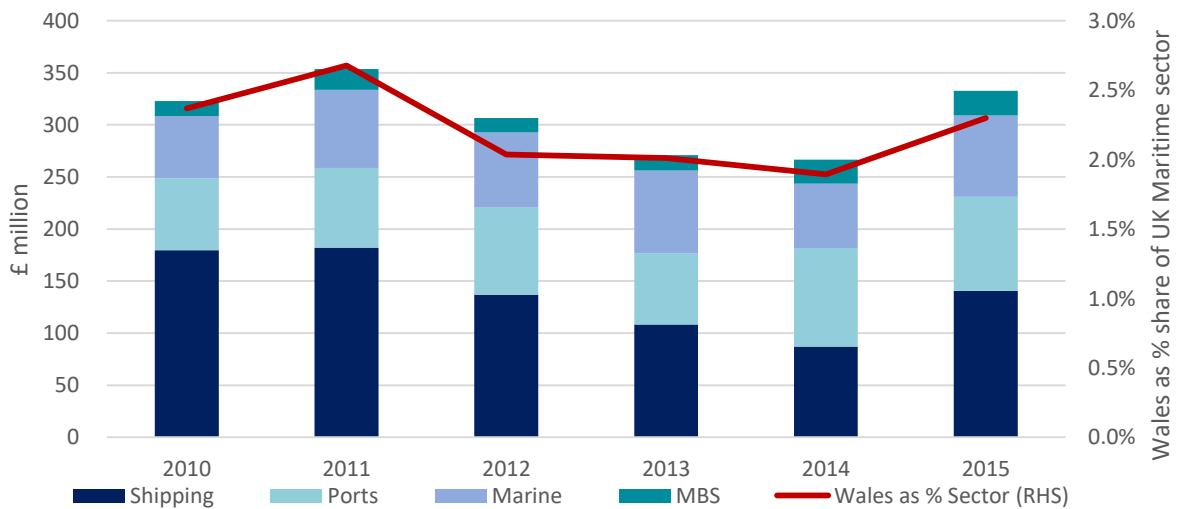
Source: ONS, FAME, Cebr analysis

In 2014 the turnover of the Maritime sector in Wales exceeded that of the Manufacture of machinery and equipment; and also postal and courier activities.

3.2 The direct impact through GVA

Following domestic output, this subsection illustrates the contributions in terms of the GVA from the Maritime sector in Wales to Welsh and UK GDP. Figure 4 below shows the direct GVA contribution of the Maritime sector in Wales, both in levels and as a percentage of the UK maritime sector, for years 2010 to 2015. The direct contributions are disaggregated by industry.

Figure 4. The direct contribution of the Maritime sector in Wales through GVA, and the Wales’s share of the Maritime sector’s total direct contribution through GVA



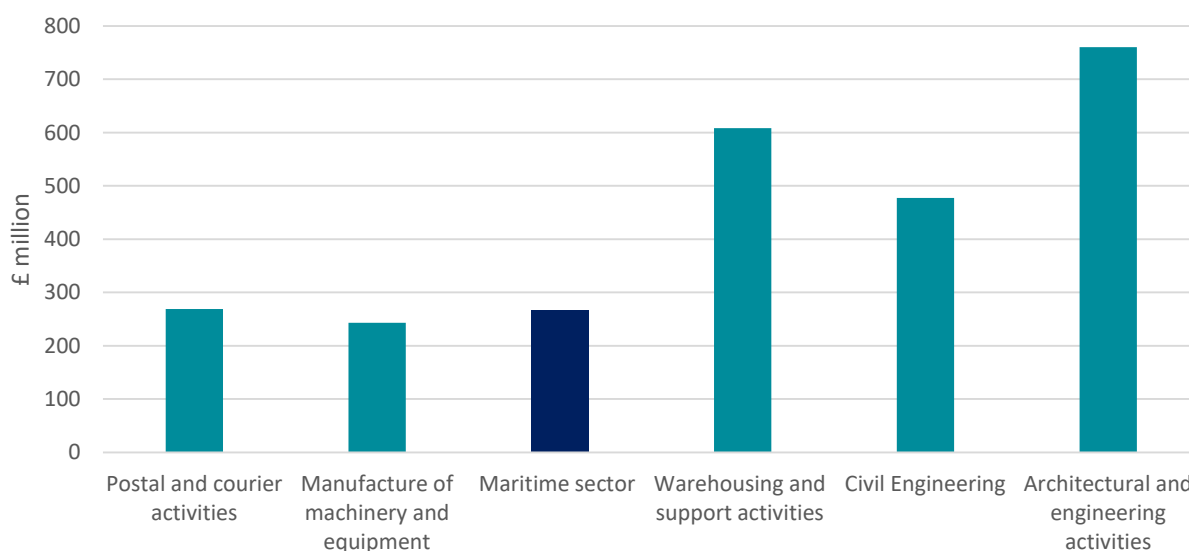
Source: ONS, FAME, Cebr analysis

In 2015 the direct GVA contribution of the Maritime sector in Wales was £333 million: this represented 2.3% of the UK Maritime sector contribution as a whole. The 2015 level was around £70 million higher than the 2014 level, which was 2% of the UK Maritime sector contribution. The direct turnover contribution of the Welsh Maritime sector peaked in 2011, at £354 million and 2.7% of the UK Maritime sector total.

For each year Figure 4 illustrates how each industry within the Welsh Maritime sector contributed to the direct GVA impact. In 2015 the Shipping industry accounted for just over 42% of the impact; the Ports industry accounted for 27%; the Marine industry accounted by 23%; whilst the Maritime Business Services industry accounted for around 7%. This *ordering* of contributions is consistent across each of the years considered (with the Ports contribution exceeding the Marine contribution in all years except 2013).

To put the Welsh Maritime sector's direct contribution through GVA in context, Figure 5 below compares the direct GVA impact of the Maritime sector in 2014 with that of postal and courier activities; manufacture of machinery and equipment; warehousing and support activities; civil engineering; and architectural and engineering activities. Turnover data for the comparable industries has been sourced from the Annual Business Survey (ABS).

Figure 5: The estimated GVA of the Maritime sector in Wales against comparable Welsh industries in 2014



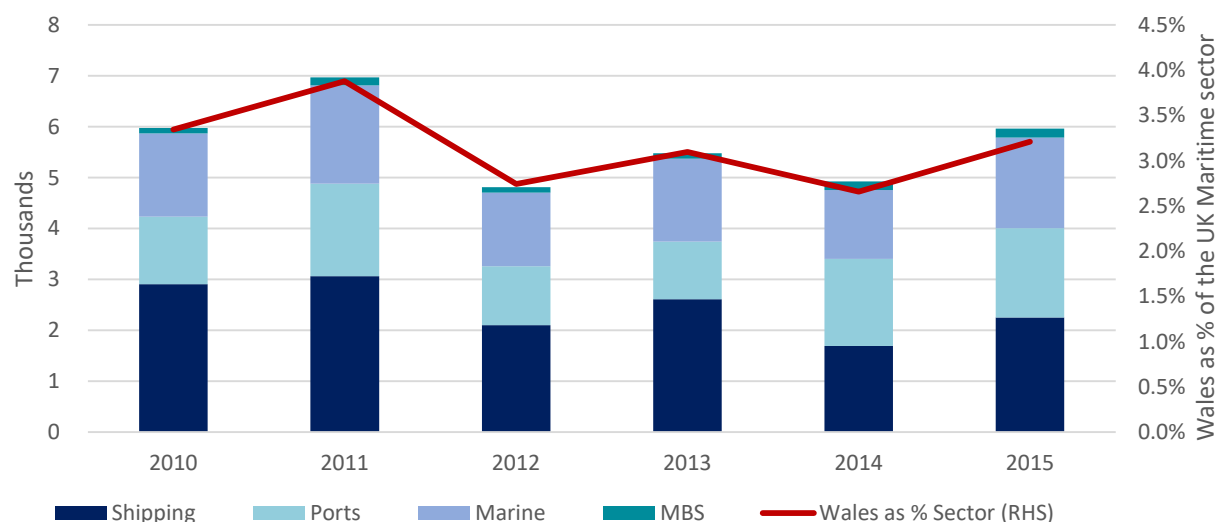
Source: ONS, FAME, Cebr analysis

In 2014 the GVA of the Maritime sector in Wales exceeded that of the manufacture of machinery and equipment; and was also highly comparable with postal and courier activities.

3.3 The direct impact through employment

This subsection outlines the direct employment impact from the Maritime sector in Wales. Figure 6 below shows the direct employment impact of the Maritime sector in Wales, both in levels and as a percentage of the UK Maritime sector, for years 2010 to 2015. The direct impacts are disaggregated by industry.

Figure 6. The direct contribution of the Maritime sector in Wales through employment, and Wales's share of the Maritime sector's total direct contribution through employment



In 2015 the direct employment contribution of the Maritime sector in Wales was 5,962 jobs: this represented 3.2% of the UK Maritime sector contribution as a whole. The 2015 direct employment level was over 1,000 jobs higher than in 2014, which was 2.7% of the UK Maritime sector contribution. The direct employment impact of the Welsh Maritime sector peaked in 2011, at 6,966 jobs and 3.9% of the UK Maritime sector total.

For each year Figure 6 illustrates how each industry within the Welsh Maritime sector contributes to the direct employment impact. In 2015 the Shipping industry accounted for approximately 38% of the impact; followed by the Marine and Ports industries which accounted for almost 30%; whilst the Maritime Business Services industry accounted for almost 3%. This *ordering* of contributions is consistent across each of the years considered (with the Marine contribution exceeding the Ports contribution in all years except 2014).

Through combining the direct economic impacts of the Welsh Maritime sector through GVA and employment, we can determine the levels of productivity across each industry within the Welsh Maritime sector. Table 8 below shows the levels of productivity across each industry within the Welsh Maritime sector, as well as productivity across Wales as a whole, for the years 2010 to 2015.

Table 8: Productivity (GVA per employee) in the Welsh 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
Wales Maritime sector	£54,039	£50,757	£63,778	£49,466	£54,137	£55,781
Wales economy as a whole	£37,074	£38,934	£39,962	£40,998	£40,762	£41,962
Ports	£52,238	£42,015	£72,071	£60,384	£55,324	£51,379
Shipping	£61,753	£59,478	£65,177	£41,531	£51,599	£62,507
Marine	£36,518	£38,863	£50,125	£48,786	£45,537	£43,780
Maritime Business Services	£130,326	£129,261	£131,874	£140,457	£136,453	£136,440

Source: ONS, Cebr analysis

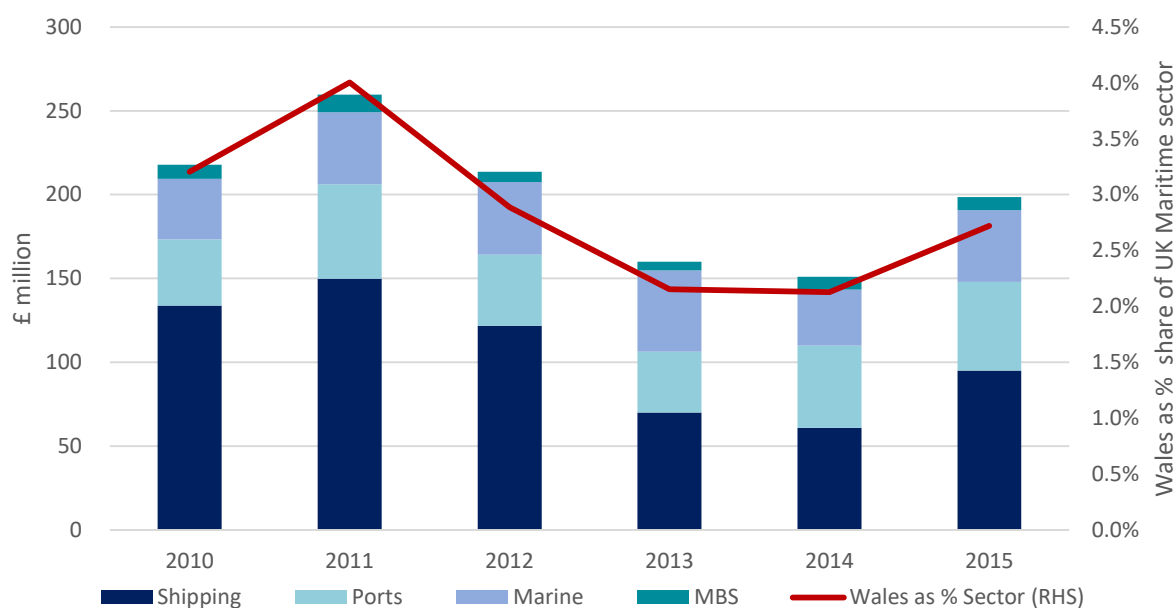
Whilst productivity in the Welsh Maritime sector is outperformed by the UK Maritime sector, it *substantially exceeds* the productivity level for Wales as a whole¹⁴.

3.4 The direct impact through the compensation of employees

This subsection considers the compensation of employees (COE) which is directly supported by the Maritime sector in Wales. 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 are 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 7 below shows the direct employment compensation impact of the Maritime sector in Wales, both in levels and as a percentage of the UK Maritime sector, for years 2010 to 2015. The direct employee compensation impacts are disaggregated by industry.

Figure 7: The direct contribution of the Maritime industries in Wales 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

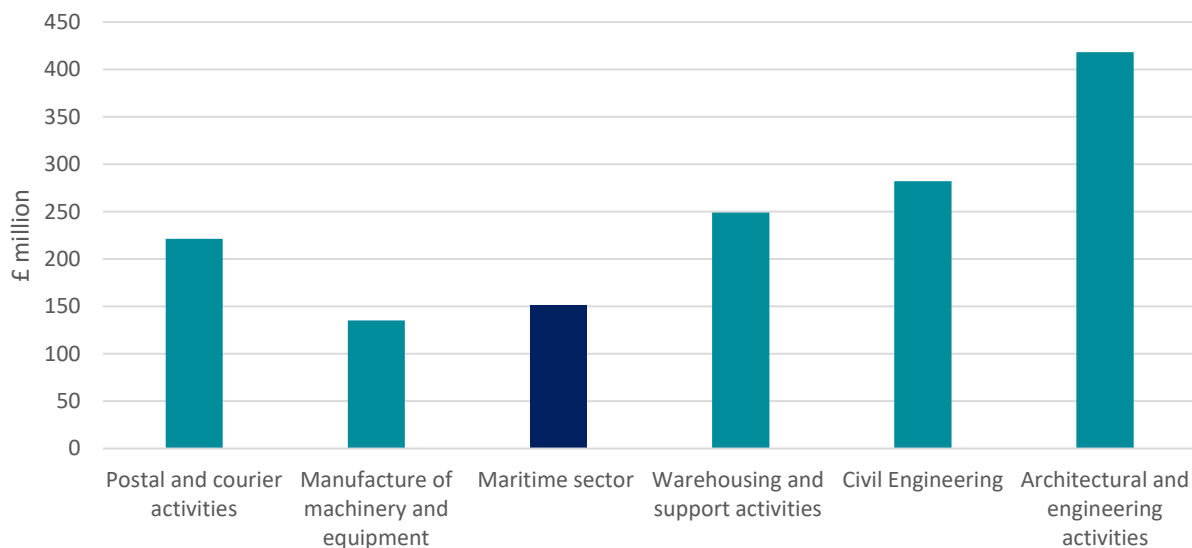
In 2015 the direct COE impact of the Maritime sector in Wales was £200 million: this represented 2.7% of the UK Maritime sector contribution as a whole. The 2015 level was almost £50 million higher than the 2014 level, which was 2.1% of the UK Maritime sector contribution as a whole. The direct COE impact of the Welsh Maritime sector peaked in 2011, at £260 million and 4% of the UK Maritime sector as a whole.

For each year Figure 7 illustrates how each industry within the Welsh Maritime sector contributes to the direct COE impact. In 2015 the Shipping industry accounted for approximately 48% of the impact; followed by the Ports and Marine industries which accounted for 27% and 22% of the impact, respectively; whilst the Maritime Business Services industry accounted for approximately 4% of the impact.

¹⁴ As calculated using statistics on GVA and employment from statswales.gov.uk.

To place the Welsh Maritime sector's direct contribution through compensation of employees in context, Figure 8 below compares the direct COE impact of the Maritime sector in 2014 with that of postal and courier activities; manufacture of machinery and equipment; warehousing and support activities; civil engineering; and architectural and engineering activities.

Figure 8: The estimated employee compensation of the Maritime sector in Wales against comparable Welsh industries in 2014



Source: ONS, FAME, Cebr analysis

3.5 The direct Exchequer contribution in Wales

In this subsection we examine the contribution of the Maritime sector in Wales 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:

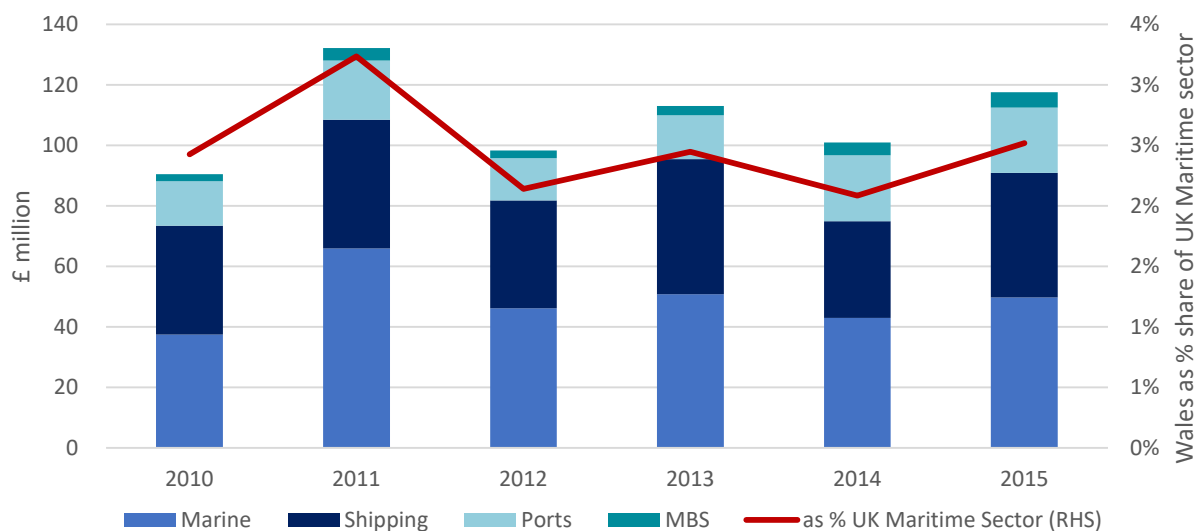
- Income Tax;
- National Insurance Contributions (NICs) – from both Employer and Employee contributions;
- Value-Added Tax (VAT) as paid by businesses operating in the Maritime sector;
- Corporation Tax;
- National Non-Domestic Rates (Business Rates).

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 Welsh 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)¹⁵ and adjusted for wage differentials in Wales. 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.

¹⁵ The Annual Survey of Hours and Earnings (ASHE) provides data on the levels, distribution and make-up of earnings and hours worked for UK employees by sex and full-time or part-time status in all industries and occupations.

Figure 9 below shows the direct contribution of the Welsh Maritime sector to the UK Exchequer, both in levels and as a percentage of the UK Maritime sector as a whole, for years 2010 to 2015. The direct exchequer impacts are disaggregated by industry contribution.

Figure 9: The direct UK Exchequer contribution of the Maritime industries in Wales, 2010 to 2015



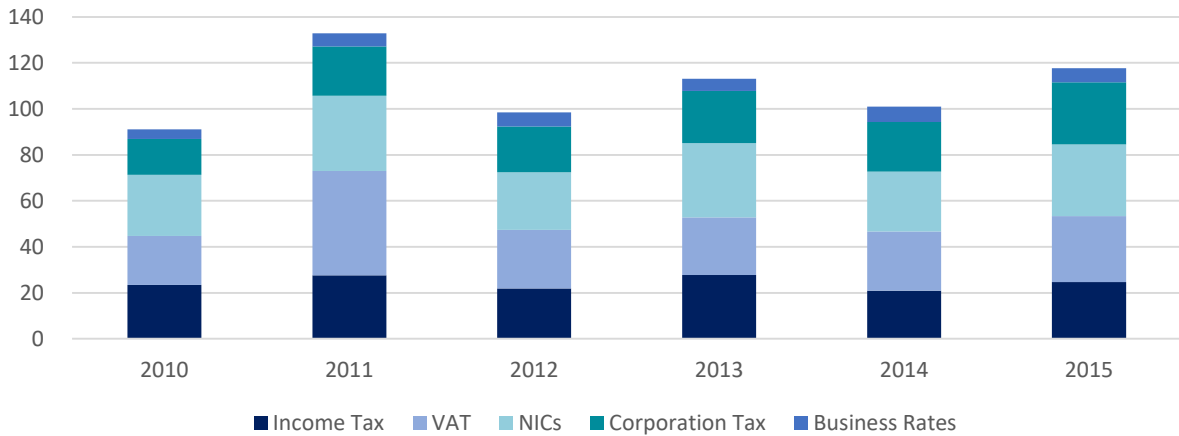
Source: ONS, FAME, Cebr analysis

In 2015 the direct Exchequer impact of the Maritime sector in Wales was £118 million: this represented 2.5% of the UK Maritime sector contribution as a whole. The 2015 tax contribution was almost £20 million higher than the 2014 level, which was 2.1% of the UK Maritime sector as a whole. The direct exchequer impact of the Welsh Maritime sector peaked in 2011, at £132 million and 3.2% of the UK Maritime sector contribution as a whole.

Disaggregating the direct impact by constituent industry, we can see that in 2015 the Marine industry contributed 42% of the direct Exchequer revenues for the Welsh Maritime sector, followed by the Shipping industry which contributed 35% and Ports industry which contributed 18%; whilst the Maritime Business Services industry contributed 4%.

Figure 10 below disaggregates the direct Exchequer contribution of the Welsh Maritime sector by tax head across the years 2010 to 2015.

Figure 10: The direct contribution of the Maritime sector in Wales to the UK Exchequer by tax head, 2010 to 2015



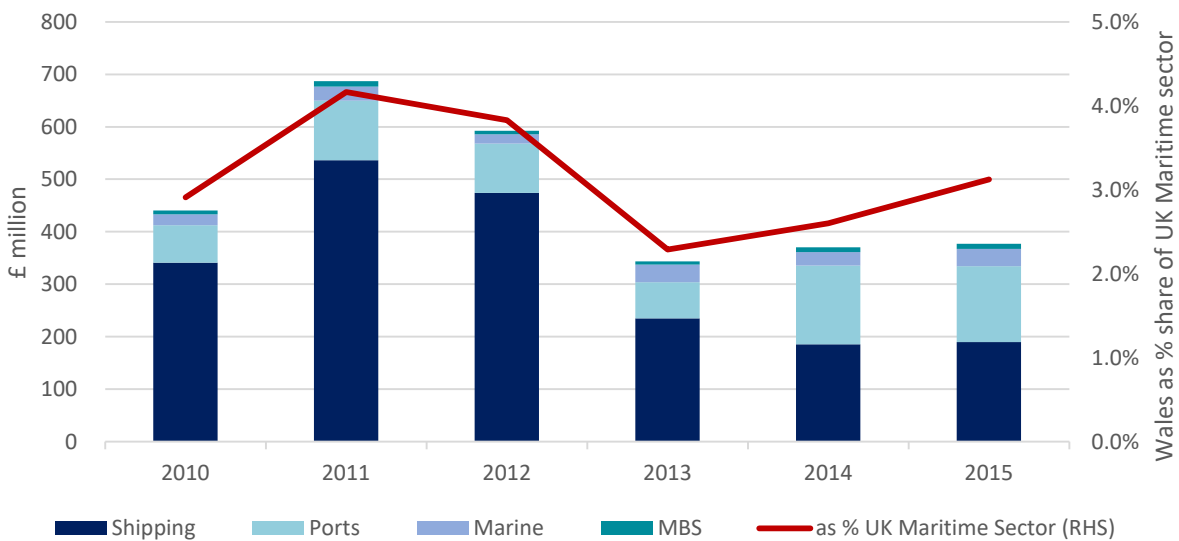
Source: ONS, FAME, Cebr analysis

Across each year, VAT and NICs were the highest contributors to the direct Exchequer impact of the Welsh Maritime sector, contributing £29 million and £31 million, respectively. These equate to 24% and 27% of the total contribution. Corporation and Incomes taxes make roughly similar contributions to the direct Exchequer impact across each year, whilst Business rates contribute the least.

3.6 The direct contribution through exports

This subsection discusses the direct contribution of the Welsh Maritime sector to UK economic activity through the exports of goods and services. Figure 11 below shows the direct contribution of the Welsh Maritime sector to exports, both in levels and as a percentage of the UK Maritime sector export value as a whole, for years 2010 to 2015. The direct impacts are disaggregated by industry contribution.

Figure 11: The direct contribution of the Maritime sector in Wales through exports of goods and services



Source: ONS, FAME, Cebr analysis

The direct impact of exports from the Welsh Maritime sector in 2015 was approximately £380 million: this represented approximately 3% of the UK Maritime sector contribution as a whole. The 2015 impact

was marginally higher than in 2014 and in turn 2013; whilst the largest impact came in 2011 at £687 million or over 4% of the UK Maritime sector.

Disaggregating the direct impact of exports by industry within the Welsh Maritime sector, we can see that the Shipping industry consistently made the largest contribution (£190 million in 2015), followed by the Ports industry (£144 million in 2015). The Marine and Maritime Business Services industry made substantially smaller contributions, respectively.

4 The wider economic impact of the Maritime sector in Wales

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

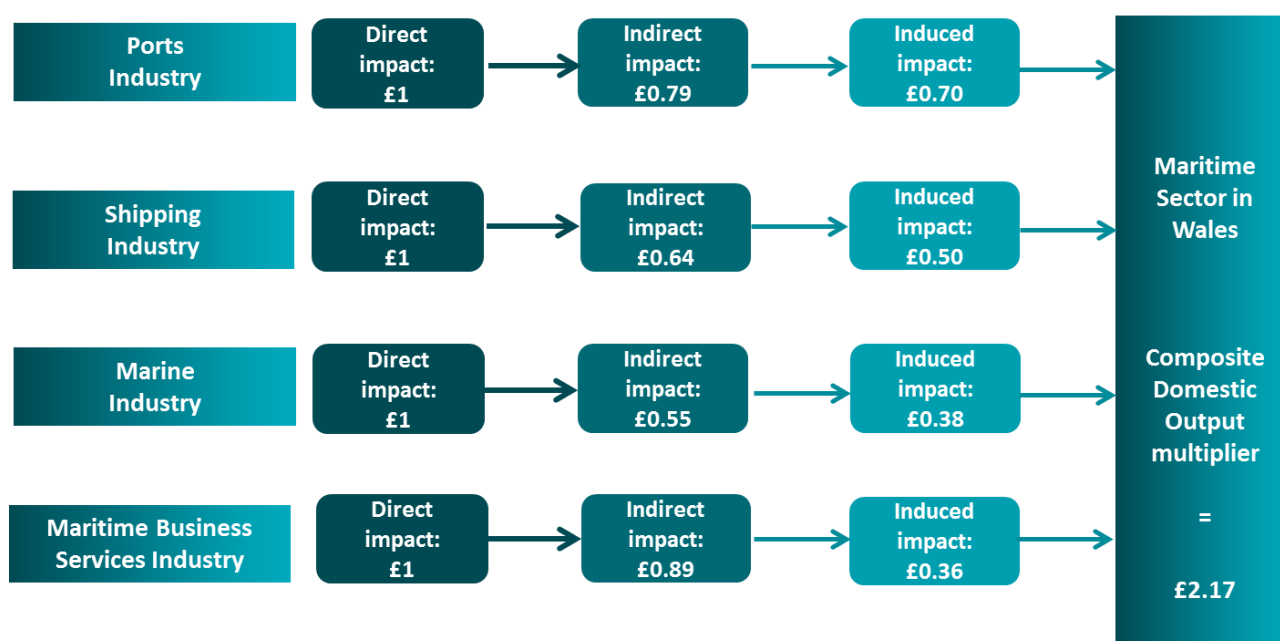
The macroeconomic indicators for which the wider economic impacts have been calculated are as follows: domestic output (through business turnover); GVA; employment; and the compensation of employees. Multipliers have been generated from Cebr's regional economic impact model.

4.1 The wider economic impacts through domestic output

This subsection sets out the aggregate economic impact of the Maritime sector in Wales through domestic output (generated through business turnover). Figure 12 below illustrates the domestic output multipliers for the Maritime sector in Wales, separated by industry activity. Here the interpretation is that, for every £1 of domestic output directly supported by the Maritime sector in Wales, '£X' of domestic output is supported in total throughout the economy through supply chain (indirect) and employee spending (induced) channels. We can also disaggregate this statement by industry sector: for example, for each £1 of domestic output directly supported by the Shipping industry, £0.64 is supported through the supply chain and an additional £0.50 is supported through employee expenditures – yielding an aggregate impact of £2.14.

Therefore after combining each industry activity, for every £1 of domestic output initially generated by the Maritime sector in Wales in 2015, the Welsh and UK economies as a whole experienced an increase in domestic output of £2.17.

Figure 12: Domestic output multiplier impacts of the Maritime sector in Wales, 2015



Source: ONS, FAME, Cebr analysis

Table 9 below shows the estimated aggregate domestic output impacts from the individual Maritime industries when taken in isolation. The Maritime sector directly contributed £936 million in turnover in

Wales in 2015; and once the indirect and induced economic channels are taken into consideration the industries contributed just over £2 billion in domestic output.

Table 9: Domestic output impact by each Maritime industry in Wales in 2015, £ million

Domestic output in 2015	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	936	622	473	2,031
Ports	178	141	125	445
Shipping	518	332	257	1,107
Marine	190	104	73	367
Maritime Business Services	50	45	18	112

Source: ONS, FAME, Cebr analysis

Table 10 Table 8 below shows the estimated direct and total domestic output impacts of the Maritime sector in Wales across the years 2010 to 2015. The total impact on domestic output was substantially higher in 2015 than in 2013 and 2014, but its highest level was in 2011 at approximately £2.6 billion. An analogous story applies to the direct impacts. The composite domestic output multipliers are relatively stable across each year, ranging from 2.13 (in 2013) to 2.17 (in 2015).

Table 10: Direct and Total domestic output impact of the Maritime sector in Wales, 2010 to 2015, £ million

Year	Direct Impact	Composite domestic output multiplier	Aggregate impact
2010	805	2.14	1,723
2011	1,209	2.15	2,603
2012	977	2.15	2,096
2013	663	2.13	1,411
2014	728	2.20	1,599
2015	936	2.17	2,031

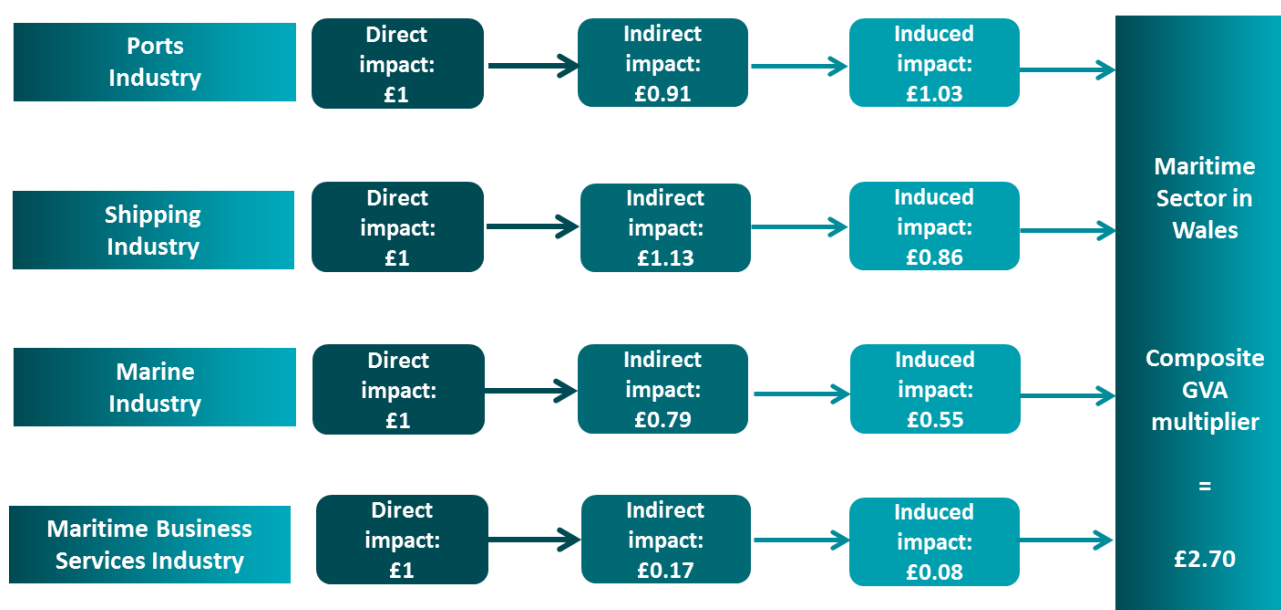
Source: ONS, FAME, Cebr analysis

4.2 The wider economic impacts through GVA

This subsection sets out the aggregate economic impact of the Maritime sector in Wales through GVA. Figure 13 below illustrates the GVA multipliers for the Maritime sector in Wales, separated by industry activity. Here the interpretation is that, for every £1 of GVA directly supported by the Maritime sector in Wales, '£X' of GVA is supported in total throughout the economy through supply chain (indirect) and employee spending (induced) channels. We can also disaggregate this statement by industry sector: for example, for each £1 of GVA directly supported by the Shipping industry, £1.13 is supported through the supply chain and an additional £0.86 is supported through employee expenditures – yielding an aggregate impact of £2.99.

Therefore after combining each industry activity, for every £1 of domestic output initially generated by the Maritime sector in Wales in 2015, the Welsh and UK economies as a whole experienced an increase in GVA of £2.70.

Figure 13: GVA multiplier impacts of the Maritime sector in Wales 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 £333 million towards GDP in Wales in 2015; and once the indirect and induced economic channels are taken into consideration the industries contributed £899 million to the economy.

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

GVA in 2015	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	333	307	259	899
Ports	90	82	93	265
Shipping	141	159	122	421
Marine	78	62	43	183
Maritime Business Services	24	4	2	29

Source: ONS, FAME, Cebr analysis

Table 12 below shows the estimated direct and total economic impacts of the Maritime sector in Wales across the years 2010 and 2015. The direct and total impacts were substantially higher in 2015 than in 2012-2014, but highest in 2011. The composite GVA multiplier was highest in 2010 at 2.82, but otherwise relatively stable ranging from 2.70 (in 2015) to 2.78 (in 2011 and 2012).

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

Year	Direct Impact	Composite GVA multiplier	Aggregate impact
2010	323	2.82	910
2011	354	2.78	983
2012	307	2.78	853
2013	271	2.72	736
2014	267	2.69	716
2015	333	2.70	899

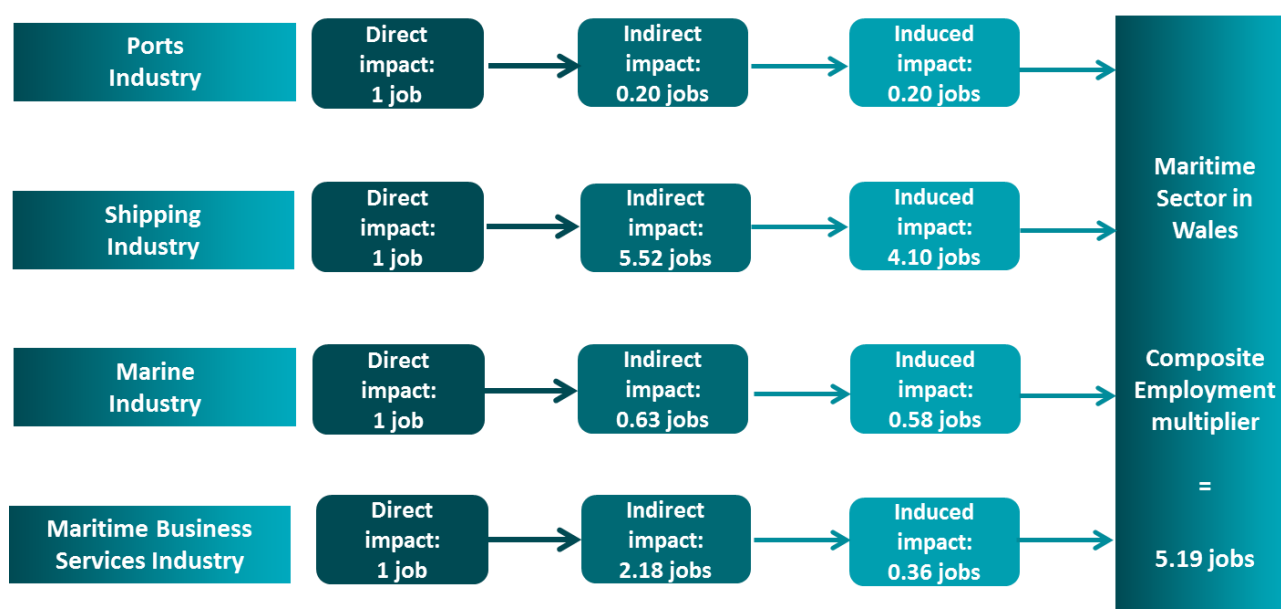
Source: ONS, FAME, Cebr analysis

4.3 The wider economic impacts through employment

This subsection sets out the wider economic impact that the Maritime sector in Wales makes through employment. Figure 14 below illustrates the employment multipliers for the Maritime sector in Wales, separated by industry activity. Here the interpretation is that for, every 1 job directly supported by the Maritime sector in Wales, 'X' jobs are supported in total throughout the economy through supply chain (indirect) and employee spending (induced) channels. We can also disaggregate this statement by industry sector: for example, for each 1 job directly supported by the Shipping industry, 5.52 jobs are supported through the supply chain and an additional 4.10 jobs are supported through employee expenditures – yielding a total employment impact of 10.63 jobs.

Combining each Maritime industry, for every 1 job initially generated by the Maritime sector in Wales in 2015, a total of 5.19 jobs were therefore supported in the wider Welsh and UK economies.

Figure 14: Employment multiplier impacts of the Maritime sector in Wales, 2015



Source: ONS, FAME, Cebr analysis

Table 13 below shows the estimated employment impacts from the Welsh Maritime industries taken in isolation. Collectively, the four Maritime industries directly contributed approximately 6,000 jobs in Wales in 2015; and once the indirect and induced economic channels are taken into consideration the total impact becomes approximately 31,000 jobs. Due to the high economic multipliers associated with

the Shipping industry, the Shipping industry makes the largest total economic impact through employment in 2015, at 23.9 million. This is approximately 77% of the total employment impact.

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

Employment in 2015	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	6.0	14.3	10.7	30.9
Ports	1.8	0.3	0.4	2.5
Shipping	2.3	12.4	9.2	23.9
Marine	1.8	1.1	1.0	3.9
Maritime Business Services	0.2	0.4	0.1	0.6

Source: ONS, FAME, Cebr analysis

Table 14 shows how the total employment impact of the Maritime sector in Wales is estimated to have evolved since 2010. The total employment in 2015 was approximately 31,000 jobs, which was higher than in 2014, but ultimately lower than in years 2010 (37,000 jobs) and 2011 (40,000). Whilst the direct impact in 2015 was approximately the same as in 2010, at 6,000 jobs, the composite employment multiplier was lower and this therefore explains the lower total impact.

Table 14: Direct and Total Employment impact of the Maritime sector in Wales, 2010 to 2015, thousands of jobs

Year	Direct Impact	Composite Employment multiplier	Total employment impact
2010	6.0	6.17	36.9
2011	7.0	5.74	40.0
2012	4.8	5.73	27.5
2013	5.5	6.09	33.4
2014	4.9	4.86	24.0
2015	6.0	5.19	30.9

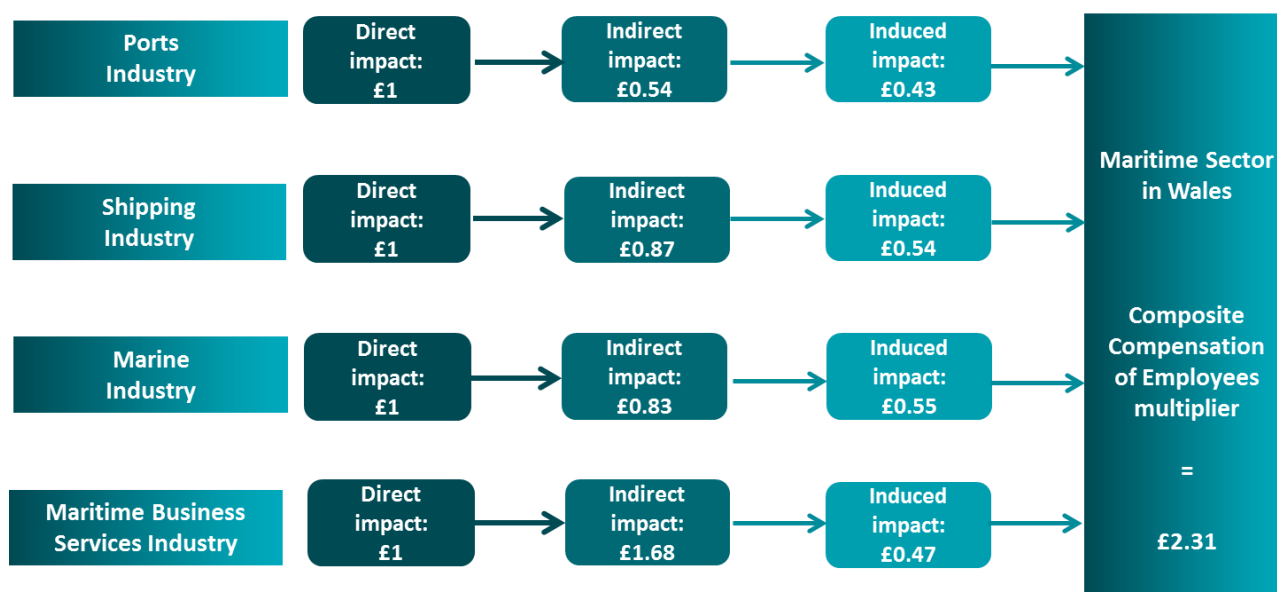
Source: ONS, FAME, Cebr analysis

4.4 The wider economic impacts through compensation of employees

This subsection sets out the wider economic impact that the Maritime sector in Wales makes through the compensation of employees. Figure 15 below illustrates the employee compensation multipliers for the Maritime sector in Wales, separated by industry activity. Here the interpretation is that for, every '£X' of wages and salaries directly supported by the Maritime sector in Wales, '£X' of wages and salaries and other employment remunerations is supported in total throughout the economy through supply chain (indirect) and employee spending (induced) channels. We can also disaggregate this statement by industry sector: for example, for each £1 of employee compensation directly supported by the Shipping industry in Wales, £0.87 is supported through the supply chain and an additional £0.54 is supported through employee expenditures – yielding a total impact of £2.41.

Combining each Maritime industry in Wales, for every £1 initially contributed by these entities in 2015, a total of £2.31 in employee compensation was supported in the Welsh economy.

Figure 15: Employee compensation multiplier impacts of the Maritime sector in Wales, 2015



Source: ONS, FAME, Cebr analysis

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

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

COE in 2015	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	199	159	101	459
Ports	53	28	22	104
Shipping	95	82	52	229
Marine	43	35	23	102
Maritime Business Services	8	13	4	25

Source: ONS, FAME, Cebr analysis

We estimate that the Maritime sector in Wales directly and indirectly supported a total of £459 million in employee compensation in 2015, with the majority of this total contribution sourced from the Shipping industry, whilst the Ports and Marine industries have similar total impacts.

Table 16 below illustrates the total impact through the compensation of employees in each year since 2010. The composite employee multipliers have remained relatively stable across each year, such that the differences in total impact can be attributed largely to differences in the size of direct impact. The direct and total impacts in 2015 were higher than in 2013 and 2014, but lower than in 2010-2012.

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

Year	Direct Impact	Composite Employee Compensation multiplier	Aggregate impact
2010	218	2.35	511
2011	260	2.32	603
2012	214	2.29	490
2013	160	2.27	363
2014	151	2.27	342
2015	199	2.31	459

Source: ONS, FAME, Cebr analysis

5 Annex: List of Welsh ports

Table A.1: List of Welsh ports considered as part of the study

Port	Council Ward	Postcode
Anglesey Marine Terminal	Twrcelyn	LL68 9DB
Bangor	Harbour	BT20 5ED
Barry	Castleland	CF63 3US
Bird Port	Liswerry	NP19 4RE
Burry Port	Burry Port	SA16 0ER
Caernarfon	Seiont	LL55 2PB
Cardiff	Butetown	CF10 4LY
Fishguard	Goodwick	SA64 0BU
Holyhead	Caergybi	LL65 1DQ
Llanddulas	Llysfaen	LL29 9YW
Milford Haven	Haverfordwest: Priory	SA73 3ER
Mostyn	Mostyn (Delyn)	CH8 9HE
Neath	Neath North	SA11 1RY
Newport	Pillgwenlly	NP2 UW
Penarth	St Augustine's	CF64 1TQ
Port Penrhyn	Arllechwedd	LL57 4HN
Port Talbot	Margam	SA13 1RB
Shotton	Dewi	LL57 2DJ
Swansea	St Thomas	SA1 1QR