The economic impact of the marine and maritime sector on the UK in 2011/12

January 2013
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Executive Summary

This study investigates the economic contribution of the marine and maritime sector to the UK economy. The sector is defined to include nine individual industries which are: ports; shipping; maritime business services; ship building and repairs; marine equipment; marine renewable energy servicing; leisure and small commercial; marine science; and maritime technical consultancy.

The results suggest the marine and maritime sector makes a large contribution to the UK economy…

...contributing £35.1 billion to UK GDP...

- After accounting for some of the nine industries being in each others supply chains, the marine and maritime sector is estimated to support a gross valued added contribution to GDP of £35.1 billion in 2011/12. This is 2.3% of the total output produced by the UK economy in the year.

...it supports 703,000 people in employment….

- In 2011/12, the marine and maritime sector supports 703,000 people in employment in the UK. Therefore, 1 in every 45 jobs in the economy is dependent or partially dependent on the sector.

…and contributes £9.2 billion for the Exchequer

- In total, the sector supported a £9.2 billion tax contribution to HM Exchequer. This is 2% of all tax receipts.

Figure 1: Summary of the economic contribution of the UK marine and maritime sectors in 2011/12
Looking at the individual channels of economic impact

- In 2011/12, firms within the sector employed 367,000 people. The largest employers were shipping (146,000 people), ports (117,000 people) and the marine sector (95,000 people).

- Firms within the sector generated a £18.9 billion gross value added contribution to GDP. This is 1.2% of the economic activity created in the UK in the year. It is larger than the aerospace and aviation sector at £18.5 billion.

...whilst generating considerable multiplier impacts.

- The marine and maritime sector’s procurement of inputs of goods and services sourced from UK-based suppliers generates economic activity and employment. The sector’s purchasing supported an £7.6 billion contribution to GDP, 157,000 people in employment and £2.1 billion in tax receipts.

- The wages paid to staff directly and indirectly employed by the sector are spent at retail and leisure outlets, which generates GDP and employment in these locations and in their domestic supply chain. These induced impacts support a £8.6 billion contribution to GDP, 178,000 jobs and £2.4 billion in tax payments.
1 Introduction

This report quantifies the economic contribution of the marine and maritime sectors to the UK economy in 2011/12. The maritime sector is here defined to include nine component industries, including:

- Ports
- Shipping
- Maritime business services
- Ship building and repairs
- Marine equipment
- Marine renewable energy servicing
- Leisure and small commercial
- Marine science
- Maritime technical consultancy

The first three categories in the list are considered maritime industries, while the latter six are marine industries. Greater detail on the activities that make up these broader categories is available in the Appendix of this report.

1.1 About economic impact analysis

One technique economists use to assess the contribution an industrial sector makes to a country’s economy is economic impact analysis. A standard economic impact assessment looks at three channels of impact. These are:

Direct effects – the economic activity created at firms within the sector.

Indirect effects – the economic activity that results from the firms within the sector’s procurement of inputs of goods and services from their domestic supply chain.

Induced effects – the economic activity created by those directly and indirectly employed by the sector spending their wages on goods and services at retail and leisure outlets.

The results of the economic impact assessment in this report are presented using three metrics, which are:

1. Gross value added (GVA) contribution to GDP – GDP is the main indicator of the level of economic activity in the UK economy.¹ The gross value added contribution to GDP is probably easiest thought of as the value at which a sector’s output is sold (excluding taxes) minus the cost of the bought in inputs of goods and services used up in producing it.

2. Employment – the number of people employed. A headcount measure is used in preference to the number of full-time equivalents (FTE) to

¹ GDP is the indicator of economic output used to judge the rate of economic growth or indicate when the economy enters a recession.
facilitate comparisons with the Office for National Statistics’ employment data.

3. **Tax revenue** – the amount of tax revenue paid as a result of the activities of the marine and maritime sectors, including corporate tax, income tax, national insurance contributions, and VAT.

The results of this economic impact study (like most others) are presented on a gross rather than a net basis. This means no account is taken of what the resources used up by the sector could alternatively be deployed to do.

1.2 Outline for the report

The economic impact analysis in this report estimates the gross value added contribution to GDP, employment, and tax contribution to HM Exchequer that are supported by the marine and maritime sector.

**Chapter 2** presents the results of the economic impact analysis on the individual industries within the marine and maritime sector.

**Chapter 3** shows the economic contribution of the marine and maritime sector in aggregate. It therefore removes the double counting from many of the industries within the marine and maritime sector being in each other’s supply chains.

**Chapter 4** concludes.

**The appendix** details the definition of the sectors, the results of the individual industries economic impact studies and the data sources and the methodology used to construct the estimates for each industry.
2 The individual industries’ economic impact

Main points

- The firms in the marine and maritime sector are estimated to have made a £18.9 billion gross value added contribution to GDP in 2011/12. This is 1.2% of the UK’s economic output made during this year.

- In 2011/12, the sector is estimated to employ 367,000 people. This is 1.2% of total employment in the UK.

- After allowing for multiplier impacts the ports sector supports the largest contribution to UK GDP, contributing £21.2 billion. It is followed by shipping (£12.5 billion) and marine (£3.8 billion).

- The ranking for employment supported across the nine industries is very similar to the GDP contribution. The three largest industries remain in the same order: ports (at 392,000 people); shipping (at 287,000) and marine (at 95,000).

2.1 Direct contribution of the marine and maritime sector to the UK economy

The direct economic impact of the marine and maritime sector is comprised of the gross value added (GVA), employment and tax receipts generated by the firms within it.

2.1.1 Direct gross value added contribution to GDP

In 2011/12, the marine and maritime sector is estimated to have made a combined direct gross value added contribution to GDP of £18.9 billion (Chart 2.1). The industries which made the largest direct contribution are ports at £7.9 billion (or 42% of total), shipping at £5.6 billion (or 30%) and marine at £3.8 billion (or 20%).
To give a sense of scale, this is 1.2% of the economic output created within the UK economy in 2011/12. Put another way £1 in every £80 of GDP created in the UK in 2011/12 was made within the marine and maritime sector.

An alternative way to gauge the scale of the marine and maritime sector’s contribution to UK GDP is to compare it with other industries in the UK. In 2011/12, the marine and maritime sector contributed more to GDP than the aerospace and aviation industry (£18.4 billion)\(^2\), and less than the radio, television and telecommunications industries (£31.7 billion)\(^3\) and automotive manufacture and motor trades (£34.3 billion)\(^4\) in 2011 (Chart 2.2).

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\(^2\) Aerospace and Aviation industries consist of: Manufacture of aircraft and spacecraft (SIC 30.3); Maintenance and repair of aircraft and spacecraft (SIC 33.16); Air Transport (SIC 51); and Service activities incidental to air transport (SIC 52.23).

\(^3\) Radio, television and telecommunications consists of: Programming and broadcast activities (SIC 60); Telecommunication (SIC 61).

\(^4\) Automotive manufacture and motor trades include: Manufacture of motor vehicles (SIC 29); and Wholesale, retail, maintenance and repair of motor vehicles (SIC 45).
2.1.2 Direct employment

In 2011/12, the marine and maritime sector is estimated to employ 367,000 people (Chart 2.3). This is 1.2% of total employment in the UK. The shipping industry employs the most people (146,000 people, of which 48,200 are UK-nationals and 97,300 are foreign nationals). Ports (117,000 people) and the marine industry (96,000 people) rank second and third. Within the marine industry, the leisure and small commercial sector employs the most (31,000 people).
To provide a sense of context, these figures can be compared to other industries in the UK economy, such as the aerospace and aviation industry, telecommunications and automotive and land transport industries (Chart 2.4). The marine and maritime sector employs more people than the aerospace and aviation industry (221,000 people) and radio, television and telecommunications industry (251,000). It employs less than the automotive manufacturing and motor trades sector (654,000).6

Chart 2.4: Industries sustaining similar levels of employment as the marine and maritime sectors in 2011 in the UK

Source: Oxford Economics, ONS

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5 See footnotes 2, 3 and 4 for the SIC codes included in each industry.
2.1.3 Productivity of the marine and maritime sectors

In 2011/12, each person employed in the marine and maritime sector produced a gross value added contribution to GDP of £51,300. This is greater than the whole economy average of £48,300 (Chart 2.5).^7^

**Chart 2.5: Productivity of the marine and maritime sectors relative to the UK average for 2011/12**

![Chart showing productivity comparison](chart.png)

Source: Oxford Economics

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2.1.4 Direct tax contribution to the Exchequer

Firms within the marine and maritime sectors pay corporation tax and employers national insurance contributions. Staff working within the sector pay income tax, make national insurance contributions and generate VAT and excise duties revenues by spending their wages.

In 2011/12, the marine and maritime sector contributed an estimated £4.7 billion to the Exchequer. This is 1.0% of total tax receipts that are expected to be collected by HM Revenue and Customs in the year.^8^ The ports, marine and shipping industries made the largest contribution to tax receipts at £2.0 billion, £1.7 billion, and £0.6 billion, respectively (Chart 2.6). Within the marine industry, the leisure and small commercial industry contributed £0.5 billion.

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2.2 Indirect contribution of the marine and maritime sector to the UK economy

The marine and maritime sector purchases inputs of goods and services from UK suppliers. This expenditure generates gross value added, employment, and tax contributions to the Exchequer down the sector’s UK supply chain.

The size of the indirect effects are calculated by multiplying the direct estimate of each of the nine industries’ gross valued added contribution to GDP by the closest industry supply linkage multiplier calculated from a manipulation of the ONS (2011) analytical input-output tables. The employment estimates are then calculated by dividing the gross value added by labour productivity estimates for the whole economy. The tax impacts are calculated using average earnings data for 2011, estimates of corporate profitability and current tax rates for corporation tax, income tax, national insurance contributions, and VAT and other indirect taxes.

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9 A supply linkage multiplier shows the knock on effects on the economy of the industries within the marine and maritime sectors purchases of inputs and further purchases.
11 Whole-economy labour productivity is derived by dividing ONS data on gross value added at market prices by total employment in the UK economy.
13 Corporate profitability is calculated by applying the ratio of gross operating surplus to total output from the nearest industry sector in the ONS (2011) analytical input output tables to each industry’s total revenue.
14 For all marine and maritime sectors apart from shipping, average effective corporate tax rates are taken from ONS, (2012), ‘Computation of corporation tax liability’. For shipping, an estimate of effective tonnage tax rates is applied (see Methodology for more detail).
15 ONS, (2012), ‘The effects of taxes and benefits on household income, 2010/2011’ is used to calculate VAT and indirect tax payments.
Many of the nine marine and maritime industries are in each other’s supply chain. In this section the results are presented for the major four industries rather than in aggregate, as calculating a total contribution to GVA, employment and tax receipts using these figures would result in an overestimate. An aggregate estimate of the total impact of the marine and maritime sector, which adjusts for potential double counting issues, is presented in Chapter 3.

2.2.1 Indirect gross value added

In 2011/12, the nine industries’ procurement generated a gross value added contribution to GDP in their domestic supply chain which ranged from £130 million for marine science to £7.8 billion for ports (Chart 2.7).

Chart 2.7: Indirect contribution to GDP in the UK in 2011/12

![Chart image]

Source: Oxford Economics

2.2.2 Indirect employment

Of the four industries shown in Chart 2.8, maritime business services has the largest employment supply chain multiplier at 3.7. So for every person employed in the industry 2.7 people are employed in its UK supply chain. This compares to 0.5 people supported in shipping industry’s supply chain for every one in the industry itself.

In total, ports procurement supported the most people in employment in 2011/12 at 167,000 people, followed by shipping (80,000) and the marine industries (68,000).
2.2.3 Indirect tax contribution to the Exchequer

The marine and maritime industries which supported the most tax receipts through their expenditure on procurement in 2011/12 were ports (£2.6 billion), shipping (£1.2 billion) and the marine industries (£0.9 billion).

2.3 Induced contribution of the marine and maritime sector to the UK economy

The people directly and indirectly employed by the marine and maritime sector spend their wages at retail and leisure outlets. This generates economic activity at those outlets, but also down their domestic supply chains.
The induced impact for each of the nine industries within the marine and maritime sector are calculated by applying consumption multipliers\textsuperscript{16} sourced from ONS (2011) analytical input output tables to each industry’s direct GDP contribution. The employment and tax impacts are calculated analogously to those for the indirect effects explained in Section 2.3.

### 2.3.1 Induced gross value added

Spending on consumer goods and services by the direct and indirect employees of the marine and maritime sector contributes and induced value added contribution to GDP. The effect is largest for ports (£5.2 billion), shipping (£3.0 billion), and the marine (£2.4 billion) industries (Chart 2.10).

#### Chart 2.10: Induced gross value added contribution to UK GDP in 2011/12

<table>
<thead>
<tr>
<th>Industry</th>
<th>£ billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports</td>
<td>5.0</td>
</tr>
<tr>
<td>Shipping</td>
<td>3.0</td>
</tr>
<tr>
<td>Marine industries</td>
<td>2.0</td>
</tr>
<tr>
<td>Business services</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: Oxford Economics

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\textsuperscript{16} A consumption multiplier shows the impact of the expenditure of those who derive their incomes from the direct and supply linkage impacts of the industries in the marine and maritime sector.
2.3.2 Induced employment

Wage-financed consumer spending by those directly and indirectly employed in the marine and maritime sector supports additional employment in the UK economy. Spending by staff employed by ports creates the most jobs (108,000 people), followed by shipping (62,000), and marine (50,000) industries (Chart 2.11).

Chart 2.11: Induced employment in the UK in 2011/12

Source: Oxford Economics

2.3.3 Induced tax contributions to the Exchequer

In 2011/12, the spending of those employed directly in ports, shipping, and marine – or their supply chains – contributed the most in tax revenues to the Exchequer. Induced tax receipts from the three sectors is estimated to be £1.7 billion, £1.0 billion, and £0.7 billion, respectively (Chart 2.12).

Chart 2.12: Induced tax contributions in the UK in 2011/12

Source: Oxford Economics
2.4 Total economic impact of the nine individual industries in the marine and maritime sector

Ports are estimated to support the largest contribution to GDP (at £21.2 billion) of the four major industries (Chart 2.12). The shipping industry (£12.5 billion) and marine (at £9.5 billion) are second and third.

Chart 2.13: Gross value added contribution to GDP supported by the nine industries in 2011/12

The ranking for employment supported across the industries is very similar. The three largest industries remain in the same order: ports (at 392,000 people); shipping (at 287,000) and marine (at 212,000) (Chart 2.14).

Chart 2.14: Employment supported by the nine industries in 2011/12

All four of the industries support tax receipts worth over a £1 billion in 2011/12 (Chart 2.15). Ports are estimated to support the largest receipts (at £6.2 billion), followed by marine (£3.3 billion) and shipping (at £2.8 billion).
Chart 2.15: Tax contribution to the Exchequer supported by the nine industries in 2011/12

£ Billion

0 1 2 3 4 5 6 7

Ports Marine industries Shipping Maritime business services

Induced Indirect Direct

Source: Oxford Economics
3 Aggregate impacts

Main points

- After allowing for ‘double counting’ the marine and maritime sector is estimated to support a £35.1 billion gross value added contribution to GDP. This is 2.3% of UK GDP in 2011/12.
- In aggregate, the nine industries in the marine and maritime sector are estimated to support 703,000 people in employment in the UK. As a result, 1 in every 45 jobs is estimated to depend on the sector.
- In 2010/11, the aggregate marine and maritime sector is estimated to support a £9.2 billion contribution to tax receipts in the UK economy.

In Chapter 2, the economic impact of each of the individual industries within the marine and maritime sector is estimated. But it is not possible to sum the contributions of the nine industries to form an aggregate estimate for the whole sector as many of the industries are in each others’ supply chains. As a result, summing the nine industries’ contribution would double count and therefore overstate some the supply chain and wage consumption impacts.

Section 3.1 of this chapter explains the methodology used to remove the double counting. Section 3.2 presents the estimate of the size of the marine and maritime sector and puts it in context of the wider UK economy.

3.1 Procedure to remove double counting of supply chain impacts

The ONS17 produces Input-Output tables which detail the value of each industry’s purchases of inputs of goods and services from other industries within the UK and the amount sourced from abroad. To form an estimate of the double counting, each of the nine industries within the marine and maritime sector is aligned to the nearest industry in the input-output tables18. The share of each of the nine industries’ inputs that come from other industries in the marine or maritime sector is then calculated. This percentage is used as the estimate of double counting. It is then used to scale the supply chain and consumption multipliers used for each of the nine industries.

The estimate of double counting is likely to be an over estimate as the definition of the industries in the ONS input-output table is wider than each of the nine industries in the marine and maritime sector. The approach is therefore conservative. More of the indirect and induced impacts are removed than would be the case if we had full information about the extent to which the nine industries are in each others supply chains.

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18 Further detail is given in the Appendix.
The economic impact of the marine and maritime sector
January 2013

Table 3.1 shows the results of the procedure to remove the ‘double counting’ so we can derive an estimate of the aggregate impact of the marine and maritime sector. The upper half of the table shows the unadjusted estimates of all nine industries’ impact summed together for each of the three metrics (shown in the columns) and channels of impact (shown in the rows). The adjusted estimates are shown in the bottom half of the table.

Looking at the bottom half of Table 3.1, the direct impacts (£18.9 billion gross value added contribution to GDP, 367,000 employed and £4.7 billion tax receipts) are unchanged. The adjusted indirect gross value added and employment aggregates are 46% of the unadjusted total, while the adjusted induced gross value added and employment aggregates are 75% of the unadjusted total. Another way to express this is that 54% of the indirect effects are already included in the direct effects of one of the sectors included in this study. The total row at the bottom of the table shows the aggregate estimates for the gross value added contribution to GDP and employment, which are 75% of the unadjusted total.

Table 3.1: Adjusted economic impact of marine and maritime sectors in 2011/12

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted GVA (£ billion)</th>
<th>Employment (000s)</th>
<th>Tax (£ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>18.9</td>
<td>367</td>
<td>4.7</td>
</tr>
<tr>
<td>Indirect</td>
<td>16.5</td>
<td>341</td>
<td>5.2</td>
</tr>
<tr>
<td>Induced</td>
<td>11.5</td>
<td>238</td>
<td>3.6</td>
</tr>
<tr>
<td>Total</td>
<td>46.9</td>
<td>946</td>
<td>13.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Adjusted GVA (£ billion)</th>
<th>Employment (000s)</th>
<th>Tax (£ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>18.9</td>
<td>367</td>
<td>4.7</td>
</tr>
<tr>
<td>Indirect</td>
<td>7.6</td>
<td>157</td>
<td>2.1</td>
</tr>
<tr>
<td>Induced</td>
<td>8.6</td>
<td>178</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>35.1</td>
<td>703</td>
<td>9.2</td>
</tr>
</tbody>
</table>

Source: Oxford Economics

The results suggest that the marine and maritime sector supports a £35.1 billion gross value added contribution to GDP. This is 2.3% of the total output of the whole UK economy. It supports 703,000 people in employment. So that 1 in every 45 jobs is dependent on the marine and maritime sector. The marine and maritime sector supports a £9.2 billion contribution to the Exchequer. This is 2.0% of total tax receipts. Chart 3.1 illustrates the adjusted impact – including direct, indirect, and induced effects – of the marine and maritime sector on the UK economy as a share of the economy overall.
Chart 3.1: The marine and maritime sector's contribution to the UK economy in 2011/12

Source: Oxford Economics
4 Conclusion

This study measures the contribution of the marine and maritime sector to the UK economy. The marine and maritime sector is defined to include ports, shipping, maritime business services, ship building and repairs, marine equipment, marine renewable energy servicing, leisure and small commercial, marine science, and maritime technical consultancy. The study begins by looking at the size of the nine individual industries, the impact they have in generating economic activity through their procurement of inputs of goods and services from domestic suppliers and the impact of their direct and indirect staff spending their wages at retail and leisure outlets.

Of the nine industries, ports make the largest impact on the UK economy, supporting a £21.2 billion value added contribution to GDP, 392,000 people in employment and £6.2 billion in tax receipts. It is followed by the shipping industry which supports £12.5 billion in value added, 287,000 jobs and £2.8 billion in tax receipts. The marine industry ranks third in importance.

As many of the marine and maritime industries are in each others supply chain, calculating the sector’s aggregate contribution to the UK economy is not simply a case of summing the individual industries’ impacts. The ONS (2011) input output tables have been used to estimate the extent of each industry’s procurement from other industries in the sector. This is a conservative approach as the industry definitions in the input output tables are wider than those in this paper.

The results suggest that the marine and maritime sector supports a £35.1 billion gross value added contribution to GDP. This is 2.3% of the total output of the whole UK economy. It supports 703,000 people in employment. So that 1 in every 45 jobs is dependent on the marine and maritime sector. The marine and maritime sector supports a £9.2 billion contribution to the Exchequer. This is 2.0% of total tax receipts.
5 Bibliography


HMRC, (2011), 'Income tax rates, rate limits and personal allowances for 2011-12'.

HMRC, (2011), 'Rates and thresholds for employers: 2011-12'.


ONS, (2012), ‘Computation of corporation tax liability’


6 Appendix: Components of the marine industry, individual industry results and methodology

6.1 Definition of the marine industries

Unfortunately, the marine sector does not neatly fit into the ONS Standard Industrial Classification codes. In this study it is therefore defined to include:

- Design, manufacture, maintain, convert and dismantle civil and military ships, leisure craft, superyachts, other vessels (e.g., submarines, RIBs/PWCs, UUVs/USVs/ROVs) and related equipment/accessories;
- Design, manufacture, install, maintain and decommission offshore wind, wave and tidal energy devices, associated substations and equipment;
- Provide related technical services throughout the lifecycle of these products (e.g., research, design and classification);
- Provide supplies to the above;
- Marine science equipment and services;
- Provide services in marine leisure.

It has been defined to exclude:

- Abstraction (e.g., aggregates, fisheries, aquaculture)
- Offshore & coastal infrastructure operation and services (e.g., energy generation & supply)
- And non-industrial organisations
  - Government (MoD, Royal Navy, DfT, MCA, DEFRA, MMO, etc.)
  - Academia & Further Education

The marine sector is defined to comprise six industries

- Ship building and repairs
- Marine equipment (note that this excludes leisure equipment, which falls within “Leisure and Small Commercial”)
- Marine renewable energy servicing
- Leisure and small commercial
- Marine science
- Maritime technical consultancy
6.2 Individual industry economic impact summaries

The three tables below show the results of the economic impact studies for the nine industries. As explained in Chapter 3, these cannot be aggregated to form a total as some of the industries are in each other’s supply chains. The numbers have been rounded to the nearest £100 million or 1000 people. As a result, they may not sum horizontally.

Table 6.1: Economic contribution of individual maritime and marine industries to UK GDP in 2011/12

<table>
<thead>
<tr>
<th>GVA (£ million)</th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maritime industries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ports</td>
<td>7,900</td>
<td>8,100</td>
<td>5,200</td>
<td>21,200</td>
</tr>
<tr>
<td>Shipping</td>
<td>5,600</td>
<td>3,900</td>
<td>3,000</td>
<td>12,500</td>
</tr>
<tr>
<td>Maritime business services</td>
<td>1,500</td>
<td>1,300</td>
<td>900</td>
<td>3,700</td>
</tr>
<tr>
<td><strong>Marine industries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship building and repairs</td>
<td>1,100</td>
<td>1,000</td>
<td>700</td>
<td>2,800</td>
</tr>
<tr>
<td>Equipment</td>
<td>800</td>
<td>700</td>
<td>500</td>
<td>1,900</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>900</td>
</tr>
<tr>
<td>Leisure and small commercial</td>
<td>900</td>
<td>800</td>
<td>600</td>
<td>2,300</td>
</tr>
<tr>
<td>Marine science</td>
<td>300</td>
<td>100</td>
<td>200</td>
<td>600</td>
</tr>
<tr>
<td>Maritime (technical) consultancy</td>
<td>500</td>
<td>300</td>
<td>300</td>
<td>1,100</td>
</tr>
</tbody>
</table>

Source: Oxford Economics

Table 6.2: Economic contribution of individual maritime and marine industries to UK employment in 2011/12

<table>
<thead>
<tr>
<th>Employment</th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maritime industries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ports</td>
<td>117,000</td>
<td>167,000</td>
<td>108,000</td>
<td>392,000</td>
</tr>
<tr>
<td>Shipping</td>
<td>146,000</td>
<td>80,000</td>
<td>62,000</td>
<td>287,000</td>
</tr>
<tr>
<td>Maritime business services</td>
<td>10,000</td>
<td>27,000</td>
<td>18,000</td>
<td>55,000</td>
</tr>
<tr>
<td><strong>Marine industries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship building and repairs</td>
<td>26,000</td>
<td>20,000</td>
<td>15,000</td>
<td>61,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>10,000</td>
<td>13,000</td>
<td>10,000</td>
<td>33,000</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>6,000</td>
<td>9,000</td>
<td>2,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Leisure and small commercial</td>
<td>31,000</td>
<td>17,000</td>
<td>13,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Marine science</td>
<td>15,000</td>
<td>3,000</td>
<td>4,000</td>
<td>21,000</td>
</tr>
<tr>
<td>Maritime (technical) consultancy</td>
<td>7,000</td>
<td>6,000</td>
<td>6,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Source: Oxford Economics
Table 6.2: Economic contribution of individual maritime and marine industries to UK tax receipts in 2011/12

<table>
<thead>
<tr>
<th>Tax (£ million)</th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maritime industries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ports</td>
<td>2,000</td>
<td>2,600</td>
<td>1,700</td>
<td>6,200</td>
</tr>
<tr>
<td>Shipping</td>
<td>600</td>
<td>1,200</td>
<td>1,000</td>
<td>2,800</td>
</tr>
<tr>
<td>Maritime business services</td>
<td>400</td>
<td>400</td>
<td>300</td>
<td>1,100</td>
</tr>
<tr>
<td><strong>Marine industries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship building and repairs</td>
<td>400</td>
<td>300</td>
<td>200</td>
<td>900</td>
</tr>
<tr>
<td>Equipment</td>
<td>200</td>
<td>200</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>200</td>
<td>100</td>
<td>-</td>
<td>300</td>
</tr>
<tr>
<td>Leisure and small commercial</td>
<td>500</td>
<td>200</td>
<td>200</td>
<td>900</td>
</tr>
<tr>
<td>Marine science</td>
<td>400</td>
<td>40</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Maritime (technical) consultancy</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
</tr>
</tbody>
</table>

Source: Oxford Economics

6.3 Direct contribution of the marine and maritime sector to the UK economy: GVA and employment

This section describes in greater detail than the main text the methodology behind the estimation of the marine and maritime sectors’ direct GVA and employment contributions to the UK economy.

Ports

The estimate for GVA and employment in ports in 2011/12 is taken from Oxford Economics (2012) study on the economic impact of ports.19

Shipping

The estimate for GVA and employment of shipping in 2011/12 is taken from Oxford Economics (2012) study on the economic contribution of shipping.20

Maritime business services

An estimate for GVA and employment of maritime business services in 2011/12 is taken from Oxford Economics (2012) study on the sector.21

Ship building and repairs

Data was sourced from the ONS’ Annual Business Survey for turnover, gross value added, and employment for ship building, boat-building, and repairs (SIC codes 30.11, 30.12, and 33.15) for 2011. From this, the British Marine Federation’s (2013) KPI figures for 2011/12 for power boat manufacture, sail

boat manufacture, other boat manufacture, boat repairs/services were subtracted to avoid double counting what is already included in the ‘leisure and small commercial’ category.

The resulting estimates are for 2011. They are translated into 2011/12 values using Oxford Economics’ forecast for GVA and employment growth for ships and rolling stock (encompassing ONS SIC code 30).

Marine equipment^{22}

BIS provided aggregate data on turnover and employment sourced from the Interdepartmental Business Register (IDBR) for 35 major equipment manufacturers and suppliers including Rolls Royce, Babcock Marine, Hamworthy, Kelvin Hughes, Fender Care, and Cosalt International for 2011.

The resulting estimates are for 2011. They are translated into 2011/12 values using Oxford Economics forecast for GVA growth for Engineering and Metal Goods (encompassing ONS Standard Industrial Classification category 25, 27, and 28).

Marine renewable energy servicing

Estimate for turnover and employment for offshore wind projects in 2011/12 were acquired via RenewableUK^{23}. In the absence of data on installation and maintenance of offshore wind, wave, and tidal, this report uses capital expenditure in 2011/12 for offshore wind projects in the UK as the closest estimate of turnover in the offshore renewable energy sector. It is a poor proxy, so the estimates should be interpreted with caution.

GVA was estimated from turnover using the ratio of GVA to turnover from a Department for Business Innovation and Skills commissioned study (2011, unpublished) focusing on the offshore wind renewable energy sector.

Leisure and small commercial

Data on turnover, GVA and employment for 2011/12 are sourced from British Marine Federation^{24} (2013) KPIs in the leisure and small commercial sector (workboats - excluding fishing boats), which includes manufacturing, distribution of boats, equipment and engines and consumer/business services.

Marine science

Data on turnover and employment in 2011/12 are sourced from the Society of Maritime Industries (2012).^{25} The gross value added contribution to GDP was estimated from the turnover figures using the GVA to turnover ratio for 2011

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^{22} Excludes leisure equipment, this falls within leisure and small commercial.
from the ONS (2012) ABS\textsuperscript{26} for the category Scientific Research and Development (SIC code 72).

**Maritime technical consultancy**

QinetiQ\textsuperscript{27} provided an estimate of this industry’s turnover by drawing on data from 11 large companies and an estimate of 100 smaller companies between 2008/9 and 2011/12. The turnover estimates were projected forward to 2011/12 values using Oxford Economics forecasts for gross output in business services (encompassing SIC codes 68 to 82).

GVA was estimated from turnover using the GVA to turnover ratio in 2011 using the ONS (2012) ABS\textsuperscript{28} category engineering activities and related technical consultancy (SIC code 71.12). Employment was then estimated using the ABS ratio\textsuperscript{29} of GVA/employment in 2011 for the same SIC code.

### 6.4 Direct contribution of the marine and maritime sector to the UK economy: Taxes

The tax contributions of the marine and maritime sector were calculated as follows:

**Income tax**

The estimates of income tax were computed using data on mean gross earnings for 2011 drawn from the ONS (2012) ASHE dataset for the nearest SIC code. The prevailing income tax allowances and rates\textsuperscript{30} in 2011/12 were applied. The income tax payable for the average employee in the industry was then multiplied the total numbers employed to get the aggregate amount of receipts.

For shipping, a number of UK seafarers will not pay income tax because they will be at sea for 183 or more days a year and will be eligible for the ‘Seafarers’ Earnings Deduction’. Discussions with the Chamber of Shipping suggest that this might be around half of all UK officers and a much lower (assumed 10%) proportion of UK ratings. In addition, all non-UK nationals are assumed not pay UK tax while all shore-based staff are assumed to pay UK income tax.

**National Insurance Contributions – employees and employers**

Analogously to the estimates of income tax, HMRC (2012) NIC thresholds and rates\textsuperscript{31} were applied to average gross earnings data from ONS ASHE data for each industry to calculate employee and employer NIC contributions for the average employee. The aggregate figure was calculated by multiplying the average amounts paid by the number of employees.

\textsuperscript{26} ONS, (2012); ‘Annual business survey’, November.
\textsuperscript{27} QinetiQ, (2008/9-2011/12).
\textsuperscript{28} ONS, (2012); ‘Annual business survey’, November.
\textsuperscript{29} ONS, (2012); ‘Annual business survey’, November.
For shipping, employee and employer NICs were calculated using similar assumptions to those for income tax, but in addition we assume that the proportion of officers and ratings whose employers are not liable for NICs in the UK is slightly higher than those who will benefit from the Seafarers’ Earnings Deduction (i.e., 60% for UK officers and 20% for UK ratings).

**VAT and other indirect taxes**

Those earning income due to employment in the marine and maritime sectors or within their supply chain will pay VAT and other indirect taxes (such as excise duties). Estimates of indirect taxes paid were calculated using the ONS’ (2012) publication ‘The Effects of Taxes and Benefits on Household Income, 2010/2011’\(^32\), which provides estimates of average indirect taxes as a share of household income for all income groups in 2010/11.

The estimate is made net of the indirect taxes paid by someone receiving the income provided by Job Seeker’s Allowance.

**Corporation tax**

The ONS publication ‘Corporation Tax Statistics’ (2012) provides data on corporate tax liabilities\(^33\), which are used to estimate tax liabilities as a share of gross trading profits. This share, approximately 14.5%, is used as the effective corporate tax rate for all sectors apart from shipping.

For shipping, corporation tax receipts are based on levels of corporation tax paid by the industry prior to the tonnage tax, scaled to reflect the estimated difference between actual accruals of tax liabilities for the UK shipping industry through tonnage tax and what they would otherwise have been under the standard UK corporation tax regime.\(^34\)

Effective tax rates are applied to Oxford Economics’ estimates of gross operating surplus for each industry. Gross operating surplus is calculated by applying the ratio of gross operating surplus to compensation of employees in each industry to the estimated total compensation of employees. This ratio is calculated using ONS (2011) analytical input-output tables.\(^35\) Total compensation of employees is calculated as the product of estimated employment and wages in the relevant sector according to ONS (2011) ASHE data.

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\(^{33}\) HMRC, (2012), ‘Corporation tax statistics’, Table T11.5.

\(^{34}\) Based on HMRC estimated costs of the principal tax expenditure and structural reliefs, 2011-12, suggesting that tax liabilities under the tonnage tax regime would be £45 million lower than under the standard corporation tax regime.

6.5 Procedure to remove double counting of supply chain impacts

To estimate potential double counting effects, each of the nine industries within the marine and maritime sector is aligned to the nearest industry available in the UK input-output tables\(^\text{36}\). Those correlates are as follows, with the marine or maritime sector on the left and the Input-Output category (or categories) on the right:

- Marine Equipment \(\rightarrow\) General purpose machinery (63)
- Ship building and repairs, Leisure and small commercial \(\rightarrow\) Shipbuilding and repair (78)
- Marine renewable energy servicing \(\rightarrow\) Electricity production & distribution (85)
- Ports, Shipping \(\rightarrow\) Water transport (95)
- Maritime business services \(\rightarrow\) Banking and finance (100), Insurance and pension funds (102), Auxiliary financial services (103), and Legal activities (109)
- Marine science \(\rightarrow\) Research and development (108)
- Maritime (technical) consultancy \(\rightarrow\) Other business services (114)

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