The Economic Impact of the Seafood Sector: Castletownbere

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Foreword

The Economic Impact of the Seafood Sector: Castletownbere

In 2019, BIM completed the project to evaluate Ireland's top ten seafood ports and assess the importance of the seafood sector directly and downstream in these ports, their hinterlands and at the regional and national levels. The seafood sector is a primary driver of rural economies around the coastline of Ireland and acts as an anchor in these locations around which other supporting service sectors develop. This report reveals the results of this project for the port of Castletownbere and its hinterland. Castletownbere is Ireland's second seafood port with high volumes of seafood landed here annually.

Castletownbere is located in west Cork on the Beara peninsula. The Beara peninsula is a mountainous landscape with agricultural land that is hence, classified as poor. The port is located at significant distances from major urban areas with Cork city being the closest urban area at a distance of 125km, Dublin at a distance of 380km and the port of Rosslare 317km away. Transport connectivity is poor, particularly on the main regional road to Glengarriff, the R572. Connection times to the capital via roads are over 4.5 hours. While the natural beauty of the peninsula attracts tourists during parts of the year this combination of factors result in the seafood sector being an integral driver of the economy.

In this report, the seafood sector in Castletownbere is shown to have significant multiplier effects in terms of gross value added, employment and wages downstream. In total, 40% of the Beara economy can be attributed to the seafood sector encompassing direct, indirect and induced effects. Direct employment of the seafood sector in the region is 950 and in turn 495 full-time employees are generated locally through downstream effects. The sector generates wages of €21.5 million annually and stimulates a further €17.1 million wages downstream at the regional level. Further downstream effects occur outside the region at the national level.

Participation in this survey by seafood producers in Castletownbere was very high with one in every two producers contributing. Special thanks are due to Patrick Murphy (Irish South and West Fish Producers Organisation), John Nolan (Castletownbere Fishermen's Co-operative Society Ltd.) and Donal Kelly (Fast Fish Ltd.) for their time and knowledge throughout this project and assistance in delivering this high level of participation. Richard Curtin, Economic and Strategic Services Unit, BIM, would also like to recognise the excellent work carried out by Oxford Economics and Perceptive Insight in the course of this project.

Executive summary

The seafood sector at the port

The seafood sector makes an important contribution to the Castletownbere economy. In 2018, direct seafood activity at the port generated €164 million in turnover, supporting 950 direct jobs and represented 25% of the local port economy in GVA terms. Fish processing is the largest seafood sub-sector at the port, generating €72 million in turnover, followed by commercial fishing (€61 million) and aquaculture (€30 million). When translated into GVA, the overall seafood sector makes a €62.7 million direct contribution to the local port economy.[1]

Our survey explores the characteristics of firms operating in this sector. In general, firms are typically well-established, having operated for more than 10 years, and turnover tends to be relatively stable year-on-year. Seafood businesses operating in Castletownbere typically invest less in capital relative to some of the other main ports across Ireland, although fish processing somewhat bucks the trend. The workforce tends to originate from the local area, and the end-market for local seafood sales tends to be internationally focussed, with exports forming almost half of the total.

Analysing the survey results allows us to quantify the port's seafood sector value within the regional economy. Once the indirect and induced effects are calculated, we estimate that the total economic contribution of the seafood sector at Castletownbere equated to €100.4 million across the south-west economy in 2018. The seafood sector at this port alone also supported over 1,450 jobs across the region in addition to €6.5 million in tax revenues.

€62.7m

Direct GVA in 2018

The seafood sector makes a significant contribution within the local port economy.

€100m

Total GVA contribution to the South-West in 2018

The seafood sector makes a significant contribution to the wider regional economy.

Fig. 1. The estimated benefits of the port seafood sector, South-West, 2018

Port seafood sector	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	62.7	950	21.5
Indirect	27.3	370	12.2
Induced	10.3	125	4.9
Total	**100.4**	**1,450**	**38.6**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

1 Gross Value Added (GVA) is the difference between the value of goods and services produced by a business or a sector, and the cost of raw materials and other inputs which are used in production. It is essentially a measure of the value added to the services or products provided by a sector or firm.

The role of the individual seafood sub-sectors

Our analysis of the seafood sector at the port produces the following headline findings throughout the region (which again will include the combined direct, indirect and induced impacts).[2]

- Activity in the commercial fishing sub-sector has been estimated to sustain 755 jobs, €19.9 million of wages and €51 million of GVA;
- Activity in the aquaculture sub-sector has been estimated to sustain 300 jobs, €8.9 million of wages and €22.7 million of GVA; and
- Activity in the fish processing sub-sector has been estimated to sustain 485 jobs, €13.4 million of wages and €35.9 million of GVA.

Socio-economic characteristics

The local economy faces significant challenges. Generally, it has an older population and hence, a below average share of working age residents. The working age share has been declining, meaning it will be increasingly difficult for growing firms to source labour. Linked to this, the qualification attainment profile of the local population is relatively more aligned with employment opportunities presented within the agriculture, forestry & fishing sector.

Given the above, and the relatively small professional services sector (which is typically the fastest growing in employment terms), the local port economy is unlikely to experience significant job creation in the short-term. Net out-commuting trends demonstrate that employment opportunities locally are already limited. As a result, the seafood sector is likely to continue to play a significant role in the local port economy through its provision of direct jobs, supply chain spending in local businesses and the consumer spending it supports. Looking forward, a vibrant and growing local seafood sector will be important for the economic and demographic health of the local area.

2 Summing the benefits of all three elements within our definition of the seafood sector (fishing, aquaculture and processing) will overestimate the indirect and induced impacts, and as a result, overall impacts. This is because the supply chain of the processing sub-sector will likely contain a proportion of the port's fishing sub-sector and its supply chain. To get the direct totals (for employment, GVA and wages), we add all the three sub-sectors. However, for the indirect and induced totals, we sum those of the processing sub-sector with a proportionate share of the fishing and aquaculture (according to the proportion of sales not destined for local processors and informed by the interview process). The remainder of the fishing and aquaculture indirect and induced impacts will already be accounted for within that of the processors.

1. Introduction

1.1 About the study

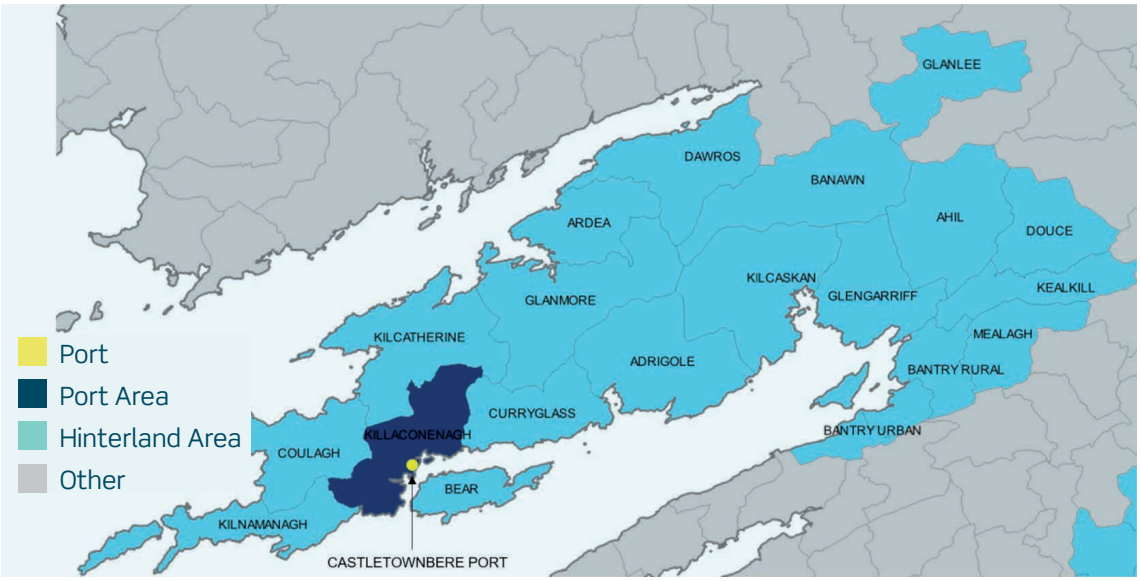
The Irish seafood sector is an important component of the Irish economy. It is, however, more important to coastal communities around the country given its concentration at Ireland's ports and the relatively lower level of alternative economic activity in these economies. In addition, as economic and employment growth is increasingly driven by office-based activity which favours urban areas, the seafood sector's role in providing labour market opportunities, wages and local demand in these local areas is arguably rising.

Against this backdrop, Bord Iascaigh Mhara (BIM) commissioned Oxford Economics and Perceptive Insight to estimate the economic contribution of the seafood sector in ten of Ireland's ports.

1.2 The port area

Castletownbere port is located on the coast of Co. Cork in the south-west region. In this report, we define the local port economy as the District Electoral Divisions (DED) of Killaconeanagh and those surrounding it, which constitute its hinterland – informed by BIM and shown in the below figure.

Fig. 2. Map of port area within the study



To inform the analysis, a comprehensive seafood-related survey exercise was carried out across Ireland's main ports. We worked closely with BIM in order to, firstly, understand the seafood population at each of the 10 ports. Following this, the market research firm Perceptive Insight collected information concerning the characteristics of the local seafood sector through both telephone and electronic surveys.

In total, there were close to 470 individual responses from seafood-related businesses across Ireland. Of this total, close to 330 unique responses were recorded from seafood operators based in the 10 port areas – a response rate of close to 40%, relative to the known seafood population. The study also draws on published data where available, to better understand the sectoral composition of coastal areas within the country. Peripheral economies tend to face significant challenges from which Castletownbere is not exempt. **Appendix 1** of this report includes a summary discussion of the pertinent issues facing the local port economy.

1.3 The key elements of the local seafood sector

In this paper, we present our estimates of the size of the local seafood sector and how it impacts the regional economy. Our analysis, therefore, estimates the direct activity associated with the commercial fishing, aquaculture and fish processing sub-sectors at the port by drawing on the survey findings and information held by BIM. We then estimate their wider impacts within the local NUTS3 region. These wider impacts include those associated with the seafood sector's supply chain and the consumer spending of those employed as a result of the direct and indirect activity – see **Box 1** for more detail concerning our methodology.

Our analysis is also careful to identify where the three different seafood sub-sectors appear in the supply chains of the other sub-sectors. The most obvious example is commercial fishing appearing within the supply chain of fish processing. Our analysis has isolated the benefits to avoid instances of double-counting (see **Appendix 2** for further information concerning the model approach).

BOX 1: INTRODUCING ECONOMIC IMPACT ANALYSIS

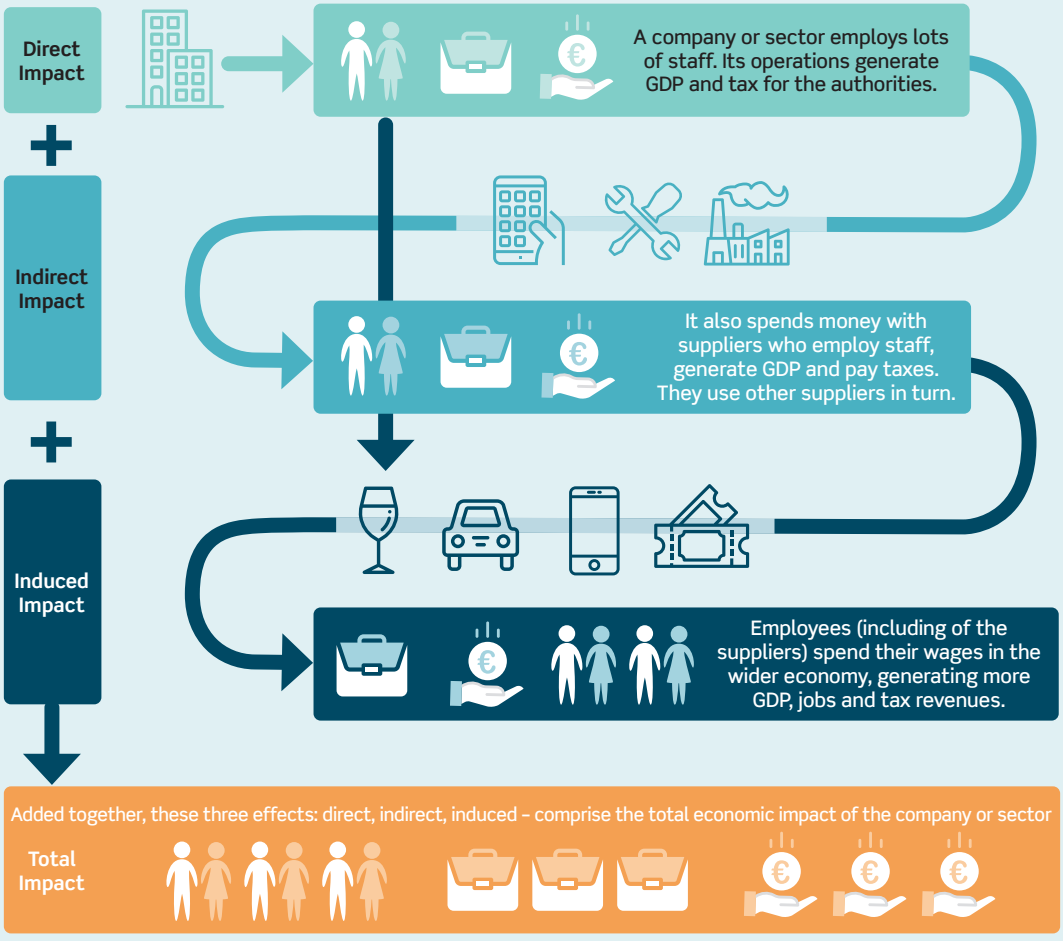
The economic impact of a sector is measured using a standard means of analysis called an economic impact assessment. The report quantifies the three 'core' channels of impact that comprise an organisation/sector's 'economic footprint':

- **Direct impact,** which is the economic activity the seafood sector generates because of its operations;
- **Indirect impact,** or supply chain impact, that occurs because the sector buys inputs of goods and services from Irish businesses; and the
- **Induced impact,** which relates to the wider economic benefits that arise when employees of the local seafood sector and its supply chain spend their wages in the consumer economy, for example, in local retail establishments.

We analyse these channels of impact using three core metrics:

- **Employment,** measured on a Full-Time Equivalent (FTE) headcount basis. This is comprised of both full-time employment and a proportion of part-time working component – where two part-time roles equate to a full-time position;
- **Gross value added** contribution to GDP; and
- **Tax receipts** generated by the Irish activity and employment supported by the seafood sector.

Fig. 3: Economic impact assessment



1.4 Report structure

This report breaks down the characteristics of the collective seafood sector within the port area. It then goes on to show the economic impact this activity creates across the south-west economy.

The report takes the following structure:

- An analysis of the seafood sector within the local port economy;
- A breakdown of the economic benefits associated with the port's seafood sector across the regional economy;
- A summary of the overall benefit associated with the port's seafood sector at the regional level; and
- Finally, we present the report's conclusions.

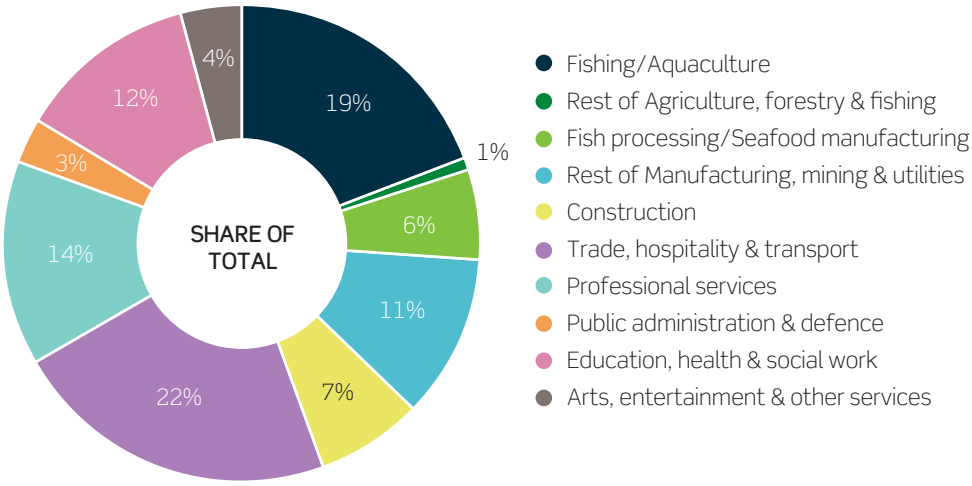
2. The seafood sector at the port

2.1 The importance of the local seafood sector

Before we present the total benefits associated with the port seafood sector, it is important to first understand the size and characteristics of the sector at the port level – the direct activity.

Unsurprisingly, the seafood sector forms a significant component of Castletownbere's economy. The latest Census (2016) provided workplace employment data at a sectoral level for small area District Electoral Divisions (DEDs) across Ireland. By combining this employment data with our regional productivity estimates we can quantify the economic footprint of the port economy. We estimate that the local economy's GVA was €249 million in 2018.[3] We estimate that the seafood sector within the port represented €62.7 million of this GVA total. Seafood, therefore, represented 25% of the port economy. The next largest sectors were the 'trade, hospitality & transport' and 'Professional services' sectors which represented 22% and 14% of the local economy respectively.

Fig. 4. GVA by sector, Castletownbere, 2018



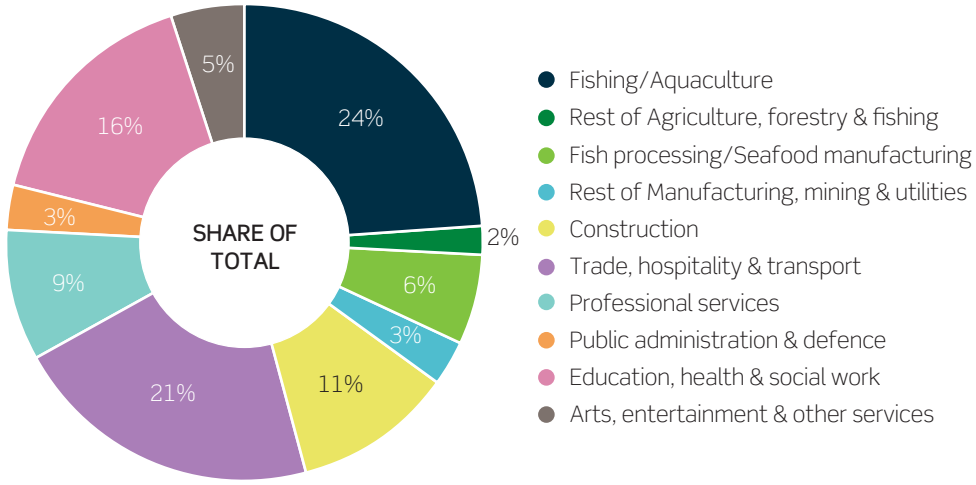
Source: *Oxford Economics, Perceptive Insight, CSO*

In employment terms, seafood is more important within the port economy. Combined commercial fishing, aquaculture and fish processing are estimated to directly sustain approximately 30% of workplace employment across the port area in 2018.[4] Commercial fishing and aquaculture represented close to 90% of local agriculture, forestry & fishing related employment and fish processing accounted for two-thirds of local manufacturing, mining & utilities jobs.

3 When estimating the size of the port economies we use the most recent workplace sectoral employment data from the 2016 Census. This employment data relates to workplace zones, which are slightly smaller than DEDs. The workplace zones are therefore mapped across to closely represent the DEDs which cover to the port areas. We then supplement this data with the current snapshot of the local seafood sector as estimated through the survey exercise. Finally, we subtract the commercial fishing and aquaculture activity from the broader 'Agriculture, forestry & fishing' sector to get an indication of its prominence locally. A similar approach is adopted with fish processing in relation to the 'Manufacturing, mining & utilities' sector.

4 The latest available sectoral employment data for the port area economies was for 2016. Therefore, both the GVA and employment estimates shown for the port economies combine this data with the current snapshot of the seafood sector.

Fig. 5. Employment by sector, Castletownbere, 2018



Source: *Oxford Economics, Perceptive Insight, CSO*

2.2 Characteristics of the seafood sector

Commercial fishing forms the largest direct component to the seafood sector at Castletownbere. In 2018, it accounted for a majority of value added (GVA) in this sector (€31.7 million), ahead of fish processing (€16.2 million) and aquaculture (€14.9 million). Commercial fishing supports a similarly high proportion of employment, with 560 jobs being directly supported by 111 fisheries based out of the port.

By contrast, BIM's data and the survey exercise identified only five seafood businesses in the fish processing sub-sector, and 24 engaged in aquaculture. This indicates that each of the port's fish processors had an average turnover of over €14 million, compared to €1.2 million in aquaculture and €0.6 million in commercial fishing. This highlights the ability of fish processors operating in Castletownbere to better exploit the economies of scale associated with industrialised processes.

Fig. 6. Headline direct economic contribution of the seafood sector, Castletownbere, 2018

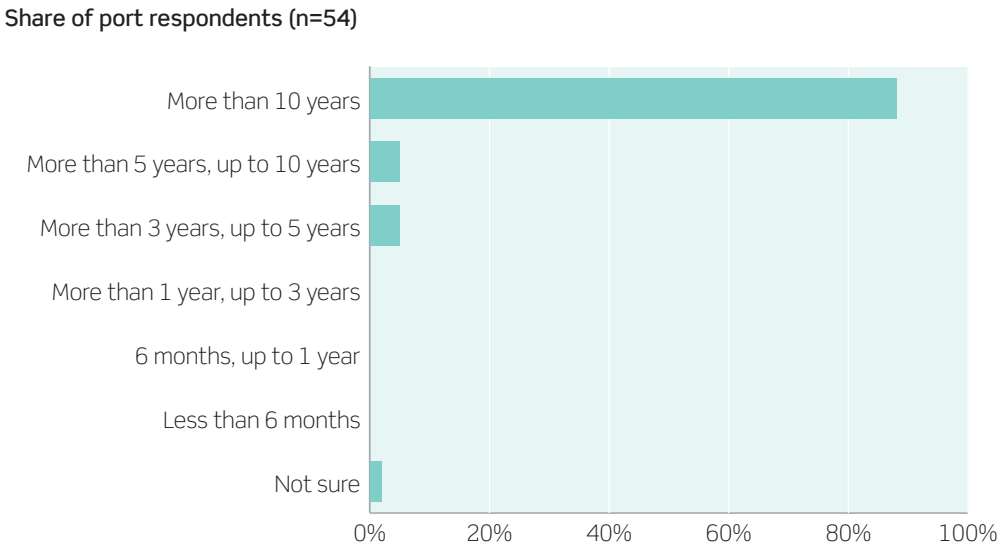
	Turnover (€m)	Jobs	Wages (€m)	Seafood operators
Commercial fishing	61.0	560	12.3	111
Aquaculture	30.5	200	5.4	24
Fish processing	72.1	190	3.7	5
Total	**163.6**	**950**	**21.5**	**140**

Source: *Oxford Economics, Perceptive Insight, BIM*
Note: *May not sum due to rounding*

Our survey also provides insight into the profile of businesses operating at the port. We surveyed 54 seafood related businesses in Castletownbere, 39% of the population. By analysing these responses, we can explore some of the unique characteristics of the seafood sector within the port area.

The survey results show that seafood businesses within the port tend to be relatively mature and well established. A significant majority (88%) of respondents identified as having operated for more than 10 years in the port area, a rate only marginally below aggregate figure for the ten ports (89%).

Fig. 7. Seafood sector maturity, Castletownbere, 2018

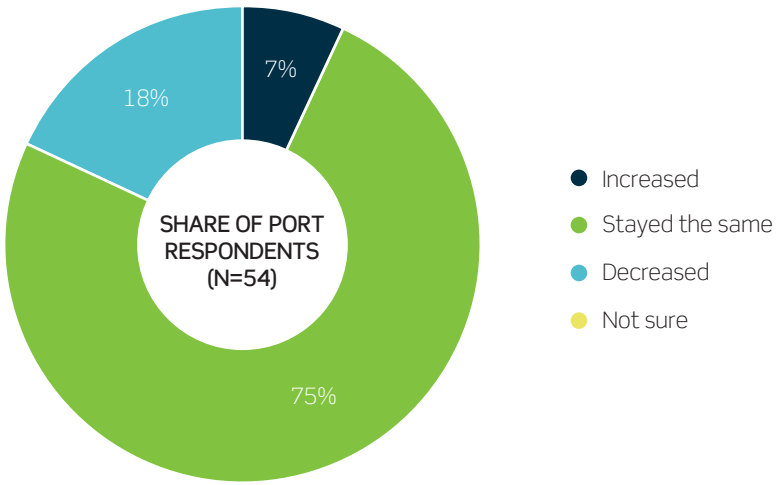


Source: *Oxford Economics, Perceptive Insight*

The survey also explored the recent turnover performance of firms operating in the local seafood sector. Overall, respondents indicated that turnover has been relatively stable over the past 12 months; three-quarters of respondents indicated that it had neither increased nor decreased over this period, a share slightly above the aggregate rate for all ten ports (72%). However, more firms have seen turnover decrease (18%) than increase (7%) over this period.

While the sample size is not sufficient to provide a robust breakdown of turnover performance across each of the seafood sub-sectors, our survey indicates that turnover is more variable within commercial fishing. All respondents who identified turnover increasing were in this group, while it also contained the highest share of respondents who saw turnover decrease (20%). Our survey indicates that turnover in fish processing, and to a lesser extent aquaculture, tended to remain unchanged over the past year.

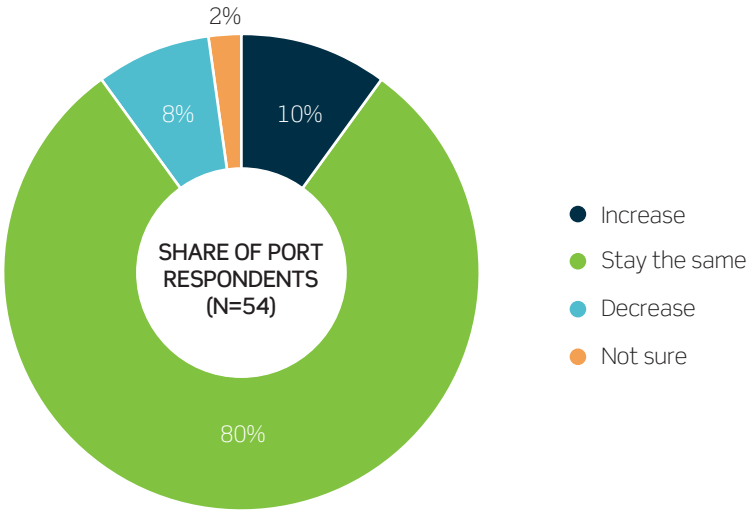
Fig. 8. Changes to turnover in the past 12 months, Castletownbere, 2018



Source: *Oxford Economics, Perceptive Insight*

The outlook for turnover over the next 12 months is slightly more positive. A greater share of businesses expected turnover to remain unchanged over the next 12 months (80%) in comparison to those who saw turnover unchanged within the previous 12 months (75%). Furthermore, a greater share of respondents said they expected their turnover to increase (10%) rather than decrease (8%) in the future, a reversal of the observed pattern over the previous year.

Fig. 9. Anticipated changes to turnover, Castletownbere, 2018



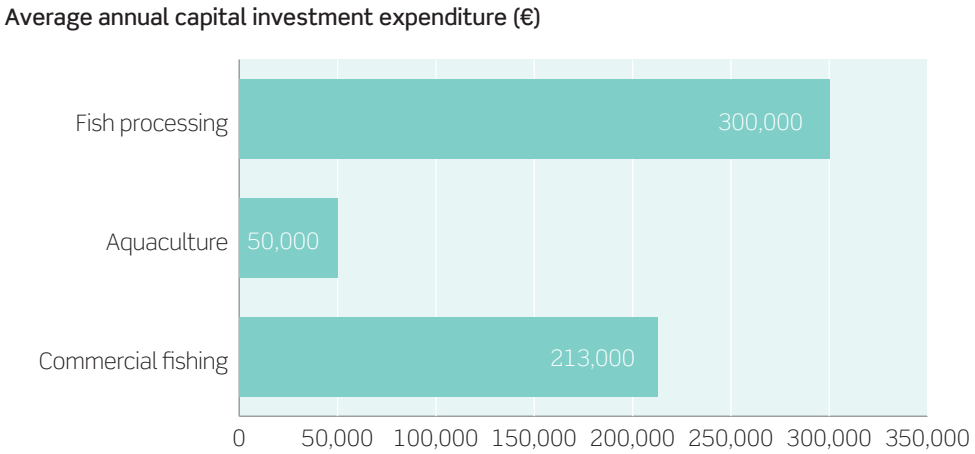
Source: *Oxford Economics, Perceptive Insight*

Improving turnover is often linked to investment: improving the quantity and/or quality of capital available to the workforce can enable improved productivity and turnover. Our survey indicates that 30% of firms at Castletownbere have spent money on capital investment in the last year, a rate slightly below the ten ports as a whole (33%).

Of those respondents who did engage in capital investment, their average spend tended to be relatively low. Respondents at Castletownbere spent on average €164,000 on capital investment in 2018, under half of the average across for the ten ports across Ireland (€389,000).

Fish processors typically made the largest average investment of the three seafood sub-sectors (€300,000) – exceeding the average for fish processors across the ten main ports (€282,600). However, the equivalent average investment by local aquaculture (€50,000) and commercial fishing (€213,000) businesses lagged somewhat below the all ports equivalents (€159,000 and €478,000 respectively).

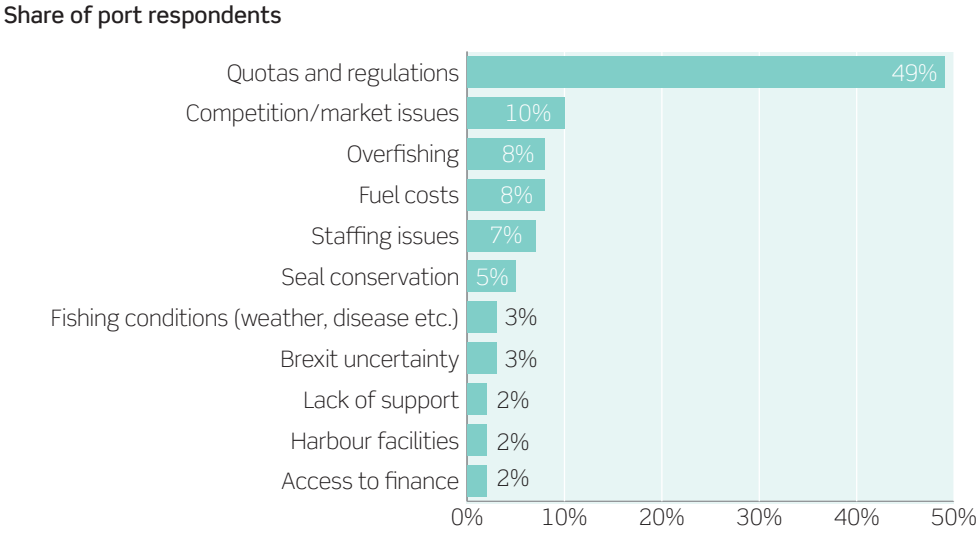
Fig. 10. Average capital investment by firm, Castletownbere, 2018



Source: *Oxford Economics, Perceptive Insight*

Our survey also explored the constraints on growth within the seafood sector. Almost half of respondents (49%) identified quotas and regulations as the main issue. Only two other ports across our survey found a higher share of respondents citing this issue. A further 10% cited competition/market issues, while 8% identified fuel costs and overfishing respectively.

Fig. 11. Main constraint on growth, Castletownbere, 2018



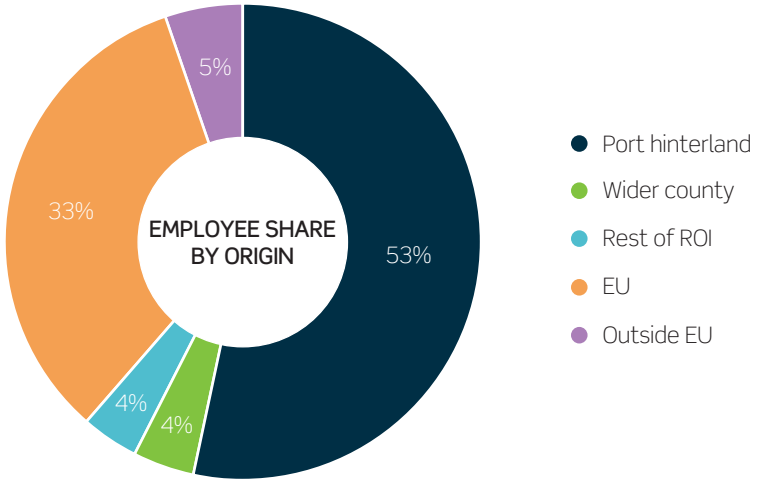
Source: *Oxford Economics, Perceptive Insight*

Alongside demonstrating the importance of the seafood sector in providing local job opportunities, our survey also sought to further understand the characteristics of this workforce – namely where the seafood sector's employees originate from. The survey results highlight that a majority (53%) of workers in the seafood sector originate from the port hinterland, further highlighting the value of the seafood sector at Castletownbere to the local population. A further 4% of workers originate from Co. Cork. Just over a third (38%) were foreign nationals, mostly originating from the EU (33%).

The profile of the workforce is broadly similar across each of the three seafood sub-sectors, with a similar share of workers originating from the port hinterland across aquaculture (56%), commercial fishing (53%) and fish processing (52%).

Given that a majority of the workforce originate from the port hinterland or the wider county, we also find that the workforce tends to also live locally. A significant majority of the workforce reside within the port hinterland (88%), while a further 5% live elsewhere in Co. Cork.

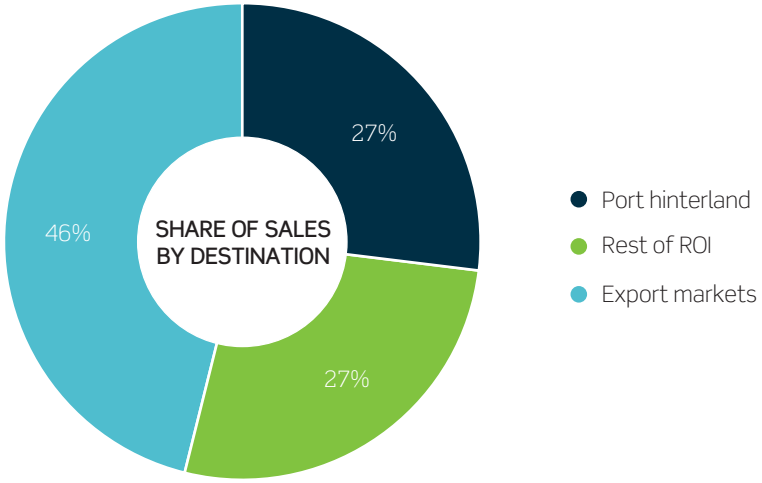
Fig. 12. Origins of the workforce, Castletownbere, 2018



Source: *Oxford Economics, Perceptive Insight*

Our survey also explored the destinations of sales made by seafood sector firms. Exports accounted for 46% of the total in Castletownbere, a share slightly above the ten ports combined average (45%). Although the sample size is relatively low, a significant majority of exports were made to the EU. The remaining share of sales were distributed evenly between the port hinterland (27%) and the rest of Ireland (27%).

Fig. 13. Sales by destination, Castletownbere, 2018



Source: *Oxford Economics, Perceptive Insight*

2.3 Conclusion

An analysis of the survey findings demonstrates the importance of the seafood sector to the local economy. It provides direct employment for 950 people and a significant majority of the workforce reside within the port hinterland (88%), while a further 5% live elsewhere in Co. Cork.

Nearly nine in every 10 seafood businesses have been operating for more than 10 years in the port area. These businesses had estimated turnover of nearly €160 million with nearly half coming from export markets.

The bulk (75%) of survey respondents experienced little change in turnover over the last year. Of the remaining 25%, more experienced a decline in turnover than enjoyed growth. Almost half of all respondents to the survey highlighted quotas and regulations as the most prominent constraint to growth.

Finally, average capital investment levels within the sector were low relative to some of the other main ports covered in the study – only fish processing demonstrated an average spend figure above the average for the ten main ports.

3. The impact of seafood's sub-sectors

In this section, we estimate the wider economic footprint of Castletownbere's seafood sector on the regional economy.

3.1 Commercial fishing

The largest of Castletownbere's seafood sub-sectors, commercial fishing generated €51 million of GVA across the south-west economy in 2018. Over a third of this total (€19.3 million) was not directly generated by commercial fishing activity at the port, but resulted from activity within its supply chain (€12.7 million) and the wider consumer spending impacts (€6.6 million).

The commercial fishing sub-sector is estimated to sustain 755 jobs throughout the south-west, supporting €19.9 million in wages. The indirect and induced effects tend to occur in relatively higher value-added sectors, generating more GVA per worker on average – and higher average wages – when compared to commercial fishing's 'direct' activity within the port area.

Fig. 14. Benefits of the commercial fishing sub-sector, South-West, 2018

Port commercial fishing	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	31.7	560	12.3
Indirect	12.7	115	4.5
Induced	6.6	80	3.1
Total	**51.0**	**755**	**19.9**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

As expected, the agriculture, forestry & fishing sector accounted for close to two-thirds of all GVA generated by Castletownbere's commercial fishing activities, equivalent to €32.7 million in 2018. It was also the main beneficiary in employment terms, supporting 580 jobs in 2018, or 77% of the total sustained within the region.

Outside of the agriculture, forestry & fishing sector, the wholesale & retail sector received the largest GVA benefit (€6.4 million) – linked largely to the indirect effects associated with commercial fishing procurement spend throughout the south-west economy and the induced impacts of those employed directly and indirectly spending their income. The manufacturing sector receives the next largest GVA benefit (€3.6 million), representing close to 7% of the GVA total.

Commercial fishing at the port has a GVA multiplier of 1.6 across the regional economy. This means that for every €1 of GVA that is directly generated by commercial fisheries at Castletownbere, a further €0.6 of GVA is supported throughout the regional economy. This was stronger than the respective GVA multiplier in aquaculture (1.5) but weaker than that of fish processing (2.2).

Fig. 15. Total benefits of commercial fishing by sector, South-West, 2018

Port commercial fishing	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	32.7	580	12.9
Mining & quarrying	0.0	0	0.0
Manufacturing	3.6	10	0.4
Electricity, gas, steam	0.2	0	0.0
Water supply	0.1	0	0.0
Construction	0.1	<5	0.1
Wholesale & retail	6.4	80	3.0
Transportation & storage	0.6	5	0.3
Accommodation & food	0.7	20	0.5
Information & communications	0.1	<5	0.0
Financial & insurance	0.9	5	0.3
Real estate	2.2	15	0.7
Professional, scientific & technical	1.5	15	0.6
Administration & support	0.3	<5	0.0
Public administration	0.1	<5	0.1
Education	0.4	5	0.3
Human health	0.6	10	0.4
Arts, entertainment & recreation	0.2	5	0.1
Other service activities	0.1	5	0.1
Total	**51.0**	**755**	**19.9**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.2 Aquaculture

Despite being the smallest of the seafood sub-sectors within Castletownbere in turnover terms, we estimate that aquaculture supported €22.7 million of GVA within the south-west economy in 2018. Alongside the 200 direct jobs taking place within the port area, the sector supports a further 100 jobs elsewhere in the south-west economy and generates €8.9 million in earnings.

Fig. 16. Benefits of the aquaculture sub-sector, South-West, 2018

Port aquaculture	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	14.9	200	5.4
Indirect	4.9	65	2.1
Induced	2.9	35	1.4
Total	**22.7**	**300**	**8.9**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

Aquaculture is similar to commercial fishing in that the agriculture, forestry & fishing sector accounts for high share of the resulting economic benefits. Close to 80% of the employment total supported by local aquaculture belonged to the agriculture, forestry & fishing sector (245 jobs). This was followed by the wholesale & retail sector which represented 5% of the jobs total (15 jobs). Agriculture, forestry & fishing also accounts for high shares of the total wage impact – 76%, or €6.8 million – and GVA impact (€17.3 million or 76%).

Wholesale & retail received the next largest GVA contribution (€1.2 million) – linked largely to the induced effects of additional spending in the south-west economy – while manufacturing receives the next largest contribution with a €0.8 million GVA impact within the south-west.

Fig. 17. Total benefits of aquaculture by sector, South-West, 2018

Port aquaculture	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	17.3	245	6.8
Mining & quarrying	0.0	0	0.0
Manufacturing	0.8	<5	0.1
Electricity, gas, steam	0.1	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	<5	0.0
Wholesale & retail	1.2	15	0.5
Transportation & storage	0.3	5	0.1
Accommodation & food	0.3	10	0.2
Information & communications	0.1	0	0.0
Financial & insurance	0.3	<5	0.1
Real estate	1.0	5	0.3
Professional, scientific & technical	0.6	5	0.2
Administration & support	0.1	<5	0.0
Public administration	0.0	<5	0.0
Education	0.2	5	0.2
Human health	0.2	5	0.2
Arts, entertainment & recreation	0.1	<5	0.0
Other service activities	0.1	<5	0.1
Total	**22.7**	**300**	**8.9**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.3 Fish processing

Castletownbere's fish processing sub-sector is estimated to have supported 485 jobs, €13.4 million in wages, and contributed €35.9 million in GVA to the south-west economy in 2018. We estimate that 300 of these jobs result from fish processing's supply chain and consumer spending impacts throughout the region. Our analysis shows that fish processing recorded the strongest employment multiplier (2.5) of the three local seafood sub-sectors. Therefore, for every one direct fish processing job within the port, 1.5 additional jobs are supported within the rest of the south-west.

Fig. 18. Benefits of the fish processing sub-sector, South-West, 2018

Port fish processing	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	16.2	190	3.7
Indirect	15.8	250	7.8
Induced	3.9	50	1.8
Total	**35.9**	**485**	**13.4**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

The south-west's manufacturing sector enjoys the largest share of the GVA benefits associated with fish processing activity at Castletownbere. In 2018, the sector accounted for €17.6 million of GVA, equivalent to half of the total, alongside two-fifths of the employment total (195 jobs). Manufacturing, however, recorded a relatively low share of earnings benefits. We estimate €3.9 million was paid to those employed in the sector, the equivalent of 30% of the earnings total. This figure was significantly lower than that paid to those employed in the agriculture, forestry & fishing sector (€6.2 million) – even though agriculture, forestry & fishing supported a similar number of jobs and a lower share of the overall GVA total (€10.9 million). This is the result of relatively low wages being paid to those employed within the manufacturing sector, the equivalent of €20,100 for every job, significantly weaker than that of agriculture (€29,400). As most of the manufacturing employment is directly associated with the fish processing activity, these differences are driven directly from the seafood survey.

Outside of manufacturing and agriculture, forestry & fishing (which enjoys a significant share of the sub-sector's procurement spend) – the wholesale & retail sector is the next largest benefactor in the south-west. Our analysis shows that fish processing supported approximately 30 jobs within the sector, alongside €1.1 million in earnings and €2.3 million in GVA.

Fig. 19. Total benefits of fish processing by sector, South-West, 2018

Port fish processing	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	10.9	210	6.2
Mining & quarrying	0.0	0	0.0
Manufacturing	17.6	195	3.9
Electricity, gas, steam	0.4	<5	0.0
Water supply	0.0	0	0.0
Construction	0.1	<5	0.1
Wholesale & retail	2.3	30	1.1
Transportation & storage	0.7	5	0.3
Accommodation & food	0.4	10	0.3
Information & communications	0.1	0	0.0
Financial & insurance	0.4	<5	0.1
Real estate	1.1	5	0.4
Professional, scientific & technical	0.8	5	0.3
Administration & support	0.2	<5	0.0
Public administration	0.1	<5	0.0
Education	0.2	5	0.2
Human health	0.3	5	0.2
Arts, entertainment & recreation	0.1	<5	0.1
Other service activities	0.1	5	0.1
Total	**35.9**	**485**	**13.4**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.4 Conclusion

All three of the port seafood sub-sectors provide significant economic benefits to the local and regional economy. However, commercial fishing is by far the most dominant in terms of standalone economic impact. We estimate that Castletownbere's commercial fishing industry supports €51 million in GVA and over 750 jobs throughout the south-west – similar to the individual aquaculture and fish processing sub-sectors combined.

4. Total impact of the overall port seafood sector

4.1 Seafood sector activity at the port

This section takes the estimates presented in the preceding sections of the report and calculates the total economic impact resulting from the activities of the seafood sector within the port area.

Simply summing the respective benefits of all three elements (commercial fishing, aquaculture and fish processing) will inevitably overestimate the indirect, induced and as a result, total impacts. This is because the supply chains of the fish processing element contain a proportion of the commercial fishing/aquaculture sub-sectors and their supply chains. Therefore, adding everything together would double-count some of the impacts. See **Appendix 2** for further detail on our approach.

We have, therefore, laid out the following approach to calculate total impacts for GVA, employment, wages and tax:

Direct impacts

- Calculated by summing the direct impacts from the three elements of the seafood sector for GVA, employment, wages and tax.

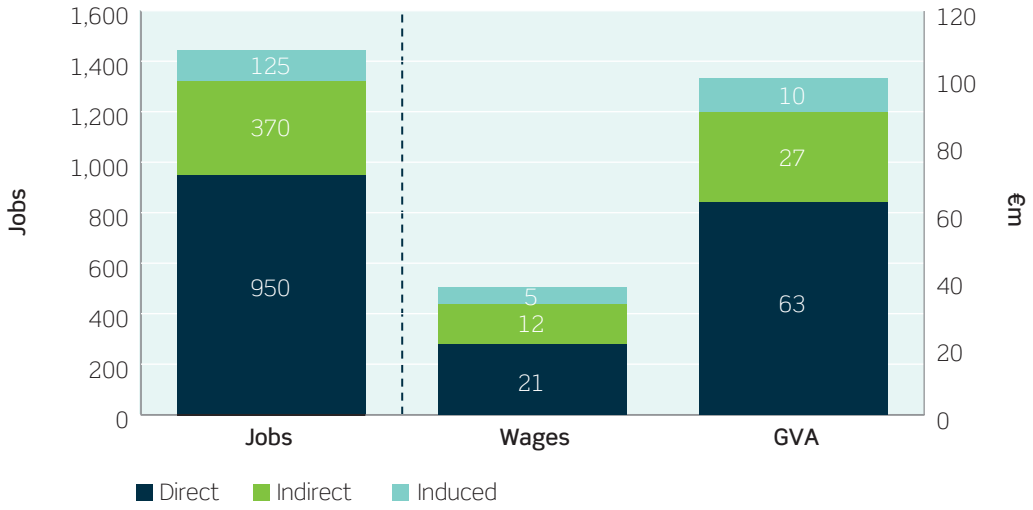
Indirect and induced impacts

- For GVA, employment, wages and taxes, the total indirect and induced impacts are calculated by summing the indirect and induced impacts of fish processing and a 100% and 52% share of the indirect and induced impacts from the respective aquaculture and commercial fishing sub-sectors (as information from the survey interviewees suggest that exports and domestic sales outside the port areas own processors account for 100% and 52% of the respective aquaculture and fishing production). The remainder of the commercial fishing/aquaculture sub-sectors' indirect and induced impacts will already be accounted for in the indirect and induced impacts from the fish processing sub-sector.

4.2 Regional estimates

We estimate that the seafood sector at Castletownbere contributed €100.4 million of GVA to the south-west economy in 2018. The seafood sector supported 1,450 jobs across the region and generated €38.6 million in earnings (see **Fig. 20**).

Fig. 20. Benefits of the seafood sector, South-West, 2018



Source: *Oxford Economics, Perceptive Insight, CSO*

Almost two-fifths of the total regional GVA benefit was generated either indirectly via seafood's wider supply chain (€27.3 million) or through the induced spending that come about as those employed within the sector and within its supply chain spend their earnings (€10.3 million). With an employment multiplier of 1.5, every two direct seafood related jobs within Castletownbere are estimated to support one additional job within the rest of the regional economy.

Fig. 21. Total seafood sector benefits, South-West, 2018

Port seafood sector	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	62.7	950	21.5
Indirect	27.3	370	12.2
Induced	10.3	125	4.9
Total	**100.4**	**1,450**	**38.6**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

Given the predominance of commercial fishing at the port, the south-west's agriculture, forestry & fishing sector benefits most from Castletownbere's seafood sector. This sector alone accounts for €60.4 million of the GVA impact associated with seafood at the port across the south-west region, equivalent to over half of the total. This sector also accounts for a dominant share of the employment benefits – representing 1,030 jobs or 70% of the total. The south-west's agriculture, forestry & fishing sector is estimated to generate €25.6 million in wages as a result, accounting for a similarly high share of the total (66%).

Manufacturing receives the next largest contribution from Castletownbere's seafood sector, largely due to its fish processing sub-sector. This sector accounted for €20.4 million of local seafood's GVA impact across the south-west economy in 2018, representing a fifth of the total. This sector, however, accounts for just 14% of employment (200 jobs) and 11% of wages (€4.2 million) because of higher output per head and relatively lower wages.

Finally, the Wholesale & retail sector was the next largest beneficiary in GVA terms (€6.8 million), supporting an estimated 85 jobs, followed by real estate (€3.2 million) and Professional services (€2.1 million).

Fig. 22. Total benefits by sector, South-West, 2018

Port seafood sector	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	60.4	1,030	25.6
Mining & quarrying	0.0	0	0.0
Manufacturing	20.4	200	4.2
Electricity, gas, steam	0.6	<5	0.0
Water supply	0.1	0	0.0
Construction	0.2	5	0.1
Wholesale & retail	6.8	85	3.2
Transportation & storage	1.3	15	0.6
Accommodation & food	1.1	30	0.8
Information & communications	0.2	<5	0.0
Financial & insurance	1.2	5	0.3
Real estate	3.2	20	1.1
Professional, scientific & technical	2.1	20	0.9
Administration & support	0.4	<5	0.1
Public administration	0.1	<5	0.1
Education	0.6	10	0.5
Human health	0.9	15	0.6
Arts, entertainment & recreation	0.3	5	0.2
Other service activities	0.2	10	0.3
Total	**100.4**	**1,450**	**38.6**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

4.3 Taxation estimates

Seafood activity at the port provides further benefits through the generation of tax revenues to the Revenue Commissioners. These fiscal impacts can again be split into their direct, indirect and induced components depending on what channel of activity they originate from. We estimate that port seafood sector's direct tax contribution equated to €6.8 million in 2018, consisting of both the labour-based tax paid by the sector's employees (income tax, PRSI etc) and corporation tax receipts.

The indirect fiscal benefits represent the same taxation components as above but are generated within the sector's wider supply chain, in addition to net taxes on input purchases and sectoral taxation on production less subsidies. Combined these represent a net fiscal deficit of €7.3 million, mainly because of agriculture's prominence within the fish processing supply chain. However, the indirect deficit are compensated for by the consumption related tax the sector supports across the economy. As those employed in the sector and within its supply chain spend their wages, this supports further jobs and activity within the Irish economy. We estimate this induced activity supported a further €7.0 million in tax revenue.

Therefore, in total, Castletownbere's seafood sector is estimated to have supported €6.5 million in fiscal benefits in 2018. This total was made up of €10.7 million in employment/labour related tax, €2.6 million in corporation tax, €4.6 million in taxation associated with the spending of wages, and a net tax deficit of €11.3 million through taxation on inputs and production.[5]

5 Net tax position refers to taxes less subsidies.

Fig. 23. Fiscal impacts by taxation type, Ireland, 2018

Ports seafood sector	Total tax estimates (€m)				
	Labour tax	Corporation tax	Production tax	Input purchases tax	Tax on consumption
Agriculture, forestry & fishing	6.0	1.2	-14.7	1.6	0.0
Mining & quarrying	0.0	0.0	0.0	0.0	0.0
Manufacturing	2.3	0.5	0.0	0.0	3.6
Electricity, gas, steam	0.1	0.0	0.1	0.1	0.1
Water supply	0.0	0.0	0.1	0.0	0.1
Construction	0.1	0.0	0.0	0.0	0.1
Wholesale & retail	0.5	0.3	0.0	0.1	0.0
Transportation & storage	0.2	0.1	0.1	0.3	0.0
Accommodation & food	0.2	0.1	0.0	0.1	0.5
Information & communications	0.0	0.0	0.0	0.0	0.2
Financial & insurance	0.2	0.3	0.0	0.2	0.0
Real estate	0.3	0.0	0.2	0.1	0.1
Professional, scientific & technical	0.3	0.1	0.0	0.1	0.0
Administration & support	0.0	0.0	0.0	0.0	0.1
Public administration	0.1	0.0	0.0	0.0	0.0
Education	0.2	0.0	0.0	0.0	-0.2
Human health	0.2	0.0	0.0	0.0	-0.1
Arts, entertainment & recreation	0.1	0.0	0.0	0.0	0.0
Other service activities	0.1	0.0	0.0	0.0	0.1
Total	**10.7**	**2.6**	**-14.1**	**2.7**	**4.6**

Source: *Oxford Economics, Perceptive Insight, CSO*

4.4 Conclusion

Our analysis shows that the seafood sector at Castletownbere supports 1,450 jobs, €38.6 million in wages and €100.4 million in GVA across the south-west. Furthermore, this activity is estimated to support €6.5 million in tax revenues towards the public purse.

5. Conclusions

5.1 The seafood sector in Castletownbere

The seafood sector makes an important contribution to the Castletownbere economy. In 2018, direct seafood sector at the port generated €164 million in turnover, supporting 950 direct jobs and represents 25% of the local port economy in GVA terms. In turnover terms, fishing processing is the largest seafood sub-sector at the port, generating €72 million in turnover, followed by commercial fishing (€61 million) and aquaculture (€30 million). When translated into GVA, the overall seafood sector makes a €62.7 million direct contribution to the local port economy.

Our survey explores the characteristics of firms operating in this sector. In general, firms are typically well-established, having operated for more than 10 years, and turnover tends to be relatively stable year-on-year. Seafood business operating in Castletownbere typically invest less in capital relative to some of the other main port across Ireland, although fish processing somewhat bucks the trend. The workforce tends to originate from the local area, and the end-market for local seafood sales tends to be internationally focussed, with exports forming almost half of the total.

5.2 The commercial fishing sub-sector is the main contributor

The commercial fishing sub-sector makes the strongest contribution to the south-west economy. In 2018, it alone generated €51 million of GVA, of which €19.3 million is linked to indirect (€12.7 million) and induced (€6.6 million) effects. The commercial fishing sector has the lowest employment multiplier of the three seafood sub-sectors, with every direct job supporting an additional third of a job within the rest of the south-west region. The commercial fishing sub-sector is estimated to provide benefits of the following size:

- 560 direct jobs and €12.3 million of wages, producing €31.7 million of GVA;
- 115 indirect jobs and €4.5 million of wages, producing €12.7 million of GVA; and
- 80 induced jobs and €3.1 million of wages, producing €6.6 million of GVA.

5.3 Though the remaining components remain significant

Although the fish processing sub-sector's economic footprint is smaller than that of the local commercial fishing sector, its employment multiplier was the strongest of the three seafood sub-sectors. Accordingly, our analysis shows the economic impact of the fish processing element was of the following size in 2018:

- 190 direct jobs and €3.7 million of wages, producing €16.2 million of GVA;
- 250 indirect jobs and €7.8 million of wages, producing €15.8 million of GVA; and
- 50 induced jobs and €1.8 million of wages, producing €3.9 million of GVA.

Furthermore, our analysis shows that the economic impact of the port's aquaculture sector equates to the following benefits across the south-west economy:

- 200 direct jobs and €5.4 million of wages, producing €14.9 million of GVA;
- 65 indirect jobs and €2.1 million of wages, producing €4.9 million of GVA; and
- 35 induced jobs and €1.4 million of wages, producing €2.9 million of GVA.

Therefore, we estimate that the port's collective seafood sector supported 1,450 jobs, €38.6 million in wages and €100.4 million in GVA within the regional economy in 2018. This activity was enough to sustain €6.5 million in tax revenues towards the public accounts.

5.4 Seafood supporting peripheral economies

The local economy faces significant challenges. Generally, it has an older population and hence, a below average share of working age residents. The working age share has been declining, meaning it will be increasingly difficult for growing firms to source labour. Linked to this the qualification attainment profile of the local population is relatively more aligned with employment opportunities presented within the agriculture, forestry & fishing sector.

Given the above, and the relatively small professional services sector (which is typically the fastest growing in employment terms), the local port economy is unlikely to experience significant job creation in the short-term. Net out-commuting trends demonstrate that employment opportunities locally are already limited. As a result, the seafood sector is likely to continue to play a significant role in the local port economy through its provision of direct jobs, supply chain spending in local businesses and the consumer spending it supports. Looking forward, a vibrant and growing local seafood sector will be important for the economic and demographic health of the local area.

Appendix 1: Castletownbere's economic challenges

Economic activity and structure

The latest available data indicates that Castletownbere's headline unemployment rate is relatively low. The unemployment rate stood at 9.9% in 2016, somewhat lower than the equivalent rates across the south-west region (11%) and Ireland (12.9%).[6]

However, the employment rate of 50% was also below that of both the regional and national averages (see **Fig. 24**). Census data for 2016 therefore reveals that the economic inactivity rate[7] among those residents aged 15 and over was over 44%. Local inactivity was therefore higher than that experienced across both the south-west (40%) and Ireland as a whole (39%) in 2016.

Fig. 24. Headline economic indicator comparisons, 2016

	Unemployment rate	Employment rate	Economic inactivity
Castletownbere	9.9%	50.0%	44.5%
South-West	11.0%	53.0%	40.4%
Ireland	**12.9%**	**53.3%**	**38.8%**

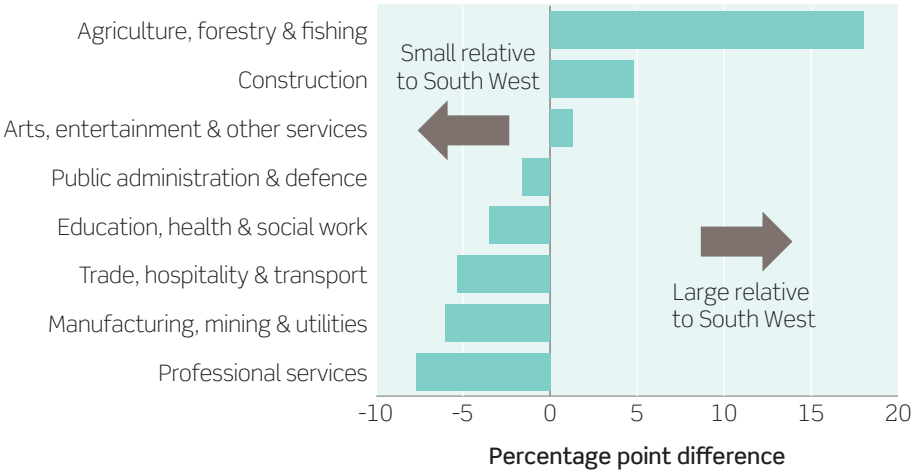
Source: *CSO*

The latest Census in 2016 showed there were close to 3,500 people employed within the port area and its hinterland. Meanwhile, there were over 5,300 residents of the area employed in jobs based either in the local economy or elsewhere. The difference represents the degree of net out-commuting of people from the local area to take up employment opportunities outside the port economy.

A sectoral breakdown of workplace employment within the port area and its hinterland points to the significance of the local seafood sector. The data shows that workplace employment within the agriculture, forestry & fishing and manufacturing, mining and utilities sectors collectively accounted for close to a third of total.[8] Agriculture, forestry & fishing is particularly relatively concentrated, accounting for almost a quarter of all workplace employment (26%), a share 18 percentage points above the regional equivalent. However, manufacturing, mining and utilities share (8.4%) slightly lagged that of the average across the south-west (see **Fig. 25**).

6 Defined as a share of the labour force aged 15 years and over.
7 Economic inactivity represents the share of the population aged 15 and over who were neither employed nor looking for employment.
8 Commercial fishing and aquaculture fall within the 'Agriculture, forestry & fishing' sector. Fish processing related activity is classified within the industry grouping of 'Manufacturing, mining & utilities'.

Fig. 25. Employment share differences, Castletownbere vs region, 2016



Source: *Oxford Economics, CSO*

Demographics

The port area and hinterland's population has fallen by 2% in the five years between 2011 and 2016, despite overall growth across the south-west (3.2%) and Ireland (3.8%). The working age population – those aged 15 to 64 – represented a relatively low 61% of the Castletownbere population, compared to 65 and 66% across the south-west and Ireland respectively. This relatively small share is compounded by the contraction of the working age population of around 5% over this period. Meanwhile, the working age cohort showed growth across both the regional and national comparators.

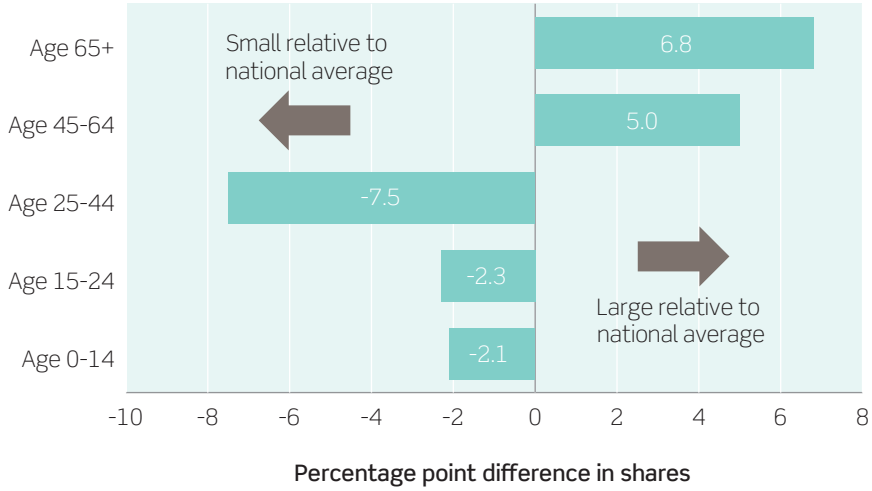
Fig. 26. Population indicators, 2016

	Growth (2011-16)		2016	
	Population	Working age	Population	Working age share
Castletownbere	-2.0%	-4.9%	13,100	60.8%
South-West	3.2%	0.5%	683,200	65.2%
Ireland	**3.8%**	**1.4%**	**4,761,900**	**65.5%**

Source: *CSO*
Note: *Working age is defined as those aged between 15 and 64*

An analysis of port area's population by age cohorts relative to the national picture shows that the distribution is skewed towards the middle-aged and older age groupings. Those aged 65 and over accounted for over 20% of the population in 2016 – a share well above the national average (13%). However, younger working age people (aged 25-44) were under-represented within the local population, relative to the national average.

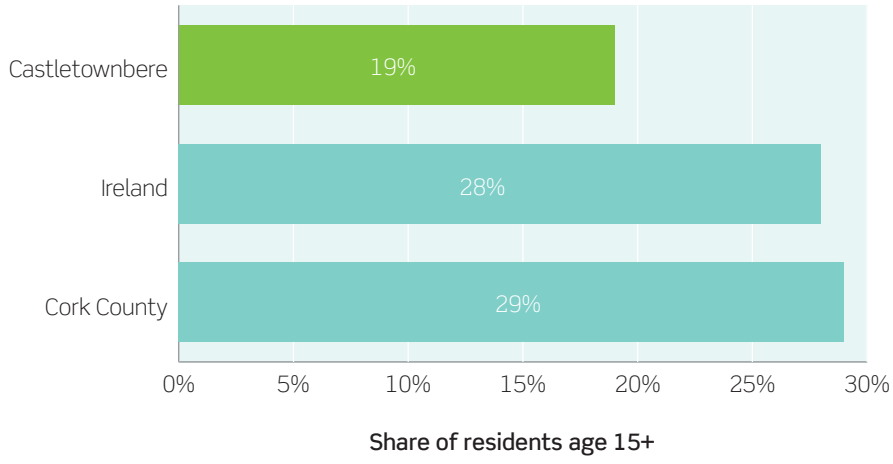
Fig. 27. Age group comparisons, Port area vs Ireland, 2016



Source: *CSO Ireland*

Qualification attainment within the port area is below what is observed at both the county and national levels. Those with no formal qualifications or at most primary level education represented 15% of residents aged 15 and over in 2016, above the national and county averages of 12% and 10% respectively. Equally, higher level attainment among the port hinterland's residents was much weaker than the national average. Those educated to degree level or above accounted for 22% of those age 15 and over in Castletownbere – a rate somewhat lower than both Co. Cork (29%) and Ireland (28%). Given that higher level qualifications tend not to be required for most occupations in the local Agriculture, forestry & fishing and manufacturing sectors, this further highlights the importance of the seafood sector in supporting job opportunities for local workers.

Fig. 28. Degree level or above attainment, 2016



Source: *CSO*

Summary

The local economy faces significant challenges. Generally, it has an older population and hence, a below average share of working age residents. The working age share has been declining, meaning it will be increasingly difficult for growing firms to source labour. Linked to this the qualification attainment profile of the local population is relatively more aligned with employment opportunities presented within the agriculture, forestry & fishing sector.

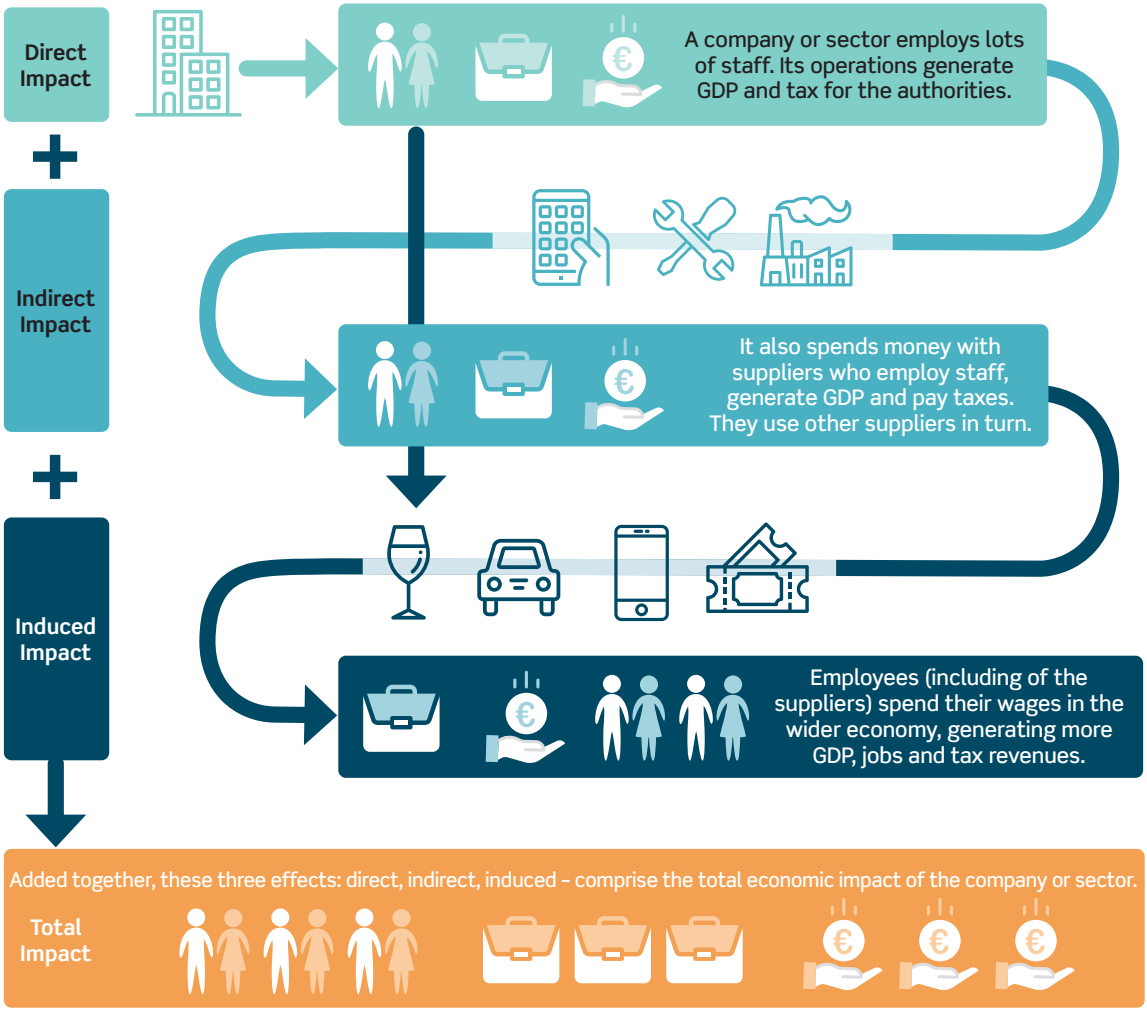
Given the above, and the relatively small professional services sector (which is typically the fastest growing in employment terms), the local port economy is unlikely to experience significant job creation in the short-term. Net out-commuting trends demonstrate that employment opportunities locally are already limited. As a result, the seafood sector is likely to continue to play a significant role in the local port economy through its provision of direct jobs, supply chain spending in local businesses and the consumer spending it supports. Looking forward, a vibrant and growing local seafood sector will be important for the economic and demographic health of the local area.

Appendix 2: Model approach

Understanding economic impact assessments

An economic impact assessment quantifies the total economic benefit created by a sector through a range of different channels. For the seafood sector at the ports this arises in four main ways. The first three are the standard channels through which economic impact is usually quantified: direct operational effects, supply chain effects, and the impact of employees spending their wages in the wider consumer economy. The fourth channel, known as 'catalytic' or 'dynamic' benefits represent the wider benefits that society and/or other industries derive from the original economic activity.

Fig. 29. Overview of economic impact methodology



Our report uses three main metrics to quantify each of the channels by which the seafood sector could contribute to the regional[9] and national economy:

- **Gross value-added** contribution to Gross Domestic Product (GDP)[10]: This measured the value of goods and services produced in an area, industry or sector of an economy and is equal to output minus intermediate consumption;
- **Employment**: Employment is presented in terms of full-time equivalent jobs as defined in the report, the combination of workplace employment by full-time and part-time status; and
- **Wages** is the total value of remuneration offered to the workers associated with the local seafood sector.

All the data used was either provided by BIM (for example recent seafood operator registrations/industry data), the seafood sector survey carried out by Perceptive Insight or published government website data and industry standards from the likes of CSO Ireland and Oxford's own economic databases. Finally, in the absence of data, reasonable assumptions based on best judgement are clearly rationalised in the study. For example, in the absence of port specific data we will use published sources for comparator geographies as a proxy estimates were appropriate.

Estimating the direct economic contribution

The first step was to understand the **direct** activity associated with the local seafood sector at each of the 10 ports in 2018.

The survey

The seafood survey was designed to provide the evidence base from which to estimate the local seafood sector's contribution to the regional/national economy. Responses from the sector were analysed according to common characteristics (sub-sector, turnover band, main port area etc) and cross-referenced with the most recent full snapshot of the local seafood sector population.[11]

Sample estimates were then 'grossed' up to that of the total population. This was done by drawing on the BIM database of the seafood sector population in each port which contained fields on sector and turnover bands. Knowing indicative turnover levels for seafood businesses not captured in the survey, we were able to apply the average ratio of jobs to turnover level in that sector and apply average sectoral wages, etc. In other words we utilised knowledge of the sectors and turnover of the missing companies and applied the ratios and averages of those covered in the survey to estimate their activity. The resulting total seafood related turnover estimate is then split into the different sectors of the economy ('Agriculture, forestry & fishing' and 'Manufacture of food products').

This turnover figure is essentially the value of output within the local seafood sector and encompasses intermediary demand, wages and profits. Using the sectoral ratios of output to GVA in the Irish input-output tables we estimated the direct sectoral GVA contributions to GDP in the local economy. Both direct employment and gross wages paid within the local port seafood sector are again informed by the survey findings and grossed to the population total based on shared characteristics.

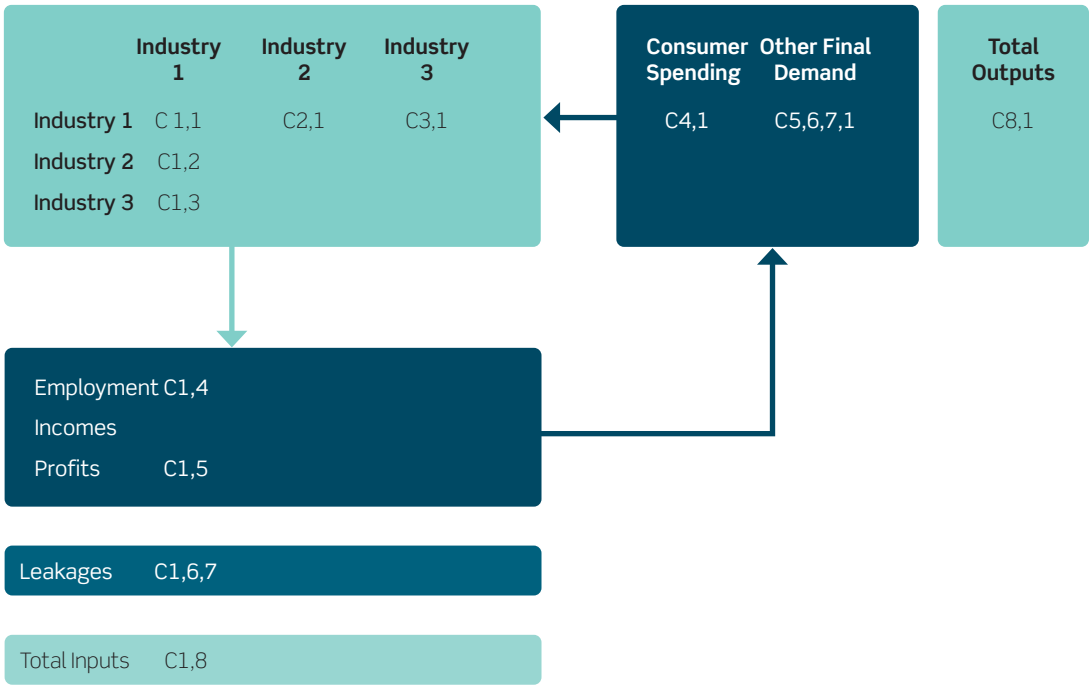
With our estimate of direct output and wages, we then applied sectoral taxation assumptions and calculated the resulting fiscal benefits that would likely be collected by the Revenue Commissioners.

9 Ideally, we would quantify the impacts of the seafood sector on the port area, however, there is not enough published sectoral employment, GDP and wage data. Sufficient data is only available at regional level to produce sub-national impacts.
10 GDP is the main summary indicator of economic activity in Ireland. GDP can be defined as GVA plus taxes on products less subsidies on products. References to economic growth (or when the economy enters recession) typically relate to the rate of change of GDP. All references in this report relate to GVA; also known as GDP at 'basic prices'; and they exclude taxes and subsidies.
11 Provided by BIM and informed by the most recent fishery registrations and activity listings in the aquaculture and processing sectors. Turnover bands were also assigned to the local seafood population based on returns when available, and when not, estimated by BIM based on shared characteristics.

Estimating indirect and induced impacts

To estimate the indirect and induced impacts we have built an input-output model. **Figure 30** presents a stylised version (showing just three sectors for presentation purposes) of our input-output model which is a model that traces how economic activity flows through an economy as one sector makes purchases from another sector.

Fig. 30. Stylised input-output model



We have used the latest Irish input-output tables for the analysis, but have adjusted these in line with academic guidelines (Flegg, A. T. and Tohmo, T. (2013) "Regional input-output tables and the FLQ formula: A case study of Finland") to account for the size and structure of the local economy.[12] The technique involves constructing sub-national input-output models by applying Location Quotients (LQs) and sub-national size adjustments to the standard Ireland input-output tables. The result is that geographies with higher concentrations of industries receiving procurement or household expenditure have larger impacts. In addition, we have used information gathered from the survey to further isolate the procurement spend locally, thereby strengthening the overall modelling assumptions.

MODELLING SUPPLY CHAIN IMPACTS

The survey provided us with information on the size of supply chain spending relative to turnover, its allocation to specific parts of the economy/goods/services and its location (local/national/international). Using this information, we were able to construct a more detailed picture of the first round of supply chain spending than the published input-output tables would otherwise provide.

12 Due to data availability, the local seafood sector's economic impact can only be localised to the regional level (NUTS 3).

We then used the impact model to estimate all the **rounds of supply chain or indirect spending** of the local seafood sector. The input-output tables provide us with an estimate of indirect output by sector. We then convert this output back into sectoral GVA and into sectoral jobs to provide a range of sectoral impact measurements. Applying average sectoral salaries allowed us to estimate the income effect.

The induced impact is economic activity and employment supported by those directly or indirectly employed spending their income on goods and services in the wider economy. This helps to support jobs in the industries that supply these purchases, and typically includes jobs in retail and leisure outlets, companies producing consumer goods and in a range of service industries. Again, our input-output model were used to estimate the induced impacts.

Overcoming double-counting

Throughout the analysis the impact estimates are presented for the core elements of the seafood sector – commercial fishing, aquaculture and fish processing. However, when estimating the total impact of the overall ports seafood sector, simply summing the respective benefits of all three sub-sectors will inevitably over-estimate the indirect and induced and as a result, total impacts. This is because the supply chains of the processing element contain a proportion of the fishing/aquaculture sub-sectors and their supply chains. Therefore, adding everything together would result in the double-counting some of the impacts.

We have, therefore, the following approach to calculate total impacts for GVA, employment, wages and tax:

Direct impacts:

- Calculated by summing the direct impacts from the three elements of the seafood sector for GVA, employment and wages.

Indirect impacts:

- For GVA, employment and wages, total indirect impacts are calculated by summing the indirect impacts of processing and a share of the indirect impacts from the fishing and aquaculture sub-sectors (as indicated by survey responses showing the extent to which local processors account for their total sales). The remainder of the fishing/aquaculture sub-sectors' indirect impacts will already be accounted for in the indirect impacts from the processing sub-sector.

Induced impacts:

- For GVA, employment and wages, total induced impacts are calculated by summing the induced impacts of the local processing sector and a share of the induced impacts from the commercial fishing and aquaculture sub-sectors (as indicated by survey responses showing the extent to which local processors account for their total sales). The remainder of the fishing and aquaculture sub-sectors' induced impacts will already be accounted for within the induced impacts from the fish processing sub-sector.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