An Analysis of the Shetland Economy based on Regional Accounts for 2010-11

George A Dyer

El Colegio de Mexico

with

Deb Roberts

The James Hutton Institute and *University of Aberdeen*

and

Andrew Blackadder

AB Associates

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1. Introduction

This report presents findings from an economic analysis of the Shetland economy, commissioned by Shetland Council in 2011.

The four principal objectives of the study were:

1. To construct regional accounts for Shetland in 2010-11 that are consistent with recognised Input-Output accounting conventions and formats.

2. To compile a Shetland occupational employment by industry matrix compatible with the core regional accounts.

3. Analyse the regional accounts and related data and provide comment on the current structure and recent performance of the Shetland economy.

4. Compare and analyse the results of'3' above with the previous results of the 2003 regional accounts study and provide comment on any changes to the Shetland economy during that time

As in the previous 2003 regional accounts study of Shetland (Newlands and Roberts, 2006), a Social Accounting Matrix (SAM) framework was adopted for the purposes of the study as opposed to the more constrained input-output table format, so as to include, in addition to detailed information on the industrial sectors of the economy, data on local household income and expenditure.

The SAM consists of seven sets of accounts. For each of these accounts, an accounting identity is satisfied. In particular the SAM included the following:

1. Thirty-one production or industry sectors accounts, for which the total value of gross output equals the total value of gross input;

2. Two factor accounts which relate to income from employment or from business profits. The accounting balance in this case requires that total value of factor payments from production equals the total value of factor receipts;

3. Forms of income accounts (wages and salaries, self employment, and investments, including rental income), for which again the total value of factor payments from production equals the total value of factor receipts;

4. Three household accounts (relating to adults without (dependent) children, adults with children, and retiree households), for which total income equals total expenditure,

5. A local government account showing income and expenditure by local government, as well as flows to and from central government;

The matrix also includes accounts which involve either payments made to, or collected from, Shetland. These relate to central government transfers, payments to and from a capital account, stock changes, savings, payments and receipts from visitors to Shetland, and finally payments to and from trade with the rest of Scotland, the rest of the UK, and the rest of the world. The full regional accounts are presented, for reference purposes, in Appendix 1 (or, on request, in spreadsheet form) while details of the methods used in the construction process are given in Appendix 2.

The structure of the report is as follows. Chapter 2 provides a summary overview of the Shetland economy in terms of total output, value added and employment, focussing on growth rates of key performance indicators since 2003. Chapter 3 focuses on the production side of the economy, indicating the contribution of each sector to output, value added, and employment and highlighting those sectors which have grown and those which have declined in relative or absolute importance since 2003. Chapter 4 looks in more depth at employment by sector and includes the Shetland occupation-employment matrix.

Chapter 5 contains the principal multiplier analysis. In particular it considers the extent of linkages within the Shetland economy identifying, amongst other things levels of sectoral integration in terms of input purchases and local labour requirements and how the pattern of linkages has changed since the previous study.

Chapter 6 presents information on income and expenditure patterns gathered from the survey of Shetland households. Again emphasis is placed on changes since the 2003 study but in this case the comparison goes back further to the 1996/97 input-output study (Gillespie et al., 1999). Chapter 7 reports the trade and exchequer balance. The final chapter sets out and analyses a number of

“scenarios”, that is potential economic situations which may occur, and show the sensitivity of the Shetland economy to these situations. The scenarios include a reduction in Shetland Islands Council spending, a reduction in exports from the aquaculture sector and finally a reduction in oil throughput at the Sullom Voe terminal and decommissioning.

2. Economic activity in Shetland

In the United Kingdom, as around the world, there is an on-going discussion on the role that government could or should play in the economy. This is true in Shetland, where, in common with other Scottish local authorities, Shetland Islands Council now faces significant budget restrictions.

The starting point of this discussion should be a clear definition of terms. Aggregate economic activity can be measured in terms of output or value added. In this report, total output refers to the value of all sales (at producer prices) net of changes in inventories summed across all economic sectors during fiscal year 2010-11. Gross regional domestic product (GRDP) is the sum of value added, i.e., wages and gross profits, through the production and sale of goods and services in Shetland. An alternative way of defining GRDP (at factor cost) is as the value of total output net of production, transport and sales costs and taxes. As GRDP reflects simultaneously levels of economic activity and income, it is presumably of most interest to authorities and the general public in Shetland. At the same time, value added necessarily derives from output sales, which are the basis of taxes, a main source of government revenue. In the remainder of this section we discuss both total output and GRDP briefly as a prelude to a more in-depth discussion in later sections of this report.

We estimate that, in 2010-11, total output in Shetland was £1,091.4 million, while GRDP was £484.9 million: £317.3 million in employment income and £167.9 million in gross profits. In 2003, total output was estimated at £860.5 million at 2010-11 prices (or £705.7 million at 2003 prices).[1,2] This implies a rate of growth of 3.5% per year in real terms, which represents a cumulative

[1] Data for 2003 is from Newlands and Roberts (2006) *Shetland Regional Accounts* 2003.

[2] 2003 prices are those observed at the time, while 2010-11 prices have been adjusted using GDP deflators: http://hm-treasury.gov.uk/data_gdp_index.htm.

increase of 27% between 2003 and 2010-11.[3] Similarly, value added in 2003 was estimated at £406.6 million at 2010-11 prices (or £333.4 million at 2003 prices), implying 2.6% annual growth or a 19% increase between 2003 and 2010-11.[4]

A third measure of regional economic activity is employment, customarily reported in terms of full-time equivalents (FTEs). We estimate that local businesses and organizations operating in Shetland employed 10,490 FTEs during 2010-11, which implies a growth rate of 2.0% per year since 2003 or a 15% increase between 2003 and 2010-11. [5] Finally, we estimate that Shetland businesses, organizations and households paid £138.2 million in direct and indirect taxes in 2010-11. This implies a 26% increase since 2003 and an annual growth rate of 3.4%.

In sum, between 2003 and 2010-11 total output, GRDP and employment in Shetland grew at rates of 3.5, 2.6 and 2.0% per year, respectively, while taxes increased by 3.4% per year. The significance of these rates is made clear when the implications of various ratios between the relevant variables are kept in mind. For instance, the ratio of GRDP to output is an indication of the economy's ability to generate value added. This ratio decreased (in percentage terms) from 47% in 2003 to 44% in 2010-11. Although value added consists of both wages and profits, it is clear that the profitability of Shetland businesses as a whole did not decrease during this period. In fact, the ratio of profits to output increased from 11 to 15%. The implication is that GRDP's relatively low rate of growth is associated with the evolution of wage income: the ratio of wages to output decreased from 37 to 29% indicating that relative increases in wage levels over the period were less than increases in non-wage costs and/or the value of output. On the other hand, the ratio of employment to output (also

[3] A cumulative increase is the result of compounding annual growth rates over the relevant period.

[4] See Appendix 3 for a comparison of economic growth in Shetland to other Scottish Island economies.

[5] This estimate is based on the *Shetland Employers Survey 2011* supplemented with own data.

known as the employment coefficient) is a measure of the labour intensity of the Shetland economy, or alternatively, an inverse measure of the productivity of labour. That is, the employment coefficient reflects the size of the labour force required to produce a unit of output. This ratio decreased from 11 (FTEs/£ million) in 2003 to 9.6 in 2010-11, which suggests that the labour force was 10% more productive in 2010-11 than in 2003.[6] This explains why output grew at a much faster rate than employment.

We identify the source of these changes in subsequent sections devoted to sectoral analyses, employment and the exchequer balance for Shetland. We return to the question of the Council's role in Shetland's economy in a later section and assess the economy's response to various potential market shocks (or stimulus) in the last section of this report.

[6] Both figures are estimated at 2010-11 prices.

3. Sectoral Analysis

Economic activity was classified into 31 sectors following, as closely as possible, the classification system adopted in previous regional accounts for Shetland so as to facilitate comparisons (see Appendix 2). Each sector's contribution to output, value added, and employments are reported in Table 3.1.

Table 3.1 Sectoral output, valued added and employment, 2010-2011

Sector	Total Output (£ million)	%	Value Added (£ million)	%	Employ-ment (FTEs)	%
Agriculture	18.450	1.7	13.765	2.8	185	1.8
Fish Catching	70.900	6.5	30.551	6.3	269	2.6
Aquaculture	156.266	14.3	49.484	10.2	350	3.3
Oil Terminal	46.427	4.3	19.911	4.1	219	2.1
Mining	12.115	1.1	4.535	0.9	31	0.3
Fish Processing	83.267	7.6	10.086	2.1	260	2.5
Other Food & Drink Process	8.752	0.8	4.019	0.8	234	2.2
Marine Engineering	11.053	1.0	6.746	1.4	441	4.2
Textiles	4.678	0.4	2.605	0.5	98	0.9
Other Manufacturing	11.592	1.1	7.281	1.5	128	1.2
Electricity, Gas & water	39.592	3.6	11.175	2.3	65	0.6
Construction	77.714	7.1	33.694	6.9	777	7.4
Wholesale	11.427	1.0	3.820	0.8	119	1.1
Retail	57.813	5.3	24.294	5.0	930	8.9
Accommodation	17.052	1.6	9.121	1.9	259	2.5
Catering	5.337	0.5	2.907	0.6	231	2.2
Ports & Harbours	23.431	2.1	10.735	2.2	46	0.4
Sea Transport	18.403	1.7	1.552	0.3	118	1.1
Land Transport	46.743	4.3	31.596	6.5	231	2.2
Air Transport	33.730	3.1	23.197	4.8	100	1.0
Oil Supply Services	25.000	2.3	5.631	1.2	49	0.5
Communications	5.781	0.5	1.902	0.4	183	1.7
Financial Services	36.548	3.3	6.072	1.3	108	1.0
IT & Real State Services	7.881	0.7	3.071	0.6	44	0.4
Technical & Prof Services	18.748	1.7	13.518	2.8	211	2.0
Public Administration	67.616	6.2	27.378	5.6	3,021	28.8
Schools	38.300	3.5	28.428	5.9	459	4.4
College	7.179	0.7	5.457	1.1	145	1.4
Health	56.782	5.2	27.745	5.7	548	5.2
Social Work	35.857	3.3	26.797	5.5	101	1.0
Other Personal Services	36.985	3.4	28.849	5.9	531	5.1
			*9.015**	*1.9**		
Shetland Totals	**1,091.421**	**100**	**484.938**	**100**	**10,490**	**100**

*Payment by Shetland households to value added (for property rent)

As highlighted in Table 3.2, the answer to which sector contributes the most to the Shetland economy clearly depends on the criterion used. For instance, *aquaculture*, the largest sector in terms of output is not among the largest employers. On the other hand, the *public administration* and *construction* head the list on employment and wages, respectively, but are not among those sectors generating the most value added.

Table 3.2 The top five economic sectors in Shetland according to various criteria[1]

Total Output (£m)	Value Added (£m)	Wages (£m)	Profits (£m)	Employment (FTES)
Aquaculture	*Aquaculture*	*Construction*	*Aquaculture*	*Public Admin*
Fish Processing	*Construction*	*Schools*	*Other Services*	*Retail*
Construction	*Land Transport*	*Health*	*Land Transport*	*Construction*
Fish Catching	*Fish Catching*	*Public Admin*	*Fish catching*	*Health*
Public Admin	*Other Services*	*Social Work*	*Retail*	*Other Services*

[1.] Shown in descending order.

From a policy perspective, the importance of employment is self-evident. Similarly, value added is the basis of income and thus, arguably, of most interest to public policy. However, output (and industrial activity) also is highly relevant as the source of income to the region and source of tax.[7] Assessed in terms of output, the structure of the Shetland economy appears relatively stable: four of the five top contributors to the region's output are the same as in 2003, while three are common with 1996-97.[8] But there have also been important changes. *Construction* and the Sullom Voe *oil terminal* have declined

[7] See Chapter 7 for a discussion of taxes.

[8] Newland and Roberts, op cit.

in relative terms since 1996, while *aquaculture* and to a lesser degree *fish processing* have taken their place (Fig. 2.1).[9]

Output

Output is not only a measure of economic activity but demand for output is a driver of economic growth. That is, the expansion of demand for output from any sector in Shetland is an intrinsic source of growth elsewhere in the economy.[10] In this sense, *aquaculture* is potentially a most important sector, as it contributed directly 21% of net output growth between 2003 and 2010-11. In contrast, the decline of the *oil terminal* directly curtailed Shetland's net output growth by 10%, while the *construction* sector contributed 2% of growth despite the loss of its preeminent place in the region's economy.

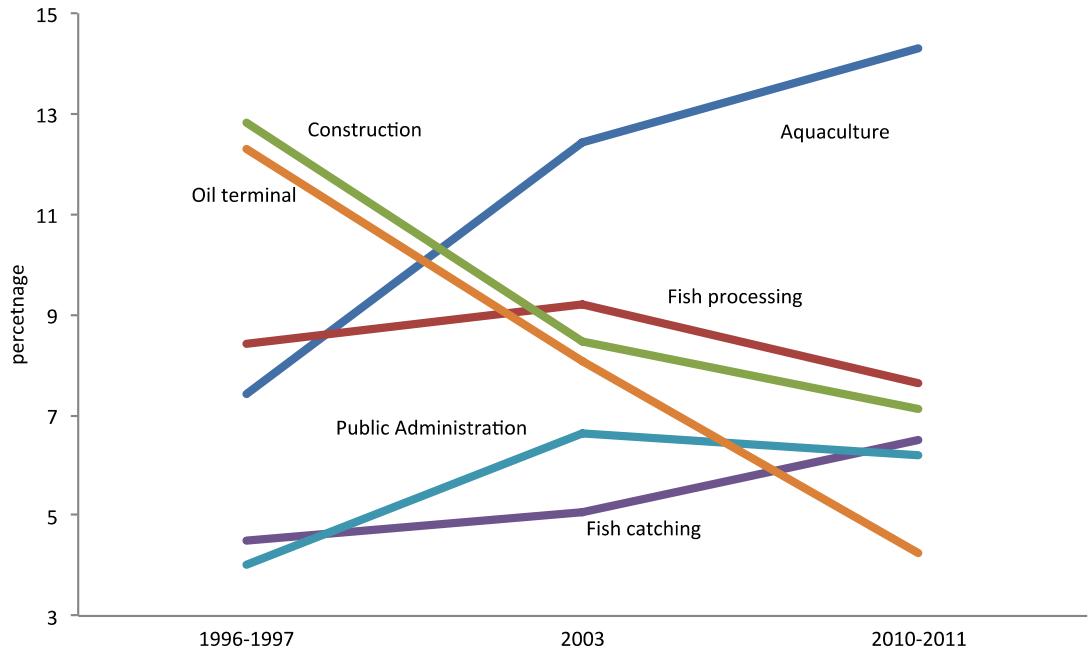

Figure 3.1 Relative contributions of largest sectors to value of output since 1996-97

[9] Oil terminal data is estimated on the basis of employment estimates for the industry.

[10] See Chapter 5 for more on this topic.

Notwithstanding the current prominence of *aquaculture*, the **industry concentration ratio** for Shetland's five largest sectors has decreased slightly in recent years, from 49 and 50 in 1996-97 and 2003, respectively, to 46 in 2010-11. That is, Shetland's economy has become more diversified as smaller sectors partly fill the space left by *construction* and the *oil terminal* however the combined importance of fisheries-related sectors *(aquaculture, fish processing and fish catching)* in 2010-11 should be noted. Sectoral growth rates for each sector since 2003 are shown in figure 3.2.[11]

The highest rates of growth are observed in *electricity, gas & water* (26%), *other food and drink processing* (26%), *oil supply services* (24%) and *other manufacturing* (20%). Negative growth rates are observed in *technical and professional services* (-9.6), *communications* (-6.6%), *oil terminal* (-5.6%) and *financial services* (-3.1%). While some of these rates are impressive, it is difficult to separate actual changes from the effect of reclassifying a number of businesses across sectors. Reclassification explains for instance the decline of *technical and professional services* and simultaneous expansion of *real state services*. It may have also contributed to the change in the *fish processing* and *wholesale* sectors.

[11] Sectoral data for 2003 and growth rates are reported in Appendix 4.

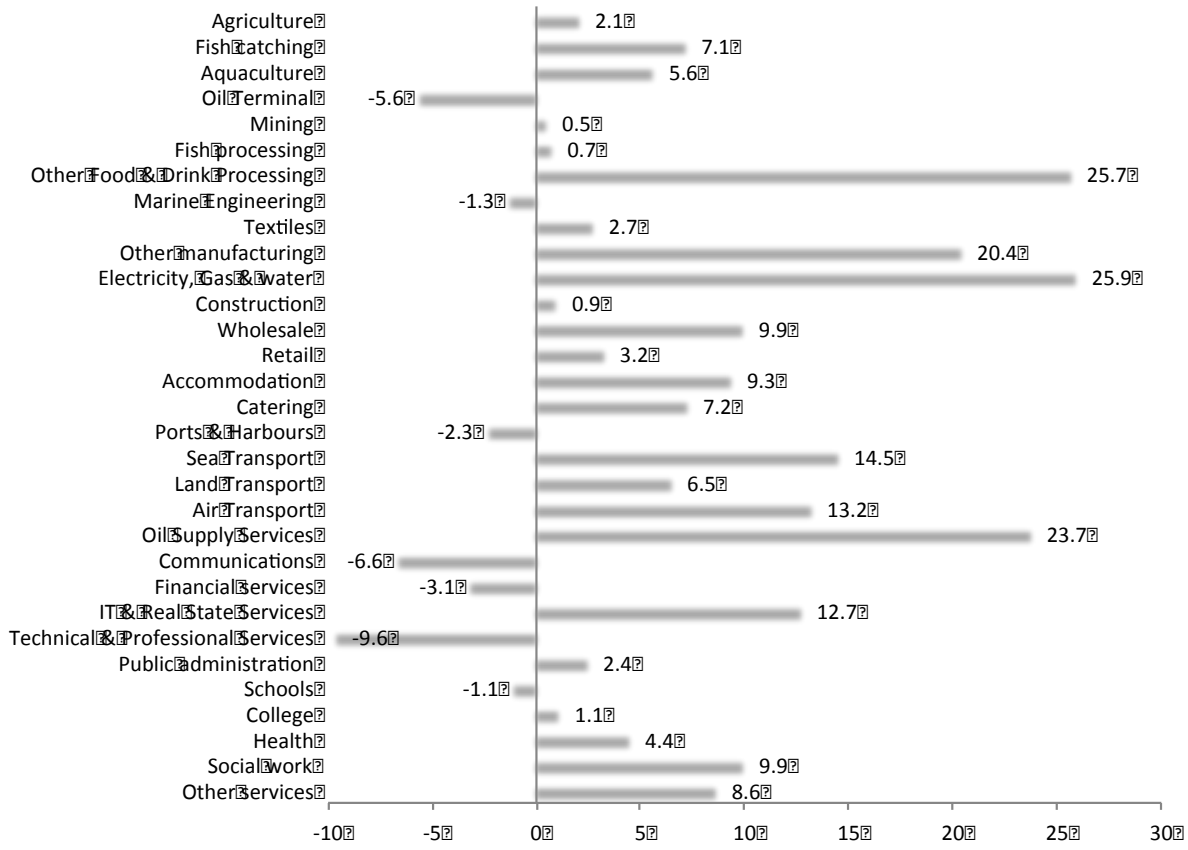

Figure 3.2 Annual output growth rates (%) by sector, 2003 to 2010-11

Despite large changes in growth rates, sectors' shares of the region's total output have remained relatively stable. The most important increases in relative contributions are in *electricity, gas and water* (2.7 percentage points), *aquaculture* (1.9), *oil supply services* (1.6), and *fish catching* (1.4); while the largest declines are the *oil terminal* (-3.8), *technical and professional services* (-2.7), *financial services* (-2.0), *fish processing* (-1.6) and *construction* (-1.3).

Value Added

Sectoral contributions to value added tell a different story. *Aquaculture* remains the largest sector, yet it contributes relatively less to GRDP than output. By contrast, although not exceedingly large in terms of output, *land transport* and *other personal services* generate a considerable share (13%) of Shetland's GRDP. Also important in terms of value added are *construction* and *fish catching.* It is worth noting nevertheless that these sectors do not contribute equally to wages and profits. *Aquaculture*, *other personal services*, *land*

transport and *fish catching* generate an overwhelming share of profits in Shetland (53%), while it is *construction*, *schools*, *health*, the *public administration* and *social work* that contribute most to wages (43% in aggregate) (Table 3.2).

Sectoral shares of GRDP are clearly more volatile than output shares. Large increases in relative contributions are observed in *land transport* (4.5 percentage points), *air transport* (4.1), *health* (3.7), *schools* (3.0), *public administration* (2.7), *social work* (2.6) and *construction* (2.2). Equally notable declines occurred in *fish processing* (-4.7), *retail* (-4.4), *aquaculture* (-4.1), *technical and professional services* (-3.0), *oil terminal* (-2.8), *financial services* (-2.5) and *fish catching* (-1.9). These changes should be attributed to fluctuations in the rate of profitability across sectors with both the 2003 and 2010-11 SAM providing only a "snapshot" of a sector's performance in that particular year. Moreover, information on profits is generally considered to be less reliable than other information in the SAM. The changes in shares of GRDP also reflect changes in the intensity of labour in each sector and in the type of remuneration offered to employees.[12]

Employment

Finally, in terms of employment, most striking is the large increase in the *public administration*'s relative contribution. The can, in part, be explained by the transfer of staff from businesses that were previously classified as *Social work* to *public administration* as a result of changes in funding. Excluding the *public administration* sector, the largest increases in employment shares are observed in *marine engineering* (2.2), *food and drink processing* (1.7), and *other personal services* (1.5). On the other side, the largest declines in employment are in *technical and professional services* (-3.7), *schools* (-3.2), *ports and harbours* (-3.1) and *social work* (-2.8). We address employment in greater detail in the next section.

[12] Changes in methodology might account for the decrease in *retail*'s contribution to GRDP.

4. Employment

Over two thirds of the labour force in Shetland is employed in services sectors; manufacturing jobs represent an additional 19% and primary sectors the remaining 10%. In 2003, manufacturing and the primary sectors offered relatively more jobs than at present (Fig. 3.2). Service sectors now constitute the main employer of every occupational category (according to the *Standard Occupational Classification 2000*) except *skilled trades* and *process plant and machine operatives*, for which manufacturing provides more jobs.

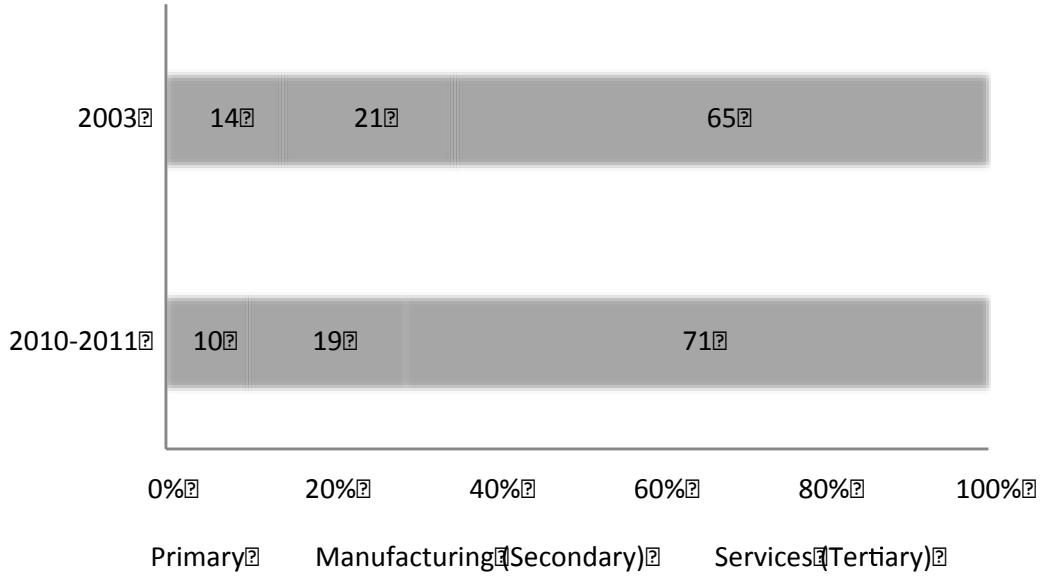

Fig. 3.2 Employment in primary, manufacturing and services sectors in Shetland

Skilled trades is the largest occupational group in Shetland (1,841 FTEs). Also important are *sales and customer services* (1,296) and *professionals* (1,214), which replaced *elementary occupations* and *process, plant and machine operatives* as the second and third largest since 2003 (Fig. 3.3). Significant representation of all nine occupational groups nevertheless remains a hallmark of the region's economy. Employment across occupational categories by sector is presented in full detail in Table 3.1.

As in 2003, Shetland maintains a relatively balanced occupational distribution across sectors. There are seven sectors that employ people in all occupational groups: *air transport, IT and real state, public administration, colleges, health, social work*, and *other personal services*. Significant changes in employment nevertheless have taken place since 2003. *Public administration* has replaced *retailing* as the largest employer of *managers and senior officials* except for *agriculture*, where every farmer or crofter was considered a manager. *Public administration* also continues to be the largest employer of *associate professional and technical occupations* and *administrative and secretarial occupations*; and it has also become the main employer of *professionals*, *personal services*, and *elementary occupations*, replacing the *technical and professional services*, *accommodation* and *fish processing* sectors, respectively. Also, *retail* continues to employ the most *sales and customer representatives* in Shetland; and although *construction* continues to be the main employer of *skilled trades*, *fish processing* now employs more *process, plant and machine operatives*.

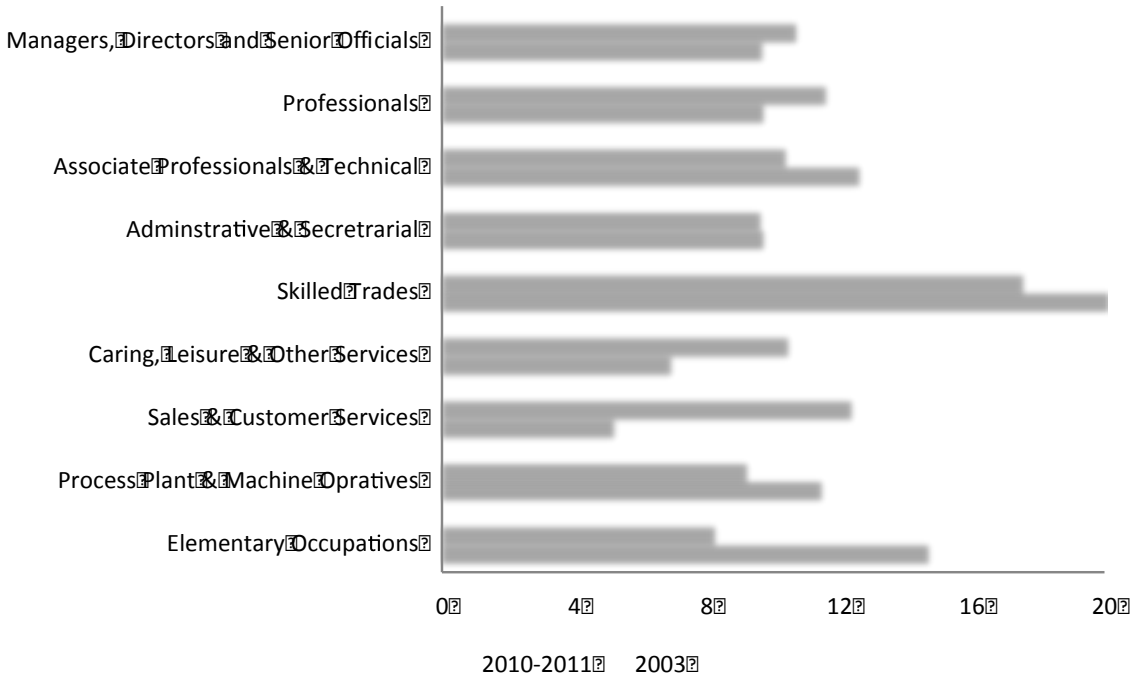

Fig. 3.3 Employment by occupational category, 2003 to 2010-11.

Employment coefficients represent the amount of labour required to produce a unit of output—a measure of the intensity of labour or an inverse measure of its productivity. We calculated these statistics for every sector in Shetland.[13] The highest coefficients across the economy are for three services sectors: *public administration* (44.7 FTEs/£ million), *catering* (43.3) and *marine engineering* (39.9). On the other hand, those with the lowest coefficients are capital-intensive sectors: *electricity, gas and water* (1.6 FTEs/£ million), *oil supply services* (2.0) and *ports and harbours* (2.0) (Fig. 3.1). As noted in the introduction, employment coefficients have decreased slightly in average since 2003. In 2003, for instance, the highest coefficients were above 45 FTEs/£ million (47.6 for *catering* and 45.5 for *other manufacturing*), while the lowest were above 2.0 FTEs/£ million (*sea transport*, 2.1, and *finance*, 2.4). More generally, 26 sectors exhibit higher labour productivities in 2010-11 than in 2003, while the intensity of labour rose in the remaining five (Fig. 3.1). Employment coefficients decreased most in *other manufacturing*, *accommodation, social work* and *textiles*; the largest increases are for *public administration*, *marine engineering* and *communications*.

[13] Employment coefficients are reported in full detail in Appendix 5.

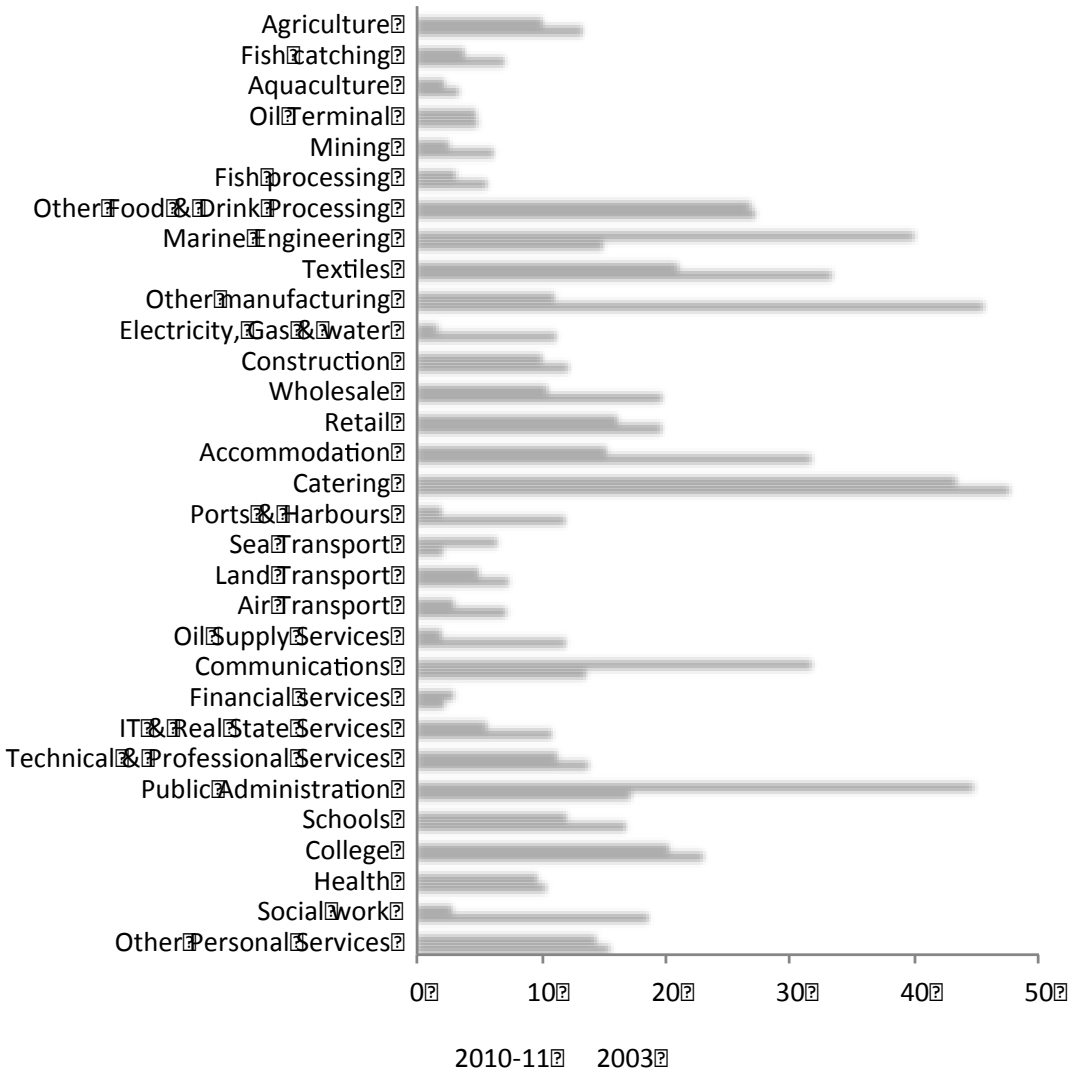

Figure 4.1 Employment coefficients by sector, 2003 to 2010-11

Table 4.1 Employment matrix for Shetland, 2010-11

	Sector	Managers, Directors and Senior Officials	Professionals	Associate Professionals & Technical	Adminstrative & Secretrarial	Skilled Trades	Caring, Leisure & Other Services	Sales & Customer Services	Process Plant & Machine Opratives	Elementary Occupations	Totals
1	Agriculture	166	0	0	2	7	0	0	10	0	**185**
2	Fish catching	88	0	43	0	22	0	0	116	0	**269**
3	Aquaculture	84	11	4	5	205	0	0	14	27	**350**
4	Oil Terminal	5	27	42	5	43	0	2	95	0	**219**
5	Mining	0	0	0	6	0	0	0	25	0	**31**
6	Fish processing	13	5	21	4	10	0	4	202	1	**260**
7	Other Food & Drink Processing	17	0	17	33	59	0	25	84	0	**234**
8	Marine Engineering	20	3	12	18	387	0	0	0	0	**441**
9	Textiles	7	0	0	5	34	0	0	52	0	**98**
10	Other manufacturing	13	0	1	8	67	0	8	8	21	**128**
11	Electricity, Gas & water	7	1	4	5	18	0	0	30	0	**65**
12	Construction	67	18	9	24	480	0	22	22	135	**777**
13	Wholesale	17	7	8	13	5	0	45	23	0	**119**
14	Retail	117	0	0	59	40	0	713	2	0	**930**
15	Accommodation	46	0	0	15	0	0	198	0	0	**259**
16	Catering	9	0	17	11	34	0	43	11	106	**231**
17	Ports & Harbours	4	3	3	6	13	0	0	17	0	**46**
18	Sea Transport	22	0	15	37	0	0	44	0	0	**118**
19	Land Transport	22	0	33	19	114	0	0	42	0	**231**
20	Air Transport	3	30	9	7	12	12	16	5	6	**100**
21	Oil Supply Services	2	0	1	6	28	0	0	4	8	**49**
22	Communications	92	0	92	0	0	0	0	0	0	**183**
23	Financial Services	14	26	0	45	0	0	23	0	0	**108**
24	IT & Real State Services	9	2	10	10	4	1	6	0	3	**44**
25	Technical & Professional Services	47	70	45	49	0	0	0	0	0	**211**
26	Public administration	119	541	574	458	135	660	36	167	331	**3,021**
27	Schools	0	301	21	0	50	0	0	0	88	**459**
28	College	16	77	17	20	7	5	0	0	3	**145**
29	Health	35	46	34	75	0	229	0	0	129	**548**
30	Social work	13	0	0	4	0	84	0	0	0	**101**
31	Other Personal Services	50	46	56	56	67	104	111	35	7	**531**
	Total	**1,122**	**1,214**	**1,088**	**1,007**	**1,841**	**1,094**	**1,296**	**965**	**864**	**10,490**

5. Multiplier Analysis

The discussion has focused so far on growth within specific sectors, but as we said in section 2, expansion within one sector can generate growth elsewhere in the economy. This process is the subject of multiplier analysis. We estimated two types of output multipliers for the Shetland economy: Type I **input-output multipliers** (also known as open multipliers) and **SAM multipliers**. Both types can provide a precise measure of the total or cumulative effect of actual or potential changes in a given sector on the rest of Shetland's economy under certain conditions.[14] They can thus be used to assess the economy's potential response to an external stimulus, such as public policy or market shocks.[15] Table 5.1 reports both types of multipliers consistent with the information included in the 2010-11 regional accounts.

Input-output multipliers measure the expected change in total output after an increase in final demand for output from the relevant sector. Such change consists of the sum of the direct effect of stimulus on that sector and its indirect effects on other sectors through production interdependencies. The largest type I multiplier in Shetland in 2010-11 was 1.573 for the *communications* sector. This means that a £1,000 increase in demand for communication services would stimulate economic activity in various sectors through the purchase of inputs (also known as intermediate demand), and generate an additional £573 in sales spread across the Shetland economy. Alternatively, a £1,000 decrease in demand would translate into £1,573 in losses across Shetland: £1,000 directly in *communications* and the rest spread across the economy.

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[14] These conditions are that technology and prices remain unchanged after the stimulus; that production capacity is not limited by the availability of labour or capital (also known as supply-side constraints), and that household consumption patterns remain unchanged.

[15] See Chapter 8.

Other sectors with significant type I multipliers are *wholesale* (1.531), *electricity, gas and water* (1.439), the *oil terminal* (1.439) and *sea transport* (1.401) (Table 5.1). A low input-output multiplier, such as that seen for *financial services* (1.001), suggests that the sector demands relatively few local inputs. This can occur either because it demands few inputs in general or because it imports most inputs into Shetland. When few inputs are required, we should expect a relatively large share of outlays from the relevant sector to be in the form of wages, profits or taxes, which can have additional repercussions (positive or negative) on the economy (see below). But this is not necessarily the case when most inputs are imported, in which case a large part of the stimulus leaks out of the economy without having significant indirect effects.

Table 5.1 Input-Output and SAM multipliers for Shetland, 2010-11

Sector	I-O	Rank	SAM	Rank
Agriculture	1.235	11	1.383	10
Fish Catching	1.245	10	1.341	15
Aquaculture	1.018	30	1.059	30
Oil Terminal	1.439	4	1.562	3
Mining	1.165	23	1.238	23
Fish Processing	1.217	15	1.255	22
Other Food & Drink Process.	1.299	8	1.408	9
Marine Engineering	1.100	26	1.235	24
Textiles	1.215	16	1.329	18
Other manufacturing	1.092	28	1.214	28
Electricity, Gas & water	1.439	3	1.519	5
Construction	1.257	9	1.367	12
Wholesale	1.531	2	1.644	2
Retail	1.139	24	1.226	26
Accommodation	1.231	12	1.342	14
Catering	1.398	6	1.538	4
Ports & Harbours	1.337	7	1.472	6
Sea Transport	1.401	5	1.456	7
Land Transport	1.166	22	1.295	20
Air Transport	1.183	19	1.332	17
Oil Supply Services	1.177	21	1.231	25
Communications	1.573	1	1.687	1
Financial Services	1.001	31	1.030	31
IT & Real State Services	1.214	17	1.309	19
Technical & Professional Services	1.065	29	1.201	29
Public Administration	1.222	14	1.337	16
Schools	1.188	18	1.372	11
College	1.177	20	1.352	13
Health	1.099	27	1.219	27
Social Work	1.229	13	1.409	8
Other Personal Services	1.129	25	1.265	21

In general, multiplier analysis assumes that prices and technologies do not change in response to the stimulus, which implies that multipliers remain fixed. The assumption of fixed prices is obviously limiting. However, technology (and

hence multipliers) also can change substantially over time due to the spread of innovation or the restructuring of interdependencies within the economy. In Shetland, the latter has been the case with the expansion of the oil industry and connected sectors.[16]

More generally, the list of sectors with the largest multipliers in Shetland has changed substantially since 1996 (Table 5.2). *Agriculture* headed this list until 2003, but it is no longer part of it in 2010-11.

Table 5.2 Sectors with largest type I multipliers in Shetland, 1996-97 to 2010-11

	2010-11	2003	1996-97
1	*Communications*	*Agriculture*	*Agriculture*
2	*Wholesale*	*Fish Processing*	*Fish Processing*
3	*Electricity, Gas & water*	*Other Food & Drink Processing*	*Communications*
4	*Oil Terminal*	*Communications*	*Other Manufacturing*
5	*Sea Transport*	*College Education*	*Oil Terminal*

Input-output multipliers also assume that economic activity and household consumption (or final consumption) are mutually independent. This could be more the case than in peri-urban areas in the UK than in Shetland. Due to the region's geographic location, the local economic activity is, per force, the main source of local household income. In Shetland output growth translates into extra wages and profits for local households, and increased spending, which means a larger demand for local goods and services. Induced effects of this sort (i.e., the multiplier effects of household spending) are not considered in type I input-output multipliers, but they are included in SAM multipliers. In fact,

[16] For a recent analysis of this process see Roberts and Newland (2010) *The economic integration of new sectors in rural areas: a case study of the Shetland economy*.

both types of multipliers differ only in that the latter take into account the additional feedbacks that occur as earned income associated with a stimulus is spent.

As we should expect, estimated SAM multipliers for 2010-11 are greater than type I multipliers, as they reflect increases in input (or intermediate) demand for local goods and services as well as in consumer (or final) demand as income gains are spent (Fig. 4.1). As the figure shows, consumer-induced effects do not affect sectoral rankings radically, but differences between the two types of multipliers can be considerable nevertheless. Cases worth noting include educational sectors, namely *schools* and *colleges*, which improve 7 points in the overall ranking, while *social work* improves 5 points and *other personal services* 4 points. These are relatively labour-intensive sectors[17] that require few material inputs, and hence their contribution to economic growth is mostly through employees' income gains. A similar argument could be made for *financial services*, but given this sector's scant demand for local inputs, its SAM multiplier remains small.

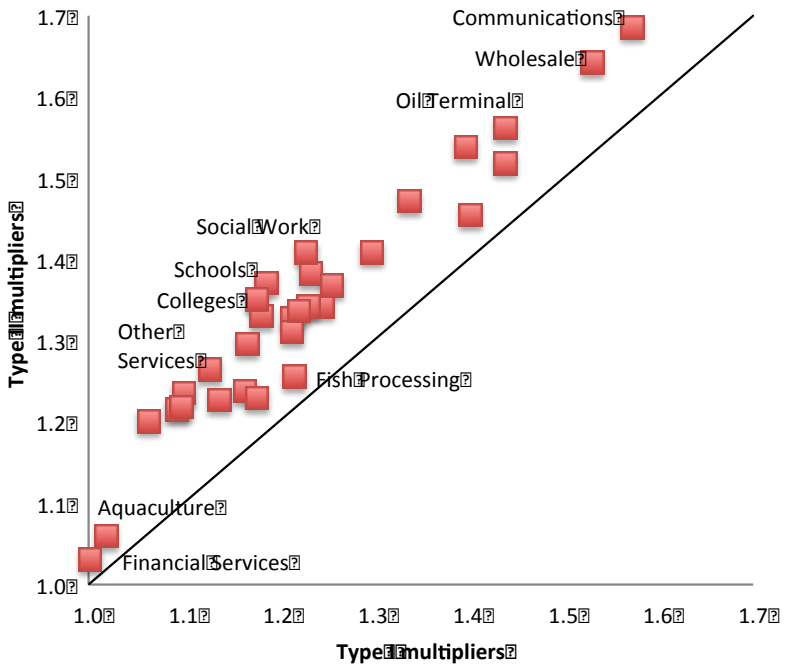

Figure 5.1 Input-output and SAM multipliers by sector in Shetland, 2010-11

[17] See Appendix 5.

At the opposite extreme is the *fish processing* sector, whose rank decreases by 7 points due to its intensive use of material inputs. Its SAM multiplier (1.255) nevertheless remains considerable. Overall, the sectors with the largest SAM multipliers are *communications* (1.687) and *wholesale* (1.644), while those with the smallest are *financial services* (1.030) and *aquaculture* (1.059).

Multiplier analysis shows thus that the contribution of *aquaculture* to economic growth in Shetland remains largely limited to its own expansion. The reason is that its effects on local consumption, both intermediate and final, are small. *Aquaculture* demands few local goods and services, while an overwhelming share of its inputs is imported from mainland Scotland.[18] It also continues to have one of the smallest employment coefficients in Shetland (Appendix 5), which means that induced effects via employee income also are limited. Therefore, although the sector accounts directly for 20% of regional growth since 2003, its expansion has not been a significant driver of growth elsewhere in the economy. This may change if local businesses gradually become better positioned to supply the inputs required by this sector, as it happened thirty years ago with the oil industry, but there is little if any evidence that any restructuring occurred during the last decade.

Employment. If the expansion of a particular sector can induce growth across Shetland, as discussed in the preceding sub-section, it must follow that it can also affect employment elsewhere in the economy. The employment generated across the economy as a result of a unit increase in output from a particular sector is known as its **employment effects**. That is, employment effects measure the multiplier effect discussed above in terms of employment gains and losses.

[18] See Chapter 7 for a discussion on trade patterns.

Since employment effects consist of direct and indirect changes in employment associated with a particular stimulus, their value should exceed that of the employment coefficients, which reflect only the former; employment is generated directly in the expanding sector and indirectly across the economy. There are two types of employment effects that correspond to the two types of multipliers discussed above. Employment effects derived from input-output multipliers measure inter-industry feedbacks alone; those associated with SAM multipliers also include effects induced through consumer demand. In what follows we refer exclusively to the latter, but both types are reported in full detail in Appendix 5.

Across sectors, employment effects are 7 to 275% larger than employment coefficients (Fig. 4.2). At one extreme, *marine engineering* has an employment coefficient and employment effect of 39.9 and 42.5 (FTEs/£ million), respectively. That is, a stimulus that increases the output of a particular sector by £1 million requires 39.9 full-time employees in marine engineering. It also raises *marine engineering*'s use of material inputs, and supplying these goods and services in turn requires an additional 2.6 FTEs distributed across other businesses and organizations in Shetland. At the opposite end is *ports and harbours* with employment coefficient and employment effects of 2.0 and 7.4 (FTEs/£ million), respectively. A £1 million increase in *ports and harbours*' output requires only 2.0 FTEs within the sector but 5.4 FTEs are generated across other economic activities.

Clearly the most important issue is not whether jobs are created directly or indirectly, but how many jobs are created in total. Although significant at the level of the entire economy, indirect employment does not change noticeably the ranking of the various sectors as generators of jobs (Fig. 4.2). Predictably, sectors with the highest employment effects are *catering* (52.5 FTEs/£ million), *public administration* (49.7) and *marine engineering* (42.5), which are also the most labour-intensive (Appendix 5). A £1 million increase in the size of the *public administration* thus creates almost 45 full time jobs directly and an

additional 5 spread across other sectors. The sectors with the lowest employment effects are *aquaculture* (3.1) *financial services* (3.4) and *mining* (4.8). A £1 million increase in *aquaculture* sales creates 2.2 jobs directly and 0.9 more indirectly. Naturally, the size of these sectors also is important. *Catering*, *marine engineering*, and *communications* have large employment effects, but none accounts for more than 1% of Shetland's total output. This is not the case of *aquaculture*, which contributes 14% of this output, or *public administration*, which employs 29% of its labour force. Either directly or indirectly, all of these sectors can have a critical impact on the region's labour market. [19]

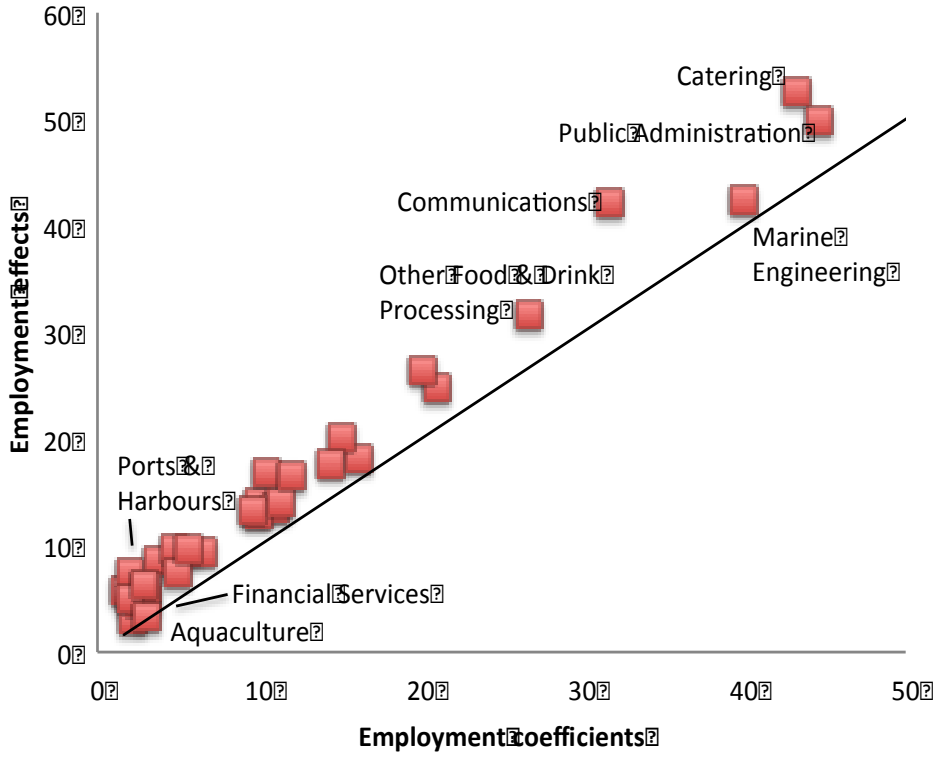

Figure 5.2 Employment coefficients and effects by sector, 2010-11

[19] See Chapter 8.

Employment multipliers are an alternative way of considering the employment generating potential of different sectors. In this case they measure the increase in total employment (in the whole economy) resulting from a unit increase in employment in one particular sector. The final columns of Appendix 5 show that the sector with the highest employment multiplier in 2010-11 was *ports & harbours* with an employment multiplier of 3.748 suggesting one extra FTE job in the *ports & harbours* sector would lead to an additional 2.748 FTE jobs being created in the wider Shetland economy. This is closely followed by the *electricity, gas and water* sector with an employment multiplier of 3.534. The magnitude of employment multipliers falls quite dramatically after these two sectors with the mean multiplier (across all 31 sectors) being only 1.634.

6. Household Income and Expenditure

This chapter reports information from the Household survey.

Household income. Average household income in Shetland for 2010-11 is estimated at £38,418, which represents a nominal increase of 17% with respect to 2003 (Table 6.1). Average income is highest for households without children, whose total earnings amounted to £45,904. Income is also above average for households with children at £41,316, while retiree households earn less than half the average, or £17,162. Wages and salaries contribute two thirds of total income in average, or £25,590, followed in importance by pensions, 15% or £5,653, and self-employed income, 12% or £4,535. Social security and various other income sources contribute an additional 5% or £1,786, while investment and rental income contribute the remaining 2% or £854 in average.

Changes in the relative contribution of different sources of income since the 1996-97 study reveal an interesting pattern. At the most aggregate level, for instance, there is an increasing reliance on income from pensions, whose relative contribution almost doubled from 8% in 1997 to 15% in 2011 (Fig. 5.1). A possible explanation for this trend is that the Shetland population is aging. Twenty-one per cent of survey respondents are retiree households. The General Register Office for Scotland (GROS) places the pensionable-age population in Shetland at 17% of the total in 2011.[20] GROS expects that this population will nevertheless increase to 22% by 2020. Alternatively, the trend in pensions might reflect an increase in the value of pensions relative to other sources of income. Among retirees, the sum of state and private pensions has increased 14% in nominal terms since 2003, amounting to £14,872 (or 87% of their income) in 2011. As expected, pensions are largest and most important for retiree households, but they have increased for other groups as well. Among households without children, pension income increased almost 300% in nominal terms, contributing £5,219 (or 11% of their income), compared to £303 (or 1%) for households with children.

[20] See National Records of Scotland, 2012

Table 6.1 Average incomes in Shetland, by household group and income source, 2010-11

	Wages & Salaries £ (%)	Self Employment £ (%)	Investment Income £ (%)	Pensions £ (%)	Social Security & Other £ (%)	Total Income £
Households with no Children	31,174	7,376	1,122	5,219	1,012	45,904
	(68)	(16)	(2)	(11)	(2)	(100)
Households with Children	34,068	3,342	394	303	3,209	41,316
	(82)	(8)	(1)	(1)	(8)	(100)
Retiree Households	0	0	962	14,872	1,329	17,162
	(0)	(0)	(6)	(87)	(8)	(100)
All Households	25,590	4,535	854	5,653	1,786	38,418
	(67)	(12)	(2)	(15)	(5)	(100)

Other sources of income show contrasting trends. For instance, the contribution of self employment to income has declined gradually from 15% in 1996-97 to 12% in 2011. However, this trend is not common to all household groups. The share of total income attributable to self employment decreased sharply for households with children, from 24% in 2003 to 8% in 2011; but it increased for households without children from 12 to 16%.

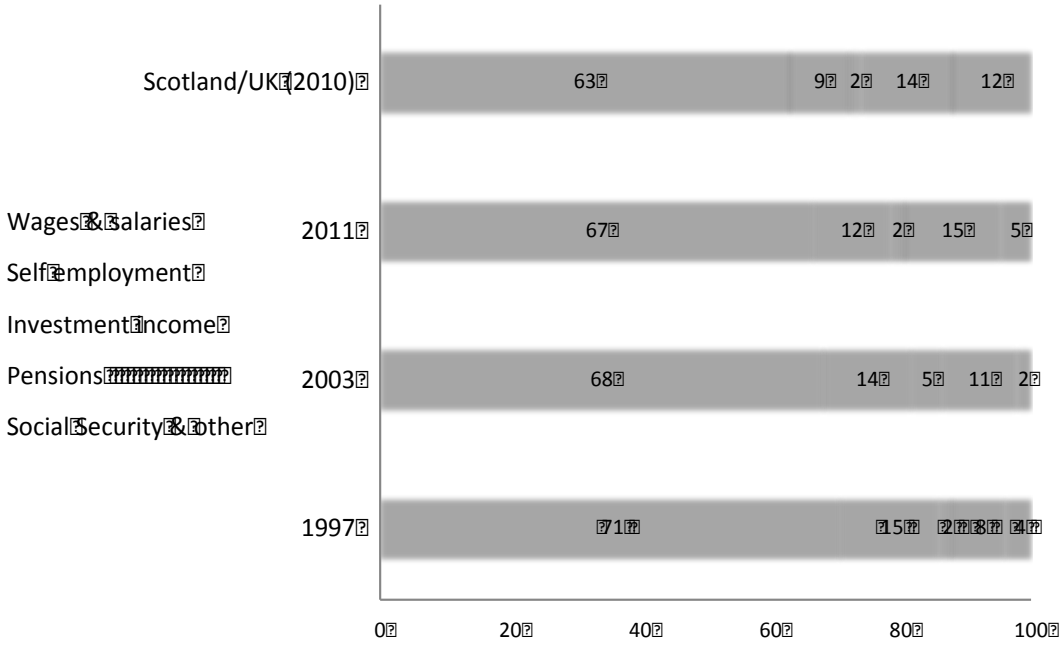

Figure 6.1 Sources of household income in Shetland, 1996-97 to 2010-11

Overall, changes since 2003 represented a 26% nominal increase in total income for households without children and a 13% increase for retiree households, but a 14% nominal decrease for households with children. This does not necessarily mean that particular households have sustained income losses, although this might be the case for some. We have not followed the same households during this fifteen-year period; household groups constitute a changing set of households each round of the survey. Thus, changes in income might reflect changes in the composition of each group. It could be the case, as suggested above, that households who had children in 2003 have experienced no income losses but they have become households without children. On the other hand, newly-formed households might enjoy fewer

opportunities today than their counterparts did in 2003. As for relative contribution of various income sources, changes seem to have followed a pattern since 1997, where wages, salaries and self-employed income have lost weight while pensions have gained in importance. This trend was apparent already in 2003.[21]

The results suggest that Shetland has moved closer to the pattern observed throughout Scotland and the rest of the United Kingdom (Fig. 5.1). The average household in Scotland and the UK derives 63% of its income from wages and salaries, and 9% from self employment. That is, in 2010, these sources jointly contributed 6 percentage points less to the average income in Scotland than in Shetland. Yet, the gap in 2003 was 1.5 times as large, i.e., 9 percentage points. [22] Similarly, in 2003, pensions contributed 2 percentage points less to the average household in Shetland than in Scotland, but the gap has closed completely in 2010-11.

Household expenditure. About 80% of household expenditure is divided evenly among four broad categories: *food and drink* (20%), *housing* (20%), *private transport* (21%), and *other regular expenditure* (18%). The remainder consists of *other capital expenditure* (7%), *other transportation and travel* (4%), *holidays, entertainment and recreation* (5%), and *savings* (7%). Again, the pattern differs among household groups (Table 6.2). Households without children spend the highest share on *private transport* (23%), while both households with children and retiree households spend most on *housing* (26% and 25%, respectively). The smallest share of expenditure by household without children is on *public transportation and travel* (4%), and to *other capital expenditure* in the case of retiree households (2%), while households with children spend equal shares on both categories (3%). The share of income that

[21] See Newlands and Roberts, op cit. The increasing share of pension income may reflect higher levels of early retirement from the public sector since 2003.

[22] Ibid.

households without children save, 9%, is twice as large as that of other groups. In absolute terms, they save 156% more than households with children and 350% more than retiree households. Yet, households without children still spend 8% more in absolute terms than households with children, and 130% more than retirees.

Table 6.2 Household expenditure in Shetland by household type, 2010-11

	All Households	Households without Children	Households with Children	Retiree Households
Food & Drink	**20%**	**19%**	**19%**	**24%**
At home	16%	15%	16%	21%
Restaurants & bars	4%	5%	3%	3%
Other Regular Expenditure	**18%**	**16%**	**20%**	**23%**
Clothing & footwear	3%	2%	3%	3%
Insurance	3%	2%	3%	2%
Communications	3%	2%	4%	4%
Other loan payments	2%	2%	2%	2%
Other	7%	7%	7%	12%
Housing	**20%**	**15%**	**26%**	**25%**
Rents & mortgages	9%	6%	15%	4%
Energy	6%	5%	6%	9%
Repairs & miscelaneous	3%	3%	2%	7%
Council Tax	3%	2%	3%	5%
Other Capital Expenditure	**7%**	**10%**	**3%**	**2%**
Durable goods	3%	3%	2%	2%
Other capital expenditure	4%	7%	1%	0%
Private Transport	**21%**	**23%**	**20%**	**13%**
Purchase & loans	10%	10%	11%	6%
Petrol & diesel	8%	10%	7%	6%
Other	2%	2%	3%	2%
Other Transportation & Travel	**4%**	**4%**	**3%**	**3%**
Travel & transportation	4%	4%	3%	3%
Holidays, Entertainment & Rec	**5%**	**4%**	**5%**	**5%**
Holidays	3%	3%	3%	4%
Entertainment & recreation	2%	1%	2%	1%
Savings	**7%**	**9%**	**4%**	**5%**
Savings	7%	9%	4%	5%

Interesting differences in spending patterns across groups are observed within these broad categories (Table 6.2). Households with children are the group that spends the greatest share on *rents and mortgages* (15%) and the least on *housing repairs* (2%). Perhaps predictably, retirees are the group that spends the least on *rents and mortgages* (4%), but also the most on *energy* (9%), *repairs* (7%) and *council tax* (5%). Households without children, for their part, spend less than average in all *housing-expenditure* categories but more than average in all *private-transport* categories. Retirees also spend a greater share of their income on *food and drink consumed at home* than other groups, while households without children spend much more on *restaurants and bars* than other groups.

Table 6.3 Percent of household expenditure on goods in Shetland by group, 2010-2011

	%				
	All Spending	Furniture	Electrical Equipment	Cars & Vehicles	Clothing & Footwear
Households with no children	67	38	55	54	35
Households with children	65	77	36	69	22
Retiree Households	76	93	62	98	54
All households	67	48	51	61	32

Table 6.4 Percent of household expenditure in and outside Shetland, 2010-2011

	%				
	All Spending	Furniture	Electrical Equipment	Cars & Vehicles	Clothing & Footwear
In Shetland	67	48	51	61	32
Outside Shetland	25	42	15	36	26
On-line purchases	7	9	28	3	30
Mail-order purchases	1	1	6	0	12

Table 6.5 Change (in percentage points) of household expenditure in and outside Shetland, 2003 to 2010-2011

	%			
	Furniture	Electrical Equipment	Cars & Vehicles	Clothing & Footwear
In Shetland	-1	4	6	5
Outside Shetland	8	-8	-9	-15
On-line purchases	5	4	3	20
Mail-order purchases	-12	0	0	-11

Spatial patterns of expenditure also differ noticeably among household groups. Retirees spend a greater share of their income within Shetland than other groups (Table 6.3). For instance, they purchase 98% of their *vehicles* and 93% of their *furniture* in Shetland, compared to 54% and 38%, respectively, for households without children. Retirees also purchase 54% of their *clothing and footwear* and 62% of their *electrical equipment* locally, compared to 22% and 36% for households with children. Presumably, these differences will be reflected on the distribution of aggregate expenditure as the population ages. In 2011, two thirds of all household expenditure occurred within Shetland (Table 6.4); another 25% occurred during trips away from Shetland, while on-line and mail-order purchases accounted for 7% and 1% of the total, respectively. Four categories where the local share of expenditure was less than average are: *furniture* (48%), *electrical equipment* (51%), *cars and vehicles* (61%), and *clothing and footwear* (32%).

Furniture and vehicles often were purchased directly outside Shetland; but electric goods, and clothing and footwear were most often purchased on-line or through mail order. It might not surprise that in all of these categories, the share of on-line expenditure has increased 3 to 20 percentage points between 2003 and 2010-11 (Table 6.5), while the share that was purchased through mail

order decreased. More unexpected, perhaps, is that in most cases the share bought during trips also has declined, while local purchases have increased.

Overall, changes in expenditure patterns suggest that for some *consumer-goods* categories, e-commerce is gaining ground in Shetland, partly substituting purchases made during trips or through mail order. Surprisingly, local commerce also has gained ground. Presumably, spending patterns reflect both convenience and pricing, with local commerce offering greater convenience (particularly to those reluctant to travel) but higher prices. Thus, it is possible that local outlets have grown increasingly competitive. Another possibility is that these changes, as other trends observed above, are linked to the spending preferences of an aging population. Households with children spend the smallest share of income in Shetland, 65%, compared to 76% for retiree households. Noticeably, retirees' apparent preference for local retail outlets is most marked for those categories where spending outside Shetland is highest (Tables 5.3 and 5.4).

7. Trade and Exchequer Balance

It is possible to consider imports and exports in Shetland, as we have done in previous sections, and even of a balance of payments as an analogy to themeaning of these terms at the national level. Shetland's balance of payments does not have monetary repercussions as that of the UK, but it does have other interesting implications. Imports into Shetland, for instance, must be financed either by external sources of income, such as exports or state benefits, or by drawing upon savings. In this section we describe Shetland's balance of trade first and then its Exchequer balance.

Imports, exports and other industry trade issues. We have considered two types of trade-related income and expenditure: i) industrial imports and exports by local businesses and organizations, and ii) expenditure of Shetland residents and tourists.

The estimated value of exports from Shetland in 2010-11 was £496.4 million: £166.5 million in exports to the rest of Scotland, £118.0 million to the rest of the UK and £212.9 million to the rest of the world. The estimated value of industrial imports to Shetland in was £365.3 million: £260.2 million in imports from the rest of Scotland, £63.1 million from the rest of the UK and £42.0 million from the rest of the world. These figures entail a trade balance of £131.1 million (Table 7.1).

Table 7.1 Imports, exports and industry trade balance in Shetland, 2010-11

	Imports (£ million)	Exports (£ million)	Trade Balance (£ million)
Value	365.3	496.4	131.1
Change since 2003[1]	-4.4%	180%	
Annual growth rate[1]	-0.6%	8.8%	

[1.] In real terms.

In 2003, imports and exports (£382 and £275 million, respectively, at 2010-11 prices) generated a trade deficit of £106 million. Since then, exports have grown at an annual rate of 8.8% in real terms, while imports decreased 0.6% per year, thus converting Shetland's deficit into a favourable trade balance (Fig. 6.1). This is in sharp contrast to the period between 1996-97 and 2003, when exports decreased 0.7% per year, while imports and the trade deficit grew at annual rates of 0.5 and 4.3%, respectively.

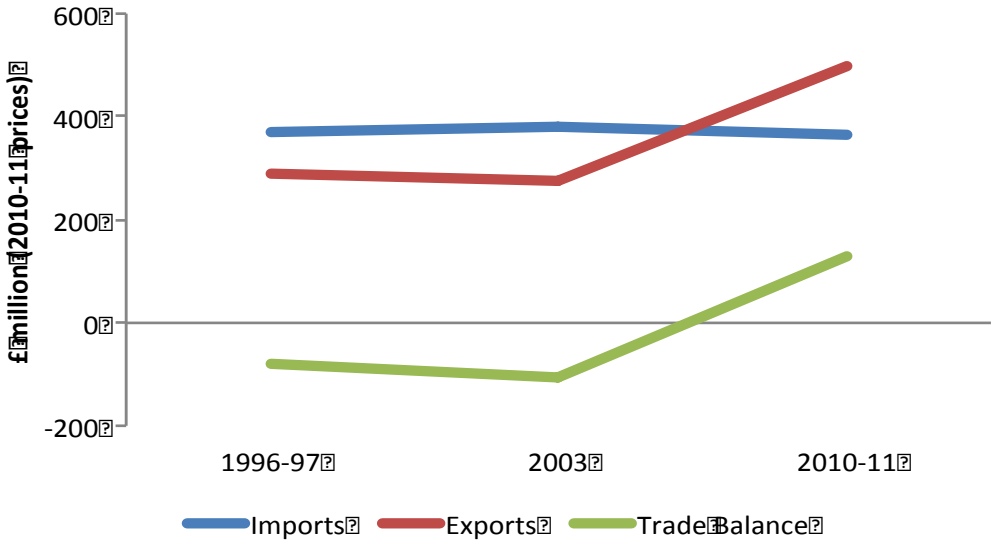

Figure 7.1 Imports, exports and industry trade balance in Shetland, 1996-97 to 2010-11

Shifts in the origin of imports and destination of exports since 1996-97 also are observed. The share of exports out of the UK has increased from 25% in 1996-97 to 43% in 2010-11 (Fig. 6.2). Similarly, exports to the rest of Scotland have increased considerably, particularly after 2003, while exports to the rest of the UK have declined as a percentage of the total from 51 in 1996-97 to 24% in 2010-11.

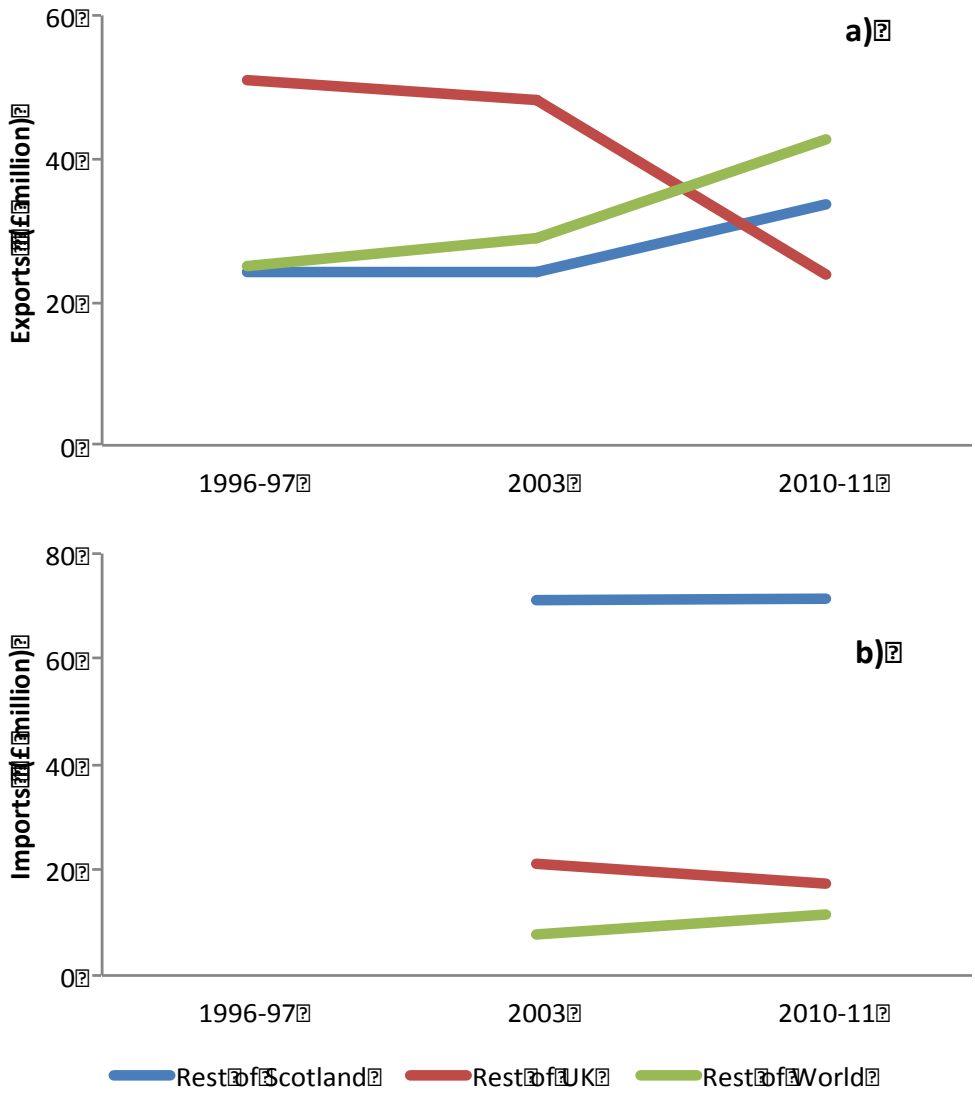

Figure 7.2 Industry Imports and exports in Shetland by origin and destination, 1996-97 to 2010-11

On the other hand, the source of industrial imports has remained relatively stable, with the rest of Scotland supplying 71% of the total since 2003. While the rest of the UK remains the second largest supplier of imports into Shetland, it has lost ground during the last decade to imports from outside the UK.

As noted in the previous regional study for Shetland, changes in export patterns might be the result of declining activity in the oil-related sectors; yet, this has not resulted in the decline in total exports or expanding trade deficit that might have been expected. As we have noted, the balance of trade for Shetland has

improved since 2003. However, the region's exports remain critically concentrated in primary sectors: 58% of Shetland exports in 2010-11 came from *aquaculture* (£144.1 million), *fish processing* (£82.1 million) and *fish catching* (£59.7 million), while *oil terminal* accounted for an additional 7.5% (or £37.2 million) (Fig. 6.3).

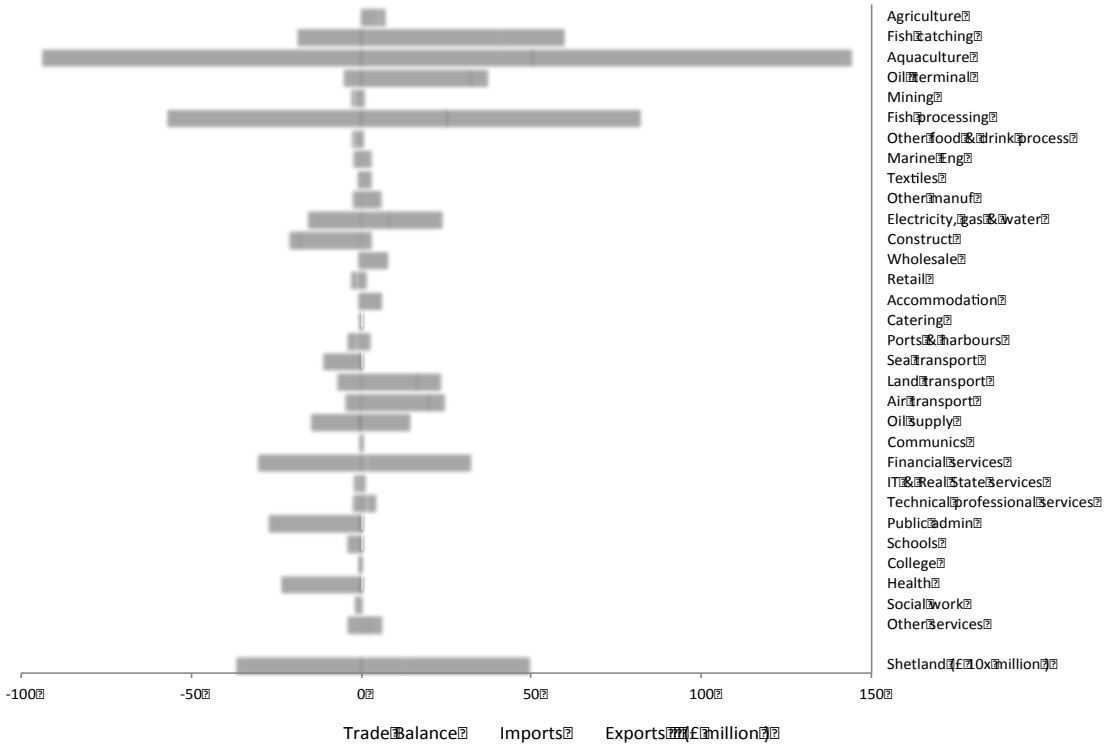

Figure 7.3 Industrial imports and exports in Shetland by sector, 2010-11

Aquaculture and *fish processing* are also the largest importers, responsible for 41% of all industrial imports (£93.6 and £56.9 million, respectively). However, all primary industries (except *mining*) have a favourable trade balance. A*quaculture*, *fish catching* and *fish processing* alone account for 89% of Shetland's industrial trade balance (Fig. 6.4). Exports of natural resources can help finance imports elsewhere in the economy, as might be the case with the construction sector, which has one of the largest trade deficits in the region. Services sectors such as *health* and *public administration* show large deficits.[23]

[23] Imports, exports and trade balances by sector are presented in full detail in Appendix 6.

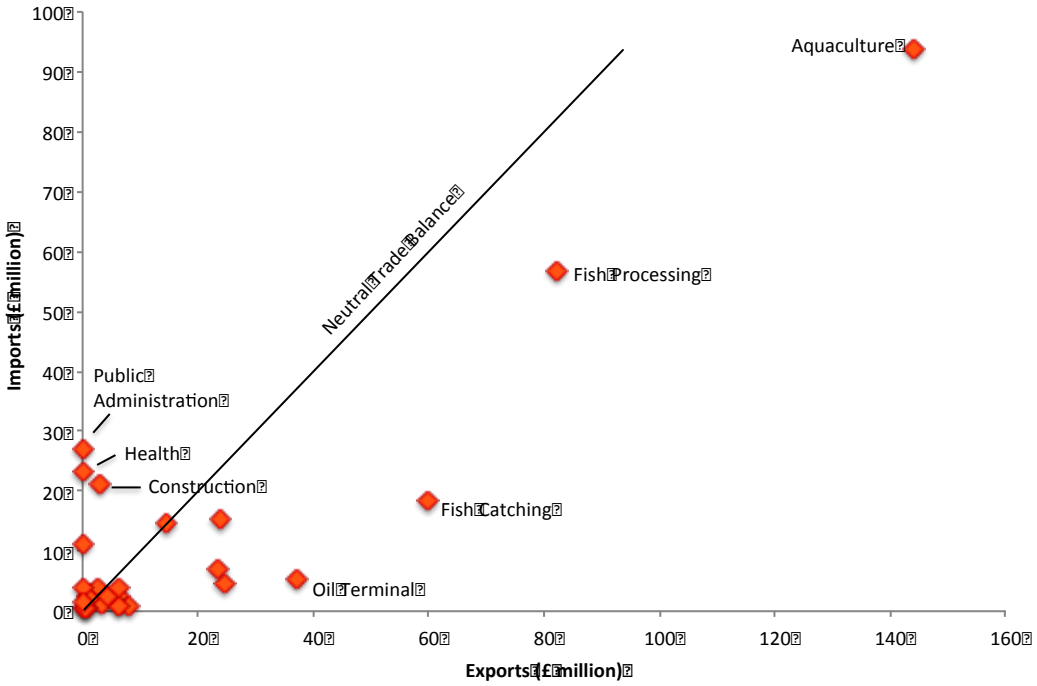

Figure 7.4 Industrial trade balances in Shetland by sector, 2010-11

In principle, the industrial trade balance also helps finance household expenditure outside Shetland, which in 2010-11 amounted to £80.4 million. As with industrial imports, 72% of domestic "imports" were purchased in Scotland, but households spent less in the rest of the UK than in other countries.

The last component of Shetland's balance of trade corresponds to tourists, who spent £13.9 million in Shetland in 2010-11, contributing 3% of the region's total "exports". Although small, tourist expenditure experienced a 26% increase in real terms since 2003, compared to a 19% increase between 1996-97 and 2003. This means that during the last decade tourism has grown on par with the rest of the economy.

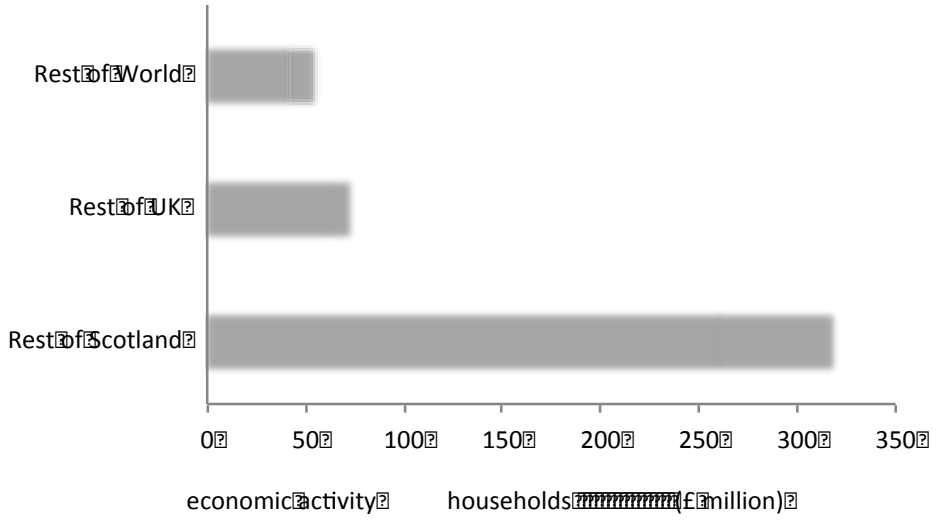

Figure 7.5 Industrial imports and domestic expenditure outside Shetland, 2010-11

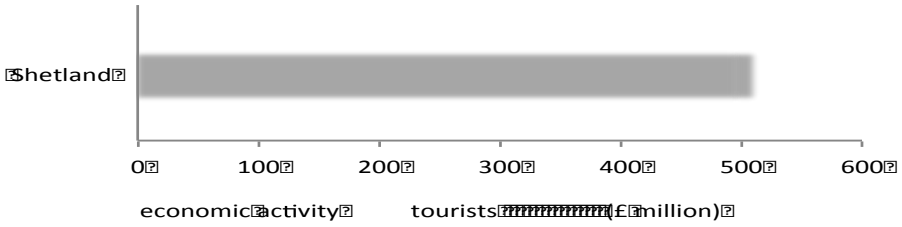

Figure 7.6 Industrial export and tourist expenditure in Shetland, 2010-11

Exchequer Balance

To allow for comparability across studies, the definition and the method of calculating the 2010-2011 exchequer balance is kept identical to that used in the 2003 study. In particular, the exchequer balance is defined as the difference between government revenue raised from businesses and households in Shetland and government expenditure on businesses and households in Shetland. Central government transfers to SIC are counted under both revenue and expenditure as in the previous study.

Using this approach, we estimate that Shetland businesses and households made a net contribution of £76.1 million to central government in 2010-11 as shown in Table 7.2.

Table 7.2 Exchequer Balance

Central Government expenditure in Shetland (£m) 2010/11	
Payments to Economic Activities	93.21
Transfers to Households	29.70
Net revenue support grant	93.55
Total	216.46

Revenue raised in Shetland (£m) 2010/11	
Direct taxes on Businesses	46.53
Income Tax	48.60
Indirect Tax	43.30
National Insurance	37.92
Local Business rates	14.12
Council Tax	8.60
Net revenue support grant	93.55
Total	292.62
Balance	**76.16**

In 2003, in comparison, the balance was £77 million (or £64 million at 2003 prices). It follows that the Exchequer balance for Shetland has increased 7% in real terms since 2003.

Looking more closely at the figures, central government transfers to Shetland Islands Council amounted to £216.5 million in 2010-2011, £93.2m of which were in the form of subsidies to businesses (including to agriculture, public administration, transport and health). This is, in real terms, 49% higher than the equivalent value in 2003. Government transfers to households, in the form of pensions and social security payments, came to £29.7 million, down 4% in real terms from 2003.

Turning to government revenue raised in Shetland, this was through a mixture of taxes on businesses (including direct taxes, indirect taxes and business rates) and taxes paid by household taxes (including income tax, council tax, national insurance payments and indirect taxes on consumption). There are a number of relatively large changes in the real values of each of these elements since the 2003 study which can be attributed to different treatment of entries. These include a 13% decrease in National Insurance contributions which came about as a result of different treatment of pension deductions in the 2003 study and an apparent real decrease in Council tax revenue which appears to be due to disaggregation into payments by Shetland resident and non-residents in the current study.

8. Scenarios

We consider various scenarios with potentially important implications for the Shetland economy. One of these – reduced Shetland Islands Council spending – is an update of a preliminary analysis published in 2012.[24] The remaining scenarios involve market shocks that could affect some of the largest sectors in Shetland in terms of output, namely *aquaculture* and the Sullom Voe *oil terminal*.

Council savings. Falling income from the General Revenue Grant and diminishing Council reserves impose serious constraints on the Council's current and future spending. Accordingly, the Council has set out to secure expenditure savings of £26 million per year from a starting position of £125 million. The Council has already identified some £7 million of efficiencies (approximately 6% of its current spending), and it intends to implement a full savings plan on an on-going basis by 2013-14. A number of possibilities are being considered, but all areas of the Council have had to look for at least a 10% reduction in on-going costs by 2013-14.

We explored the potential implications of Council savings on the local economy through two scenarios. The first considers efficiencies of £7 million in 2011-12; the second assumes efficiencies of £26 million per year by 2013-14. Simulations suggest that efficiencies of £7 million per year already entailed a 0.9% decrease in Shetland's total output in 2011-12, equivalent to £9.5 million (Table 8.1). This implies that Council savings had indirect effects with a value of £2.5 million - a 0.3% decrease in total output. Similarly, £26 million in annual savings expected by 2013-14 could entail a decrease of £35.4 million in Shetland's total output, or 3.3%, 2.4% of which would be directly attributable to Council savings and an additional 0.9% due to their indirect effects.

[24] See Dyer (2012) Implications of Council Savings on the Shetland Economy.

Table 8.1 Expected changes in output, GRDP, wages and profits after Council savings

	2011-12		2013-14	
	(£ million)	**(%)**	**(£ million)**	**(%)**
Council savings	7.0		26.0	
Output	-9.5	-0.9	-35.4	-3.3
GRDP	-5.3	-1.1	-19.8	-4.1
Wages	-4.4	-1.4	-16.3	-5.2
Profits	-0.9	-0.6	-3.5	-2.1

As a percentage of output, the sectors most affected by the savings are *schools*, *social work*, *public administration* and *sea transport* (Fig. 7.1)[25]which experience decreases in revenue of 16, 15, 14 and 12%, respectively. Another 16 sectors contract by between 1 and 10%, while 7 sectors experience declines between 0.1 and 1%. *Aquaculture*, *fish catching*, *fish processing* and *health* are not affected significantly.

[25] Expected sectoral decline rates are reported in full detail in Appendix 8.

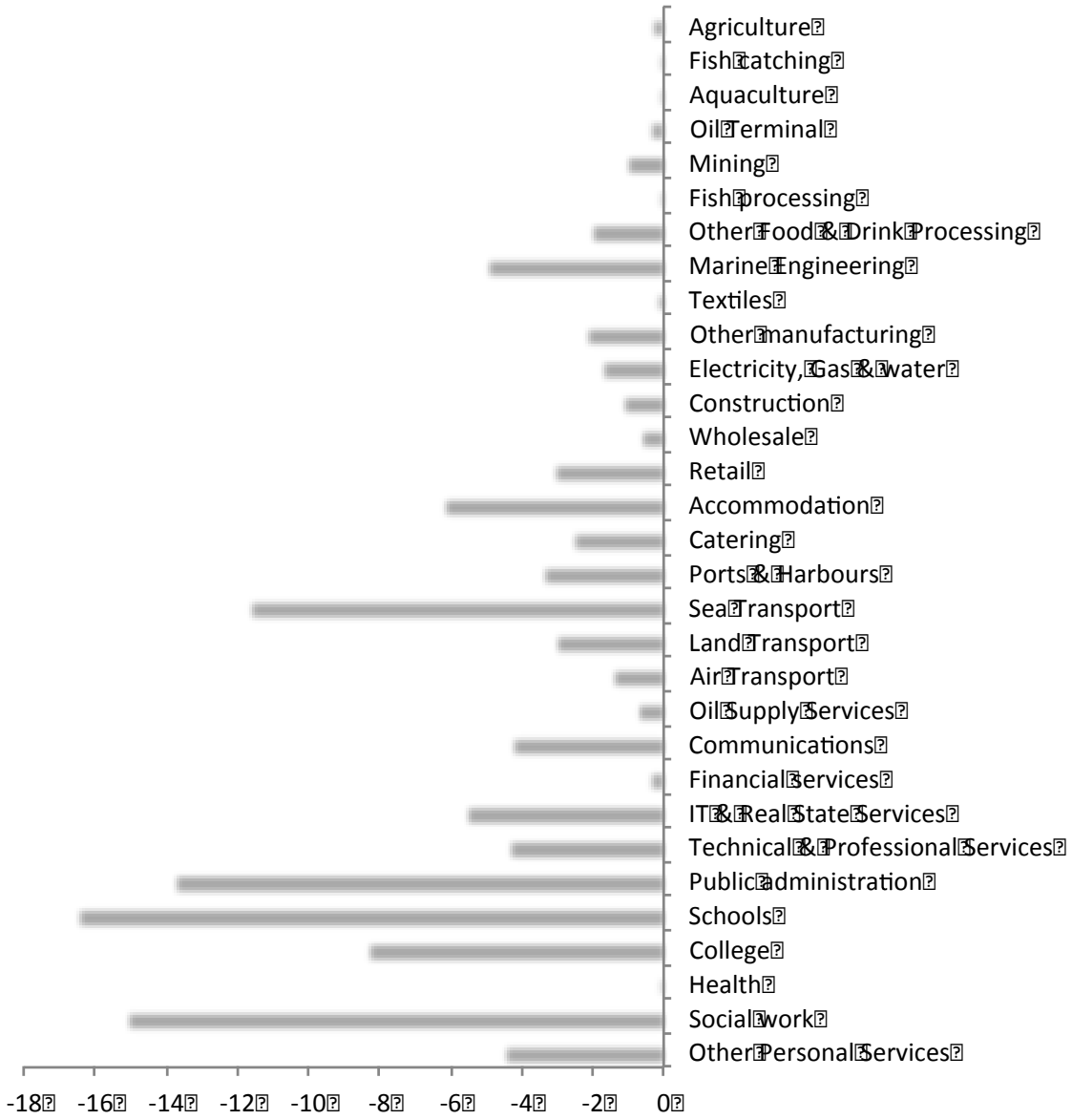

Figure 8.1 Expected declines in sectoral output (%) after Council savings by 2013-14

Percentage changes are slightly more pronounced in terms of GRDP than output (Table 8.1). Council savings are anticipated to lead to a 1.1% decrease in Shetland's GRDP in 2011-12, equivalent to £5.3 million. According to simulation results, savings will result in a 4.1% decrease in the region's GRDP by 2013-14, or £19.8 million. This decrease is not distributed equally between wages and profits, which decrease by 5.2 and 2.1%, respectively, by 2013-14.

Council savings also entail the loss of 181 FTEs in 2011-12 and 673 FTEs by 2013-14, which imply decreases in employment of 1.7% and 6.4%, respectively. In 2013-14, 73% of losses (489 FTEs) occur within the public sector, namely, *public administration* (414 FTEs) and *schools* (75). Another 184 full-time jobs are lost indirectly across the Shetland economy. In absolute terms, the largest losses are in *retail* (28 FTEs), *other personal services* (23), *marine engineering* (22), *accommodation* (16) and *social work* (15) (Fig. 7.2).

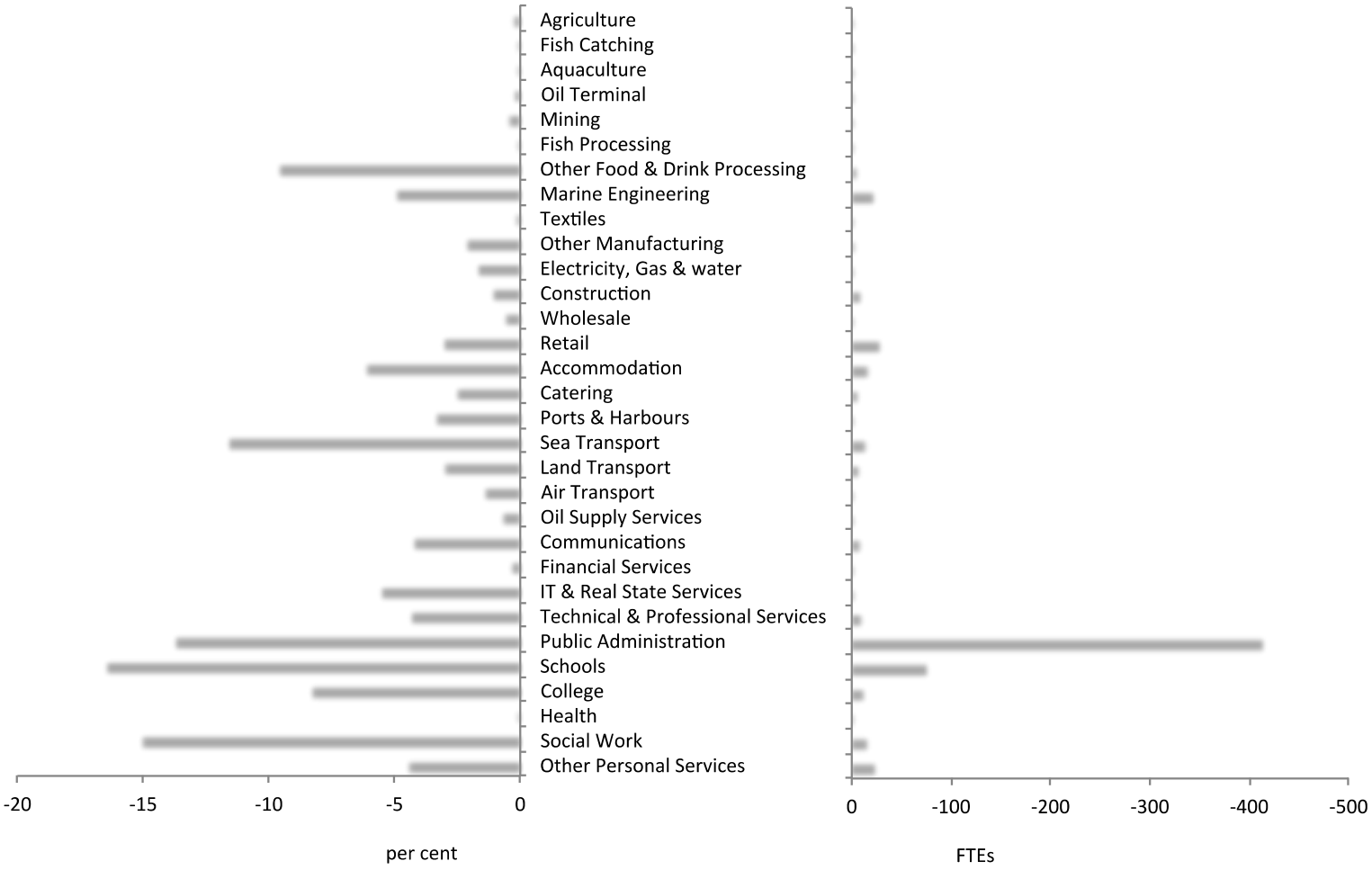

Figure 8.2 Expected declines in sectoral employment after Council savings by 2013-14

In percentage terms, five sectors decrease their labour force by 10% or more: *schools* (16%), *social work* (15%), *public administration* (14%), *sea transport* (12%) and *other food and drink processing* (10%). On the other hand, sectors that are tightly linked to the rest of Scotland or the world, such as *aquaculture*, *oil supply services*, *financial services* and *health* do not experience significant changes in employment.[26]

In both percentage and absolute terms, the largest expected changes in employment are observed in the *associate professional and technical* category, where 108 full-time jobs are lost, representing a 9.4% decrease with respect to pre-savings levels. The *administrative and secretarial*, *professional,* and *personal service occupations* categories also experience losses of at least 7.4%. Decreases in other categories range between 5.3 and 2.1%. In the case of *skilled trade occupations*, this could nevertheless represent the loss of 47 FTEs.

Changes reported above ultimately reduce the income of Shetland residents. Losses for the average household are equal to 1.1% of their income in 2011-12 and 4.1% by 2013-14 (Table 8.2). The source of these changes is decreases in wage income and profits. By 2013-14, we expect these two sources of income to drop by 5.2 and 2.1%, respectively. The distribution of these reductions across household groups is far from uniform. Households with and without children experience above-average losses (-4.1 and -3.6%, respectively), while retiree households experience rather small changes (-0.1%).

[26] Expected changes in employment are reported in full detail in Appendix 8.

Table 8.2 Expected changes in income, wages and profits after Council savings

	2011-12 (%)	2013-14 (%)
Wages	-1.4	-5.2
Profits	-0.6	-2.1
Total Income	-1.1	-4.1

***Aquaculture exports*.** We now analyse the implications of a scenario where the value of aquaculture exports falls by 50%. Although, in principle, this could be the result of either a decrease in the price of aquaculture goods or in the volume of sales, the latter is closer to model assumptions.

Since most aquaculture produce is exported out of Shetland, a 50% reduction in their value decreases the revenue of the sector by 49%. In 2010-11, this would have represented £77.2 million less in sales, which is equivalent to 7.1% of Shetland's total output. The decline of *aquaculture* also leads to lower sales in other economic sectors. *Other food and drink processing*, *retail* and *catering* decrease by more than 2%; four other sectors decrease between 1 and 2%, and 19 sectors by up to 1% (Fig 7.4). Overall, Shetland's total output declines by 7.5%: 7.1% due directly to *aquaculture* and 0.4% distributed across the wider economy. This large decline is expected given that *aquaculture* is the largest sector in terms of output value and the largest contributor to economic growth in recent years.[27] At the same time, it is not surprising that the indirect effects of the sector's decline are relatively small, since the multiplier of *aquaculture* is among the smallest in Shetland.[28]

[27] See Chapter 3 for a discussion on *aquaculture*'s contribution to the Shetland economy.

[28] See the discussion on this topic in Chapter 4.

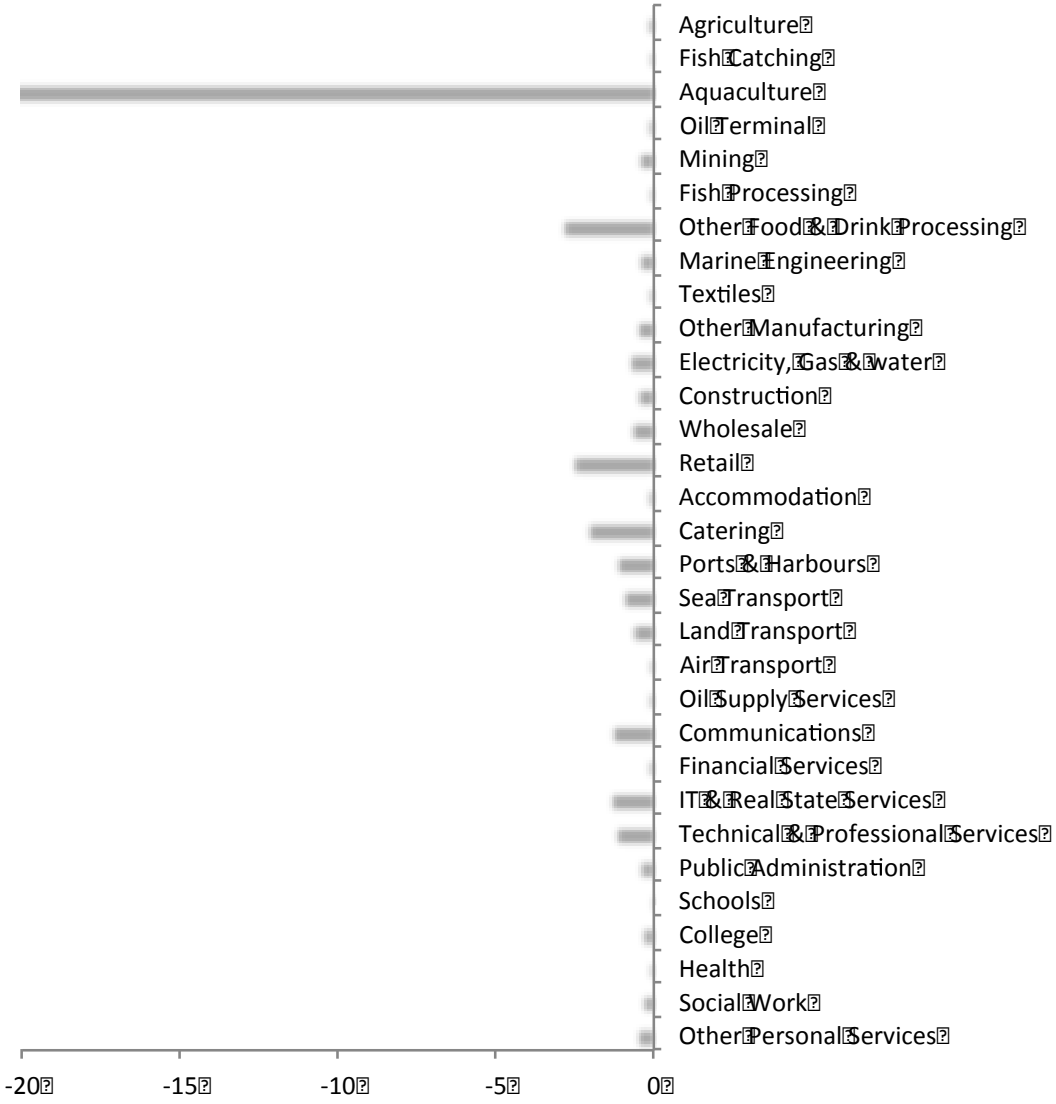

Figure 8.3 Expected declines in sectoral output (per cent) after a decline of aquacultural exports

As expected, the overall effect on Shetland's GRDP is smaller than that on output (Table 8.3). While GRDP decreases by 5.5%, local profits decrease by 13% given the sector's large contribution to this type of value added. In contrast, due to the low employment coefficient of the sector, the loss of over £77 million in sales results in only 173 less full-time jobs in *aquaculture*. An additional 65 full-time jobs are lost in other sectors. However, compared to the large decrease in Shetland profits, the impact on local employment is relatively small: the loss of 238 FTEs represents only a 2.3% decrease in employment.

Table 8.3 Expected changes in income, wages and profits after a decline of aquacultural exports

	(£ million)	(%)
GRDP	-26.8	-5.2
Wages	-5.2	-1.6
Profits	-21.6	-12.9
Total Income	-8.6	-2.9

Among the sectors that reduce their labour force the most are *retail* (23 FTEs) and *other food and drink processing* (7 FTEs) (Fig. 7.5). Given the reliance of *aquaculture* on services provided by the Council, the *public administration* could also reduce its labour force significantly (11 FTEs).

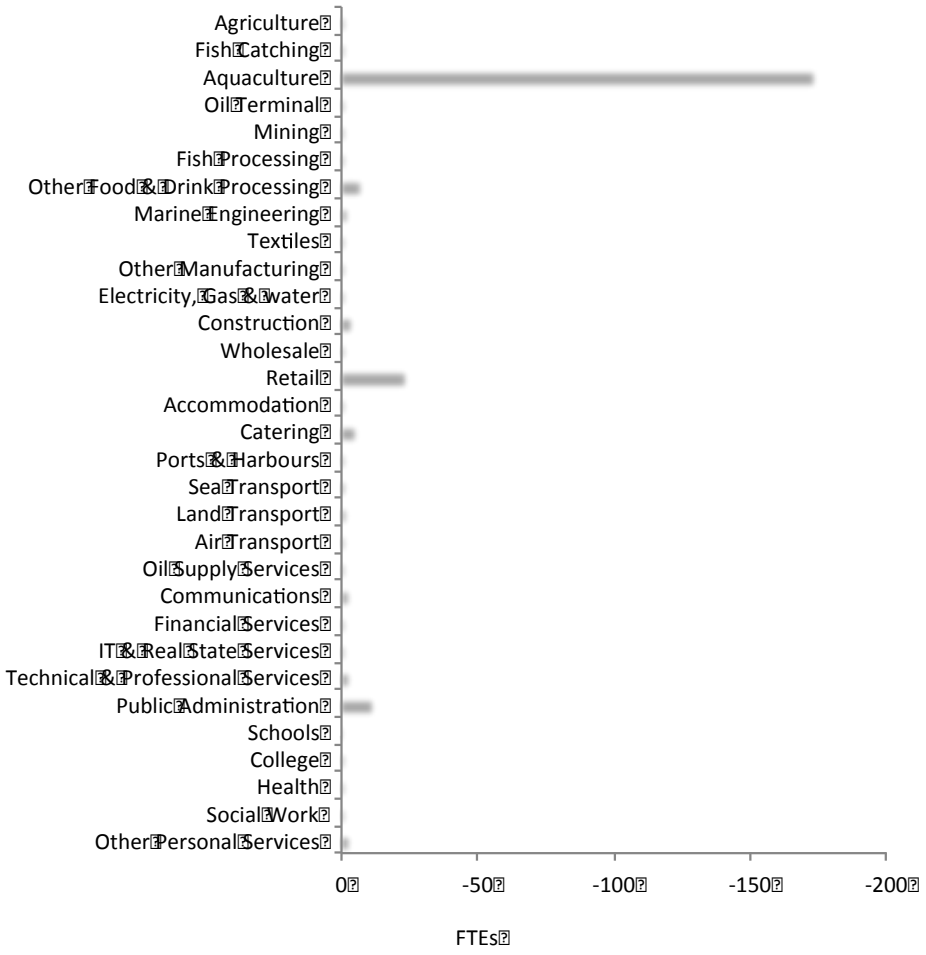

Figure 8.4 Expected declines in sectoral employment after a decline of aquacultural exports

In terms of income, households with and without children experience decreases of 2.5 and 3.5%, respectively, while retiree households' income decreases only 0.7%.

Income changes in the two scenarios analysed so far—a decrease in the value of aquacultural exports and the implementation of Council savings—are compared in Figure 7.5. Both scenarios have similar effects on households without children, and to a lesser degree, on households with children. However the actual distribution of these effects across households within groups could differ markedly. As we have said, the first scenario leads to large wage losses, while the second one results in a large decline in profits.

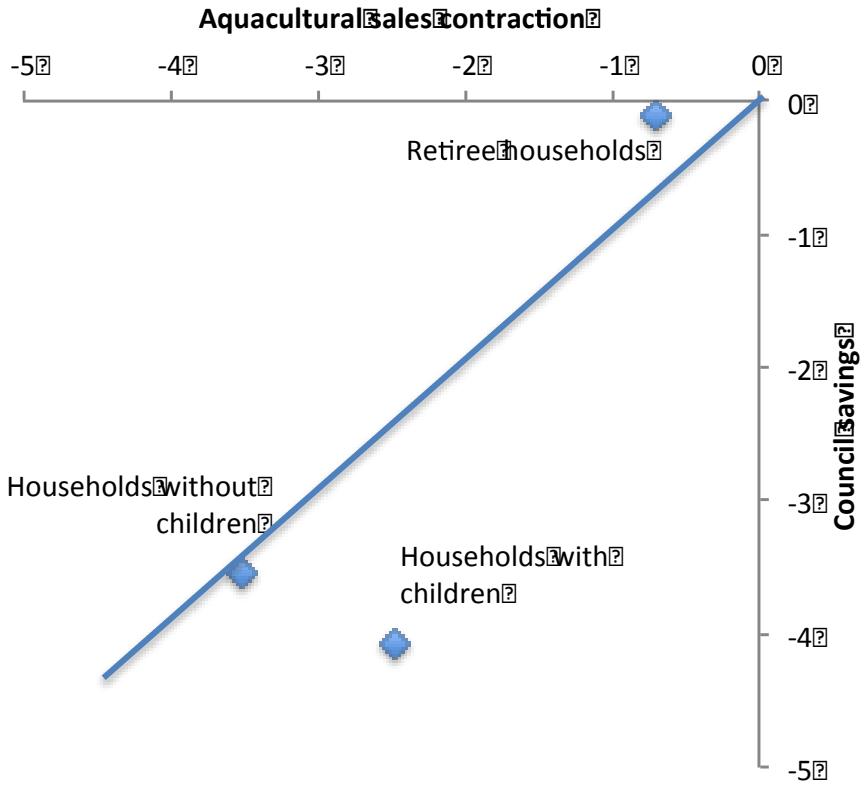

Figure 8.5 Comparison of effects of two scenarios on household income (%)

Also, as shown in Figure 7.6, the two shocks have very different effects on individual sectors. *Schools*, for instance, declines markedly with Council savings but not at all when aquaculture sales contract, while *aquaculture* is not affected by Council savings. This suggests that different households would bear the cost of these two shocks. On the other hand, while numerous other sectors, including *fish catching*, *textiles* and *health*, are not affected noticeably in either scenario, others such as *retail* and *sea transport* contract noticeably in both cases and hence presumably are most vulnerable.

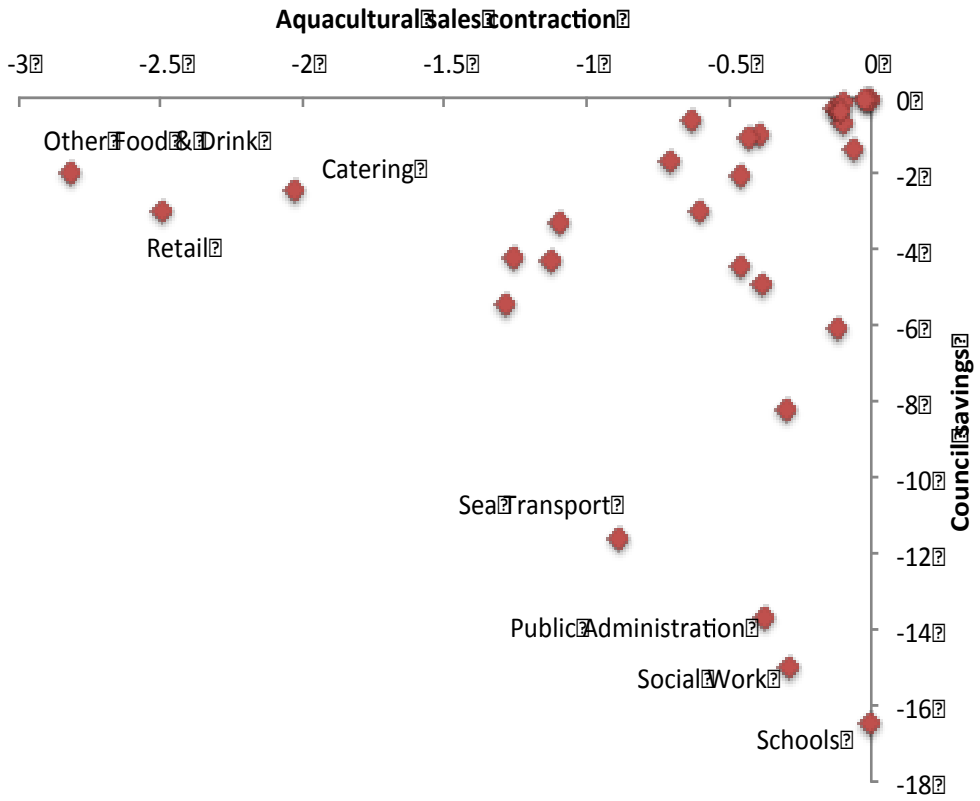

Figure 8.6 Comparison of the effects of two scenarios on sectoral output (%)

***Oil throughtput and decommissioning*.** We explore next the implications of likely changes in the activity of the Sullom Voe terminal and associated decommissioning work. This scenario assumes a 15% decrease in oil exports and a 30% increase in final demand for *marine engineering* and *construction*. Given that a significant share of terminal revenue consists of domestic sales of electricity, the fall in throughput results in only a 12% decrease in revenue of

the sector, or £5.6 million. Revenue in the *marine engineering* and *construction* sectors increases 30%, or £3.3 and £23.3 million respectively.

Although changes in these sectors have opposite effects on the local economy, it is growth in *marine engineering* and *construction* sectors that prevails, resulting in a 2.5% increase in total output, or £26.8 million. Twenty-one sectors experience increases in output, *mining* by 27% due to its association with *construction* (Fig. 7.5). Another 7 sectors grow by more than 1%. Some sectors decline, but excluding the *oil terminal*, only *ports and harbours* experiences a significant contraction (-3.5%); other sectors contract less than 0.8%. Overall, around 80% of the increase in Shetland's total output is associated *marine engineering* and *construction*, while the rest is associated with other sectors. The net results occur despite the higher level of integration of the *oil terminal* in the Shetland economy than either *marine engineering* or *construction*.[29]

[29] See Table 5.1 in the section on Multiplier Analysis.

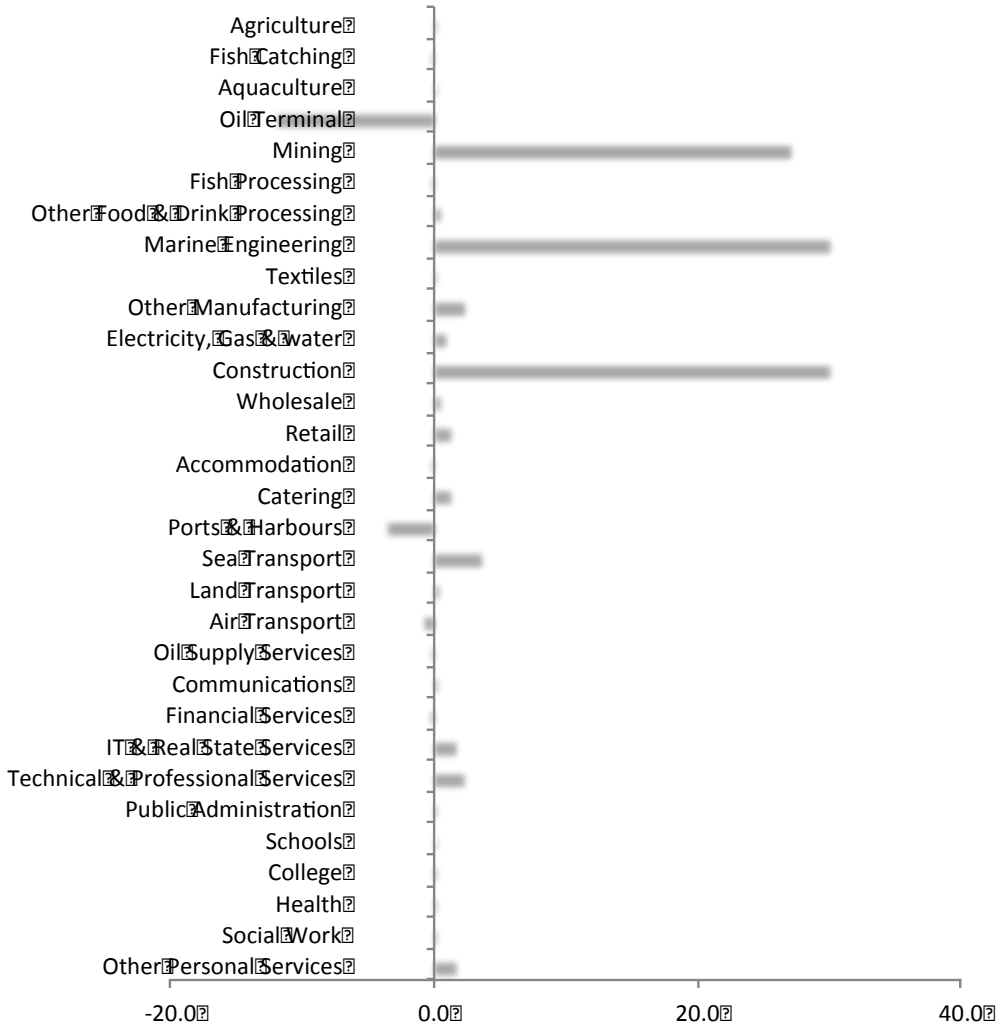

Figure 8.7 Expected changes in sectoral output in the oil throughput-decommissioning scenario

Employment in the *oil terminal* decreases by 26 FTEs, but it expands by 132 FTEs in *marine engineering* and 233 FTEs in construction, resulting in a net gain of 339 FTEs (Fig. 7.6). This reflects the large differences in the employment coefficients of the three sectors (Appendix 5). Additionally, another 47 full-time jobs are created elsewhere in the economy. Only *ports and harbour* and *air transport* reduce their labour force, by 2 and 1 FTEs respectively, which represent decreases of 3 and 1%. The net result is a 3.7% increase in local employment, entailing the creation of 386 full-time jobs.

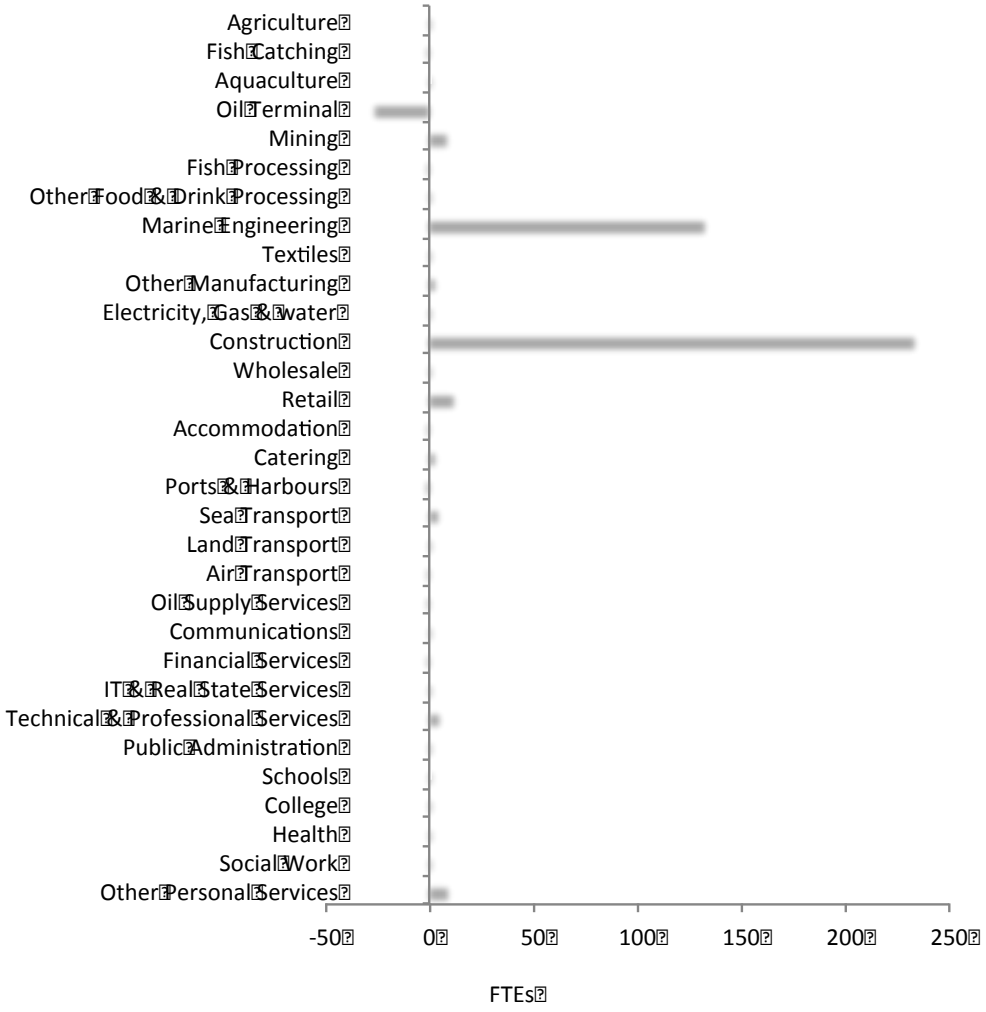

Figure 8.8 Expected changes in sectoral employment in the oil throughput-decommissioning scenario

Finally, GRDP increases by 2.3%, including a 3.2% in increase in wages and 1.4% in profits. In terms of income, households with and without children experience increases of 2.5 and 2.2%, respectively, while retiree households' income increases only 0.1%.

Glossary

Direct taxes on are corporation tax on businesses and income tax on individuals.

Employment coefficient is the ratio of employment to output, a measure of the intensity of labour or an inverse measure of the productivity of labour.

Employment effect for a particular sector is the amount of employment generated across the economy as a result of a unit increase in output from that sector.

Employment multiplier for a particular sector is the increase in total employment resulting from a unit increase in employment in that sector.

Full-time equivalent (FTE) is a measure of the workload of an employed person in comparison to full-time employment. In this study, part-time employment is considered equal to 0.5 FTE.

Gross Regional Domestic Product (GRDP) is the sum of value added, i.e., wages and gross profits, generated through the production and sale of goods and services.

Gross Value Added (GVA) is the sum of value added, i.e., wages and gross profits, generated through the production and sale of goods and services.

Indirect taxes are VAT.

Industry concentration ratio is the ratio of the output of a number of sectors to the total output in an economy, a measure of the concentration of production in those sectors.

Input-output table is a representation of the interdependencies between different economic sectors in an economy.

Input-output (type I or open) multiplier for a particular sector is the expected change in total output due to productive interdependencies after a unit increase in final demand for that sector.

Output (see **total output**).

SAM (social accounting matrix) is a representation of flows of all economic transactions that take place within an economy. It includes an **input-output table** as a sub-matrix.

SAM multiplier is the expected change in total output due to both productive interdependencies and induced consumption feedbacks after a unit increase in final demand for that sector.

Taxes (see **direct taxes**, **indirect taxes**).

Total ouput is equal to the value of all sales (at producer prices) net of changes in inventories summed across all economic sectors during a fiscal year.

Value added consists of wages and gross profits.

Appendix 1. The 2010-2011 Regional Accounts

		1	2	3	4	5	6	7	8	9	10	11
1	Agriculture	1,119,276	0	0	0	0	0	440,803	0	268,545	0	0
2	Fish catching	0	0	0	0	0	11,117,079	0	0	0	0	0
3	Aquaculture	8,296	0	189,823	0	0	1,651,184	0	0	0	0	0
4	Oil terminal	0	0	0	0	0	0	0	0	0	0	9,143,698
5	Mining	0	0	0	0	414,478	0	29	0	0	0	0
6	Fish processing	4,642	0	0	0	8	0	28,791	511	0	0	11,452
7	Other food & drink process	137,465	1,686,479	354,415	3,360	55	0	436,723	849	0	0	54,156
8	Marine Eng	0	2,724,581	0	0	0	0	0	0	0	0	0
9	Textiles	8,624	1,220,181	0	0	0	0	0	0	1,343	0	0
10	Other manuf	209,220	183,800	50,754	8,685	320,771	4,894	65,054	92,162	20,026	0	1,601,878
11	Electricity, gas & water	17,034	139,137	45,702	91,257	248,000	857,858	245,742	97,412	144,532	34,994	0
12	Construct	559,773	2,060,500	266,483	97,565	62,000	248,957	118,854	320,131	81,145	3,980	112,504
13	Wholesale	3,010	39,394	64,766	763,859	11,691	0	289,249	657	2,392	424,542	74,209
14	Retail	31,970	418,335	68,782	2,704,143	0	6,932	0	7,017	25,474	0	787,872
15	Accommodation	5,169	36,883	11,810	446,782	6,377	70,805	6,309	3,116	0	0	209,975
16	Catering	912	6,509	2,084	79,465	1,125	12,495	1,113	550	0	0	37,054
17	Ports & harbours	415,900	1,685,750	269,372	7,037,560	0	0	0	0	0	0	0
18	Sea transport	43,743	0	50,331	2,805	0	4,050	29,832	123,082	81,346	50	0
19	Land transport	202,655	109,764	315,547	72,785	76,480	288,370	94,365	77,292	21,564	1,151	545,238
20	Air transport	153,268	227,400	6,780	2,445,435	28,917	20,406	9,617	4,594	18,874	94,685	3,116
21	Oil supply	0	3,074,271	0	0	0	0	0	0	0	0	0
22	Communics	2,258	0	1,334	322,228	0	500	251	6,563	62	0	0
23	Financial services	149,056	681,165	5,554	1,292,084	0	60,851	75,493	3,445	19,806	46,275	733
24	IT & Real State services	160,164	0	3,789	1,706	0	311,982	0	38,008	3,971	75,685	23,861
25	Technical profession services	258,273	176,800	96,552	98,935	545,600	66,168	171,418	116,086	39,441	76,399	17,617
26	Public admin	0	0	479,190	0	0	26,111	20,910	0	63,267	25,669	1,396
27	Schools	0	0	0	0	0	0	0	0	0	0	0

28	**College**	0	0	0	0	0	0	0	0	0	0	0
29	**Health**	0	0	0	0	0	0	0	0	0	0	0
30	**Social work**	0	0	0	0	0	0	0	0	0	0	0
31	**Other services**	79,044	8,117	0	783,852	0	0	426	0	573	92	213,728
32	**Income**	6,849,484	17,213,756	7,676,462	14,306,459	1,846,475	6,481,778	2,485,480	5,687,892	1,406,786	4,642,508	3,473,812
33	**Profits**	6,915,758	13,337,100	41,807,068	5,604,569	2,688,959	3,604,244	1,533,245	1,058,104	1,197,867	2,638,595	7,701,624
34	**Wages & Salaries**											
35	**National Insurance**											
36	**Self-employment**											
37	**Investment Income**											
38	**Rental Income**											
39	**Hhs without Children**											
40	**Hhs with Children**											
41	**Hhs Retired**											
42	**Local Government**	19,693	0	39,997	2,244,597	1,234,104	436,556	69,739	234,810	64,622	109,728	100,477
44	**CG Direct Tax**	-12,060	7,332,300	-81,381	0	1,785,600	3,828	-199,301	829,570	123,219	871,069	0
45	**CG Indirect Tax**	0	0	10,892,067	2,858,596	0	1,078,697	169,683	56,228	48,612	99,536	0
46	**CG Transfers**											
47	**Capital Account**											
48	**Rest of Scotland**	290,637	7,462,494	89,183,605	1,150,916	961,744	25,091,886	1,370,685	1,643,504	194,739	1,093,980	10,785,081
49	**Rest of UK**	591,707	0	2,909,221	2,708,921	1,882,605	9,167,811	1,094,734	619,679	222,108	1,174,470	1,859,072
50	**Rest of World**	225,029	11,075,284	1,556,021	1,299,973	0	22,653,407	193,060	32,074	627,662	178,963	2,833,586
	Total	**18,450,000**	**70,900,000**	**156,266,126**	**46,426,538**	**12,114,989**	**83,266,848**	**8,752,302**	**11,053,333**	**4,677,978**	**11,592,373**	**39,592,141**

Appendix 1. The 2010-2011 Regional Accounts (cont.)

		12	13	14	15	16	17	18	19	20	21	22
1	Agriculture	21,150	0	0	138,594	103,025	0	0	0	0	0	0
2	Fish catching	0	0	0	13,321	9,902	0	0	0	0	0	0
3	Aquaculture	0	0	0	8,343	6,202	0	0	0	0	0	0
4	Oil terminal	0	0	0	0	0	0	0	0	0	0	0
5	Mining	10,562,737	0	0	4,283	3,183	0	0	0	0	0	0
6	Fish processing	963	0	0	76,092	56,564	0	0	0	9,683	0	0
7	Other food & drink process	5,250	0	0	1,478,123	1,098,777	0	0	0	47,502	0	0
8	Marine Eng	0	0	0	0	0	1,368,074	287,426	0	0	1,427	0
9	Textiles	20,352	0	0	10,432	7,755	0	0	0	5,245	0	0
10	Other manuf	426,765	0	0	174,642	92,730	0	32	0	358,260	6	0
11	Electricity, gas & water	289,084	185,901	489,302	559,461	116,273	0	5,232	549,600	182,000	14,695	29,821
12	Construct	433,894	119,616	617,621	371,243	81,342	0	4,252	5,725	309,600	138,175	305,635
13	Wholesale	13,087	0	0	0	0	0	7,800	0	0	744,000	1,503
14	Retail	139,038	0	0	439	326	0	82,760	0	346	14,387	15,966
15	Accommodation	28,245	0	0	52,327	38,898	0	25,462	0	102,710	7,820	14,819
16	Catering	4,984	0	0	9,234	6,864	0	4,534	0	18,125	1,398	2,638
17	Ports & harbours	0	18,183	590,284	0	0	4,613,646	4,790,565	564,035	183,378	1,513,728	0
18	Sea transport	1,825,906	21,131	2,194,898	238	357	0		0	0	4,628	8,545
19	Land transport	284,057	3,712,795	2,066,444	0	0	0	5,771	174,039	62,003	1,197	221,849
20	Air transport	52,272	14,425	78,117	0	0	0	0	0	93,600	193	83,890
21	Oil supply	0	0	0	0	0	0	0	3,942,235	3,526,600	7,845	0
22	Communics	6,007	5,134	10,125	0	74	0	6,500	0	0	54,142	799,186
23	Financial services	65,401	83,897	21,362	0	23,013	0	486,483	0	123,660	23	3,582
24	IT & Real State services	130,509	274,847	32,516	0	0	0	20	9,715	3,799	1,072	58,588
25	Technical professional services	531,591	167,922	47,660	166,587	10,279	179,972	1,560	1,130,218	52,796	0	1,019,962

26	Public admin	0	526,254	29,760	914	3,515	0	0	0	65,000	638,143	0
27	Schools	0	0	0	0	0	0	0	0	0	0	0
28	College	0	0	0	0	0	0	0	0	0	0	0
29	Health	0	0	0	0	0	0	0	0	0	49,642	0
30	Social work	0	0	0	0	0	0	0	0	0	86,362	10,747
31	Other services	1,964,640	0	0	268	18	34,286	2,251	150,704	42,770	0	36,334
32	Income	30,122,129	2,170,860	15,892,125	4,989,050	2,229,452	9,910,922	1,017,752	17,918,907	18,554,031	2,831,000	1,121,552
33	Profits	3,571,498	1,649,549	8,401,644	4,132,135	677,060	823,819	534,449	13,677,437	4,642,701	2,800,000	779,980
34	Wages & Salaries											
35	National Insurance											
36	Self-employment											
37	Investment Income											
38	Rental Income											
39	Hhs without Children											
40	Hhs with Children											
41	Hhs Retired											
42	Local Government	692,371	493,539	2,013,945	940,119	33,157	1,551,493	0	196,194	651,073	356,811	48,641
44	CG Direct Tax	4,467,839	565,231	22,349,146	2,190,799	378,671	602,581	0	1,470,180	0	465,000	776,918
45	CG Indirect Tax	984,365	540,892	148,526	898,882	62,741	417,676	126,708	0	0	520,800	0
46	CG Transfers											
47	Capital Account											
48	Rest of Scotland	18,923,733	694,309	2,159,758	522,921	194,558	3,100,765	656,294	1,338,714	4,620,350	7,776,573	142,001
49	Rest of UK	2,146,272	144,385	664,505	209,198	102,354	529,466	10,357,021	5,615,767	75,000	6,938,199	298,897
50	Rest of World	0	38,363	5,430	104,679	0	298,195	0	0	0	32,733	0
	Total	77,714,138	11,427,233	57,813,166	17,052,325	5,337,091	23,430,894	18,402,871	46,743,470	33,730,232	25,000,000	5,781,053

Appendix 1. The 2010-2011 Regional Accounts (cont.)

		23	24	25	26	27	28	29	30	31	32	33
1	**Agriculture**	0	0	0	0	99,170	0	5,262	0	6,878		
2	**Fish catching**	0	0	0	0	41,169	0	0	0	0		
3	**Aquaculture**	0	0	0	0	0	0	0	0	0		
4	**Oil terminal**	0	0	0	0	0	0	0	0	0		
5	**Mining**	0	0	0	0	0	0	134	0	0		
6	**Fish processing**	0	3,773	0	0	0	0	13,157	0	13,007		
7	**Other food & drink process**	0	14,993	0	0	3,343	0	54,227	0	67,218		
8	**Marine Eng**	0	0	0	3,259,427	0	0	0	0	0		
9	**Textiles**	0	4,285	0	0	0	0	19,104	0	3,803		
10	**Other manuf**	0	94,945	0	1,074,648	8,640	22,451	429,369	47,065	424,650		
11	**Electricity, gas & water**	11,739	28,673	93,845	1,049,698	127,709	111,958	250,000	527,085	1,163,876		
12	**Construct**	1,155	768,533	76,903	0	2,830,830	34,431	273,600	114,584	881,752		
13	**Wholesale**	0	0	0	58,780	22,270	0	0	0	0		
14	**Retail**	0	1,505	0	410,005	236,534	0	92	0	2,304		
15	**Accommodation**	0	58,374	0	0	0	0	62,404	0	24,774		
16	**Catering**	0	10,301	0	58,019	0	0	11,013	0	4,372		
17	**Ports & harbours**	0	0	0	0	0	0	0	0	0		
18	**Sea transport**	0	7,498	0	101,500	32,915	0	0	0	0		
19	**Land transport**	0	263	243,461	1,827,000	854,271	0	16,236	839,249	0		
20	**Air transport**	0	14,978	105,018	887,911	323,032	83,296	482,300	91,667	99,840		
21	**Oil supply**	0	0	0	0	0	0	0	0			
22	**Communics**	0	0	36,016	304,111	527,674	2,310	0	6,875	11,213		
23	**Financial services**	0	28,585	15,488	74,429	0	72,630	0	0	17,703		
24	**IT & Real State services**	0	99,299	135,622	157,351	0	7,223	0	1,784,838	116,902		
25	**Technical professional services**	2,660	103,307	102,220	3,670,383	0	144,987	1,355,900	126,042	243,722		
26	**Public admin**	0	137,500	181,972	0	0	455,771	1,716,000	82,500	380,201		

27	**Schools**	0	0	0	0	0	0	0	0	0		
28	**College**	0	0	0	0	0	0	0	0	0		
29	**Health**	0	0	0	52,080	0	0	0	0	0		
30	**Social work**	0	0	0	0	224,723	0	0	3,045,597	0		
31	**Other services**	150	4,847	5,141	73,431	382,154	132,335	102,445	0	305,357		
32	**Income**	3,715,635	2,271,665	8,420,309	27,378,148	28,428,422	4,684,851	27,745,465	22,733,233	13,127,068		
33	**Profits**	**2,356,189**	799,356	**5,098,009**			771,775		4,064,055	15,722,378		
34	**Wages & Salaries**										260,343,760	
35	**National Insurance**										37,920,981	
36	**Self-employment**											37,338,029
37	**Investment Income**											123,195,452
38	**Rental Income**											7,070,909
39	**Hhs without Children**											
40	**Hhs with Children**											
41	**Hhs Retired**											
42	**Local Government**	24,171	310,734	336,559	0	0	104,135	726,644	983,153	134,515		
44	**CG Direct Tax**	0	833,512	1,398,105	0	0	43,500	117,000	0	220,319		
45	**CG Indirect Tax**	122,087	96,813	68,759	0	110,622	0	0	0	11,751		
46	**CG Transfers**											
47	**Capital Account**										19,068,724	
48	**Rest of Scotland**	30,167,420	1,598,951	528,182	20,003,607	2,882,570	481,761	21,818,930	210,547	3,188,141		
49	**Rest of UK**	146,970	519,602	1,726,493	6,634,348	1,164,123	25,867	1,582,440	1,200,260	777,930		
50	**Rest of World**	0	68,269	176,248	540,855	0	0	0	0	35,751		
	Total	**36,548,175**	**7,880,562**	**18,748,350**	**67,615,731**	**38,300,172**	**7,179,280**	**56,781,722**	**35,856,749**	**36,985,425**	**317,333,466**	**167,604,391**

Appendix 1. The 2010-2011 Regional Accounts (cont.)

		34	35	36	37	38	39	40	41	42
1	**Agriculture**						148,730	97,130	40,778	0
2	**Fish catching**						0	0	0	0
3	**Aquaculture**						1,430	934	392	0
4	**Oil terminal**						0	0	0	0
5	**Mining**						4,047	5,156	1,837	0
6	**Fish processing**						129,667	84,681	35,551	0
7	**Other food & drink process**						629,151	410,876	172,496	0
8	**Marine Eng**						252,423	148,552	36,211	0
9	**Textiles**						88,613	44,649	13,552	0
10	**Other manuf**						33,201	16,729	5,077	0
11	**Electricity, gas & water**						3,992,244	2,702,915	1,399,183	0
12	**Construct**						3,160,089	1,383,043	1,717,889	0
13	**Wholesale**						690,131	101,923	60,389	0
14	**Retail**						28,543,190	14,381,984	4,365,133	0
15	**Accommodation**						133,874	170,231	41,971	5,973,739
16	**Catering**						2,279,077	971,937	269,101	0
17	**Ports & harbours**						0	0	0	-900,877
18	**Sea transport**						1,637,684	628,469	152,954	11,450,909
19	**Land transport**						560,312	229,682	107,351	4,192,032
20	**Air transport**						29,721	13,384	56,352	1,407,145
21	**Oil supply**						0	0	0	0
22	**Communics**						851,320	1,084,625	386,548	0
23	**Financial services**						514,731	256,711	86,912	0
24	**IT & Real State services**						1,117,528	1,799,996	241,995	0
25	**Technical profess. services**						2,155,203	1,268,342	309,176	0
26	**Public admin**						0	0	0	54,378,091
27	**Schools**						0	0	0	37,303,065

28	**College**						418,871	246,507	60,089	3,362,361
29	**Health**						207,857	122,325	29,818	0
30	**Social work**						1,353,509	1,494,229	1,290,255	28,343,535
31	**Other services**						2,480,517	2,496,243	538,077	7,739,328
32	**Income**									
33	**Profits**						3,188,705	5,136,024	690,496	
34	**Wages & Salaries**									
35	**National Insurance**									
36	**Self-employment**									
37	**Investment Income**									
38	**Rental Income**									
39	**Hhs without Child.**	109,629,635		28,523,606	2,663,816	1,676,478	211,321			35,220
40	**Hhs with Children**	81,695,879		8,814,423	696,184	342,809		45,786		41,090
41	**Hhs Retired**	0		0	927,229	704,403				0
42	**Local Government**						2,872,158	2,638,833	1,205,813	
44	**CG Direct Tax**						30,874,131	17,566,305	164,903	
45	**CG Indirect Tax**						9,024,636	11,408,588	3,294,183	
46	**CG Transfers**		37,920,981							5,431,274
47	**Capital Account**				18,263,768	4,838,289	23,701,342	5,097,806	4,441,551	-37,026,854
48	**Rest of Scotland**						31,132,053	21,283,666	5,586,460	
49	**Rest of UK**					506,459	6,441,809	3,005,722	471,543	
50	**Rest of World**	89,509,257			104,305,977		7,728,348	4,464,594	251,431	
	Total	**280,834,771**	**37,920,981**	**37,338,029**	**126,856,974**	**8,068,437**	**166,587,623**	**100,808,575**	**27,525,469**	**121,730,059**

Appendix 1. The 2010-2011 Regional Accounts

		43	44b	44c	45	46	47	48	49	50	TOTAL
1	**Agriculture**	9,130,000	0	518,173		180,674	0	6,131,812	0	0	**18,450,000**
2	**Fish catching**	0	0	0		0	0	23,887,411	0	35,831,117	**70,900,000**
3	**Aquaculture**	0	32,845	41,362		10,251,584	0	5,632,526	46,561,833	91,879,372	**156,266,126**
4	**Oil terminal**	0	0	0		0	0	0	37,282,839	0	**46,426,538**
5	**Mining**	0	0	0		62,000	0	0	0	1,057,105	**12,114,989**
6	**Fish processing**	0	0	0		703,956	0	2,130,000	9,404,739	70,559,612	**83,266,848**
7	**Other food & drink process**	1,171,187	0	0		-67	130,407	509,751	279,495	6,071	**8,752,302**
8	**Marine Eng**	0	0	18,375		-58,380	0	529,224	2,485,995	0	**11,053,334**
9	**Textiles**	0	0	0		29,072	28,422	1,381,942	48,782	1,741,820	**4,677,978**
10	**Other manuf**	0	0	1,497		-230,773	4,783	3,626,470	1,911,940	512,000	**11,592,373**
11	**Electricity, gas & water**	0	0	0		14,921	0	23,775,257	0	0	**39,592,140**
12	**Construct**	0	0	0	57,653,746	-505,454	0	106,560	2,897,482	0	**77,714,138**
13	**Wholesale**	13,793	0	9,195		106,953	12,739	123,593	2,581,910	5,205,396	**11,427,232**
14	**Retail**	0	0	0		1,980,881	1,884,766	35,593	1,387,102	280,292	**57,813,166**
15	**Accommodation**	0	0	0		-1,508	3,335,428	3,711,318	1,855,659	618,553	**17,052,325**
16	**Catering**	0	75,677	0		11,139	1,457,368	0	0	0	**5,337,091**
17	**Ports & harbours**	0	0	0		0	0	2,429,868	199,548	19,955	**23,430,894**
18	**Sea transport**	0	0	0		0	0	0	0	0	**18,402,872**
19	**Land transport**	235,000	0	0		0	5,838,060	23,242,188	225,000	0	**46,743,470**
20	**Air transport**	2,240,000	0	0		0	0	24,559,999	0	0	**33,730,231**
21	**Oil supply**	0	0	0		0	0	8,835,264	3,254,400	2,359,385	**25,000,000**
22	**Communics**	0	0	0		695,400	0	660,596	0	0	**5,781,053**
23	**Financial services**	0	0	0		0	0	32,339,102	0	0	**36,548,175**
24	**IT & Real State services**	32,504	197	0		0	0	1,256,875	0	0	**7,880,563**
25	**Technical profess.l services**	0	0	0		0	0	812,699	1,727,660	1,754,215	**18,748,350**
26	**Public admin**	8,403,567	0	0		0	0	0	0	0	**67,615,732**
27	**Schools**	997,107	0	0		0	0	0	0	0	**38,300,172**

28	**College**	2,440,335	206,296	0		0	0	383,425	30,698	30,698	**7,179,280**
29	**Health**	56,300,000	0	0		20,000	0	0	0	0	**56,781,722**
30	**Social work**	0	0	0		0	0	7,792	0	0	**35,856,749**
31	**Other services**	12,243,311	0	304,993		71,988	519,400	404,546	5,864,058	0	**36,985,425**
32	**Income**	0									**317,333,466**
33	**Profits**	0									**167,604,391**
34	**Wages & Salaries**	0						14,398,551	6,092,460	0	**280,834,771**
35	**National Insurance**	0									**37,920,981**
36	**Self-employment**	0									**37,338,029**
37	**Investment Income**	0						642,415	2,862,861	156,246	**126,856,974**
38	**Rental Income**	0						701,867	295,661	0	**8,068,437**
39	**Hhs without Children**	9,827,589						8,587,817	5,430,859	1,282	**166,587,623**
40	**Hhs with Children**	7,368,050						307,350	777,687	719,316	**100,808,575**
41	**Hhs Retired**	12,505,493						6,761,983	6,468,618	157,744	**27,525,469**
42	**Local Government**	98,980,592								1,881,087	**121,730,058**
44	**CG Direct Tax**	0									**95,136,984**
45	**CG Indirect Tax**	0					715,700				**43,757,147**
46	**CG Transfers**	0									**43,352,255**
47	**Capital Account**	0									**38,384,627**
48	**Rest of Scotland**	0									**318,241,535**
49	**Rest of UK**	0									**73,514,955**
50	**Rest of World**	0									**248,235,189**
	Total	**221,888,528**	**315,015**	**893,595**	**57,653,746**	**13,332,386**	**13,927,074**	**197,913,792**	**139,927,287**	**214,771,265**	

Appendix 2. Methods

The approach taken to construct the 2010-2011 was very close to that followed in the 2003 Shetland Regional Accounts study (Newlands and Roberts, 2006). In particular the valuation of transactions, measurement of output and treatment of impacts, exports and capital mirrored those used in the 2003 study (and standard input-output practices).

Primary data was collected through two surveys: a face-to-face survey of 105 Shetland businesses and a survey of Shetland households with data collected through 70 face to face structured surveys and 120 postal questionnaires. Both surveys were conducted by AB Associates and took place during Autumn 2011. The business survey sample and employment coverage is shown in Table A2.1 below.

The aim of the business survey was to ensure a high coverage of economic activity while paying particular attention to key local sectors, and sectors which were thought to have changed since the 2003 study. The aim of the household survey was to get detailed information the level and on source of income for each of the three types of Shetland households distinguished in the SAM as well as information on their particular expenditure patterns (including where they purchase goods).

While both surveys generated a large amount of primary data, the information needed to be supplemented by a range of other secondary data, much of this provided direct from Shetland Islands Council. In particular, sectoral turnover, imports and exports were estimated using data from the responses of each sector to the business survey, extrapolated based on employment figures from the Shetland Islands Council's *Shetland Employers Survey 2011*. In contrast, the *oil terminal* and *sea transportation* sectors were not represented in the survey. In the case of Sea transportation, turnover was based on expenditure on this sector by other local sectors and households. In the case of the Oil Terminal, turnover was extrapolated from the 2003 SAM based on estimated changes in employment. Imports and exports for both sectors were estimated

based on the shares observed in the 2003 SAM as well. Turnover, imports and exports of the Fish Catching sector and Aquaculture are direct estimates by AB Associates. Turnover of the Aquaculture sector is based on estimates from Shetland Aquaculture; imports and exports were estimated using business-survey data.

Table A2.1 Business survey sample and employment coverage

Sector name	Sample size (number of firms)	Sample employment			Total Shetland employment (FTEs)
		Full time	Part time	Total	
Agriculture	2	3	7	10	**185**
Fish catching		256	121	377	**269**
Aquaculture	7	87	22	109	**350**
Oil terminal				0	**219**
Mining and quarrying	1	1	3	4	**31**
Fish processing	2	239	23	262	**260**
Other food and drink process.	3	4	5	9	**234**
Marine engineering	5	210	3	213	**441**
Textiles and crafts	5	29	51	80	**98**
Other manufacturing	2	15	0	15	**128**
Electricity, gas and water	4	76	24	100	**65**
Construction	3	173	4	177	**777**
Wholesale	6	58	14	72	**119**
Retail	15	167	80	247	**930**
Accommodation	1	16	2	18	**259**
Catering	3	17	47	64	**231**
Ports and harbours	1	44	3	47	**46**
Sea transport				0	**118**
Land transport	3	33	19	52	**231**
Air transport	3	254	16	270	**100**
Oil supply services	1	70	8	78	**49**
Communications	1	2	0	2	**183**
Financial	3	21	4	25	**108**
IT/computer, real estate	3	19	9	28	**44**
Technical, professional, other	10	16	13	29	**211**
Public administration	6	1742	2302	4044	**3,021**
School education	0			0	**459**
College education	2	92	93	185	**145**
Health	1	266	534	800	**548**
Social work	2	3	18	21	**101**
Other personal services	10	255	225	480	**531**
Total	105	4168	3650	7818	**10,490**

Sources: Shetland Islands Council, *Employment in Shetland by Sector 2003*; business survey returns

Table A2.2 indicates the mapping of the 31 production sectors in the 2010-2011 SAM into 2003 Standard Industrial Classification codes.

Table A2.2 Classification of economic activities in the Shetland 2010-2011 SAM

Sector title	SIC 2003 Code
Agriculture	01,02
Fish catching	05.01
Aquaculture	05.02
Oil Terminal	11
Mining and quarrying	10,12,14
Manufacturing: Fish processing	15.20
Manufacturing: Other food and drink processing	15 (excluding 15.20)
Manufacturing: Marine Engineering	35.11, 35.12
Manufacturing: Textiles and crafts	17,18
Other manufacturing	19 -34, 35 (excluding 35.11 and 35.12), 36, 37
Electricity, gas and water supply	40,41
Construction	45
Wholesale	51
Retail	50, 52
Accommodation	55.1, 55.2
Catering (including pubs and social clubs)	55.3, 55.4, 55.5
Ports and harbours	63.1, 63.22 (part)
Transportation, Sea	61
Transportation, Land	60, 63.21
Transportation, Air	62, 63.23
Oil supply services	63.22 (part)
Communications and Supplier Services	64
Financial services	65, 66, 67
IT/computer related and real estate services	70, 71, 72
Technical, Professional, other business services	73, 74
Public administration - Local/Central	75 (part - local government)
School Education	80.1, 80.21
College Education	80.22, 80.3
Health	85.11, 85.12, 85.14 (part)
Social work and other services	85.13, 85,14 (part), 85.20, 85.3
Other community, social and personal services	75 (part - central government), 80.4, 90 - 93,95 - 97,99

Appendix 3. Comparison of economic growth rates in Shetland and neighbouring localities.

The Office of National Statistics (ONS) publishes an alternative estimate of GRDP for Shetland by the name of **Gross Value Added** (**GVA**), which is based on a different database and methodology than the one used here; however, GVA and GRDP at factor costs are equivalent.[30] According to the ONS, GVA in Shetland was £528.5 million in 2010-2011 and £435.3 million in 2003 at 2010-11 prices (or £357 million at 2003 prices) (Table A3.1).

Table A3.1 Gross Value Added in Shetland, Orkney and Western Isles, 2003 to 2010/11

	Gross Value Added (£ million)		Cumulative change (%)	Annual growth rate (%)
	2010-11	2003[1]		
Shetland	528.5	435.3	21.4	2.8
Orkney	341.0	282.9	20.5	2.7
Western Isles	396.0	395.1	0.2	0.0

[1.] At 2010-2011 prices.

Source: Office of National Statistics, 2012

While both estimates of GVA for Shetland are higher than both regional-account estimates of GRDP, the implicit growth rates are similar: 2.8% annual growth or a 21% increase between 2003 and 2010-11. By the same criteria, Orkney has grown at the rate of 2.7% per year, while the Western Isles did not grow significantly in real terms during the same period (Table A3.1).

Since our own estimates for Shetland are based on other detailed information reported here, including data on Council income and expenditure, we refer to them throughout this report for consistency.

[30] See Regional Trends Online Tables <http://www.ons.gov.uk/ons/rel/regional-trends/regional-trends-online-tables/index.html>

Appendix 4. Sectoral contributions to total output, valued added and employment, 2003 (at 2011 prices) and implied annual rate of growth between 2003 and 2010-11

Sector	Total Output (£ million)	Annual growth rate %	Value Added (£ million)	Annual growth rate %	Employment (FTEs)	Annual growth rate %
Agriculture	16.006	2.1	3.907	19.7	212	-1.9
Fish catching	43.776	7.1	29.378	0.6	306	-1.8
Aquaculture	106.823	5.6	26.327	9.4	358	-0.3
Oil Terminal	69.502	-5.6	30.331	-5.8	337	-6.0
Mining	11.737	0.5	8.616	-8.8	72	-11.3
Fish processing	79.261	0.7	27.410	-13.3	444	-7.4
Other Food & Drink Processing	1.769	25.7	0.695	28.5	48	25.4
Marine Engineering	12.077	-1.3	9.563	-4.9	180	13.7
Textiles	3.878	2.7	2.238	2.2	129	-3.9
Other manufacturing	3.162	20.4	2.108	19.4	144	-1.7
Electricity, Gas & water	7.899	25.9	3.487	18.1	88	-4.2
Construction	72.887	0.9	31.800	0.8	885	-1.8
Wholesale	5.903	9.9	5.690	-5.5	116	0.3
Retail	46.248	3.2	37.827	-6.1	907	0.4
Accommodation	9.138	9.3	4.909	9.3	289	-1.6
Catering	3.278	7.2	2.522	2.0	156	5.8
Ports & Harbours	27.532	-2.3	18.656	-7.6	326	-24.4
Sea Transport	7.133	14.5	0.598	14.6	15	34.3
Land Transport	30.131	6.5	4.486	32.2	222	0.6
Air Transport	14.161	13.2	6.686	19.4	101	-0.1
Oil Supply Services	5.630	23.7	3.323	7.8	67	-4.4
Communications	9.320	-6.6	3.711	-9.1	126	5.5
Financial services	45.679	-3.1	14.701	-11.9	102	0.8
IT & Real State Services	3.413	12.7	1.382	12.1	37	2.5
Tech. & Professional Services	38.005	-9.6	23.036	-7.3	523	-12.2
Public administration	57.084	2.4	23.734	2.1	978	17.5
Schools	41.261	-1.1	24.132	2.4	690	-5.7
College	6.666	1.1	3.639	6.0	153	-0.8
Health	41.895	4.4	20.180	4.7	434	3.4
Social work	18.510	9.9	18.195	5.7	343	-16.0
Other services	20.771	8.6	13.287	11.7	321	7.5
Shetland Totals	**860.537**	**3.5**	**406.550**	**2.3**	**9,109**	**2.0**

Appendix 5. Employment coefficients, effects and multipliers for Shetland by sector 2010-11

			IO model		SAM model			
	Employment Coefficients	Rank	Employment effects	Rank	Employment effects	Rank	Employment multipliers	Rank
Agriculture	10.0	15	12.1	13	14.1	13	1.406	14
Fish catching	3.8	22	7.4	21	8.7	21	2.281	5
Aquaculture	2.2	28	2.5	31	3.1	31	1.379	16
Oil terminal	4.7	21	8.0	20	9.6	18	2.042	6
Mining	2.6	27	3.8	29	4.8	29	1.863	8
Fish processing	3.1	23	4.3	25	4.9	28	1.555	11
Other food & drink processing	26.7	5	30.2	5	31.7	5	1.186	26
Marine Eng	39.9	3	40.7	3	42.5	3	1.066	31
Textiles	20.9	6	23.1	7	24.7	7	1.177	27
Other manufacturing	11.0	13	11.9	15	13.5	15	1.226	23
Electricity, gas & water	1.6	31	4.7	24	5.8	26	3.534	2
Construct	10.0	16	11.4	17	12.9	17	1.293	21
Wholesale	10.4	14	15.1	11	16.7	11	1.603	10
Retail	16.1	8	16.9	9	18.1	9	1.124	29

Accommodation	15.2	9	18.7	8	20.2	8	1.328	19
Catering	43.3	2	50.6	1	52.5	1	1.213	25
Ports & harbours	2.0	29	5.5	23	7.4	23	3.748	1
Sea transport	6.4	18	8.7	18	9.4	20	1.473	13
Land transport	4.9	20	5.8	22	7.5	22	1.522	12
Air transport	3.0	24	4.0	28	6.0	25	2.023	7
Oil supply	2.0	30	4.2	26	4.9	27	2.508	3
Communications	31.7	4	40.6	4	42.2	4	1.332	18
Financial services	3.0	25	3.0	30	3.4	30	1.137	28
IT & Real Estate services	5.6	19	8.3	19	9.6	19	1.712	9
Technical professional services	11.3	12	12.1	14	13.9	14	1.238	22
Public admin	44.7	1	48.2	2	49.7	2	1.113	30
Schools	12.0	11	13.9	12	16.4	12	1.369	17
College	20.2	7	24.1	6	26.4	6	1.308	20
Health	9.7	17	11.7	16	13.3	16	1.379	15
Social work	2.8	26	4.0	27	6.4	24	2.282	4
Other Personal services	14.4	10	15.8	10	17.6	10	1.225	24

Appendix 6. Imports, exports and trade balance by sector, 2010-11

Sector	Imports (£m)	Rank	Exports (£m)	Rank	Trade Bal. (£m)	Rank
Agriculture	1.107	25	6.132	13	5.024	10
Fish catching	18.538	7	59.719	3	41.181	3
Aquaculture	93.649	1	144.074	1	50.425	2
Oil Terminal	5.160	12	37.283	4	32.123	4
Mining	2.844	17	1.057	22	-1.787	19
Fish processing	56.913	2	82.094	2	25.181	1
Other Food & Drink Process.	2.658	19	0.795	23	-1.863	26
Marine Engineering	2.295	22	3.015	17	0.720	17
Textiles	1.045	26	3.173	16	2.128	15
Other manufacturing	2.447	20	6.050	14	3.603	12
Electricity, Gas & water	15.478	8	23.775	7	8.298	7
Construction	21.070	6	3.004	18	-18.066	29
Wholesale	0.877	27	7.911	10	7.034	8
Retail	2.830	18	1.703	20	-1.127	25
Accommodation	0.837	28	6.186	12	5.349	11
Catering	0.297	31	0.000	31	-0.297	21
Ports & Harbours	3.928	16	2.649	19	-1.279	24
Sea Transport	11.013	10	0.000	30	-11.013	27
Land Transport	6.954	11	23.467	8	16.513	5
Air Transport	4.695	13	24.560	6	19.865	6
Oil Supply Services	14.748	9	14.449	9	-0.298	9
Communications	0.441	30	0.661	24	0.220	18
Financial services	30.314	3	32.339	5	2.025	16
IT & Real State Services	2.187	23	1.257	21	-0.930	23
Technical & Professional Services	2.431	21	4.295	15	1.864	13
Public administration	27.179	4	0.000	28	-27.179	30
Schools	4.047	14	0.000	29	-4.047	28
College	0.508	29	0.445	25	-0.063	20
Health	23.401	5	0.000	27	-23.401	31
Social work	1.411	24	0.008	26	-1.403	22
Other services	4.002	15	6.269	11	2.267	14
Shetland Totals	**365.304**		**496.369**		**131.064**	
Rest of Scotland	**260.239**		**166.514**		**-93.726**	
Rest of United Kingdom	**63.089**		**117.999**		**54.910**	
Rest of World	**41.976**		**211.856**		**169.880**	

Appendix 7. Shetland Household Imports, 2010-11

Sector	Imports (£m)	Exports (£m)	Trade Balance (£m)
Households without Children	45.302	-	-45.302
Households with Children	28.754	-	-28.754
Retired Households	6.309	-	-6.309
Shetland Household Totals	80.366	**-**	-80.366

Appendix 8. Expected changes in output and employment in Shetland after Council savings by 2013-14

	Output	Employment	
	(%)	(%)	(FTEs)
Agriculture	-0.3	-0.2	0
Fish Catching	0.0	0.0	0
Aquaculture	0.0	0.0	0
Oil Terminal	-0.3	-0.2	-1
Mining	-1.0	-0.4	0
Fish Processing	0.0	0.0	0
Other Food & Drink Processing	-2.0	-9.6	-5
Marine Engineering	-4.9	-4.9	-22
Textiles	-0.1	-0.1	0
Other Manufacturing	-2.1	-2.1	-3
Electricity, Gas & water	-1.7	-1.7	-1
Construction	-1.1	-1.1	-8
Wholesale	-0.6	-0.6	-1
Retail	-3.0	-3.0	-28
Accommodation	-6.1	-6.1	-16
Catering	-2.5	-2.5	-6
Ports & Harbours	-3.3	-3.3	-2
Sea Transport	-11.6	-11.6	-14
Land Transport	-3.0	-3.0	-7
Air Transport	-1.4	-1.4	-1
Oil Supply Services	-0.7	-0.7	0
Communications	-4.2	-4.2	-8
Financial Services	-0.3	-0.3	0
IT & Real State Services	-5.5	-5.5	-2
Technical & Professional Services	-4.3	-4.3	-9
Public Administration	-13.7	-13.7	-414
Schools	-16.4	-16.4	-75
College	-8.2	-8.2	-12
Health	0.0	0.0	0
Social Work	-15.0	-15.0	-15
Other Personal Services	-4.4	-4.4	-23
Shetland	-3.3	-6.4	-673