SHETLAND REGIONAL ACCOUNTS 2003

Final Report

University of Aberdeen Business School
and
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A B Associates Ltd contributed to the entire study but played a particularly key role in the design, conduct and analysis of the survey work:

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Survey respondents in Shetland – officials, business people and householders – were unfailingly helpful during the study

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EXECUTIVE SUMMARY

- Gross Regional Domestic Product (GRDP) in Shetland in 2003 was £333 million. GRDP per capita was £15245.

- GRDP per capita in Shetland was 93% of the UK average and 99% of the Scottish average but significantly higher than the comparable figures for the Western Isles and the Highlands and Islands as a whole.

- Shetland GRDP declined by just under 3% in real terms between 1996/97 and 2003. GRDP per capita in real terms increased by just over 2% between 1996/97 and 2003. However, this has been at a time of steady economic growth throughout most of the UK. While Shetland GRDP per capita was 98% of the UK average in 1996/97, it had fallen to 93% by 2003.

- The five sectors which account for most employment in Shetland (in descending order of importance) are: Public administration, Retailing, Construction, School education, and Technical, professional, other services.

- The five sectors which account for most value added (in descending order of importance) are: Retailing, Construction, Oil terminal, Fish catching, and Fish processing.

- The five sectors which account for most output (in descending order of importance) are: Aquaculture, Fish processing, Construction, Oil terminal, and Public administration.

- There were various changes in the sectoral contributions to value added and output between 1996/97 and 2003. The most significant increases in relative importance, among sectors of any size, were Other services, Fish farming, and Health. The most significant declines in relative importance were the Oil terminal (and Oil supply services), Marine engineering, and Construction.

- Compared to the Scottish economy, Shetland is "over represented" in agriculture, forestry and fishing (including fish catching and aquaculture) and in mining (including oil) and "under represented" in manufacturing and in business and finance services. However, Shetland actually has a more diversified economy than Scotland as a whole, in terms of value added and output.

- Wages and salaries are the largest source of income of Shetland households, accounting for 68% of average income. Self employment income and pensions are the two next most important sources of income, both contributing between 10% and 15% of average household income. Investment income accounts for 5% of household income and social security benefits (and other sources) only 2% of the total.

- Compared to the Scottish average, households in Shetland have a slightly higher reliance on wages and salaries; self employment income and income from investments are both more important; pensions make a slightly smaller contribution and social security benefits a much smaller contribution.

- Internet shopping is most important in the purchase of electrical and electronic equipment although the combination of mail order and Internet expenditure is higher still for clothing and footwear. The only category of large expenditure items in which more than half of spending is in Shetland is on cars (and other vehicles).

- Not surprisingly, retiree households are more likely to purchase larger expenditure items in Shetland and less likely to use the Internet. Similarly, low income households are more likely to spend in Shetland and less likely to use the Internet. As elsewhere in the UK and globally, there is evidence of a "digital divide" in Shetland.

- Lerwick is the dominant shopping centre for the whole of Shetland. More than half of expenditure by households on the Non Mainland islands is made locally but this is presumably because of the greater difficulty and cost of travel to Lerwick. Only in the North, of any of the areas of the Mainland, is there anything approaching a rival concentration of shopping to Lerwick.

- The value of exports from Shetland in 2003 was £226 million and the value of imports £313 million, a trade deficit of £87 million. The trade deficit increased by 34% in real terms between 1996/97 and 2003.

- The trade deficit increased because, while a few sectors improved their relative contribution to Shetland's trade balance, four sectors showed a marked deterioration in their relative contribution, either in the form of a reduced trade surplus (the oil terminal) or an increased deficit (transport, public administration, and health).

- The fisheries and oil sectors between them account for 92% of total Shetland exports. Judged by this criterion, the Shetland economy appears much less diversified.

- The total value of tourism in 2003 was £13 million (or £9 million net of imports). The value of tourism has increased by 19% in real terms since 1996/97.

- Government revenue raised in Shetland in 2003 exceeded government expenditure in Shetland by £64 million, a measure of the net contribution of Shetland businesses and households to the central government Exchequer.

- Various "multipliers" were calculated. The largest output multiplier was for agriculture. The largest household multiplier was for retiree households. The highest employment multipliers belong to sea transport, aquaculture, and fish processing. By far the most important final demand category in terms of stimulating income and employment in Shetland was the export sector.

- Five possible future "scenarios" were explored. Growth of the fisheries sector has a large positive effect on income and employment while Council spending cuts have a large negative effect. Decommissioning provides some opportunities for job creation. An increase in the number of households has a very small impact while even a doubling of tourism expenditure does not have a great effect on the Shetland economy.

1. INTRODUCTION

In October 2004, Shetland Islands Council, Shetland Enterprise, Shetland Development Trust, and Highlands and Islands Enterprise commissioned Aberdeen University Business School and A B Associates Ltd to conduct a study of the Shetland economy. This Report contains the findings from the study.

The five principal objectives of the study, as laid down in the study brief, were:

a) To construct an Input-Output (I-O) table for Shetland that is consistent with recognised Input-Output accounting conventions and formats.

b) To compile a Shetland occupational employment by industry matrix compatible with the core Input-Output table.

c) Analyse the I-O table and related data and provide comment on the current structure and recent performance of the Shetland economy.

d) Compare and analyse the results of (c) above with the previous results of the 1996/1997 I-O table and provide comment on any changes to the Shetland economy during that time. It is particularly important that the study identifies trends rather than minor fluctuations in the economy with comparisons to wider regional/national economic performance during this period.

e) Provide a computer package that will enable the project sponsors to complete impact analysis and simulations on the data on an in-house basis.

This Report discusses findings relevant to objectives a)-d). The computer package, e), has been prepared separately.

The study brief refers to an Input-Output table which has been the traditional core of the regional economic accounts for a particular area. The abiding virtue of an Input-Output table is the detail it provides about the interrelationships between industrial sectors. However, as outlined in the tender document, our preferred approach is to construct a Social Accounting

Matrix (SAM) rather than an Income-Output table. As well as providing detailed information on the industrial sectors of the economy, a SAM includes data on households. Despite being termed an Input-Output study, the last study of the Shetland economy (Gillespie et al, 1999) incorporated quite a lot of information on the household accounts. In this study, the move towards a comprehensive SAM approach is made complete. One of the benefits is a much more accurate estimate of Shetland's Exchequer balance, the difference between government revenue and expenditure, as explained in chapter 4.

The structure of the Report is as follows. Chapter 2 explains the methodology adopted in this study, with particular reference to the structure of the regional accounts and the methods of data collection. Chapter 3 presents the Shetland SAM and the occupation-employment matrix. Points a) and b) of the study brief are dealt with in this chapter. Chapter 4 details the key performance indicators of the Shetland economy, notably Gross Regional Domestic Product (GRDP) and Gross Regional Domestic Expenditure (GRDE). In addition, this chapter identifies and analyses some of the key changes in the size, composition and performance of the Shetland economy since the last regional accounts study. Points c) and d) of the study brief are dealt with in this chapter. Chapter 5 contains the principal multiplier analysis. It discusses the results from using the SAM to produce output and employment multipliers which measure the effect on the Shetland economy of external shocks. Chapter 6 sets out and analyses a number of "scenarios", consisting of economic developments where the effects on the Shetland economy are likely to be of significance. Finally, chapter 7 considers a number of policy issues. It reports on qualitative evidence, not picked up elsewhere in the Report, particularly the responses to a number of open ended questions at the end of the questionnaire put to business respondents. In addition, it analyses recent trends and possible future developments of the Shetland economy.

2. METHODOLOGY

2.1 Introduction

Traditionally, regional accounts have adopted an Input-Output structure. However, a Social Accounting Matrix (SAM) structure is now generally recognised as best practice for the type of study of the Shetland economy which has been conducted. The principal reason is that a SAM provides detailed information not only on the production sphere of the economy but also flows of income to and from household accounts and capital accounts. Essentially, a SAM includes all that an Input-Output table would, and more. The inclusion of detailed information on household income and capital flows is potentially very important for the analysis of the Shetland economy since there tend to be substantial levels of transfer income into and out of rural areas.

The approach to the construction of the various tables upon which the study is based broadly followed that used in the previous study (Gillespie et al, 1999). The Input-Output table for 1996/97 provided the starting point in terms of the sectors employed and the decisions as to where to concentrate data collection efforts. A large amount of new primary data was collected. Specifically, a number of Shetland businesses were surveyed and two surveys of households were conducted, one face-to-face and the other a postal questionnaire. Each of these surveys collected the type of detailed income and expenditure information necessary to ensure that the accounts accurately reflect the structure of the Shetland economy. The base year of the study is 2003. Most data relate to this year although some relate to 2003/04 or even, particularly the data derived from the household surveys, to 2004.

This chapter describes the methods used to construct the Shetland regional accounts. It begins by describing the structure of the accounting framework and the way in which it presents the flows of incomes and expenditures within the Shetland economy. It then presents details of the surveys undertaken with Shetland businesses and households, including sample coverage.

2.2 Structure of the accounts

Entries in the columns of the SAM represent expenditures, entries in the rows of the matrix represent receipts. Essentially, the matrix is a single entry accounting system reflecting the identity that for every income there is a corresponding outlay or expenditure.

The SAM consists of five sets of accounts. For each of these accounts, the relevant accounting identity is satisfied.

The five sets of accounts are as follows:

1. Production sector accounts, for which the total value of gross output equals the total value of gross input;
2. Factor accounts, which relate to the return to factors of production, principally income from employment or from business profits, for which the total value of factor payments from production equals the total value of factor receipts;
3. Forms of income accounts, for which again the total value of factor payments from production equals the total value of factor receipts;
4. Household accounts, for which total income equals total expenditure, and
5. The local government account where total inflows equal total outflows.

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.

2.3 The classification system

To permit the maximum comparability with the last Shetland study, a similar sectoral classification system was used. We disaggregated a number of sectors used in the previous Input-Output table, those of significant size and/or in which different patterns of linkage or behaviour might be expected of the subsectors.

We disaggregated the following service sectors:
Distribution (into Wholesale and Retail);
Transport (Sea transport; Land transport; Air transport); and
Business services (Financial; IT/computer, real estate; Technical, professional, other).

The household accounts were disaggregated by household composition: households without children, households with children and retiree households. As well as having different income and expenditure patterns, as will be demonstrated in chapter 4, the three different household categories provide the SAM with the potential for investigating the impact on the economy of changes in the population structure through in- or out-migration.

In all these cases, the sectors which were disaggregated were ones used in the previous Input-Output table. Hence, re-aggregation makes possible comparison with the 1996/97 table although various changes in the official classification of business activities sometimes complicate the picture.

In summary, the SAM constructed in this study consists of:
31 production or industry sectors;
Factor income from employment and from profits;
Household income receipts from wages and salaries, self employment, and investments, including rental income;
Three separate accounts for Shetland households, relating to adults without (dependent) children, adults with children, and retiree households;
Income and expenditure by local government, as well as flows to and from central government;
Tourist expenditure in Shetland;
Imports and exports to the rest of Scotland, the rest of the UK and the rest of the world.

2.4 Data collection

While the existence of the previous Shetland Input-Output study was an invaluable starting point, a large amount of primary data collection was required to ensure changes in the economy were adequately reflected in the updated accounts. Three questionnaires were drawn up: a business questionnaire, a face-to-face household questionnaire and a postal household questionnaire. The design of the questionnaires sought to reflect the new features of the study: the disaggregation of a number of sectors, the disaggregation of the household accounts, and mapping of the distribution of household expenditure across different parts of Shetland. While each of the questionnaires successfully generated a large amount of good quality primary data, for both the business sector and for households, these primary survey data were supplemented by a range of other primary (non survey based) and secondary data.

2.4.1 The business survey

Construction of the sampling frame for the business survey involved updating of the business records of A B Associates. 150 requests were sent out to businesses based in Shetland or with activities in Shetland. The survey sample was drawn so as to ensure a high coverage of economic activity. Particular attention was paid to key local sectors, and sectors which were thought to have changed since the 1996/97 study.

87 questionnaires were completed in interviews conducted, mainly by A B Associates, in late Spring and Summer 2005. There were few outright refusals but a number of businesses were unable to provide the requisite information. This was particularly true of organisations with headquarters outwith Shetland. These gaps were filled from other (non survey based) primary data and from secondary data.

Table 2.1 shows the employment coverage of the business survey sample. The mapping of the 31 industrial sectors on to the official Standard Industrial Classification 2003 codes is listed in Appendix 2. Some of the sectors cover a wide range of activities and the labels we have used do not therefore fully describe what is included in each sector. For example, Social work (sector 30) includes a number of miscellaneous services as well as social work itself.

The 87 business returns generated data for 27 of the 31 industrial sectors. The overall sample coverage of 55% of total Shetland employment is excellent by the standard of studies of this sort. The high rate of sample coverage was due in large part to capturing all of public sector employment. However, even if the public sector is excluded, the sample covers over 40% of the rest of the Shetland economy, providing a good foundation for construction of the SAM.

In cases where either the number of survey returns or the employment coverage was low, information from the business survey was supplemented with data from the previous Shetland study and from other sources.

Some explanation of the details of Table 2.1 is necessary. With a few exceptions, the Shetland employment figures are taken from the Shetland Islands Council (SIC) survey of *Employment in Shetland by Sector 2003*. The exceptions are agriculture, fish catching and the local authority itself. For agriculture and fish catching, more recent surveys and SEERAD (Scottish Executive Environment and Rural Affairs Department) data suggest that the 2003 SIC figures are underestimates and these figures have therefore been adjusted upwards after discussions with SIC.

For the local authority, the availability of high quality data from the SIC accounts enabled a more detailed sectoral allocation of employment. We stripped out from the Public administration category (26) those activities which the local authority either dominates (such as Ports and harbours, 17, and Social work, 30) or accounts for in their entirety (School education, 27). The local authority employment data from the SIC accounts revealed some differences with the figures in the SIC survey of employment in Shetland. In such situations, we used the former data as a measure of employment in Shetland.

Finally, we were assured that the SIC figure for employment in Shetland at the Oil terminal (sector 4) was an underestimate, the main reason being the number of employees who are non Shetland residents. This explains why we have a sample coverage rate in excess of 100% for the Oil terminal.

Table 2.1 Business survey sample and employment coverage

Sector number	Sector name	Sample size (number of firms)	Sample employment (FTEs)	Total Shetland employment (FTEs)	% coverage
1	Agriculture	1	1.2	211.6	1
2	Fish catching	0	0	306.0	0
3	Aquaculture	9	165.1	357.9	46
4	Oil terminal	2	441.6	337.3	131
5	Mining and quarrying	0	0	72.4	0
6	Fish processing	5	292.5	444.0	66
7	Other food and drink processing	3	25.2	47.7	53
8	Marine engineering	3	72.5	179.8	40
9	Textiles and crafts	5	59.3	129.2	46
10	Other manufacturing	2	6.5	143.7	5
11	Electricity, gas and water	4	88.4	88.4	100
12	Construction	5	204.6	885.3	23
13	Wholesale	5	77.5	115.8	67
14	Retail	5	114.1	907.3	13
15	Accommodation	5	69.4	289.3	24
16	Catering	0	0	155.8	0
17	Ports and harbours	3*	326.0	326.0	100
18	Sea transport	1	10.5	14.9	70
19	Land transport	1	17.2	221.6	8
20	Air transport	2	46.5	101.2	46
21	Oil supply services	0	0	67.0	0
22	Communications	1	33.3	125.8	26
23	Financial	4	31.8	102.2	31
24	IT/computer, real estate	2	19.2	37.2	52
25	Technical, professional, other	3	11.0	522.7	2
26	Public administration	1	978.4	978.4	100
27	School education	1**	689.8	689.8	100
28	College education	3	153.3	153.3	100
29	Health	1	434.0	434.0	100
30	Social work	3**	341.2	342.8	100
31	Other personal services	10	301.9	321.1	94
	Total	90***	5012.0	9109.5	55

* Surveys of two firms plus Shetland Islands Council
** Survey of Shetland Islands Council
*** 87 separate surveys

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

2.4.2 The household surveys

The face-to-face survey was intended to gather detailed information on income, particularly sources of income, for use in the SAM. The postal survey was used more for identification of the key expenditure patterns.

The sample for the (face-to-face and postal) household survey was drawn from the Shetland electoral register. For the postal household survey, 2477 questionnaires were sent out, approximately 30% of the total number of Shetland households. There was a slight degree of (deliberate) oversampling of areas other than Lerwick. There were 443 returns, representing an 18% response rate, and just under 5% of all Shetland households. In contrast, the UK Family Resources Survey has a sample size of 0.05% and, in any case, for cost reasons does not include the Scottish islands.

Table 2.2 shows the distribution of total gross annual household income (for the 428 valid cases for this variable). 54% of households in the sample had a total annual income of £25000 or less. 87% had a total annual income of £50000 or less.

Table 2.2 The distribution of total gross annual household income in Shetland

Income band	Percentage	Cumulative percentage
up to £ 5,000	5.8	5.8
£ 5,001 – 10,000	14.3	20.1
£ 10,001 – 15,000	11.7	31.8
£ 15,001 – 20,000	11.0	42.8
£ 20,001 – 25,000	11.4	54.2
£ 25,001 – 30,000	10.3	64.5
£ 30,001 – 35,000	7.0	71.5
£ 35,001 – 40,000	8.4	79.9
£ 40,001 – 45,000	4.7	84.6
£ 45,001 – 50,000	2.6	87.1
£ 50,001 – 75,000	9.6	96.7
£ 75,001 - £100,000	2.8	99.5
£100,001 or more	0.5	100.0

For the face-to-face survey, more detailed questionnaires were completed by interview, again conducted by A B Associates, in early Summer 2005. 45 interviews were conducted although for most purposes only 44 returns were useable. 23 of the households lived in the Central mainland, 7 in the North mainland, 6 in the islands, 5 in the South mainland, and 4 in the West mainland.

3. THE SOCIAL ACCOUNTING MATRIX AND EMPLOYMENT MATRIX

Table 3.1 shows the balanced SAM for Shetland, 2003. The table is so large it is difficult to read but, as explained in the preceding chapter, it consists of the following components: 31 production sectors, two factors, five forms of income, three types of household, and other row and column accounts corresponding to local government, central government, capital formation, stocks, tourism, imports and exports.

With regard to the interpretation of the SAM, as mentioned in the previous chapter, column entries represent expenditures and row entries represent receipts. As an example, reading down the agriculture column, the values in the cells indicate what the agriculture sector has spent in purchases from the sectors on the left hand side of the table (including purchases from itself), the payments that agriculture has made to factors of production (income from employment or from business profits) and to local and central government in the form of taxes, and spending outside Shetland, on imports. Reading along the agriculture row, the values in the cells indicate what the agriculture sector received in sales to the sectors at the top of the table (including sales to itself), to households, to other final demand categories (such as central government), and outside Shetland, as exports.

The main use of the matrix is to generate a wide variety of results including performance indicators such as Gross Regional Domestic Product (GRDP), sectoral contributions to employment and output, multiplier values, and possible economic "scenarios". These results are discussed in subsequent chapters.

Table 3.1 The balanced Social Accounting Matrix for Shetland, 2003 (£000)

	Agri-culture	Fish catching	Aqua-culture	Oil terminal	Mining	Fish process	Other process	Marine eng	Textiles	Other man	Elec, gas	Con-struct	Whole-sale	Retail	Acc-omm	Cater	Ports	Sea trans	Land trans	Air trans	Oil supply	Comms	Finance	IT servs	Tech servs
Agriculture	1222.24	0	0	0	0	0	348.62	0	64.07	0	0	0	0	0	172.12	17.32	0	0	0	0	0	0	0	1.12	11.54
Fish catching	0	0	0	0	0	21676.82	0.42	0	0	0.10	0	0	0	0	8.85	0.06	0	0	0	0	0	0	0	2.53	25.96
Aquaculture	0	0	4330.96	0	0	3834.37	0.11	0	0	0.03	0	0	0	0	1.03	0.32	0	0	0	0	0	0	0	0.67	6.84
Oil terminal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mining	0	0	0	0	0	0	0	31.97	0	6.45	0	9584.81	0	0	1.74	0	0	0	0	0	0	0	0	0	0
Fish process	0	0	0	0	0	9875.09	0.36	0	0	0.70	0	0	0	0	1.66	0.16	0	0	0	0	0	0	0	1.55	15.88
Other process	5.15	0	27.02	4.24	0.50	4.28	0	25.52	12.62	0	0.37	5.13	0.01	0.50	15.58	0.87	0	0.00	0.38	0.08	0.00	0	112.25	0.01	0.13
Marine eng	0	3704.83	4098.59	0	0	0	0	0	0	0	0	0	1.26	65.87	0	0	397.02	102.89	50.66	10.74	2.62	0	0	0	0
Textiles	0	0	431.60	0	0	0	15.82	0	258.11	0.00	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.01	0.09
Other man	13.31	0	69.83	10.96	1.30	11.05	0.02	65.94	32.62	7.56	0.95	13.25	0.02	1.29	5.29	0.19	0	0.01	0.99	0.21	0.01	0	290.08	7.54	77.40
Elec, gas	40.40	17.88	71.17	115.16	69.66	319.33	3.84	64.71	19.00	24.53	42.89	16.84	11.13	211.83	48.10	22.85	20.06	1.65	162.92	34.53	26.97	26.00	80.44	4.75	5.39
Construct	873.74	0	585.60	136.80	537.38	101.38	0.13	12.01	35.87	44.75	619.14	147.12	3.66	190.85	24.09	0.87	1117.75	1.49	146.78	31.11	252.62	266.47	189.12	34.40	353.23
Wholesale	54.10	19.83	179.05	963.94	23.54	43.23	47.53	0.59	1.62	92.20	11.67	9.97	6.04	314.68	402.99	33.32	0	2.46	242.01	51.30	2.39	1.31	28.26	2.25	23.09
Retail	574.60	210.58	1901.52	3412.45	250.01	459.08	0	6.30	17.25	0	123.90	105.92	64.15	3341.99	0	0	0	26.10	2570.26	544.82	25.37	13.92	300.18	0	0
Accomm	9.47	0	0	563.81	0	0	0.04	25.40	0	0.08	0	0	19.74	1028.44	0.16	0.02	0	8.03	790.95	167.66	13.70	12.92	165.00	0.00	0.00
Cater	1.68	0	0	100.28	0	0	0	4.52	0	0	0	0	3.51	182.91	0.05	0	0	1.43	140.68	29.82	2.44	2.30	29.35	0.32	3.34
Ports	218.89	252.86	116.20	6697.54	0	0	0	0	0	0	0	0	5.59	291.19	0	0	3392.61	1162.16	223.95	47.47	226.77	0	0	0	0
Sea trans	22.00	2.82	93.92	3.54	1.18	7.74	0.56	2.68	0.94	1.09	3.61	12.32	0.17	8.96	12.05	0.63	5.77	0.07	6.89	1.46	0.33	7.45	0	21.83	224.20
Land trans	570.86	73.13	2437.32	91.85	30.60	200.77	0.34	69.44	24.47	0.25	93.65	319.65	4.46	232.45	0	0.08	149.78	1.82	178.78	37.90	8.53	193.42	0	25.22	259.01
Air trans	215.87	27.65	921.65	34.73	11.57	75.92	0.94	26.26	9.25	0.52	35.41	120.87	1.69	87.90	3.29	0.19	56.64	0.69	67.60	14.33	3.22	73.14	0	11.44	117.45
Oil supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Comms	379.48	34.69	95.25	406.63	40.81	85.43	13.54	20.71	3.50	9.20	155.48	92.00	5.03	262.09	27.85	5.91	99.47	2.05	201.57	42.73	27.54	278.71	12.73	86.73	890.63
Finance	425.72	139.15	2056.55	3623.39	170.77	911.43	168.93	3.38	104.38	3.59	220.62	341.19	4.19	218.26	854.10	11.58	719.54	340.94	167.86	35.58	212.20	6.94	33.22	319.40	3279.73
IT servs	81.88	14.17	70.78	3.40	0.68	20.99	8.61	0.41	2.41	5.85	1.55	22.67	0.02	1.11	17.71	3.76	0	0.01	0.85	0.18	0.18	80.67	4.45	55.16	566.43
Tech servs	3008.60	520.74	2600.61	124.85	24.95	771.21	118.43	15.17	88.59	5.04	56.83	832.84	0.78	40.74	1197.58	16.24	0	0.32	31.33	6.64	6.69	2964.20	163.37	447.84	4598.65
Public admin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schools	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
College	0	0	1791.30	0	0	316.50	0.03	90.94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.58	16.18
Health	0	0	0	0	0	0	0.05	0	0	0.01	0	0	0	0	0.10	0.01	0	0	0	0	0	0	0	0.68	7.01
Social work	0	0	0	0	0	5.60	0.00	0	0.23	0.01	21.59	91.00	1.02	53.39	0.09	0.01	0	0	0	8.70	189.63	9.37	3.07	0.60	6.15
Other servs	111.33	4.11	2423.55	989.17	180.55	47.59	0.07	0	0.39	0.02	36.71	1547.57	1.74	90.80	0.16	0.01	57.25	0.71	69.83	14.80	322.47	15.94	5.23	1.09	11.16
INC	1185.86	16495.96	10069.14	18053.81	6163.16	16980.44	450.50	5336.19	1385.41	1416.19	2634.51	22914.65	3975.78	26434.38	3005.46	1583.14	7266.86	320.97	2892.51	5118.39	1523.34	2363.04	3617.56	849.41	15982.29
PROF	2018.16	7596.32	11520.66	6820.58	903.03	5497.78	119.09	2506.04	449.94	312.38	225.72	3163.75	689.86	4586.80	1020.31	484.66	8031.98	168.55	786.38	365.01	1202.13	680.03	8438.91	283.25	2908.57
F1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HH no child	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HH children	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HH retired	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LG	8.93	51.85	75.80	4720.89	46.40	97.14	3.39	40.17	10.43	10.66	19.83	172.51	29.93	199.00	22.63	11.92	54.71	2.42	21.78	38.53	11.47	17.79	27.23	6.39	120.32
CG direct tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CG indirect tax	126.62	186.86	3276.46	3607.36	9.41	1055.83	3.66	257.81	38.61	7.20	15.16	1872.28	6.35	33.77	223.77	8.16	532.21	39.96	78.26	165.25	112.02	284.15	724.46	116.34	1194.59
CG transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MROS	1957.32	6546.57	24572.46	1452.38	1159.46	1649.25	121.17	1204.86	55.82	436.29	1659.24	13576.68	3.61	36.05	165.37	485.25	659.13	217.87	15856.76	2966.09	0	111.16	13912.03	154.61	333.34
MRUK	0	0	11563.45	3418.48	0	906.66	24.99	79.40	359.66	132.44	499.01	4771.78	0.85	11.31	261.80	0	17.02	3447.41	19.77	1151.01	444.34	233.98	9323.16	362.00	120.09
MROW	0	0	2222.55	1640.48	0	45.11	0	13.92	204.77	75.66	0	38.47	0	0	0	0	0	0	0	728.62	0	0	0	0	8.71
Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	13126.22	35900.00	87603.00	56996.74	9624.97	65000.00	1451.19	9904.30	3179.99	2592.80	6477.84	59773.25	4840.62	37926.56	7493.89	2687.54	22577.78	5850.00	24709.73	11612.97	4616.99	7642.93	37460.10	2798.73	31167.39

Public admin	Schools	College	Health	Social work	Other servs	INC	PROF	F1	F2	F3	F4	F5	HH no child	HH children	HH retired	LG	CG	GDFCF	Stocks	Tour-ism	XROS	XRUK	XROW	TOTAL	
0	107.39	0	64.14	0	0	0	0	0	0	0	0	0	379.82	331.89	103.79	0	7558	0	0	0	2667.65	70.93	5.75	13126.22	**Agriculture**
0	57.51	0	0	0	0	0	0	0	0	0	0	0	667.89	583.59	182.50	0	0	0	0	0	3938.87	2481.60	6273.31	35900.00	**Fish catching**
0	0	93.53	0	0	0	0	0	0	0	0	0	0	388.44	339.42	106.14	0	0	0	-989.71	0	18762.91	29010.06	31717.87	87603.00	**Aquaculture**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210.59	0	0	0	56786.1472	0	56996.74	**Oil terminal**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9624.97	**Mining**
0	0	0	0	0.00	0	0	0	0	0	0	0	0	829.09	724.45	226.55	0	0	0	51.25	115.50	14907.35	15273.17	22977.22	65000.00	**Fish process**
65.97	4.67	29.07	10.93	0.01	1.98	0	0	0	0	0	0	0	495.97	433.37	135.52	0	2	0	-0.32	57.58	0	0	0	1451.19	**Other process**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	319.329962	-0.20	0	1140.67	7.81	0	9904.30	**Marine eng**
0.00	0	0	0	0.00	0	0	0	0	0	0	0	0	172.94	76.90	18.10	0	0	0	2.90	59.78	117.32	165.08	1861.35	3179.99	**Textiles**
173.13	12.07	75.11	28.23	3.84	5.12	0	0	0	0	0	0	0	1016.88	457.24	65.39	0	0	0	0.65	2.67	142.65	0	0	2592.80	**Other man**
133.45	178.40	17.47	86.10	84.61	66.69	0	0	0	0	0	0	0	2123.42	1596.60	664.15	0	0	0	0	64.93	0	0	0	6477.84	**Elec, gas**
4093.85	4089.40	864.42	870.02	2.98	232.88	0	0	0	0	0	0	0	5469.06	4654.94	1343.40	0	0.23	29288.1274	14.66	0	3089.71	52.90	0	59772.94	**Construct**
40.45	31.11	0	46.35	19.94	52.18	0	0	0	0	0	0	0	1031.55	777.58	234.89	0	49	0	0	0	0	0	0	4840.62	**Wholesale**
282.15	330.42	0	492.29	0	554.18	0	0	0	0	0	0	0	10875.29	8197.78	2476.37	0	0	0	0.42	769.26	0	0	0	37926.56	**Retail**
792.31	0	379.10	0	0.00	0	0	0	0	0	0	0	0	85.14	56.82	25.06	0	0	0	0	3350.02	0	0	0	7493.89	**Accomm**
140.92	0	67.42	0	0.00	0	0	0	0	0	0	0	0	760.01	664.08	207.67	0	0	0	0	344.82	0	0	0	2687.54	**Cater**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8600.5	0	0	0	0	1342.05	0	0	22577.78	**Ports**
43.16	45.98	1.55	29.76	18.08	10.05	0	0	0	0	0	0	0	2412.17	1609.86	709.94	0	0	0	0	527.26	0	0	0	5850.00	**Sea trans**
793.82	1193.35	40.34	772.28	0.80	260.75	0	0	0	0	0	0	0	8097.15	4959.80	1350.80	0	0	0	0	2236.88	0	0	0	24709.73	**Land trans**
299.97	451.25	15.25	292.03	0.01	98.60	0	0	0	0	0	0	0	2072.32	1383.05	609.92	0	3506	0	0	966.35	0	0	0	11612.97	**Air trans**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4616.99	0	4616.99	**Oil supply**
520.00	737.12	139.20	489.46	7.96	381.65	0	0	0	0	0	0	0	1086.10	649.92	291.90	0	0	0	0	59.84	0	0	0	7642.93	**Comms**
232.70	0	111.34	0	0	186.06	0	0	0	0	0	0	0	7040.35	5420.74	2118.24	0	0	0	0	0	4663.87	8.86	3305.30	37460.10	**Finance**
28.93	0	5.07	48.01	5.06	14.91	0	0	0	0	0	0	0	805.13	602.03	261.33	0	60	0	0	0	4.15	0	0	2798.73	**IT servs**
933.32	0	186.31	1764.23	0	548.03	0	0	0	0	0	0	0	3509.02	2623.83	1138.98	0	2821	0	0	0	0	0	0	31167.39	**Tech servs**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46813	0	0	0	0	0	0	0	46812.75	**Public admin**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33836.75	0	0	0	0	0	0	0	33836.75	**Schools**
0	0	0	0	0	0	0	0	0	0	0	0	0	983.70	683.76	2.25	0	1585	0	-114.28	0	56.04	31.48	22.82	5467.39	**College**
0.00	0	0	0	0.00	0	0	0	0	0	0	0	0	417.41	302.79	64.34	0	33508	0	2.17	54.44	0	0	0	34357.00	**Health**
258.97	313.92	59.26	36.47	0.00	76.44	0	0	0	0	0	0	0	237.53	200.23	70.19	10558	2979	0	0	0	0	0	0	15180.00	**Social work**
440.39	533.84	100.78	62.03	0.00	129.98	0	0	0	0	0	0	0	6839.94	2314.34	200.42	0	108	0	0	372.38	0	0	0	17034.18	**Other servs**
19463.94	19790.31	2984.09	16549.23	13461.14	7972.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	258240.58	**INC**
0	0	0	0	1459.96	2922.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75162.57	**PROF**
0	0	0	0	0	0	222385.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	222385.11	**F1**
0	0	0	0	0	0	35855.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35855.48	**F2**
0	0	0	0	0	0	0	67106.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67106.25	**F3**
0	0	0	0	0	0	0	4298.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4298.19	**F4**
0	0	0	0	0	0	0	3758.13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3758.13	**F5**
0	0	0	0	0	0	0	0	133710.06	0	25392.83	959.02	460.22	0	0	0	0	6740.40	0	0	0	1710.01	788.25	0	169760.80	**HH no child**
0	0	0	0	0	0	0	0	86214.35	0	40958.69	2604.20	3188.08	0	0	0	0	2859.51	0	0	0	14517.99	1380.94	0	151723.76	**HH children**
0	0	0	0	0	0	0	0	949.85	0	754.74	716.14	97.08	0	0	0	0	16494.72	0	0	0	2669.65	6856.27	0	28538.46	**HH retired**
0	148.98	0	124.59	0	60.02	0	0	0	0	0	0	0	3823.64	1842.28	1287.64	0	58010	0	0	0	0	0	0	71119.25	**LG**
0	0	0	0	0	0	0	0	0	0	0	0	0	29294.37	24099.51	157.80	0	0	0	0	0	0	0	0	53551.68	**CG direct tax**
7.34	154.53	145.86	261.89	15.22	177.33	0	0	0	0	0	0	0	10565.60	9043.67	2498.54	0	0	0	0	109.26	0	0	0	36955.78	**CG indirect tax**
0	0	0	0	0	0	0	0	0	35855.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35855.48	**CG transfers**
0	0	0	0	0	0	0	0	0	0	0	0	0	13381.87	16580.27	714.61	-28689	0	0	0	0	0	0	0	1988.01	**CAP**
12873.60	4030.31	143.10	7574.68	88.79	3050.61	0	0	0	0	0	0	0	37727.06	44791.68	9980.42	0	0	8950.03	0	3755.48	0	0	0	222258.52	**MROS**
5194.39	1626.19	9.10	4754.28	11.60	210.36	0	0	0	0	0	0	0	7806.44	6325.57	842.43	0	0	2106.57	0	184.44	0	0	0	66219.98	**MRUK**
0	0	0	0	0	20.74	0	0	0	0	0	0	0	9365.52	9395.78	449.19	0	0	0	0	9.97	0	0	0	24219.49	**MROW**
0	0	0	0	0	0	0	0	1510.84	0	0	18.83	12.75	0	0	0	0	0	0	0	0	0	0	0	1542.41	**Transfers**
46812.75	33836.75	5467.39	34357.00	15180.00	17034.18	258240.58	75162.57	222385.11	35855.48	67106.25	4298.19	3758.13	169760.80	151723.76	28538.46	71119.25	136282.96	40874.65	-1032.45	13040.86	69730.91	117530.50	66163.61		**TOTAL**

Key to row and column titles

Production sector	*Sector number and name*
Agriculture	1. Agriculture
Fish catching	2. Fish catching
Aquaculture	3. Aquaculture
Oil terminal	4. Oil Terminal
Mining	5. Mining and quarrying
Fish process	6. Fish processing
Other process	7. Other food and drink processing
Marine eng	8. Marine Engineering
Textiles	9. Textiles and crafts
Other man	10. Other manufacturing
Elec, gas	11. Electricity, gas and water
Construct	12. Construction
Wholesale	13. Wholesale
Retail	14. Retail
Accomm	15. Accommodation
Cater	16. Catering
Ports	17. Ports and harbours
Sea trans	18. Sea transport
Land trans	19. Land transport
Air trans	20. Air transport
Oil supply	21. Oil supply services
Comms	22. Communications
Finance	23. Financial
IT servs	24. IT/computer, real estate
Tech servs	25. Technical, professional, other
Public admin	26. Public administration
Schools	27. School education
College	28. College education
Health	29. Health
Social work	30. Social work
Other servs	31. Other personal services

Factors

INC	Income from employment
PROF	Gross profit and other trading surplus

Forms of income

F1	Wages and salaries
F2	Employers' National Insurance contributions
F3	Self employment income
F4	Investment income
F5	Rental income

Households

HH no child	Households, no children
HH children	Households with children
HH retired	Retiree households

Other row accounts

LG	Local government
CG direct tax	Central government direct taxes
CG indirect tax	Central government indirect taxes
CG transfers	Central government transfers
CAP	Capital account
MROS	Imports from Rest of Scotland
MRUK	Imports from Rest of UK
MROW	Imports from Rest of World
Transfers	Transfer payments abroad

Other column accounts

LG	Local government
CG	Central government final consumption
GDFCF	Gross Domestic Fixed Capital Formation
Stocks	Changes in the value of stocks
Tourism	Tourist expenditure
ROS	Exports to Rest of Scotland
RUK	Exports to Rest of UK
ROW	Exports to Rest of World

Note on cell values

0 = zero
0.00 = < 0.005

Table 3.2 shows the balanced employment matrix for Shetland, 2003. It shows the distribution of employment, by occupational group (according to the Standard Occupational Classification 2000), across the 31 industrial sectors.

The distribution of employment across the industrial sectors is discussed at length in the next chapter. Regarding the occupational distribution of employment, the three largest occupational groups (in descending order) are: skilled trades, elementary occupations, and process, plant and machine operatives. However, there is significant representation in all 9 occupational groups. Shetland has a relatively balanced occupational distribution. There are seven sectors which employ people in all 9 occupational groups: construction, retail, ports and harbours, land transport, public administration, social work, and other personal services.

Retailing is the largest employer of both managers and senior officials (occupational group 1) and sales and customer service occupations (7). The technical, professional and other services sector is the largest employer of professional occupations (2). Public administration is the largest employer of both associate professional and technical occupations (3) and administrative and secretarial occupations (4). Construction is the largest employer of both skilled trades (5) and process, plant and machine operatives (8). The accommodation sector is the largest employer of personal service occupations (6). Finally, fish processing is the largest employer of elementary occupations (9).

Table 3.2 The balanced employment matrix for Shetland 2003 (FTEs)

		Occupation Type									
	Sector	Managers and Senior Officials	Professional Occupations	Associate Professional and Technical	Administrative and Secretarial	Skilled Trade Occupations	Personal Service Occupations	Sales and Customer Service	Process, Plant and Machine Operatives	Elementary Occupations	Total
1	Agriculture	6	0	0	4	146	0	6	8	42	212
2	Fish catching	7	0	0	0	86	0	0	43	170	306
3	Aquaculture	8	0	0	0	122	0	0	0	228	358
4	Oil terminal	7	42	65	7	67	0	3	147	0	337
5	Mining and quarrying	12	0	0	0	9	0	0	51	0	72
6	Fish processing	44	1	2	21	21	0	35	48	272	444
7	Other food and drink processing	3	0	0	2	11	0	4	6	22	48
8	Marine Engineering	2	1	0	8	169	0	0	0	0	180
9	Textiles and crafts	4	0	0	1	20	1	9	33	60	129
10	Other manufacturing	6	0	0	0	14	0	0	124	0	144
11	Electricity, gas and water	12	1	3	5	38	0	2	27	0	88
12	Construction	56	26	22	28	417	8	2	209	116	885
13	Wholesale	20	0	4	3	44	0	30	11	3	116
14	Retail	152	3	37	27	257	1	287	110	34	907
15	Accommodation	18	0	0	21	53	149	8	0	40	289
16	Catering	18	0	9	11	74	22	1	0	21	156
17	Ports and harbours	39	23	28	44	29	59	14	49	42	326
18	Sea transport	3	0	2	5	0	0	6	0	0	15
19	Land transport	29	1	6	21	34	33	15	56	26	222
20	Air transport	8	54	0	4	5	19	12	0	0	101
21	Oil supply services	15	0	1	4	5	1	0	39	1	67
22	Communications	15	18	11	32	14	19	0	0	17	126
23	Financial	23	1	24	46	0	2	4	2	1	102
24	IT/computer, real estate	6	2	7	6	9	0	0	0	8	37
25	Technical, professional, other	47	259	0	146	59	0	12	0	0	523
26	Public administration	114	84	364	208	50	53	8	32	65	978
27	School education	79	199	211	87	0	46	0	0	66	690
28	College education	18	48	46	20	0	4	5	0	13	153
29	Health	67	85	122	62	0	54	0	0	44	434
30	Social work	16	29	74	40	34	107	5	15	22	343
31	Other personal services	24	8	109	20	45	50	7	31	27	321
	Total	879	884	1146	884	1834	629	474	1042	1338	9109

4 CORE REGIONAL ANALYSIS

4.1 Gross Regional Domestic Product and Expenditure

Gross Regional Domestic Product (GRDP) is a measure of the total economic activity within a regional economy. It corresponds to Gross Domestic Product (GDP) at national level. It represents the sum of all value added earned by the production of goods and services within the area. Per capita GRDP is often used as an indicator of economic welfare of a region, with comparisons of GRDP across regions indicating different living standards, and changes over time indicating the extent to which the regional economy has been growing (or declining).

There are various ways of calculating GRDP from the SAM. The simplest is the so-called income measure which is the sum of income from employment and gross profits and other trading income. This measures GRDP at factor cost, that is net of the effect of indirect taxes and subsidies. Division of GRDP by the population base yields a measure of GRDP per capita. For Shetland, the mid year estimate of the General Register Office for Scotland for 2003 of 21870 is used. Table 4.1 shows the GRDP and GRDP per capita estimates for Shetland

Table 4.1 GRDP and GRDP capita in Shetland

Income from employment	Row total of SAM	£258,240,580
Gross profit and other trading surplus	Row total of SAM	£75,162,570
GRDP at factor cost		£333,403,150
GRDP per head	Population: 21870	£15245

Gross Regional Domestic Product in Shetland in 2003 was £333 million. GRDP per capita was £15245.

Table 4.2 compares this estimate of GRDP per capita in Shetland with figures for the Western Isles, the Highlands and Islands, Scotland, the UK, and the EU, some of which relate to Gross Value Added, a very similar measure to GRDP. GRDP per capita in Shetland was 93% of the UK average and 99% of the Scottish average but significantly higher than the comparable figures for the Western Isles and the Highlands and Islands as a whole.

Table 4.2 GRDP per capita in Shetland and comparator areas

Region	Year	GRDP/GVA per head (£)	GRDP/GVA per head (UK = 100)
Shetland	2003	£15245	93
Western Isles	2003	£10078	62
Highlands and Islands	2003	£10524	64
Scotland	2003	£15409	94
UK	2003	£16383	100
EU 25	2003	-	84

Sources: Roberts, D. (2005), Office of National Statistics, Eurostat

To analyse changes in GRDP and per capita GRDP over time, it is necessary to allow for inflation. According to the GDP deflator for the UK, prices rose by 18.4% between 1996/97 and 2003/04. In the previous Shetland study, GRDP was estimated at £289.6 million in 1996/97. This is equivalent to £342.9 million in 2003. The estimate of GRDP for 2003 of £333.4 million therefore implies that the Shetland economy experienced a shrinkage of 2.8% in real terms over the seven years.

The estimate of GRDP per capita in 1996/97 was £12583, equivalent to £14898 in 2003. The estimate for 2003 of £15245 is higher by 2.3% but because Shetland's population has fallen. Moreover, this has been at a time of sustained economic growth throughout most of the UK. While Shetland GRDP per capita was 98% of the UK average in 1996/97, it had fallen to 93% by 2003.

Gross Regional Domestic Expenditure (GRDE) is an alternative measure of economic welfare or standard of living in a region. While GRDP is the value of economic activity within a region, GRDE measures the value of expenditure of residents, regardless of the source of goods and services.

Table 4.3 shows the calculation of GRDE and GRDE per capita. In 2003, GRDE per capita in Shetland was £17,264, 13% higher than GRDP per capita. In 1996/97, GRDE per capita in Shetland was £14,592, equivalent to £17,277 in 2003, virtually unchanged in real terms.

Table 4.3 GRDE and GRDE capita in Shetland

GRDP	£333,403,000
+ imports	£312,698,000
- exports	£225,502,000
- tourist expenditure	£13,041,000
= GRDE	£377,558,000
GRDE per head	£17,264

4.2 Sectoral analysis

Table 4.4 shows the contributions of each of the 31 industrial sectors to employment (FTE jobs), value added (£000) and output (£000).

The five sectors which account for most employment (in descending order of importance) are: Public administration, Retailing, Construction, School education, and Technical, professional, other services.

The five sectors which account for most value added (in descending order of importance) are: Retailing, Construction, Oil terminal, Fish catching, and Fish processing.

The five sectors which account for most output (in descending order of importance) are: Aquaculture, Fish processing, Construction, Oil terminal, and Public administration.

Table 4.4 Sectoral contributions to employment, value added and output

Sector	Employment (FTE jobs)	%	Value added (£000)	%	Output (£000)	%
Agriculture	212	2.3	3204	1.0	13126	1.9
Fish catching	306	3.4	24092	7.2	35900	5.1
Aquaculture	358	3.9	21590	6.5	87603	12.4
Oil terminal	337	3.7	24874	7.5	56997	8.1
Mining and quarrying	72	0.8	7066	2.1	9625	1.4
Fish processing	444	4.8	22478	6.7	65000	9.2
Other food and drink	48	0.5	570	0.2	1451	0.2
Marine engineering	180	2.0	7842	2.4	9904	1.4
Textiles and crafts	129	1.4	1835	0.6	3180	0.5
Other manufacturing	144	1.6	1729	0.5	2593	0.4
Electricity, gas and water	88	1.0	2860	0.9	6478	0.9
Construction	885	9.7	26078	7.8	59773	8.5
Wholesale	116	1.3	4666	1.4	4841	0.7
Retail	907	10.0	31021	9.3	37927	5.4
Accommodation	289	3.2	4026	1.2	7494	1.1
Catering	156	1.7	2068	0.6	2688	0.4
Ports and harbours	326	3.6	15299	4.6	22578	3.2
Sea transport	15	0.2	490	0.1	5850	0.8
Land transport	222	2.4	3679	1.1	24710	3.5
Air transport	101	1.1	5483	1.6	11613	1.6
Oil supply services	67	0.7	2725	0.8	4617	0.7
Communications	126	1.4	3043	0.9	7643	1.1
Financial	102	1.1	12056	3.6	37460	5.3
IT/computer, real estate	37	0.4	1133	0.3	2799	0.4
Technical, professional, other	523	5.7	18891	5.7	31167	4.4
Public administration	978	10.7	19464	5.8	46813	6.6
School education	690	7.6	19790	5.9	33837	4.8
College education	153	1.7	2984	0.9	5467	0.8
Health	434	4.8	16549	5.0	34357	4.9
Social work	343	3.8	14921	4.5	15180	2.2
Other personal services	321	3.5	10896	3.3	17034	2.4
Total	9109	100	333402	100	705705	100

Note: percentages may not exactly total to 100% due to rounding.

While clearly there is some overlap between these three rankings – Construction for example features as second or third on each ranking – the overlap is limited, as would be expected, given that sectors vary greatly in their capital intensity and profitability.

Table 4.5 shows how the sectoral contributions to value added and output have changed between 1996/97 and 2003. The sectors used in the present study are reaggregated to be consistent with the sectoral classification employed in 1996/97. There is some uncertainty where the service activities in Social work (sector 30) were classified in the earlier study although it appears to have been under Other services. As a more general point, there have been a number of changes to the official Standard Industrial Classification, particularly affecting how service activities are categorised.

Table 4.5 Sectoral contributions to value added and output, 1996/97 and 2003

Sectors, 1996/97	Sectors, 2003	Value added, 1996/97 %	Value added, 2003 %	Output, 1996/97 %	Output, 2003 %
Agriculture	1. Agriculture	1.6	1.0	2.4	1.9
Fishing	2. Fish catching	5.0	7.2	4.5	5.1
Fish farming	3. Aquaculture	5.3	6.6	7.4	12.4
Oil terminal	4. Oil Terminal	9.3	7.5	12.3	8.1
Electricity and water	11. Electricity, gas and water	1.4	0.9	2.2	0.9
Quarries	5. Mining and quarrying	2.1	2.1	1.7	1.4
Marine engineering	8. Marine engineering	4.2	2.4	3.0	1.4
Fish processing	6. Fish processing	6.5	6.7	8.4	9.2
Knitwear	9. Textiles and crafts	0.9	0.6	0.9	0.5
Other manufacture	7. Other food and drink 10. Other manufacturing	0.7	0.7	0.7	0.6
Construction	12. Construction	8.8	7.8	12.8	8.5
Distribution	13. Wholesale 14. Retail	11.5	10.7	7.0	6.1
Hotels and catering	15. Accommodation 16. Catering	1.6	1.8	1.6	1.5
Transport	18. Sea transport 19. Land transport 20. Air transport	2.7	2.8	5.0	5.9
Ports and harbours	17. Ports and harbours	4.2	4.6	3.0	3.2
Oil supply base	21. Oil supply services	1.8	0.8	1.5	0.7
Communications	22. Communications	1.0	0.9	1.0	1.1
Business services Other professional services	23. Financial 24. IT/computer, real estate 25. Technical, professional, other	12.0	9.6	10.2	10.1
Public administration	26. Public administration	7.2	5.8	4.0	6.6
Education	27. School education 28. College education	5.8	6.8	6.2	5.6
Health	29. Health	3.5	5.0	2.5	4.9
Other services	30. Social work 31. Other personal services	2.5	7.8	1.9	4.6

The most significant increases in relative importance, among sectors of any size, were other services, fish farming, and health. The most significant declines in relative importance were the oil terminal (and oil supply services), marine engineering, and construction.

Public administration declined in relative importance in terms of value added but became more important in terms of output. Education moved in the opposite direction, making a larger relative contribution to value added but a smaller one to output. In terms of value added, which is ultimately of greater significance than output, two further changes are notable. Fishing increased in importance while business and other professional services declined in importance.

Despite these various changes, there is considerable stability of the sectoral contributions to value added and to output. For example, four out of five of the largest contributors to value added were common to 1996/97 and 2003 while all five of the largest contributors to output in 2003 were the same as in 1996/97.

We use the sum of the five largest sectors' value added and output as a measure of the degree of specialisation or diversification of the Shetland economy. The five largest sectors accounted for 48.8% of total value added in 1996/97 but only 43.4% in 2003. The five largest sectors accounted for 51.1% of output in 1996/97 but only 48.3% in 2003. It was noted in the last study that "the Shetland economy is relatively well diversified in the composition of its value added" (Gillespie et al, 1999, p.22). By our measure, Shetland now has an even more diversified economy than in the 1990s.

The distribution of value added and output in Shetland can be compared with the pattern for Scotland as a whole. Table 4.6 shows the percentage distribution for Shetland in 2003 and Scotland in 2002, for 11 larger sectors. There are some big differences between Shetland and Scotland. By comparison with Scotland, agriculture, forestry and fishing (which includes both fish catching and aquaculture) and mining (which includes the oil terminal) are significantly "over represented" in Shetland while manufacturing as well as finance and business are significantly "under represented" in Shetland.

However, it should be said that there is no such thing as an "ideal" sectoral distribution of economic activity. Judged by the criterion of the concentration of value added and output in a few large sectors, Shetland actually has a more diversified economy than Scotland. According to Table 4.6, the three largest sectors in Shetland account for 43.5% of value added and 43.8% of output compared to 56.0% and 56.4% respectively in Scotland. Alternatively, taking the five largest sectors, they account for 63.5% of value added and 64.8% of output in Shetland compared to 77.7% and 74.9% respectively in Scotland.

Finally, it should be said that, judged by criteria other than value added or output, the Shetland economy appears much less diversified. For example, as will be shown in section 4.4.1, the fisheries and oil sectors accounted for 92% of total exports in 2003.

Table 4.6 Sectoral contributions to value added and output, Shetland 2003 and Scotland 2002

Sector	Value added, Shetland, %	Value added, Scotland, %	Output, Shetland, %	Output, Scotland, %
Agriculture, forestry and fishing	14.7	1.5	19.4	2.2
Mining	9.6	1.6	9.5	2.0
Manufacturing	10.4	15.5	11.7	20.5
Energy and water	0.9	2.6	0.9	3.4
Construction	7.8	6.2	8.5	6.4
Distribution and catering	12.5	15.2	7.6	11.8
Transport and communications	9.1	7.5	10.9	7.8
Finance and business	9.6	23.3	10.1	24.1
Public administration	5.8	7.1	6.6	7.1
Education, health and social work	16.3	14.2	12.7	10.7
Other services	3.3	5.3	2.4	4.1
Total	100	100	100	100

Note: percentages may not exactly total to 100% due to rounding.

4.3 Households

4.3.1 Household income

Table 4.7 shows the main different sources of income for Shetland households. Three types of household are identified: households without (dependent) children, households with children, and retiree households. Note that the figures shown relate to the household as a whole and not to individuals.

Investments include income from property rental. Pensions refers to state, occupational and private pensions. Social security benefits and other includes child benefit, tax credits and educational grants.

Table 4.7 is based on 43 of the 44 useable returns from the household face-to-face survey. The decision was made to exclude one household which had an extremely high investment income (but not an especially high overall income) because of the potentially very distorting effect upon the distribution of the sources of household income. Indeed, all the results of the face-to-face survey should be treated with some caution since we cannot be confident about how representative just 43 households are of the population as a whole.

Table 4.7 Sources of income, by household type, Shetland

	Adults, no children, £	%	Adults, with children, £	%	Retiree house-holds, £	%	All house-holds, £	%
Wages and salaries	28395	78	35232	73	465	3	222363	68
Self employment	4283	12	11507	24	300	2	4440	14
Investments	1681	4	0	0	2329	15	1573	5
Pensions	1235	4	0	0	12082	80	3722	11
Social security benefits and other	878	2	1372	2	0	0	734	2
Total	36472	100	48111	100	15176		32832	100

Source: Face-to-face household survey
Note: Percentages may not sum to exactly 100% due to rounding

The average income of households in Shetland, as derived from the face-to-face household survey, was just under £33000. There are significant differences in the level and sources of income for each of the three household types. Households with children had the highest average income, over £48000. Households without children had an average income of over £36000. Retiree households, unsurprisingly, had a much lower level of average income, just over £15000.

Wages and salaries are the largest source of income of Shetland households, accounting for just over two thirds of average income. Self employment income and pensions are the two next most important sources of income, both contributing between 10% and 15% of average household income. Investment income accounts for 5% of household income and social security benefits (and other sources) only 2% of the total.

The major source of income for households with and without children is wages and salaries. However, in both cases other sources of income are significant. Self employment income is also important to both types of household, especially those with children, for whom it constitutes nearly a quarter of household income. For retiree households, by far the largest source of income is (state, occupational and private) pensions although income from investments is also significant.

Table 4.8 compares sources of household income in Shetland with the Western Isles and Scotland.

Table 4.8 Sources of household income, Shetland, Western Isles, and Scotland

	Shetland, 2003, %	Western Isles, 2003, %	Scotland, 2003/04, %
Wages and salaries	68	70	65
Self employment	14	8	8
Investments	5	1	2
Pensions	11	14	13
Social security benefits and other	2	7	12
Total	100	100	100

Sources: Shetland: Face-to-face household survey
Western Isles: Roberts, D. (2005) The Western Isles Regional Accounts 2003, University of Aberdeen
Scotland: Office of National Statistics, Family Resources Survey 2003-04

Note: Percentages may not sum to exactly 100% due to rounding

Households in Shetland have a slightly higher reliance on wages and salaries than Scotland as a whole (and slightly less reliance than households in the Western Isles). The pattern of other sources of income is distinctly different from both the Western Isles and the Scottish average. Self employment income and income from investments are both more important in Shetland. Pensions make a slightly smaller contribution and social security benefits a much smaller contribution to the income of households in Shetland than is true in the Western Isles or Scotland as a whole.

Table 4.9 compares sources of household income in Shetland in 2003 with the corresponding figures for 1996/97

Table 4.9 Sources of household income, Shetland, 1996/97 and 2003

	Shetland, 1996/97, %	Shetland, 2003, %
Wages and salaries	70	68
Self employment	15	14
Investments	2	5
Pensions	8	11
Social security benefits and other	4	2
Total	100	100

Sources: Face-to-face household survey; Gillespie et al (1999)
Note: Percentages may not sum to exactly 100% due to rounding

There appears to have been a slight reduction in the proportion of household income derived from wages and salaries and from social security benefits and a slight increase in the relative importance of income from investments and from pensions.

4.3.2 Household expenditure

The main source of data on household expenditure is the household postal survey. Table 4.10 shows mean expenditure for 26 different categories of household expenditure, totalling £1203.77 per month or £14,455 per annum.

Table 4.10 Mean monthly household expenditure

Food, drink and tobacco	£271.04
Heating, fuel and light	£88.96
Newspapers, magazines and stationary	£13.87
Donations to charity	£15.85
Petrol, diesel, motor oil	£92.27
Other non durable goods	£26.95
Public transport in Shetland	£8.68
Personal care	£24.78
Telephone, fax and internet	£43.02
Post	£7.52
Household maintenance	£17.95
TV, entertainment and recreation	£43.08
Professional services	£10.49
Other services	£13.49
Furniture	£29.81
Electrical and electronic equipment	£24.71
Cars	£114.19
Clothing and footwear	£48.91
Other	£20.47
Vehicle costs (service, insurance, tax)	£57.29
Housing costs	£99.79
Other insurance	£26.79
Holidays	£78.59
Health	£7.57
Education	£9.55
Other services	£8.15
Total	£1203.77

In 17 of the 26 categories, households with children spend most. Households without children spend most in seven categories. Retiree households spend most in just two categories: donations to charity and household maintenance. Most categories of expenditure display continuous income gradients, in other words household expenditure rises steadily as income rises.

4.3.3 Spatial patterns of household expenditure

The data derived from the household postal survey permit analysis of two aspects of the spatial distribution of household expenditure. One relates to whether expenditure is in Shetland, outside Shetland, by mail order or by the Internet. The other concerns the pattern of expenditure in the different areas of the Shetland islands.

To focus upon the growing importance of Internet shopping in Shetland, we concentrate upon larger expenditure items. Table 4.11 shows the pattern of spending in and outside Shetland, by mail order and by the Internet, for five larger expenditure items.

Table 4.11 Household spending in and outside Shetland, by mail order and by the Internet

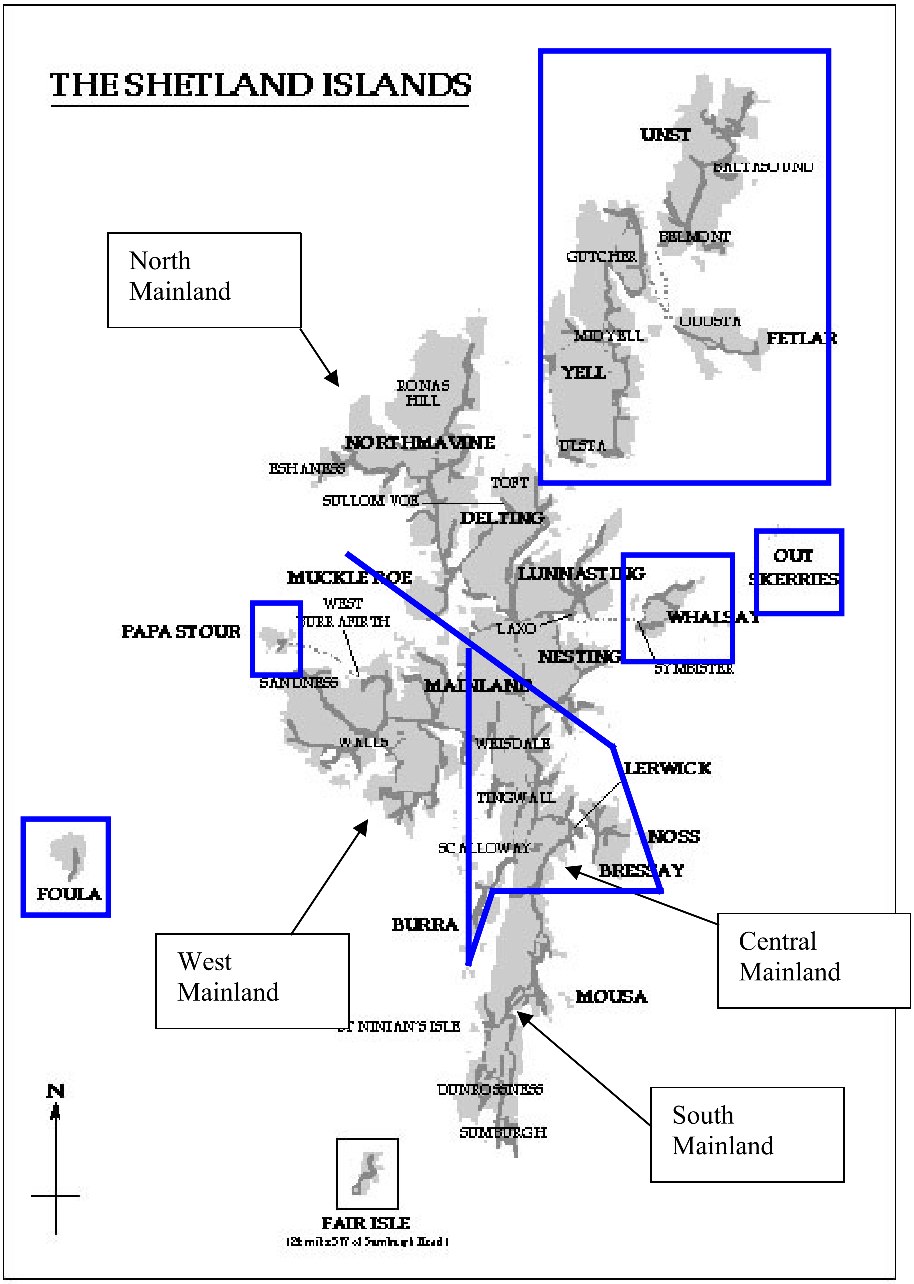
	Furniture, %	Electrical equipment, %	Cars and other vehicles, %	Clothing and footwear, %	Other products, %
In Shetland	49	47	55	27	47
Outside Shetland	34	23	45	41	26
By mail order	13	6	0	23	11
By internet	4	24	0	10	16

Internet shopping is most important in the purchase of electrical and electronic equipment although the combination of mail order and Internet expenditure is higher still for clothing and footwear. The only category of expenditure in which more than half of spending is in Shetland is on cars (and other vehicles).

Not surprisingly, retiree households are more likely to purchase larger expenditure items in Shetland and less likely to use the Internet. Similarly, low income households are more likely to spend in Shetland and less likely to use the Internet. As elsewhere in the UK and globally, there is evidence of a "digital divide" in Shetland.

In a modest attempt to push forward best practice in this type of local economic study, the household surveys asked where within the Shetland islands households made their purchases. Figure 4.1 reproduces the map which respondents were shown.

Figure 4.1 Map of Shetland islands, showing division into five areas



Non Mainland (in boxes): Unst, Yell, Fetlar, Outer Skerries, Whalsay, Papa Stour, Foula, Fair Isle

Table 4.12 shows the unweighted average distribution of household spending in the five areas across the five areas, unweighted in the sense that it makes no allowance for the amount of expenditure by different households. Reading down the columns of Table 4.12 indicates where households in each area made their expenditure.

Table 4.12 Distribution of household spending across five areas of the Shetland islands

	North Mainland	Central Mainland	West Mainland	South Mainland	Non Mainland
North Mainland	27%	1%	3%	1%	2%
Central Mainland	68%	94%	78%	76%	42%
West Mainland	2%	1%	16%	2%	1%
South Mainland	2%	2%	1%	19%	1%
Non Mainland	2%	1%	0%	1%	53%

Note: column totals may not add to 100% due to rounding.

Table 4.12 shows very clearly the dominance of Lerwick, in Central Mainland, as a shopping centre for the whole of Shetland. More than half of expenditure by households on the Non Mainland islands is made locally but this is presumably because of the greater difficulty and cost of travel to Lerwick. Only in the North, of any of the areas of the Mainland, is there anything approaching a rival concentration of shopping to Lerwick.

4.4 The Shetland balance of payments

Although Shetland is a region within a country, it is meaningful – and indeed important – to talk about its trade, its exports and imports, and its balance of payments.

If a region exports less than it imports, whether to and from other regions of the same country or to and from foreign countries, there is no currency crisis but there is a hidden balance of payments problem of how to continue paying for imports. These may be partly financed by an inflow of state benefits and partly by drawing upon savings (the equivalent for a region of foreign exchange reserves). However, devaluation is not a possibility and in the long run there will be contractionary multiplier effects on regional income and employment. While cash outflows in the form of import spending exceed cash inflows in the form of export revenues, income and employment will fall until balance is restored.

Two different types of export income and import expenditure can be identified from the SAM: exports and imports of goods and services by Shetland residents and tourist expenditure.

4.4.1 Trade

The estimated value of exports from Shetland in 2003 was £226 million, £51 million in exports to the rest of Scotland, £109 million in exports to the rest of the UK and £66 million in exports to the rest of the world. The estimated value of imports to Shetland in 2003 was £313 million, £222 million in imports from the rest of Scotland, £66 million in imports from the rest of the UK and £24 million in imports from the rest of the world. This means a trade deficit of £87 million.

In 1996/97, exports were £201 million and imports £256 million, a trade deficit of £55 million. Adjusting by the GDP deflator, exports in 1996/97 were equivalent to £238 million in 2003/04 prices, implying a decline of 5.0% in real terms. Imports in 1996/97 were equivalent to £303 million in 2003/04 prices, implying growth in real terms of 3.3%. Adjusted by the GDP deflator, the trade deficit was equivalent to £65 million in 2003/04 prices, implying an increase of 34% in real terms between 1996/97 and 2003.

The previous study did not identify the source of imports – whether the rest of Scotland, the rest of the UK, or the rest of the world – so any changes in the pattern of where Shetland imports goods and services from are not known.

We can highlight shifts in the pattern of destination of exports. From 1996/97 to 2003, the proportion of Shetland exports to the rest of Scotland was almost unchanged: 24% in 1996/97 and 23% in 2003. However, the importance of exports to the rest of the UK declined, from 51% of the total to 48%, while the proportion of exports to the rest of the world increased from 25% to 29%. These are not dramatic changes but they are significant. The reasons for the shifts in export markets are not completely clear but the reduced (relative) importance of oil exports to the rest of the UK is at least one relevant factor.

We turn next to the role of different sectors in Shetland's trade. Table 4.13 shows sectoral, other final demand and household contributions to the trade balance. On this occasion, the business sectors are ranked in order of their trade balance (from largest positive to largest negative balance). There are three sectors which have a large positive trade balance: fish processing, the oil terminal, and aquaculture (despite importing more than any other business sector). The five fisheries and oil sectors (fishing, fish farming, fish processing, oil terminal, and oil supply services) between them account for 92% of total Shetland exports.

The majority of business sectors have comparatively small positive or negative trade balances. Five sectors – health, financial services, construction, land transport, and public administration – have large negative trade balances, of over £10 million. Other final demand categories (Gross Domestic Fixed Capital Formation and tourism) also have a large trade deficit. However, not surprisingly, by far the largest source of imports and contributor to Shetland's trade deficit is household expenditure.

Table 4.13 Sectoral, other final demand and household contributions to exports, imports and the trade balance

Sector	Exports, £ million	%	Imports, £ million	%	Trade balance, £ million
Fish processing	53.2	23.6	2.6	0.8	+50.6
Oil terminal	56.8	25.2	6.5	2.1	+50.3
Aquaculture	79.5	35.3	38.4	12.3	+41.1
Fish catching	12.7	5.6	6.5	2.1	+6.2
Oil supply services	4.6	2.0	0.4	0.1	+4.2
Textiles and crafts	2.1	0.9	0.6	0.2	+1.5
Agriculture	2.7	1.2	2.0	0.6	+0.7
Ports and harbours	1.3	0.6	0.7	0.2	+0.6
Wholesale	0	0	0.0	0.0	0.0
Retail	0	0	0.0	0.0	0.0
Other food and drink processing	0	0	0.1	0.0	-0.1
College education	0.1	0.0	0.2	0.1	-0.1
Social work	0	0	0.1	0.0	-0.1
Marine engineering	1.1	0.5	1.3	0.4	-0.2
Communications	0	0	0.3	0.1	-0.3
Accommodation	0	0	0.4	0.1	-0.4
Other manufacturing	0.1	0.0	0.6	0.2	-0.5
Catering	0	0	0.5	0.2	-0.5
IT/computer, real estate	0.0	0.0	0.5	0.2	-0.5
Technical, professional, other	0	0	0.5	0.2	-0.5
Mining and quarrying	0	0	1.2	0.4	-1.2
Electricity, gas and water	0	0	2.2	0.7	-2.2
Other personal services	0	0	3.3	1.1	-3.3
Sea transport	0	0	3.7	1.2	-3.7
Air transport	0	0	4.8	1.5	-4.8
School education	0	0	5.7	1.8	-5.7
Health	0	0	12.3	3.9	-12.3
Financial	8.0	3.6	23.2	7.4	-15.2
Construction	3.1	1.4	18.4	5.9	-15.3
Land transport	0	0	15.9	5.1	-15.9
Public administration	0	0	18.1	5.8	-18.1
Other final demand	0	0	15.0	4.8	-15.0
Households	0	0	126.7	40.5	-126.7
Total	225.3	100	312.7	100	-87.4

Note: percentages may not exactly total to 100% due to rounding.

Table 4.14 shows how sectoral, other final demand and household contributions to the trade balance have changed between 1996/97 and in 2003 although the earlier qualification that changes in industrial classification methods prevent a completely accurate comparison of the two years should be borne in mind again.

Examining the columns which show the relative contributions to the trade balance, the sectors which have shown a marked improvement (in the form of a reduced deficit) are construction, other final demand, and households. Fish farming has shown a smaller improvement, in this case in the form of an increased surplus.

Four sectors – the oil terminal, transport, public administration, and health – have shown a marked deterioration in their relative contributions to the trade balance, either in the form of a reduced surplus or an increased deficit. Two sectors – agriculture, and business and other professional services – have shown a smaller deterioration.

4.4.2 Tourist expenditure

The total value of tourism in 2003 was £13.0 million but the import content of this was £4.0 million, signifying a net trade balance of £9.0 million.

In 1996/97, the value of tourism was £9.2 million. In the previous study, the import content of tourism was not separately identified and thus the net trade balance cannot be derived. Adjusting by the GDP deflator, the value of tourism in 1996/97 was equivalent to £10.9 million in 2003/04 prices, implying growth in real terms of 19%.

Table 4.14 Sectoral, other final demand and household contributions to the trade balance, 1996/97 and 2003

Sectors, 1996/97	Sectors, 2003	Trade balance, 1996/97, £ million	Trade balance, 1996/97, %	Trade balance, 2003, £ million	Trade balance, 2003, %
Agriculture	1. Agriculture	+7.6	+14	+0.7	+1
Fishing	2. Fish catching	+8.6	+15	+6.2	+7
Fish farming	3. Aquaculture	+18.9	+34	+41.1	+47
Oil terminal	4. Oil Terminal	+49.9	+90	+50.3	+58
Electricity and water	11. Electricity, gas and water	-5.4	-10	-2.2	-3
Quarries	5. Mining and quarrying	-1.8	-3	-1.2	-1
Marine engineering	8. Marine engineering	+2.4	+4	-0.2	-0
Fish processing	6. Fish processing	+27.8	+50	+50.6	+58
Knitwear	9. Textiles and crafts	+2.8	+5	+1.5	+2
Other manufacture	7. Other food and drink 10. Other manufacturing	-0.2	-0	-0.6	-1
Construction	12. Construction	-26.9	-48	-15.3	-18
Distribution	13. Wholesale 14. Retail	-0.9	-2	0.0	0
Hotels and catering	15. Accommodation 16. Catering	-1.2	-2	-0.9	-1
Transport	18. Sea transport 19. Land transport 20. Air transport	+2.9	+5	-24.4	-28
Ports and harbours	17. Ports and harbours	+1.2	+2	+0.6	+1
Oil supply base	21. Oil supply services	+7.3	+13	+4.2	+5
Communications	22. Communications	-0.5	-1	-0.3	-0
Business services Other professional services	23. Financial 24. IT/computer, real estate 25. Technical, professional, other	-3.5	-6	-16.2	-19
Public administration	26. Public administration	0.0	0	-18.1	-21
School education	27. School education	-7.9	-14	-5.7	-7
College education	28. College education	-0.3	-1	-0.1	-0
Health	29. Health	-1.8	-3	-12.3	-14
Other services	30. Social work 31. Other personal services	-1.9	-3	-3.4	-4
Other final demand	Other final demand	-42.3	-77	-15.0	-17
Households	Households	-90.5	-162	-126.7	-145
Total	Total	-55.7	-100	-87.4	-100

4.5 The Exchequer balance

The construction of a full Social Accounting Matrix in this study makes the calculation of Shetland's Exchequer balance much easier – and more accurate – than in the previous study.

The Exchequer balance is the difference between government revenue raised from businesses and households in Shetland and government expenditure on businesses and households in Shetland. "Government" is defined to include all arms of government which in this case means the sum of central government and Shetland Islands Council. Central government transfers to Shetland Islands Council (principally consisting of Revenue Support Grant), which amount to £58 million, are both a source of revenue and an item of expenditure. The appropriate way to deal with such transfers within "government" as just defined is to either exclude them from both revenue and expenditure or to include them in both. Either way, the entries under revenue and expenditure cancel each other out and make no difference to the Exchequer balance. We have counted central government transfers to SIC under both revenue and expenditure in order to maximise comparability with the previous study which did the same.

Total government revenue raised in Shetland in 2003 was £200 million. Local government revenue totalled £71 million, £7 million raised from households as Council Tax, £6 million raised from business as business rates and £58 million received from central government, as just discussed. Direct taxes, such as income tax, raised £54 million from households. Indirect taxes, such as VAT, raised £37 million from business, households and tourists. Employers' National Insurance contributions raised £36 million. Finally capital account transactions raised £2 million.

Total government expenditure in Shetland in 2003 was £136 million, including the transfer to Shetland Islands Council of £58 million. The remaining £78 million is made up of £52 million business expenditure in the form of subsidies, for example to agriculture and air transport, and direct financing, notably of health care. Government transfers to households, in the form of pensions and social security payments, make up £26 million.

We estimate that Shetland businesses and households made a net contribution of £64 million to central government in 2003. This compares with a net contribution of £10 million in 1996/97, the difference between government revenue of £101 million and expenditure of £91 million. However, a different method of calculation was employed in the previous study. Specifically, it did not directly identify income and expenditure taxes collected from businesses and households in Shetland. Rather, receipts from these taxes were estimated on the basis of secondary data.

Government expenditure in Shetland increased significantly between 1996/97 and 2003, by over a third. The main contributory factors were an increase of more than 150% in health spending and a more than doubling in government transfers to households.

Government revenue raised in Shetland appears to increase dramatically, indeed almost to double, between 1996/97 and 2003. We cannot be certain but we would largely attribute this apparent large increase in government revenue (and as a consequence the net contribution of Shetland to central government) to the change in the method of estimating government revenue. Government revenue raised in Shetland was probably underestimated in 1996/97. Certainly, a sharp increase in revenue from income and expenditure taxes does not appear consistent with the fall in Shetland GRDP per capita compared to other areas of the country, the increase in pension and social security transfers, and other evidence that the Shetland economy has performed relatively poorly in recent years.

5 MULTIPLIER ANALYSIS

5.1 Introduction

This chapter reports various multipliers which can be produced from simple manipulation of the SAM. Essentially, these multipliers measure how the Shetland economy would behave in response to external “impacts” according to several assumptions. In particular it is assumed that there is no change in the technologies used by production sectors from that observed in the base year, 2003, there are no supply-side constraints (such as a lack of production capacity or lack of employees to fill new posts), and there are no changes to household consumption patterns or sources of income.

Five different types of multipliers are presented:

Type 1 input-output multipliers, which measure the effect of a change in final demand (e.g. an increase in export demand) for one sector on the output of the whole economy, taking into account the indirect effects of inter-sectoral purchases of input goods and services (but not the induced effects of spending by households).

SAM output multipliers, which are similar to type 1 multipliers except that they also take into account the distribution of income and the induced effects of the spending behaviour of local households as more (or less) income is available as a result of the initial injections.

SAM household multipliers, which measure the total effect of a unit change in income of a particular household type on the incomes of all households in the economy.

Employment effects, which measure the amount of employment generated in the whole economy as a result of a unit increase in demand for output from a particular sector.

Employment multipliers, which measure the total number of jobs created in the economy as a result of an increase of employment in one sector.

The multiplier analysis is useful for identifying the extent to which different sectors and households have the potential to generate income and employment in the economy as a whole. The chapter concludes by considering the extent to which the economy is dependent on different types of final demand – local government demand, central government demand, Gross Fixed Capital Formation and exports. Where appropriate, the multipliers and results of the final market analysis are contrasted with those found in the previous 1996/97 Shetland study.

5.2 Sectoral analysis (type 1 and SAM multipliers)

Two types of "output" multipliers are shown in Table 5.1. The first, "type 1 input-output" multipliers show the total change in the value of output in the economy due to a unit increase in final demand for a particular sector's output. Since only the industry accounts are treated as endogenous in this case, i.e. the behaviour of households are treated as exogenous and independent of industrial activity levels, these multipliers include direct effects (upon the particular industries concerned) and indirect effects (multiplier effects through other industries) but not induced effects (the multiplier effects of household spending).

The largest type 1 multiplier in the Shetland economy in 2003 relates to the agriculture sector with a value of 1.855. This suggests a £1000 increase in demand for agricultural output from Shetland is estimated to generate an additional £855 in the output of all sectors of the local economy, as agricultural businesses increase their demand for inputs and services in the local economy. A decline of £1000 in the value of demand for agricultural output would have an equally large but negative effect on the Shetland economy. The results thus demonstrate the still important role of agriculture in Shetland. Although the sector may have declined in relative and absolute size, fluctuations in demand for agricultural output have unusually large effects on the local economy.

Table 5.1 Type 1 input-output and SAM output multipliers, 2003

		Type 1	Rank	SAM	Rank
1	Agriculture	1.855	1	2.135	1
2	Fish catching	1.159	24	1.485	20
3	Aquaculture	1.348	11	1.527	15
4	Oil terminal	1.377	9	1.655	11
5	Mining and quarrying	1.172	23	1.511	19
6	Fish processing	1.807	2	2.133	2
7	Other food and drink	1.765	3	2.061	4
8	Marine engineering	1.063	27	1.406	26
9	Textiles and crafts	1.280	16	1.576	14
10	Other manufacturing	1.092	26	1.392	28
11	Electricity, gas and water	1.281	15	1.517	16
12	Construction	1.266	17	1.516	18
13	Wholesale	1.035	30	1.440	23
14	Retail	1.222	20	1.618	12
15	Accommodation	1.481	7	1.808	6
16	Catering	1.057	28	1.388	29
17	Ports and harbours	1.339	13	1.711	9
18	Sea transport	1.356	10	1.483	21
19	Land transport	1.260	18	1.393	27
20	Air transport	1.118	25	1.342	30
21	Oil supply services	1.345	12	1.679	10
22	Communications	1.743	4	2.070	3
23	Financial	1.049	29	1.201	31
24	IT/computer, real estate	1.488	6	1.751	8
25	Technical, professional, other	1.448	8	1.784	7
26	Public administration	1.258	19	1.480	22
27	School education	1.309	14	1.605	13
28	College education	1.530	5	1.861	5
29	Health	1.203	22	1.439	24
30	Social work	1.012	31	1.415	25
31	Other personal services	1.204	21	1.516	17

The next largest multipliers are possessed by fish processing (1.807), other food and drink processing (1.765), communications (1.743) and college education (1.530). As shown in Table 5.2, three of these sectors were also found to have the highest type 1 multipliers in the previous input-output study.

Table 5.2 Comparison of sectors with largest multipliers, 2003 and 1996/97 (in descending order)

Type 1 multipliers	
2003	1996/97
1. Agriculture	1. Agriculture
2. Fish processing	2. Fish processing
3. Other food and drink processing	3. Communications
4. Communications	4. Other manufacture
5. College Education	5. Oil terminal

In general, the type 1 multipliers are all fairly low as expected, given the open nature of the Shetland economy. The lowest four type 1 multipliers all relate to service sectors (Social work, Wholesale, Financial services, and Catering) reflecting the fact that such activities require few (local) material inputs.

SAM output multipliers are defined similarly to the open input-output multipliers above except that households are now treated as endogenous to the system. Thus, the SAM multiplier effects allow for induced feedbacks as spending of additional earned income occurs.

The second column of multipliers in Table 5.1 shows the values of these SAM multipliers. Again, agriculture has the largest multiplier value, 2.135. In other words, a £1000 increase in demand for agricultural output is estimated to generate an additional £1135 in the output of all sectors of the local economy. In the case of the SAM model, this comes about partly as a result of increased demand for inputs and services in the Shetland economy and partly because some of the extra wages, salaries and profits of those working in all sectors affected is spent within the region.

The lowest SAM multiplier value belongs to financial services at 1.201. Some of the other service sectors (e.g. social work, wholesale) perform relatively better when SAM multipliers are considered rather than input-output multipliers because the re-spending by households whose incomes come mainly from these sectors helps to generate additional output effects over and above those relating to inter-industry dependencies.

5.3 Household multipliers

The SAM household multipliers shown in Table 5.3 measure the total effect of a unit change in income of a particular household group (rather than a change in demand for sectoral output as in the previous section) on the incomes of all households in the local economy. This effect might be brought about by, for example, a change in the income tax regime or a change in value of transfer earnings (social security payments, pensions, etc.) from outside the region. One interpretation of these multipliers is that they measure the "trickle-down" effect of changed income or wealth in one group on society as a whole.

Table 5.3 indicates that retiree households in Shetland have the greatest potential for generating increases in total household income. For this group, a £1000 expenditure injection (due, for example, to decreased direct taxation or increased pensions) would result in an additional £299 increase in total Shetland household income. This £299 increase mainly accrues to households with no children and, to a lesser extent, households with children. Even though neither of these latter household types benefit directly from the injection, they benefit through the economic activity stimulated by the injection.

Table 5.3 SAM household multipliers, Shetland, 2003

	Injection to:		
	Households no children	Households with children	Retiree Households
Households, no children	1.128	0.099	0.162
Households with children	0.105	1.081	0.134
Retiree households	0.002	0.002	1.003
Total multiplier	1.235	1.181	1.299

5.4 Employment effects and employment multipliers

The employment effects arising from a policy change or stimulus to an economy are often considered critical. Table 5.4 presents various measures associated with employment. The first column of figures, **employment coefficients**, measure the amount of employment (measured in full time equivalents, FTEs) required per unit of output of each sector. As shown, the highest value is for catering, with 58 FTE jobs required to increase "output" of catering by £1 million. After catering, the highest employment coefficients are for other manufacturing and then textiles.

Perhaps more interestingly, **employment effects** measure the amount of employment generated in the whole economy as a result of a unit increase in demand for output from a particular sector. These exceed the values of the employment coefficients, since inter-industry links are taken into account. For example, fish catching has an employment effect of 16, indicating that a £1 million increase in final demand for sea fish output leads to 16 additional FTE jobs in Shetland, some of which will be in the fish catching sector, others elsewhere in the economy. Arguably, employment effects are the most useful measures from a policy perspective in assessing the potential of a sector to generate knock-on benefits in the economy as a whole.

Employment multipliers measure the increase in total employment resulting from a unit increase in employment in one particular sector. The final columns of Table 5.4 show that the highest values, with over 2.5 FTE jobs generated for every one in the initial sector, are shown by sea transport, aquaculture, and fish processing. However, all these sectors have quite low employment coefficients and therefore it follows that, for a whole extra job to be created in these sectors, the boost to the economy has to be significant.

Table 5.4 Employment coefficients, effects and multipliers, Shetland, 2003

		Employ-ment coefficients	Rank	Employ-ment effects	Rank	Employ-ment multipliers	Rank
1	Agriculture	16	16	33	8	2.078	6
2	Fish catching	9	25	16	25	1.933	9
3	Aquaculture	4	29	12	29	2.981	2
4	Oil terminal	6	28	16	26	2.753	4
5	Mining and quarrying	8	26	16	27	2.070	7
6	Fish processing	7	27	19	23	2.851	3
7	Other food and drink processing	33	5	49	5	1.479	19
8	Marine engineering	18	13	25	17	1.378	25
9	Textiles and crafts	41	3	52	3	1.278	29
10	Other manufacturing	55	2	62	2	1.117	30
11	Electricity, gas and water	14	20	21	21	1.561	16
12	Construction	15	17	22	20	1.461	21
13	Wholesale	24	7	31	10	1.302	27
14	Retail	24	8	35	7	1.476	20
15	Accommodation	39	4	50	4	1.303	26
16	Catering	58	1	64	1	1.106	31
17	Ports and harbours	14	19	25	18	1.721	13
18	Sea transport	3	31	9	30	3.591	1
19	Land transport	9	23	17	24	1.900	10
20	Air transport	9	24	15	28	1.720	14
21	Oil supply services	15	18	25	16	1.728	12
22	Communications	16	15	33	9	2.000	8
23	Finance	3	30	6	31	2.362	5
24	IT/computer, real estate	13	21	23	19	1.766	11
25	Technical, professional, other	17	14	28	14	1.647	15
26	Public administration	21	10	29	13	1.382	24
27	School education	20	11	30	11	1.454	22
28	College Education	28	6	44	6	1.553	17
29	Health	13	22	20	22	1.545	18
30	Social work	23	9	29	12	1.292	28
31	Other personal services	19	12	27	15	1.439	23

Occupation-employment effects are like employment effects except that they indicate the type of employment resulting from a stimulus to the economy rather than simply the total number of jobs created. The values are shown in Table 5.5. To improve presentation, rather than injections of £1000, the employment arising from a £1million increase in final demand is considered. The totals for each sector in Table 5.5 are shown to be equivalent to the values in the employment effects column of Table 5.4. For example, reading across the top row of Table 5.5 indicates that of the 33 jobs created from a £1 million increase in final demand for agricultural output, 2.24 would be classified as managerial, 3.33 as professional, 15.41 as skilled trades, and so on.

Table 5.5 Occupation-employment effects, Shetland, 2003 (expressed per £'000,000 change in final demand)

	Managers and Senior Officials	Professionals	Associate Professional and Technical	Administrative and Secretarial	Skilled Trades	Personal Service	Sales and Customer Services	Process, Plant and Machine Operatives	Elementary	Total
1 Agriculture	2.237	3.330	0.726	2.771	15.414	0.708	1.720	2.205	4.387	33.497
2 Fish catching	0.914	0.581	0.420	0.662	5.560	0.363	0.691	2.076	5.210	16.477
3 Aquaculture	0.883	0.859	0.673	0.748	3.679	0.448	0.700	0.868	3.322	12.179
4 Oil Terminal	1.413	1.345	1.902	1.082	3.447	0.986	1.333	3.925	0.860	16.293
5 Mining and quarrying	2.221	0.530	0.614	0.634	3.038	0.446	0.909	6.536	0.644	15.571
6 Fish processing	1.698	0.743	0.553	1.114	3.748	0.397	1.412	2.301	7.507	19.474
7 Other food and drink processing	3.304	2.049	0.889	3.310	12.783	0.460	3.652	5.188	16.982	48.617
8 Marine engineering	0.960	0.639	0.499	1.376	18.616	0.437	0.695	1.229	0.562	25.012
9 Textiles and crafts	2.291	0.773	0.497	1.249	8.847	0.637	3.937	12.685	21.025	51.941
10 Other manufacturing	3.179	0.425	0.412	0.496	6.972	0.312	0.797	48.862	0.475	61.931
11 Electricity, gas and water supply	2.726	0.781	1.020	1.501	7.948	0.427	0.959	5.300	0.637	21.298
12 Construction	1.770	0.954	0.898	1.000	8.415	0.518	0.607	5.109	2.367	21.639
13 Wholesale	4.965	0.568	1.287	1.176	10.926	0.524	7.024	3.374	1.299	31.143
14 Retail	5.395	0.708	1.618	1.585	9.657	1.144	9.168	4.256	1.771	35.301
15 Accommodation	3.751	2.122	0.569	4.527	9.720	20.298	2.185	1.138	6.007	50.316
16 Catering	7.316	0.498	3.675	4.720	29.197	8.512	1.029	0.868	8.329	64.145
17 Ports and harbours	2.866	1.752	1.972	2.942	3.829	3.496	1.448	3.747	2.804	24.857
18 Sea transport	1.254	0.427	0.763	1.540	1.350	0.791	1.444	0.924	0.653	9.147
19 Land transport	2.199	0.384	0.598	1.423	3.478	2.328	1.872	3.100	1.655	17.038
20 Air transport	1.429	4.985	0.366	0.822	1.992	2.212	1.936	0.755	0.489	14.987
21 Oil supply services	4.378	0.719	1.328	1.817	3.510	1.364	0.816	9.960	1.183	25.075
22 Communications	3.698	6.957	2.006	7.370	4.689	3.072	0.918	1.173	3.032	32.916
23 Financial services	1.013	0.267	0.836	1.513	0.864	0.301	0.478	0.853	0.321	6.445
24 IT/computer, real estate	3.353	2.815	3.002	3.930	5.042	0.428	0.654	0.976	3.270	23.469
25 Technical, professional	2.734	10.459	0.618	6.443	3.940	0.484	1.163	1.114	0.665	27.621
26 Public administration	3.233	2.474	8.237	5.159	3.115	1.896	0.753	1.918	2.090	28.875
27 School education	3.319	6.588	6.883	3.335	2.491	1.983	0.769	1.485	2.781	29.633
28 College education	4.654	9.922	9.212	5.135	3.894	2.861	1.692	2.333	3.846	43.548
29 Health	2.713	3.437	3.946	2.627	1.555	1.942	0.664	0.871	1.764	19.520
30 Social work	1.841	2.424	5.386	3.179	3.820	7.429	1.111	1.974	2.005	29.171
31 Other personal services	2.388	1.372	6.964	2.035	4.519	3.428	1.377	2.874	2.166	27.123

5.5 Final market analysis

Economic activity within Shetland is stimulated by sales of goods and services to so-called "final demand categories" and/or flows of transfer income into the region. Within the SAM model, the sources of final demand and income flows are: local government; central government; sales which add to capital stocks (GFCF); sales to tourists; and finally exports to other regions (the rest of Scotland, the rest of the UK and the rest of the world). Using standard multiplier techniques, it is possible to assess the relative importance of each of these different sources in terms of generating local economic activity.

Table 5.6 indicates the extent to which each source stimulated output, factor income and employment in Shetland in 2003. The totals presented in the table are consistent with those in the SAM. The results indicate the importance of export markets for the economy. Taking into account the various inter-sectoral and household linkages in the economy, the export market is responsible for generating 54% of the value of output produced in the economy, 50% of total factor income and 40% of employment in the economy. The second most important stimulus in terms of output, income and employment is local government expenditure.

Table 5.6 Source of Shetland economic activity by final market, 2003

	Output		Factor income		Employment	
	£'000	%	£'000	%	£'000	%
Local government	153242	21.7	82624	24.8	2876.2	31.6
Central government	97299	13.8	48150	14.4	1437.9	15.8
GFCF plus change in stocks	43605	6.2	21596	6.5	629.7	6.9
Tourist expenditure	14304	2.0	6847	2.1	298.1	3.3
Exports	383240	54.3	167070	50.1	3652.0	40.1
Household transfer income*	14014	2.0	7115	2.1	215.6	2.4
Total	705703	100.0	333403	100.0	9109.4	100.0

* private transfer income i.e. excluding transfer income from central government

Note: figures may not exactly add to totals due to rounding

The 1996/97 study presented a similar analysis of the importance of different final markets for the Shetland economy and Table 5.7 compares the results from the earlier study to those shown above. Although the figures should be interpreted with some caution due to differences in sectoral classifications and the structure of accounts, Table 5.7 indicates that dependence of the economy on local and central government expenditure has increased since 1996/97 while dependence on exports has remained roughly constant in output terms but declined in terms of employment. The figures which are most different between the two years are those relating to factor income. This is due to the fact that in the 1996/97 study, only labour income of households was treated as endogenous within the system whereas in the 2003 SAM other factor income (gross profits, self employment income, etc) are also treated as endogenous.

Table 5.7 Comparison of importance of different final markets: 1996/97 and 2003

	Output (%)		Factor income (%)		Employment (%)	
	1996/97	2003	1996/97	2003	1996/97	2003
Local government	21.3	21.7	21.6	24.8	26.0	31.6
Central government	8.6	13.8	13.7	14.4	9.1	15.8
GFCF plus change in stocks	9.0	6.2	7.8	6.5	7.5	6.9
Tourist expenditure	2.7	2	2.8	2.1	6.3	3.3
Exports	55.3	54.3	46.6	50.1	49.9	40.1
Household transfer income*	3.1	2	7.5	2.1	1.3	2.4
Total	100	100	100	100	100	100

* private transfer income i.e. excluding transfer income from central government

Note: figures may not exactly add to totals due to rounding.

Drawing on the occupation-employment effects presented earlier, it is possible to assess not only the total employment associated with each different final demand category but also the type of employment. Such analysis, known as “embodied skills analysis”, can be used to indicate the labour market implications of either an increase or decrease in sales to markets which are liable to fluctuate in accordance with the macroeconomic environment. Table 5.8 indicates the occupational content of sales to each final demand category.

Table 5.8 Embodied skills analysis of Shetland final demand, 2003 (FTEs)

	Local government		Central government		GFCF and stocks		Tourists		Exports		Household transfer income		Total	
	FTEs	%	FTEs	%	FTEs	%	FTEs	%	FTEs	%	FTEs	%	FTEs	%
1. Managers and Senior Officials	308	35.0	163	18.5	51	5.8	28	3.2	303	34.5	26	2.9	878.8	100
2. Professional Occupations	379	42.9	230	26.1	27	3.0	15	1.7	215	24.3	17	2.0	883.7	100
3. Associate Professional and Technical	692	60.4	187	16.3	25	2.2	10	0.8	219	19.1	13	1.2	1146.2	100
4. Administrative and Secretarial	413	46.7	170	19.2	29	3.2	25	2.8	229	25.8	19	2.2	884.3	100
5. Skilled Trades Occupations	303	16.5	265	14.5	249	13.6	65	3.5	897	48.9	54	3.0	1833.8	100
6. Personal Service Occupations	264	42.0	120	19.1	15	2.4	81	12.9	137	21.7	12	1.9	628.9	100
7. Sales and Customer Service	85	18.0	81	17.1	18	3.7	23	4.8	241	50.8	26	5.6	473.9	100
8. Process, Plant and Machine Operatives	193	18.5	94	9.0	150	14.4	19	1.8	556	53.4	30	2.8	1041.8	100
9. Elementary Occupations	237	17.7	128	9.6	66	5.0	33	2.5	856	63.9	18	1.3	1337.9	100
Total	2876	31.6	1438	15.8	630	6.9	298	3.3	3652	40.1	216	2.4	9109.4	100

Notes: percentages relate to each occupation type (i.e. should be read across the rows of the table).

Figures may not exactly add to totals due to rounding.

Differences in the type of employment associated with each market are noticeable. Whilst the production of exports is responsible (directly and indirectly) for the majority of skilled trades jobs (48.9%), sales and customer services occupations (50.8%), processing, plant and machine operatives (53.4%) and elementary occupations (63.9%), local government demand is most important in terms of generating professional and administrative employment in the Shetland economy. The most important contribution of Shetland tourism in terms of employment is the generation of jobs in the personal and service occupations category.

6 SCENARIOS

6.1 Introduction

We consider five scenarios (and “sub-scenarios”) of potential importance to the Shetland economy. One of these – reduced Shetland Islands Council spending – is an attempt to model an actual change already underway. However, the remainder are possible future developments which are intended to be at least fairly realistic. Again with the exception of the cut in SIC spending, there is no specific time horizon attached to any of the scenarios although we implicitly assume that these scenarios would take place in the relatively near future, perhaps over the next five years.

The five scenarios are described and analysed in turn in the following sections but in summary they are:

Fisheries: 15% growth in final demand for fish catching, 25% growth in final demand for aquaculture, and growth of 20% and of 40% in final demand for fish processing output;

Oil and decommissioning: decline in the value of oil output but matched by new oil related opportunities related to decommissioning;

Tourism: an increase in the total value of tourism of 100%;

Local government: reduced Shetland Islands Council spending; and

Households: an increase in the number of households but accompanied by increased household consumption expenditure on imported goods and services.

6.2.1 The fisheries scenarios

We constructed separate scenarios for each of the three fisheries sectors.

Fish catching: we assume significant growth of shellfish output reflecting good long run prospects of that sector, modest growth of pelagic output reflecting recent upward trends and no change in whitefish output reflecting doubts about quotas. Specifically, we assume growth of 15% in final demand for fish catching.

Aquaculture: despite short run problems, aquaculture has good long run prospects. We assume a 25% increase in final demand above 2003 levels.

Fish processing: there is potential for significant increases in fish processing output. We pursue two specific scenarios: a) that final demand for fish processing output increases by 20% to match the increase in demand for local fish; and b) fish processing final demand increases by a further 20% over and above the increase in a), reflecting a move up the value chain.

6.2.2 Effects of the fisheries scenarios

Table 6.1A shows the incremental effects on output, factor income and employment in Shetland of the fish catching, aquaculture and first (20%) fish processing scenarios, together with their combined effect. Table 6.1B shows the combined effect substituting the second (40%) fish processing scenario. The figures in brackets indicate the percentage change from the base year levels.

Table 6.1A Economy wide effects of fish scenarios (20% growth in final demand for fish processing)

Changes in:	Fish catching (+15%)		Aquaculture (+25%)		Fish processing (+20%)		Combined effect	
Value of output (£'000)	2828	(0.4)	29963	(4.2)	22745	(3.2)	55535	(7.9)
Factor income (£'000)	1812	(0.5)	10152	(3.0)	10158	(3.0)	22122	(6.6)
Employment (FTEs)	31	(0.3)	239	(2.6)	208	(2.3)	478	(5.2)

Table 6.1B Economy wide effects of fish scenarios (40% growth in final demand for fish processing)

Changes in:	Combined effect (with fish processing +40%)	
Value of output (£'000)	78280	(11.1)
Factor income (£'000)	32280	(9.7)
Employment (FTEs)	686	(7.5)

The assumed increases in fisheries demand have very significant effects: with a 20% increase in demand for fish processing, the combined effect is an additional £55 million of output, £22 million of factor income and nearly 500 full time equivalent jobs; with a 40% increase in demand for fish processing, the combined effect is an additional £78 million of output, £32 million of factor income and nearly 700 full time equivalent jobs. As can be seen, fish catching only contributes a small proportion of these gains in output, income and employment. Most of the increases stem from aquaculture and fish processing.

Table 6.2 shows how the 686 FTE jobs created under the combined impact summarised in Table 6.1B are distributed across the 31 sectors. As expected, the largest employment effects are in the three fisheries sectors directly affected but together they account for only 52% of the total. There is significant employment creation in other sectors: 39 full time equivalent jobs in Marine engineering, 73.5 FTEs in Retail, and 41 FTEs in Technical, professional, other services.

Table 6.2 Sectoral employment effects of the combined impact in Table 6.1B

Sector	Impact on employment (FTEs)	Change from 2003 level, %
1. Agriculture	1.8	0.9
2. Fish catching	89.2	29.1
3. Aquaculture	91.1	25.5
4. Oil terminal	0.0	0.0
5. Mining and quarrying	1.8	2.5
6. Fish processing	172.9	39.0
7. Other food and drink	3.7	7.7
8. Marine engineering	39.0	21.7
9. Textiles and crafts	5.9	4.6
10. Other manufacturing	11.6	8.0
11. Electricity, gas and water	7.7	8.7
12. Construction	21.3	2.4
13. Wholesale	7.6	6.6
14. Retail	73.5	8.1
15. Accommodation	9.3	3.2
16. Catering	9.9	6.3
17. Ports and harbours	4.0	1.2
18. Sea transport	1.1	7.2
19. Land transport	18.3	8.3
20. Air transport	5.6	5.5
21. Oil supply services	0.0	0.0
22. Communications	7.3	5.8
23. Financial	6.9	6.7
24. IT/computer, real estate	2.9	7.8
25. Technical, professional, other	41.0	7.8
26. Public administration	0.0	0.0
27. School education	0.0	0.0
28. College education	21.0	13.7
29. Health	0.8	0.2
30. Social work	1.5	0.4
31. Other personal services	29.1	9.1
Total	685.8	7.5

Note: figures may not exactly add to totals due to rounding

Table 6.3 shows how the same 686 FTE jobs are distributed across the 9 occupational categories. While employment is created in all occupational categories, the largest impacts are on elementary occupations and skilled trades. Together they account for 58% of the total.

Table 6.3 Occupational employment effects of the combined impact in Table 6.1B

	Impact on employment (FTEs)	Change from 2003 level, %
1. Managers and Senior Officials	55.3	6.3
2. Professional Occupations	33.8	3.8
3. Associate Prof. and Technical Occupations	25.8	2.2
4. Administrative and Secretarial Occupations	39.7	4.5
5. Skilled Trades Occupations	162.7	8.9
6. Personal Service Occupations	18.0	2.8
7. Sales and Customer Service Occupations	45.2	9.5
8. Process, Plant and Machine Operatives	70.1	6.7
9. Elementary Occupations	235.2	17.6
Total	685.8	7.5

Note: figures may not exactly add to totals due to rounding

6.3.1 The oil and decommissioning scenario

The value of output of the oil sector in Shetland has been declining for some years. Despite the recent rise in oil prices, which may result in increased North Sea activity, the future of the Sullom Voe Terminal is still probably one of managed decline.

We therefore assume that the decline in the value of oil output continues but at a slower rate than before and that new oil related opportunities arise with regard to decommissioning, such that overall output remains constant. Specifically, we assume a 15% fall in final demand for oil from the Sullom Voe Terminal and a 27.5% increase in final demand for marine engineering and construction. The objective of this scenario is to investigate the different sectoral linkages of the oil sector and the decommissioning industry.

6.3.2 Effects of the oil and decommissioning scenario

Table 6.4 shows the incremental effects on output, factor income and employment of a 15% fall in final demand for oil and a 27.5% increase in final demand for marine engineering and construction (the "decommissioning" sector). The figures in brackets indicate the percentage change from the base year levels.

Table 6.4 Economy wide effects of oil and decommissioning scenario

Changes in:	Oil (-15%)		"Decommissioning" (+27.5%)		Net effect	
Value of output (£'000)	-14153	(-2.0)	+14092	(+2.0)	-61	(-0.0)
Factor income (£'000)	-6946	(-2.1)	+7004	(+2.1)	58	(-0.0)
Employment (FTEs)	-139.3	(-1.5)	+203.2	(+2.2)	+63.9	(+0.7)

The net effect of this scenario, as shown in Table 6.4, is that the value of output is virtually unchanged but of course the changes in final demand were manipulated to this end. Factor income is also virtually unchanged but this result is coincidental. However, there is a net increase in employment despite output and factor income, aggregated across the oil and decommissioning sectors, not changing. The main explanation of this result is the differing labour intensities of the oil terminal, marine engineering and construction. From Table 5.4, we can see that the employment coefficient for the oil terminal is only 0.006. This means that for every £1 million reduction in output only 6 jobs are lost. The employment coefficients for marine engineering and construction are 0.018 and 0.015 respectively. For every £1 million increase in output of these two sectors, 18 and 15 jobs respectively are created.

6.4.1 The tourism scenario

The total value of tourism in 2003 was £13.0 million. Tourism has been gradually increasing in importance. In 1996/97, the value of tourism was £9.2 million or £10.9 million in 2003/04 prices, implying growth in real terms of 19%.

Despite the difficulties posed by Shetland's location, there is almost certainly considerable future potential for the expansion of tourism. Tourism contributed just 3.9% of Shetland Gross Regional Domestic Product in 2003 compared to 15.6% in the Western Isles in 2003 (Roberts, 2005). We therefore assume that the total value of tourism doubles.

6.4.2 Effects of the tourism scenario

Table 6.5 shows the effects on the Shetland economy of a doubling of tourism expenditure over 2003 levels. The figures in brackets indicate percentage changes from base year levels.

Table 6.5 Economy wide effects of a 100% increase in tourism expenditure

Changes in:	Tourism (+100%)
Value of output (£'000)	14304 (2.0)
Factor Income (£'000)	6847 (2.1)
Employment (FTEs)	298 (3.3)

These results suggest that even an extremely large, and probably quite unfeasible, increase in tourism expenditure would have significant but not dramatic effects on output, income and employment in Shetland, certainly much smaller impacts than under the (more realistic) fisheries scenarios.

6.5.1 The local government scenario

Shetland Islands Council is currently midway through a programme of seeking savings of £21 million from General Fund Revenue spending. We assume that it is successful in realising these savings and that they occur across different sectors proportionate to the distribution of SIC spending in 2003. The sectors concerned are: Public administration, School education, Social work, and Ports and harbours. Table 6.6 shows the distribution of these savings.

Table 6.6 Sectoral distribution of SIC spending cuts

	Share of SIC spending, 2003, %	Share of savings, £ million
Public administration	46.9	9.85
School education	33.9	7.12
Social work	10.6	2.23
Ports and harbours	8.6	1.81
Total	100	21.0

6.5.2 Effects of the local government scenario

Table 6.7 shows the effects of a £21 million reduction in Shetland Islands Council expenditure over 2003 levels. The figures in brackets indicate percentage changes from base year levels.

Table 6.7 Economy wide effects of a £21 million reduction in local government expenditure

Changes in:		
Value of output (£'000)	-32,243	(-4.6)
Factor Income (£'000)	-17,385	(-5.2)
Employment (FTEs)	-605	(-6.6)

As might be expected, such a large programme of SIC spending cuts has a significant effect on the Shetland economy. Output falls by £32 million, factor income by £17 million, and FTE employment by 605.

Table 6.8 shows how the 605 FTE jobs lost are distributed across the 31 sectors. Not surprisingly, the largest job losses – 72% of the total – are in the four sectors directly affected but there also significant impacts on employment in a number of other sectors such as Construction and Retail.

Table 6.8 Sectoral employment effects of the reduction in SIC expenditure

Sector	Impact on employment (FTEs)	Change from 2003 level, %
1. Agriculture	-1.4	-0.7
2. Fish catching	-0.9	-0.3
3. Aquaculture	-0.2	0.0
4. Oil terminal	0.0	0.0
5. Mining and quarrying	-3.0	-4.1
6. Fish processing	-0.6	-0.1
7. Other food and drink	-2.1	-4.4
8. Marine engineering	-1.1	-0.6
9. Textiles and crafts	-0.6	-0.4
10. Other manufacturing	-6.9	-4.8
11. Electricity, gas and water	-4.0	-4.5
12. Construction	-36.3	-4.1
13. Wholesale	-3.8	-3.2
14. Retail	-32.4	-3.6
15. Accommodation	-10.2	-3.5
16. Catering	-6.6	-4.2
17. Ports and harbours	-31.9	-9.8
18. Sea transport	-0.6	-3.9
19. Land transport	-10.2	-4.6
20. Air transport	-3.1	-3.1
21. Oil supply services	0.0	0.0
22. Communications	-7.7	-6.1
23. Financial	-2.6	-2.5
24. IT/computer, real estate	-1.4	-3.7
25. Technical, professional, other	-16.4	-3.1
26. Public administration	-205.8	-21.0
27. School education	-145.1	-21.0
28. College education	-2.3	-1.5
29. Health	-0.4	-0.1
30. Social work	-53.6	-15.6
31. Other personal services	-14.1	-4.4
Total	-605.2	-6.6

Note: figures may not exactly add to totals due to rounding

Table 6.9 shows how the 605 lost jobs are distributed across the 9 occupational categories. While jobs are lost in all occupational categories, three categories account for just over half the total: Associate professional and technical occupations (24% of the total), Administrative and secretarial occupations (14%) and Professional occupations (13%).

Table 6.9 Occupational employment effects of the reduction in SIC expenditure

	Impact on employment (FTEs)	Change from 2003 level, %
1. Managers and Senior Officials	-64.7	-7.4
2. Professional Occupations	-79.8	-9.0
3. Associate Prof. and Technical Occupations	-145.7	-12.7
4. Administrative and Secretarial Occupations	-86.9	-9.8
5. Skilled Trades Occupations	-63.8	-3.5
6. Personal Service Occupations	-55.6	-8.8
7. Sales and Customer Service Occupations	-18.0	-3.8
8. Process, Plant and Machine Operatives	-40.6	-3.9
9. Elementary Occupations	-49.9	-3.7
Total	-605.2	-6.6

Note: figures may not exactly add to totals due to rounding

6.6.1 The households scenario

The population of Shetland has been falling in recent years, from 23020 in 1996/97 to 21870 in 2003, a decline of 5%. However, despite this, the number of households actually increased, from 9036 in 1997 to 9201 in 2003, an increase of 1.8%.

We assume further growth in the number of households, by 2% (for all three household types). However, we also assume a continuation of the trend towards increased consumption expenditure on imported goods and services, due in part to increased Internet shopping. Import content is defined as import expenditure divided by the sum of household spending on good and services within Shetland plus expenditure taxes plus import expenditure. In particular we assume a 20% increase in the import content of expenditure for all three household types.

6.6.2 Effects of the households scenario

Table 6.10 shows the effects on the Shetland economy of, first, a 2% increase in the number of households in Shetland and, then, of this increase in the number of households coupled with a 20% increase in the import content of household expenditure. The figures in brackets indicate percentage changes from base year levels.

Table 6.10 Economy wide effects of an increase in the number of households and an increase in import content

Changes in:	2% increase in number of households		2% increase in number of households plus 20% increase in import content	
Value of output (£'000)	3347	(0.5)	1887	(0.3)
Factor income (£'000)	1713	(0.5)	965	(0.3)
Employment (FTEs)	53	(0.6)	30	(0.3)

As will be seen from Table 6.10, even without an increase in the import content of household expenditure, the economic benefits of an increase in the number of households are comparatively small. The percentage increases in output, factor income and employment are only half of one percent. Once the increase in import content is taken into account, these gains fall further, to one third of one percent.

7 POLICY ISSUES

7.1 Views expressed by business respondents

The final section of the questionnaire administered to business respondents sought to elicit views on a number of issues such as skills gaps, use of the Internet, opportunities for and threats to "your business", and opportunities for and threats to the Shetland economy.

Regarding skills gaps, difficulties in recruiting and retaining staff of the right quality were cited for a large number of categories. However, the only category mentioned frequently was skilled trades such as plumbers, welders and electricians while many respondents said they had no problems employing people and no skills shortages: "35-40 written applications for jobs". There was general satisfaction with available training opportunities. One respondent went further: "in the salmon industry, there is a high level of training available".

Various workforce problems were cited, several along the lines that people "have it too good". The low unemployment rate in Shetland was cited as a problem; one respondent felt that the recent economic downturn would not solve this since it may force young people to leave Shetland. Several respondents referred to Shetland Islands Council: "too many well paid council jobs"; "Council wages too high"; "Council workforce too high"; "company has lost many of their best personnel to the SIC".

Concerning use of the Internet, most respondents reported that use of email and the Internet had increased, often dramatically, and expect this trend to continue, specifically with increased use of broadband. Many respondents have created their own websites and several respondents aspire to full e-commerce over the next five years.

Various uses and advantages of the Internet (or IT more generally) were cited: use of computers for accounts and "doing the wages"; much more communication by email; a research tool and source of information; sourcing equipment and suppliers, tendering, sales; banking and travel arrangements; and data transfer. However, some respondents were more sceptical. A number of respondents do not have an internet connection or have one but do not use it. Of these, most do not see this situation changing in future. The reasons that were cited included perceived lack of relevance to their business, lack of computing skills, and problems of technical reliability.

Under “opportunities for your business”, most respondents identified positive business opportunities which were sometimes expressed in terms simply of business expansion or more exporting. However, a large number of specific examples were given: promotion of tourism, renewable energy, decommissioning, new music and cinema venue, niche or high value added products, islands games, diversification into new fish species, more stability in the fish catching regime allowing expansion of the fleet, new housing developments, new college courses, district heating schemes, extension of the runway at Sumburgh, more domestic and international flights, and cheaper plane fares.

Specific market opportunities which were cited included: more Scandinavian trade, the possibility of expanding into Orkney, starting sales throughout the UK on-line, the generation of sales growth outside Shetland, and possible opportunities in Iceland and the Faroes.

Most of the opportunities identified for the Shetland economy had already been mentioned as “opportunities for your business”, suggesting – perhaps quite understandably – that most respondents view the Shetland economy through the prism of their own business. However, a few additional points were raised: the new distillery, direct flights to Stansted and links with Smyril, better organisation of tourism with more eating opportunities, broadband making the possibility of working from home more realistic, promoting the Shetland flag, and giving Shetland more of an identity.

Respondents cited a number of general and specific threats to their own business: local competition but also increasingly global market competition, the decline of traditional markets, lack of development capital, over regulation (including the EU Working Time Directive), lack of skilled labour and escalating costs of training, high production costs, transport costs (especially higher freight rates with Northlink), direct sales from outside Shetland through the internet, shortage of central/local government contracts, further falls in the price of salmon, and the inability of small companies to compete with the wage rates paid by SIC.

As with opportunities, most of the threats to the Shetland economy had already been cited. The new points raised included: "lack of self-belief, huge opportunities are available but not grasped", "economy is very vulnerable, Shetland does not have a diverse economy", lack of young management in fishing/fish processing, and "failure in tourist industry to adapt to market segment they should be aiming for – better off, well educated, for culture".

7.2 Recent past trends and possible future developments

GRDP per capita in Shetland increased by just over 2% in real terms between 1996/97 and 2003 but as a proportion of the UK average fell from 98% in 1996/97 to 93% in 2003. Part of the reason was the continued fall in the contribution to value added and output of the Sullom Voe Terminal.

Oil also contributed less to Shetland's trade, helping explain the increased trade deficit, although by far the largest source of imports into Shetland is household expenditure. Increased Internet shopping has already had an impact on increased imports and this can only continue into the future.

If these points represent some of the "bad news", in many other regards the findings of this study suggest grounds for optimism for policy makers. Shetland has a relatively diversified economy, at least in terms of value added and output if not exports. Indeed, it is more diversified than Scotland as a whole. Other sectors, in fisheries and in services, have picked up at least some of the slack from the declining areas of business.

Shetland businesses and households make a substantial Exchequer contribution to central government suggesting that Shetland would be justified in expecting a favourable hearing from government when arguing for developments which will aid its economic development.

The Internet has created problems for the retail sector in Shetland but it also provides the opportunity for increased home working and thus the attraction or retention of more people in Shetland.

The “scenarios” we generated indicate some of the negative effects which will result from cuts in SIC spending but also indicate some of the potential growth areas, in fisheries and in decommissioning.

Finally, the views expressed by our business respondents, for all that they include some airing of grievances, indicate a generally positive outlook for the future. Almost all respondents identified concrete business opportunities and displayed a determination to act on them.

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APPENDIX 1
CONSTRUCTION OF THE SOCIAL ACCOUNTING MATRIX

This Appendix details various decisions made in the process of constructing the 2003 Shetland SAM.

A1.1 The valuation of transactions

In order to achieve a balance between the row and column sums of the SAM, the transactions in the matrix have to be valued in a uniform manner. In other words, the prices used to value purchases or expenditures (recorded in the column entries) have to be consistent with the prices used to value receipts (recorded in the row entries of the matrix). There are numerous reasons why differences may prevail, the most obvious being that purchasers' prices include margins to cover distribution costs, transport margins and commodity taxes. In fact, the requirement of uniform valuation arises as much from theoretical as accounting considerations because, if the SAM is to be used for Leontief modelling, it is assumed at the outset that the price of commodities does not vary between purchasers. Consequently, an important stage in the construction of a SAM is deciding how to value transactions.

In line with the Scottish and UK input-output tables as well as established guidelines for constructing regional accounts, the SAM was constructed on the basis of so called "approximate basic prices" (United Nations Statistics Division, 1993). This means that distributive margins, transport margins and net commodity taxes have been deducted from both intermediate and final purchases of domestic goods and reallocated to the distribution commodity group or the government row of the matrix as appropriate. Net commodity taxes were estimated indirectly using data from the UK and Scottish input-output tables and adjusted to reflect the pattern of commodity demand in Shetland. Although not ideal, this use of secondary data sources was considered preferable to the alternative, i.e. not identifying net commodity taxes within the SAM, for two reasons. First, it allows the Shetland GDP to be calculated at factor cost, thereby facilitating comparisons of GDP estimates at the Scottish and UK level. Second it avoids bias in the multiplier analysis stage of the study (Bulmer Thomas, 1982).

A1.2. Measurement of output

The methods used to measure the output of firms and sectors in Shetland followed standard conventions. In particular, for all of the sectors producing goods and services, output was defined as the value of sales of these goods/services plus changes in the value of stocks. In the case of the financial sector, output was similarly defined as the value of services (measured by bank charges) plus net interest charges. The way of measuring output from the distribution sectors and public sectors is less obvious. In the case of the former, output has been defined as gross margin on sales for whatever services were rendered. Including only the value of this margin as opposed to the value of actual sales from retailers and wholesalers avoids double counting the value of output from the producing sectors. An additional double counting problem arose with regard to the aquaculture and fish processing sectors which was resolved, after consultation with Shetland Islands Council, by adjusting the estimate of fish processing output to £65 million.

With respect to the treatment of public sector activities, a number of alternative options were available. Following the approach adopted in both the Scottish and UK input-output tables, services such as health, education and social work, and ports and harbours have been separately identified as sectors within the production boundary while the remainder of public sector activity is included in either the public administration sector or sector 31 (see Appendix 2 for the precise Standard Industrial Classification coverage of each sector). These sectors then "sell" their output valued at cost to either central government or the local council.

In order to place the production accounts on a symmetric basis (i.e. where the rows and columns relating to the production sphere of the economy have the same output dimensions reflecting either commodity by commodity transactions or industry by industry transactions), a link needs to be established between commodity and activity output. This requirement is brought about by: a) the nature of the raw data that can be collected – intermediate input flows are recorded only in the form of commodity purchases by industry groups, and b) the nature of production – except at extreme levels of disaggregation, industries are commonly involved in the production of more than one commodity. Twenty five of the 87 firms surveyed in the Shetland business survey had secondary production. It was decided to deal with this secondary production by using the industry technology assumption to convert the inter-industry transaction data on to an industry by industry basis. When reviewing the level and nature of transactions relating to production activity, the fact that the figures include the value of purchases and sales relating to secondary production should be borne in mind.

A1.3 The treatment of imports, exports and capital transactions

The inter-industry transactions matrix and household consumption data reflect only flows of locally produced goods and services, with the value of imports recorded separately in the SAM. In this way, the database can be used to investigate, for example, the potential advantages of increasing the degree of local sourcing of inputs. Imports have been valued on a "free-on-board" basis so as to be consistent with their valuation in the Scottish and UK input-output tables. The treatment of exports in the SAM is conventional. Exports represent an additional source of final demand and are recorded at the intersection of the production accounts with the rest of world accounts. With respect to capital formation, a SAM should ideally show who invests, which industries expand and what assets are created in the expansion process – the latter two processes being conventionally termed "investment by sector of destination" and "investment by sector of origin" respectively. However, the treatment adopted in the Shetland SAM is less ambitious and instead mirrors that used in the UK Input-output Tables. GFCF on an ownership basis is translated into GFCF on a producer basis by examination of the type of asset being produced (for example vehicle or buildings etc.) and then the resulting data entered as a column of final demand in the SAM. Ideally, the capital accounts would have been balanced so as to ensure all savings and investments relating to the region were accounted for. However, insufficient information was available to fully articulate capital-related transactions and it is left as an area for possible extensions/refinement in the future.

A1.4 Balancing the initial matrix

Figure A1.1 shows the main stages in the construction of the Shetland SAM. Whilst the process can be thought of as taking place in a number of distinct stages it was in practice iterative, with decisions made at an earlier stage often adjusted to accommodate the findings of a later stage.

Figure A1.1 Flow chart of stages in the SAM construction process

Within the latter stages of construction, in addition to the 1996/97 Shetland input-output table, a number of other more recent input-output studies were of great value in guiding the data cleaning process and judging the reliability of sectoral control totals for the balancing process. These were the recently completed studies of the Western Isles economy (Roberts, 2003), and the most recent Scottish input-output tables (Scottish Executive, 2005).

Given the number of different data sources used in the construction process, it is not surprising that initial estimates of the elements within a SAM do not satisfy the accounting balances of the matrix. The first stage of balancing such a database involves manually checking initial estimates so as to remove any obvious discrepancies and, where appropriate, replacing estimated values with data considered more accurate from other sources. This stage is generally considered vital in ensuring the accuracy of the construction process. The survey of key organisations provided valuable information to guide this stage of balancing as did various reports and data provided by Shetland Island Council and other sources. Following this stage, mechanical methods are required to adjust elements in the initial matrix so as to satisfy the row and column constraints of the database and thus the basic accounting identities of the economy. On the understanding that certain estimates in the initial unbalanced matrix were "correct" and should not be adjusted, these entries were subtracted from the initial flows and controls totals leaving only the remaining net entries subject to mechanical RAS adjustment (Bulmer Thomas, 1982).

APPENDIX 2

MAPPING OF SAM SECTORS ON TO STANDARD INDUSTRIAL CLASSIFICATION CODES

Table A2.1 Coding of economic activities in the Shetland SAM by the Standard Industrial Classification 2003

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