2 THE BENCHMARK DATA SET

The theoretical structure discussed in Chapter 1 requires a supporting database. Many equations require share parameters. These shares are calculated using a database which describes the state of the economies modelled in their initial, pre-shock situation.

The initial equilibrium data set for the SALTER model is constructed from basic input-output tables, along with macroeconomic and fiscal information for the different regions obtained from secondary data sources. In addition to region-specific information, international bilateral trade flow data are also necessary to specify the SALTER model's database.

Sources for each input-output table are found in Table 2.1, along with the year to which they apply. Data sources are heterogeneous, based on varying commodity classifications, and applying to a variety of different years. The benchmark data set, however, must present a picture of a homogeneous system being modelled at a single point in time. The reference time period chosen for the SALTER model is 1988.

Table 2.1: **Sources of the input-output data used to build the equilibrium database**

	Year	*Source*	*Original aggregation* *Commodity*	*Industry*
Australia	1986–87	Kenderes and Strzelecki (1992)	115	113
New Zealand	1986–87	Department of Statistics (1991), New Zealand	184	184
Canada	1986	Statistics Canada (1987)	592	216
United States	1985	MITI (1989), Japan	163	163
Japan	1985	MITI (1989), Japan	163	163
Korea	1985	Bank of Korea (1988)	403	403
European Community	1980	Ryan (1992)	34	34
Indonesia	1985	Central Bureau of Statistics (1989), Indonesia	66	66
Malaysia	1983	Department of Statistics (1988), Malaysia	60	60
Philippines	1985	National Economic and Development Authority (1988), Philippines	427	186
Singapore	1983	Department of Statistics (1987), Singapore	175	175
Thailand	1985	Institute for Developing Economies, Tokyo and Socio Economic Policy and Forecasting Unit, Chulalongkorn University Social Research Institute, Thailand	180	180
China	1987	Department of Balances of National Economy of the State Statistical Bureau and Office of the National Input-Output Survey (1987), China	117	117
Hong Kong	1988	Tormey (1993b)	37	37
Taiwan	1986	Directorate General of Budget, Accounting and Statistics (1986), Taiwan	123	123
Rest of the world	1988	Tormey (1993b)	37	37

2.1 Construction of the database

The construction of the SALTER model database is described in detail in Hambley (1993), Hanslow (1993), Tormey (1993a), Gotch (1993), James and McDougall (1993a), Calder, McDougall and Strzelecki (1993), Brown, Strzelecki and Watts (1993) and Tormey (1993b). An aggregation facility is also available should the model user decide that the degree of regional or industry detail in the final model database is excessive for a particular purpose (James and McDougall 1993b). This chapter describes briefly the process of database construction and presents the key features of the resulting database. A detailed summary of the database is presented in Watts (forthcoming).

The SALTER model database was constructed in several steps:

— developing concordances to map the industry and commodity structures in the various input-output tables to the industry structure of the SALTER model, and constructing an input-output database for each region according to these concordances;

— developing concordances to map the commodity structure of disaggregated international bilateral trade data for 1988 to the industry structure of the SALTER model, and constructing a trade flow database according to these concordances in which trade in each commodity between partner countries is consistent;

— updating each region's input-output database to 1988;

— adjusting each region's input-output database to agree with external data for industry assistance;

— adjusting each region's input-output database to agree with external macroeconomic and fiscal data;

— adjusting each region's input-output database to agree with the international trade data;

— removing changes in stocks from each region's input-output database;

— constructing synthetic input-output databases for Hong Kong and the Rest of the World; and

— combining the adjusted individual region input-output databases with the international trade database to the form the SALTER multi-region database.

The methods for making the data from different sources compatible were developed by James and McDougall (1993a).

Hambley (1993) describes the input-output and trade concordances and the initial aggregation of the input-output and international trade data to the SALTER level of

aggregation. Hanslow (1993) provides a method to produce an internally consistent international trade database. Tormey (1993a) and Gotch (1993) detail the data on industry assistance, while Tormey (1993b) provides a method to produce synthetic single region databases for Hong Kong and the Rest of the World. Calder, McDougall and Strzelecki (1993) and Brown, Strzelecki and Watts (1993) document the methods used in the final stages of constructing the model database.

Developing input-output data for the SALTER model

Raw input-output data are supplied in a variety of forms and commodity and industry disaggregations. The first step in making the diverse databases compatible involved converting them to the 37-commodity and industry classification used in the SALTER model. This involved aggregating some commodities and industries and disaggregating others, based on external information. The concordances used to map the industry and commodity classifications in the various input-output tables into the SALTER model's 37 sectors are found in Hambley (1993). The external information used to disaggregate commodities and industries is found in Hambley (1993) and Brown, Strzelecki and Watts (1993).

Developing the trade flow database

The international trade database was constructed from bilateral trade data provided by Reuters, the Australian Bureau of Statistics and the International Economic Data Bank at the Australian National University. The data supplied by Reuters are compiled by the Statistical Office of the United Nations and reflect the trade flows that occurred in 1988. These data had to be adjusted to fit the commodity classification used in the SALTER model. This process is described in Hambley (1993). The data were also reconciled so that the fob value of exports from region A to region B equalled the cif value of imports by region B from region A, less freight costs. Details of the procedure used to achieve the reconciliation are found in Hanslow (1993). The procedure used international trade margins data from Gehlhar, Binkley and Hertel (1992).

Updating the input-output data to 1988

In a preliminary step, the regional input-output databases were updated to 1988 and converted to a common currency. This was simply done by scaling all the elements in each table by the ratio of the initial local currency value of Gross Domestic Product (GDP) implicit in the original input-output table, to a target level of GDP in 1988 $US million, obtained from external sources. The external estimates of GDP are given in Brown, Strzelecki and Watts (1993).

Incorporating data on industry assistance

Estimates of industry assistance are included in the database in the form of estimates of a range of commodity and industry taxes and subsidies. Import duties levied on imports of particular commodities are used to capture the impact of tariffs and non-tariff barriers on imports. The impact of export restraints is captured by export taxes in the exporting region, on the assumption that most of the rents generated by export restraints are captured by the exporting rather than the importing region. The impact of the producer price support schemes which affect agriculture in a number of countries is captured by a combination of import duties and export subsidies. The impact of such price support schemes on consumers in those regions is captured by commodity taxes on the full range of domestic uses. The impact of producer income support schemes is captured by subsidies on production.

Considerable effort has been taken to collect tariff data and estimates of the tax/subsidy equivalents of other policy measures which currently affect trade in agricultural and food products, resources and non-food manufacturing. Measures of assistance to agriculture and food are taken primarily from OECD and US Department of Agriculture (USDA) sources, obtained mostly for 1988. The estimates from these sources capture the impact of border protection measures but also the internal income and domestic price support measures used in many countries to assist agricultural and food production.

For non-food manufacturing, tariff data are taken from the tariff schedules for individual regions for 1988, where available (Tormey 1993a). Estimates of the tariff equivalents of non-tariff barriers are taken primarily from Deardorff and Stern (1989). Two important types of export restraint are also captured in the model database:

- voluntary export restraints on Japanese exports of transport equipment to Canada, the United States and the EC; and
- the impact of the Multifibre Arrangement in restricting textile and clothing exports from the major Asian exporters — South Korea, Indonesia, Malaysia, the Philippines, Thailand, Singapore, Hong Kong, Taiwan and China — into Canada, the United States and the EC.

Data has also been collected on industry assistance in the resources sector in some regions. One important form of assistance captured in the model is the domestic purchasing arrangements for coal in Japan and the EC, which operate in a manner similar to producer price supports.

There are no good estimates of assistance to the service sectors.

The data on industry assistance is discussed in full in Gotch (1993). The resulting estimates of the tax/subsidy equivalents of industry assistance are presented later in

this chapter. The method by which these external estimates are incorporated into the input-output database of each region is discussed in full in James and McDougall (1993a).

Incorporating macroeconomic, fiscal and international trade data

At the same time as the regional input-output tables are adjusted to agree with this external data on industry assistance, they are also adjusted to agree with macroeconomic, fiscal and international trade data. The trade totals in each input-output table are adjusted to agree with the corresponding totals from the bilateral trade data. The major aggregates of gross national expenditure (household consumption, fixed investment, government consumption) in each input-output table are also adjusted to agree with independent estimates obtained from UN national accounts sources. As before, the method of adjustment is outlined in James and McDougall (1993a).

At this and later stages, various additional pieces of external data are also incorporated into each region's database to supplement the basic input-output information. These additional data are mainly fiscal aggregates and various data on net foreign interest and capital flows. The details are spelt out in Brown, Strzelecki and Watts (1993).

Removing changes in stocks from the input-output databases

The national accounting systems used to compile input-output tables typically account for changes in stocks. These changes in stocks reflect temporary disequilibrium in supply and demand. The SALTER model is supposed to show changes between two equilibria that result from a shock, once all permissible adaptations have been made. Thus characteristics of disequilibrium are eliminated from the database. James and McDougall (1993a) show how changes in stocks are eliminated.

Constructing synthetic databases for Hong Kong and the Rest of the World

No published input-output tables are available for these regions. The method by which synthetic input-output tables were constructed for 1988 is explained in full in Tormey (1993b).

Forming a SALTER multi-region database

The process of assembling the adjusted input-output tables for each region together with the international bilateral trade data to form a SALTER multi-region database is

explained in Brown, Strzelecki and Watts (1993). The resulting database satisfies the following balance requirements:

- net domestic product (NDP) calculated from the expenditure side equals NDP calculated from the income side in each region;
- total costs and total sales are equal in each industry in each region;
- fob exports plus freight reported from region A to region B equal the cif imports reported by B from A;
- the sum of the exports of freight services from each region equals the total freight required to ship all goods and services around the world;
- the sum of all exports reported by all regions (including exports of freight services) equals the total of the imports reported by all regions, ie. global trade sums to zero; and
- global net bond holding is zero.

2.2 Relative sizes and characteristics of modelled regions

The regional disaggregation in the SALTER model results in a group of large economies (the United States, the European Community, and Japan) accounting for 65 per cent of world gross product (Table 2.2). The Rest of the World aggregate accounts for a further 26 per cent. Among the smaller economies, New Zealand accounts for only 0.2 per cent of world gross product, while the ASEAN economies combined account for just 1.2 per cent.

The large economies can therefore be expected to determine many of the global results in the SALTER model, while smaller economies such as members of the ASEAN region can be expected to be affected by policy changes made in the larger economies. Policy changes made in the smaller economies are not expected to affect the large economies significantly.

The structure of final demand (Table 2.3) shows large disparities between countries in the proportion of domestic production accounted for by consumption (household plus government), investment, and exports. Consumption generally accounts for anywhere between 35 per cent of final demand (Malaysia) and 77 per cent (the United States). Exports generally account for anywhere between 9 per cent of final demand (the United States) and 51 per cent (Malaysia). Investment accounts for a more stable proportion of final demand, generally ranging from 10 per cent (the Philippines) to 29 per cent (China).

Table 2.2: **Gross domestic product by region, 1988**

	Gross domestic product 1988 US$m	*Share of world gross product %*
Australia	257 811	1.4
New Zealand	42 096	0.2
Canada	481 693	2.6
United States	4 801 959	25.4
Japan	2 836 282	15.0
Korea	170 383	0.9
European Community	4 646 402	24.6
Indonesia	77 874	0.4
Malaysia	33 992	0.2
Philippines	38 282	0.2
Singapore	23 693	0.1
Thailand	55 724	0.3
China	296 740	1.6
Hong Kong	44 580	0.2
Taiwan	112 881	0.6
Rest of the world	4 961 230	26.3
Total	18 881 620	100.0

Source: SALTER database.

Table 2.3: **Final demand for domestic production by region, 1988** (basic values)[a]

	Consumption % of final demand	*Investment % of final demand*	*Exports % of final demand*
Australia	64	21	16
New Zealand	61	13	26
Canada	60	16	23
United States	77	15	9
Japan	62	28	10
Korea	48	19	33
European Community	65	15	20
Indonesia	58	18	24
Malaysia	35	14	51
Philippines	69	10	22
Singapore	12	9	80
Thailand	56	13	31
China	57	29	14
Hong Kong	37	16	47
Taiwan	44	11	44
Rest of the world	70	16	14

Source: SALTER database.

[a] Basic values are exclusive of commodity taxes.

Singapore is markedly different in that only 12 per cent of final demand for domestic production is for consumption purposes, 9 per cent for investment and 80 per cent for export. The very high share of exports in final demand is a reflection of Singapore's entrepot role. While Hong Kong is also an entrepot, this role is not similarly reflected in its structure of final demand. The reason is that re-export data available for Hong Kong was used to convert its indirect entrepot trade back into direct trade between ultimate source and destination regions. The conversion was undertaken primarily so that the SALTER database could record trade between China and Taiwan. The details are given in Hambley (1993). Since re-export data of comparable quality are not available for Singapore, no corresponding conversion was made.

The structure of final demand therefore reflects Singapore's entrepot role. It also distinguishes the smaller, more open economies such as Malaysia, Hong Kong, Taiwan, Korea, Thailand and New Zealand from the larger, more internally diversified economies such as the United States and Japan. According to Table 2.3, the European Community appears more open than either the United States or Japan, but this is partly because the exports for this region record trade between individual EC members as well as exports outside the region.

The distribution of income by primary factor in each region is found in Table 2.4. Most regions fall into one of two broad groups, with the exception being China. The first group has relatively high labour shares (55–65 per cent) and correspondingly low capital shares (34–42 per cent). The regions in this group are mostly OECD regions, including Australia, New Zealand, Canada, the United States, Japan, the European Community and Taiwan.

The other group, predominantly ASEAN economies, has relatively low labour shares (25–51 per cent) and correspondingly high capital shares (47–70 per cent). It may seem paradoxical that regions traditionally regarded as concentrating in labour-intensive manufactures should have relatively low labour shares. The explanation lies in the different skill mixes of labour in the different regions. The OECD regions tend to have higher per unit returns to higher skilled labour.

China is an important exception to this pattern, having an even higher labour share in domestic factor income than the OECD regions. The major cause of this is the high labour share in the Chinese agricultural and services sectors (more than 77 per cent). These sectors combined account for 69 per cent of China's domestic factor income.

Table 2.4: **Share of primary factors in domestic factor income by region, 1988**

	Labour	*Capital*	*Land*
	%	*%*	*%*
Australia	61	37	1
New Zealand	55	42	3
Canada	57	42	1
United States	65	34	1
Japan	58	41	1
Korea	47	49	5
European Community	64	35	1
Indonesia	26	66	8
Malaysia	29	66	5
Philippines	40	55	5
Singapore	49	49	2
Thailand	25	70	5
China	76	21	3
Hong Kong	46	54	..
Taiwan	57	42	1
Rest of the world	51	47	2

Source: SALTER database.
.. less than 0.5 per cent.

Production structures

The sectoral pattern of value added in each of the modelled regions is found in Table 2.5. Relative to other regions, agriculture is largest in China and four of the ASEAN economies, where it accounts for between 15 and 35 per cent of total primary factor income. In the other regions of the SALTER model, agriculture accounts for around 5 per cent of primary factor income on average. Food processing is also an important activity in the Philippines and Thailand, while the resource sector accounts for a significant share of value added in Indonesia and Malaysia. Overall, these four ASEAN economies are very reliant on agricultural and resource based production.

Non-food manufacturing accounts for more than 25 per cent of primary factor income in Korea, Singapore and Taiwan, while only 12–25 per cent in other regions. The services sector typically accounts for more than 55 per cent of primary factor income, except in China and the ASEAN economies where it accounts for 34–53 per cent.

The structure of gross production costs in each modelled region is presented in Table 2.6. Overall, labour costs as a proportion of total production costs are largest for the United States and the European Community (36 per cent). Labour costs account for less than 20 per cent of total costs in Korea, most ASEAN economies and Hong Kong.

Table 2.5: **Sectoral shares in total primary factor income by region, 1988**

	Agriculture %	*Resources* %	*Food processing* %	*Non-food manufacturing* %	*Services* %
Australia	7	5	2	15	72
New Zealand	8	3	4	16	69
Canada	3	5	2	23	66
United States	2	3	2	20	73
Japan	3	2	2	25	69
Korea	10	4	2	28	56
European Community	3	3	3	23	68
Indonesia	22	18	3	13	45
Malaysia	16	22	3	18	41
Philippines	19	9	9	12	51
Singapore	4	1	1	45	48
Thailand	15	7	6	19	53
China	35	9	1	21	34
Hong Kong	1	3	1	25	71
Taiwan	5	6	2	31	57
Rest of the world	7	11	3	24	56

Source: SALTER database.

Table 2.6: **Input shares in gross production costs by region, 1988**[a]

	Intermediate inputs				
	Domestic %	*Imported* %	*Labour* %	*Capital* %	*Land* %
Australia	41	7	32	19	1
New Zealand	50	8	23	18	1
Canada	41	8	29	21	..
United States	41	3	36	19	..
Japan	46	4	29	21	1
Korea	46	14	18	19	2
European Community	35	9	36	19	1
Indonesia	35	9	15	37	4
Malaysia	33	23	13	29	2
Philippines	37	11	21	29	3
Singapore	19	50	15	15	1
Thailand	40	13	12	33	2
China	47	8	34	10	1
Hong Kong	39	21	18	22	..
Taiwan	42	18	23	17	..
Rest of the world	52	5	22	20	1

Source: SALTER database.
.. less than 0.5 per cent.
[a] Gross production costs calculated prior to imposition of production taxes or subsidies.

Returns to farm land are relatively small, accounting for 1 per cent or less of total production costs in most regions, but 2 per cent in Korea and between 2 and 4 per cent in four of the ASEAN economies. This reflects the importance of the agricultural sector in the ASEAN economies. In the non-agricultural sectors, returns to land are aggregated with those of capital; this results in relatively high returns to capital in resource-intensive economies such as Malaysia and Indonesia.

The overall share of intermediate inputs in total production costs is between 44 and 60 per cent for all economies except Singapore (69 per cent). Imported intermediates have a noticably larger role in production in Korea, Hong Kong, Taiwan and most of the ASEAN regions (13–50 per cent) than in other regions (less than 10 per cent).

Trade structures

The main international commodity flows are summarised in Table 2.7 and Table 2.8. These tables show the shares of aggregate imports, by origin, and exports, by destination, for each modelled region.

The first row of Table 2.7 shows that Australia's main suppliers are the United States, Japan, the European Community and the Rest of the World, each providing 14 per cent or more of Australia's aggregate imports. The table shows the importance of Australia as a supplier of New Zealand's imports (23 per cent), and the heavy reliance of Canada on imports from the United States (70 per cent).

The table also shows the importance of the large economies — the United States, Japan, the European Community and the Rest of the World — in supplying imports to most regions. The countries in the European Community are particularly important suppliers to other EC countries (54 per cent), and to the Rest of the World (35 per cent). This reflects the strong links of the European Community with the European Free Trade Area (EFTA) and, via the Lome convention, with a number of African and Caribbean countries.

Finally, Table 2.7 shows the pattern of trade links within the Asian region. It shows the importance of Singapore in supplying imports to other ASEAN economies. It also shows the importance of Hong Kong in supplying Hong Kong manufactured products to China (Hong Kong's re-exports were converted back to direct trade between ultimate source and destination countries).

On the export side (Table 2.8), the main trade links observed in the import structure are largely reinforced.

Table 2.7: **Major import flows by region, 1988**

	Imports from							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*European Community*	*Indonesia*
	%	%	%	%	%	%	%	%
Importer								
Australia	..	5	2	27	16	3	20	1
New Zealand	23	..	2	20	12	2	16	..
Canada	1	..	..	70	6	2	10	..
United States	1	..	17	..	18	5	17	1
Japan	5	1	3	26	..	5	9	4
Korea	4	..	2	29	27	..	9	2
European Community	1	..	1	10	4	1	54	..
Indonesia	4	1	2	16	20	3	17	..
Malaysia	3	1	1	19	16	2	10	1
Philippines	4	1	1	25	17	4	11	1
Singapore	3	..	1	18	19	3	11	4
Thailand	2	..	1	16	26	3	13	1
China	2	1	6	17	27	3	17	2
Hong Kong	4	..	2	12	19	6	12	1
Taiwan	3	..	2	40	30	3	12	1
Rest of the world	1	..	1	14	6	1	35	..

	Imports from							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of the world*
	%	%	%	%	%	%	%	%
Importer								
Australia	1	..	3	1	2	1	4	14
New Zealand	..	..	2	..	1	1	3	17
Canada	..	..	..	..	1	1	2	8
United States	1	1	2	1	2	2	6	27
Japan	2	1	2	2	5	1	4	31
Korea	2	..	2	1	2	1	2	17
European Community	..	..	1	..	1	1	1	26
Indonesia	2	..	8	1	3	1	5	17
Malaysia	..	1	30	3	2	1	4	5
Philippines	3	..	6	1	3	2	5	16
Singapore	12	1	..	3	4	2	5	14
Thailand	2	1	14	..	1	1	4	14
China	1	..	3	..	..	11	6	4
Hong Kong	1	1	6	2	19	..	9	6
Taiwan	1	..	4	1	1	1	..	1
Rest of the world	..	..	1	..	..	..	..	39

Source: SALTER database.

.. less than 0.5 per cent.

Table 2.8: **Major export flows by region, 1988** (excluding exports of freight services)

	Exports to							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*European Community*	*Indonesia*
	%	%	%	%	%	%	%	%
Exporter								
Australia	1	6	2	11	28	5	14	2
New Zealand	19	..	2	14	18	2	18	1
Canada	1	..	..	75	6	1	7	..
United States	3	1	21	..	13	4	23	1
Japan	3	..	3	35	..	5	16	1
Korea	2	..	3	39	18	..	12	1
European Community	1	..	1	9	2	1	57	..
Indonesia	2	..	1	17	41	4	10	..
Malaysia	3	..	1	17	18	5	12	1
Philippines	2	..	2	37	24	2	15	..
Singapore	3	..	1	26	8	2	12	3
Thailand	3	..	2	24	19	2	19	1
China	2	..	2	23	24	2	15	1
Hong Kong	2	..	3	33	5	2	21	..
Taiwan	3	..	3	45	14	2	14	1
Rest of the world	1	..	1	18	9	1	34	..

	Exports to							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of the world*
	%	%	%	%	%	%	%	%
Exporter								
Australia	2	1	3	1	3	4	4	15
New Zealand	2	1	1	1	6	1	2	13
Canada	..	..	..	..	2	..	1	6
United States	1	1	2	1	2	1	5	22
Japan	1	1	3	2	6	3	6	15
Korea	1	1	2	1	2	3	2	14
European Community	..	..	1	..	1	..	1	25
Indonesia	1	..	8	1	4	2	3	6
Malaysia	..	1	22	2	3	2	3	9
Philippines	1	..	3	2	2	3	3	4
Singapore	12	1	..	6	4	5	5	13
Thailand	3	..	8	..	1	3	3	13
China	1	1	4	..	..	16	2	6
Hong Kong	1	1	3	1	19	..	2	8
Taiwan	1	1	4	1	5	6	..	..
Rest of the world	..	..	1	..	..	..	..	33

Source: SALTER database.

.. less than 0.5 per cent.

Table 2.9: **Structure of exports of each region by broad non-service commodity group, 1988**

	Agriculture	*Resources*	*Food processing*	*Non-food manufacturing*	*Total*
	%	%	%	%	%
Australia	22	23	11	44	100
New Zealand	28	7	32	34	100
Canada	6	12	2	79	100
United States	8	4	4	84	100
Japan	..	..	..	99	100
Korea	1	2	2	95	100
European Community	4	3	6	87	100
Indonesia	13	41	4	41	100
Malaysia	13	24	12	51	100
Philippines	10	12	12	66	100
Singapore	6	2	3	90	100
Thailand	16	11	23	50	100
China	11	12	6	71	100
Hong Kong	..	2	1	97	100
Taiwan	1	2	3	94	100
Rest of the world	7	21	5	67	100

Source: SALTER database.

The sectoral source of non-service exports for each region is shown in Table 2.9. Agriculture contributes a significant proportion of non-service export earnings for Australia and New Zealand (22 and 28 per cent respectively), while resources are most important for Indonesia (41 per cent), Malaysia (24 per cent), Australia (23 per cent) and the Rest of the World (21 per cent). Processed food products represent 32 per cent of New Zealand's non-service export earnings and 23 per cent of Thailand's, but account for less than 12 per cent in other regions.

For many regions in the model, non-food manufactures represent roughly 80–90 per cent of non-service export earnings; this is the case for Canada, the United States, the European Community and Singapore. In Japan, Korea, Hong Kong and Taiwan, practically all non-service exports are manufactured products.

This depiction of exports does not account for the relative size of exports by each region, but confirms some of the conclusions reached in analysing the production structures above. Primary products are the major export earners for Australia, New Zealand and four of the ASEAN economies. As a low cost producer of processed food in the South Pacific region, New Zealand earns a substantial proportion of its earnings from this source. Although the United States and the European Community are major exporters of agricultural products (their exports of these products are among the largest of those for any SALTER region), these exports are dwarfed by the importance of their

manufactured commodity exports. Japan, Korea, Hong Kong and Taiwan are similarly more heavily specialised in manufactured products, indicating a significant advantage in these countries' costs in producing these commodities.

The prominence of the large economies in global exports, by broad commodity group, is shown in Table 2.10. The United States and the European Community each account for 22 per cent of global agricultural exports. The Rest of the World (which includes the OPEC member countries) accounts for almost 60 per cent of global trade in resources. The United States and the European Community are large exporters of processed food products, and these regions are also major players in manufactured goods markets. Japan also contributes significantly to trade in non-food manufactures.

Table 2.10: **Share of each region in global non-service commodity exports, by broad commodity group, 1988**

	Agriculture	*Resources*	*Food processing*	*Non-food manufacturing*
	%	%	%	%
Australia	6	4	3	1
New Zealand	2	..	3	..
Canada	5	7	2	5
United States	22	6	11	14
Japan	..	1	1	13
Korea	..	1	1	3
European Community	22	13	43	36
Indonesia	2	4	1	..
Malaysia	2	2	2	1
Philippines	1	..	1	..
Singapore	2	..	1	2
Thailand	2	1	3	..
China	4	3	2	2
Hong Kong	..	..	..	1
Taiwan	..	1	2	3
Rest of the world	30	58	24	19
Total	100	100	100	100
Total value US$m	129 785	206 101	114 586	1 957 973

Source: SALTER database.

In summary, the structure of exports is in large part related to the production capacity of the regions modelled.

2.3 Industry assistance data

Assistance to producers can be provided in a variety of ways. The structure of the SALTER model provides a number of tax/subsidy instruments through which changes in producer assistance can be made. These instruments are also used to capture the patterns of market intervention existing in the initial situation, prior to a simulation. Most assistance is given in the form of tariff protection and various domestic subsidy measures.

In the agriculture and food sectors, assistance is estimated from producer and consumer subsidy equivalents and price comparisons. In the non-food manufacturing sector, assistance is based on tariff schedules and estimates of the tariff equivalents of non-tariff barriers. For all resource industries except coal in the EC and Japan, assistance is also based on tariff schedules. Producer subsidy equivalents are used to estimate assistance to coal in the EC and Japan.

These initial assistance arrangements are reflected in the SALTER database by ensuring that the database meets certain target tax or subsidy rates for some or all of the tax/subsidy instruments in each sector. The choice of tax instruments varies according to the type of assistance being modelled.

Duties are used to model a variety of barriers to imports including producer price supports. Export taxes are used to model voluntary export restraints. They are also used to model export subsidies or, in the case of agriculture and food, the subsidies needed to dispose of surpluses generated by price support policies. Negative user taxes are used to model subsidies for the purchase of domestic and imported goods for domestic use by households, government and for investment and intermediate usage purposes. Negative production taxes are used to model producer income supports.

However, the final SALTER database also contains tax rates that are generally non-zero for those tax instruments and sectors that have not been explicitly targeted to reflect known assistance arrangements. These remaining taxes come from existing input-output information (Hambley 1993). In some cases these 'non-protective' taxes may represent assistance arrangements for which no reliable external information has been found. In other cases the taxes may reflect those imposed for revenue-raising rather than for protective reasons.

This section presents the estimates of taxes/subsidies in those sectors where reliable external information has been found. It is left to the model user to decide how to treat other non-targeted tax rates in any trade policy simulation. Information on these 'non-protective' taxes can be found in Watts (forthcoming).

Assistance to agriculture and food

Producer subsidy equivalent (PSE) and consumer subsidy equivalent (CSE) data (OECD 1990, USDA 1988, 1990) are used to create a set of taxes and subsidies for agricultural and food commodities for all SALTER regions except the Philippines and China. The method used broadly follows Lienert (1989). Where PSE and CSE data are not available, price comparisons are used (Saxon, Anderson and Tyers 1986). This source provides all the estimates for the Philippines and some of the estimates for Indonesia and Thailand. Assistance to agriculture and food in China is estimated separately.

PSEs and CSEs estimate the value of transfers from the government to producers and consumers of a given commodity. These transfers create a wedge between the price paid by the consumer and the price received by the producer. PSEs and CSEs each have two elements — a price support element and a non-price support element.

The price support element of a PSE reflects price intervention by government. This price intervention creates a wedge between the domestic producer price and the world price of a commodity. The price support element measures the net effect of a range of price intervention policies, including tariffs, non-tariff barriers and producer price supports.

It is evident from the original data sources that in the agriculture and food sectors, producer price supports are the predominant form of price intervention. Not only do these measures protect domestic producers from import competition, they have frequently been used to encourage production to the point where export subsidies are required to dispose of surpluses on world markets. In the agriculture and food sectors, the price support element of a PSE is therefore used to calculate duties and corresponding export subsidies for the agriculture and food sectors in the model.

The non-price support element of PSEs includes direct payments such as deficiency payments and indirect payments, for example, input subsidies. The non-price support element is used to calculate production subsidies for the agriculture and food sectors in the model.

The price support element of a CSE itself has two components. The first component is the implicit tax consumers pay as a result of the market price support benefiting producers. The second component covers taxes other than implicit taxes born by the consumer and/or explicit subsidies that partially compensate the consumer for the higher price paid as a result of the market price support provided to producers.

Since the SALTER model pricing equations ensure that an explicit producer price support is automatically passed through in the form of higher prices to domestic users, the implicit tax components of the CSE estimates do not need be introduced into the model separately. Only the explicit tax/subsidy component is introduced.

These explicit consumer taxes/subsidies are added to the non-price support element of the CSE to find an overall ad valorem consumer tax equivalent. This is then introduced into the model via user tax variables.

The resulting consumption taxes/subsidies are assumed to affect all units demanded, not just those demanded by households. The consumption taxes/subsidies are therefore applied to all domestic uses of both domestic and imported commodities.

Assistance in China

Evidence generally suggests that prices for many commodities in China are lower than world prices. One reason is that planned prices are often below world prices.

With China's internal pricing regime, producers can receive three different prices for their output — planned prices, negotiated prices and market prices. Planned prices are received for output meeting government quotas, negotiated prices are received for output sold to the government in excess of required quotas and market prices are received for output sold on private markets (Sicular 1988).

On the other hand, tariffs are collected on imports in China and the imports are then generally sold internally at market prices (Yang 1992). This suggests there can be major differences between the prices of domestically produced and imported commodities within China, with imports being above and domestically produced goods often being below the world price benchmark. It also demonstrates the internal inconsistencies between China's tariff policy and its internal pricing regime, in terms of the true assistance afforded industries in China (Yang 1992).

To broadly capture these stylised facts within the SALTER database, positive import duties are imposed on imports into China, while estimates of world to domestic price ratios are used to calculate user subsidies that are imposed on the domestic use of *domestically produced* commodities. Note that this treatment differs from the imposition of user taxes/subsidies discussed above, since these were applied to the domestic usage of both domestically produced and imported commodities.

Treatment of intra - European Community trade

Since 1968 border protection on intra-EC trade has been negligible due to European integration (Weiss et al. 1988). Therefore in all areas where duties and export taxes have been targeted to reflect industry assistance arrangements, the corresponding duties and export taxes on intra-EC trade have been set to zero.

Assistance in the Rest of the World

The SALTER model includes a Rest of the World aggregate. Import duties are the only form of industry assistance calculated for this region. In the absence of detailed

information, import duties are calculated as the simple average of import duties for the corresponding commodity for all other modelled regions.

Assistance to agriculture and food -- summary

The resulting estimates of assistance to agriculture and food are shown in Table 2.11. The estimates demonstrate the relatively high assistance afforded agriculture and food in Korea, Japan, the EC, the United States, Canada and Taiwan.

Assistance to non-food manufacturing

The procedure used to obtain a set of taxes and subsidies for non-food manufacturing commodities differs from the procedure used for agriculture and food for several reasons. Firstly, PSE and CSE estimates are not available on a comparable basis for non-food manufacturing. Alternative sources are used instead. Secondly, the only interventions for which external data are readily available – tariffs, non-tariff barriers and voluntary export restraints – are border interventions.

The SINTIA (Software of Industrial, Trade and Incentives Analysis) program is used to provide rates of tariff protection for non-food manufacturing commodities (Tormey 1993a). The program is used to summarise customs tariff data from tariff schedules for Canada, the United States, Japan, Korea, EC, Indonesia, Malaysia, Philippines, Singapore, Thailand and Taiwan. Tariffs for Australia, New Zealand and China are calculated using different procedures while Hong Kong is assumed to be free of non-food manufacturing protection.

Customs tariff data are highly disaggregated and classified according to the Harmonised System (HS) of product classification. The data are aggregated by taking weighted averages of the HS tariff rates to obtain estimates for individual SALTER commodities. The tariffs are weighted by either the value of imports or the value of domestic production of each HS item. Whenever possible, production weighted average rates are used. The advantage of using production weights is that import tariffs on goods that have no domestic competition are not included in the average tariff rate. Therefore production weighted averages give a better picture of the protective effect that tariffs have on domestic industry.

Nominal rates of assistance to non-food manufacturing in Australia are provided by the Assistance Evaluation Branch of the Industry Commission. The assistance data provided at the HS level are aggregated to the individual SALTER commodity level using value of domestic production weights. Note that these assistance estimates incorporate both tariff and non-tariff protection.

Table 2.11: Assistance to agriculture and food by region[a]

	Export tax %	*Import tax %*	*Production tax %*	*User tax %*	*Export tax %*	*Import tax %*	*Production tax %*	*User tax %*
	Australia[b]				New Zealand[b]			
Paddy Rice	-7.60	8.22	-16.63	0.00	0.00	0.00	0.00	0.00
Wheat	0.00	0.00	-11.95	0.00	0.00	0.00	-13.38	0.00
Other grains	0.00	0.00	-8.02	0.00	0.00	0.00	-6.23	0.00
Non-grain crops	-0.27	0.28	-0.98	0.00	0.00	0.00	0.00	0.00
Wool	0.00	0.00	-3.89	0.00	0.00	0.00	-5.85	0.00
Other livestock	0.00	0.00	-1.61	0.00	0.00	0.00	-0.09	-0.09
Processed Rice	-7.60	8.22	0.00	69.36	0.00	0.00	0.00	0.00
Meat	0.00	0.00	-5.85	0.00	-2.56	4.42	-7.28	0.15
Dairy	-24.52	32.49	-5.72	0.02	0.00	0.00	-5.57	4.32
Other food	-0.14	0.15	-0.21	0.66	0.00	0.00	0.00	0.00
	Canada[b]				United States[b]			
Paddy Rice	0.00	0.00	0.00	0.00	0.00	0.00	-54.46	0.00
Wheat	-14.35	16.76	-33.91	0.06	-9.75	10.80	-26.92	-1.24
Other grains	-17.75	21.59	-24.06	-2.58	0.00	0.00	-33.74	-0.08
Non-grain crops	-1.40	1.32	-3.91	0.00	-0.33	3.10	-4.44	0.01
Wool	0.00	0.00	0.00	0.00	-3.91	4.07	-39.91	-0.88
Other livestock	-0.00	0.00	-0.53	0.00	0.00	0.00	-0.36	-0.01
Processed Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-10.00
Meat	-16.44	22.10	-15.30	0.00	-20.10	27.84	-7.84	-0.66
Dairy	-57.53	135.47	-16.81	-0.01	-49.15	96.66	-11.67	-6.58
Other food	0.00	0.00	-0.01	-0.10	-0.67	1.74	-0.09	0.00
	Japan[b]				Korea[c]			
Paddy Rice	-79.51	388.12	-15.07	0.00	-76.55	326.36	-6.90	0.00
Wheat	-83.78	516.63	-18.31	-58.27	-59.43	146.50	-1.33	-58.66
Other grains	-86.20	624.78	-20.35	-84.66	-26.54	132.69	-1.18	-1.74
Non-grain crops	-1.30	3.74	-0.5	0.00	-1.90	7.56	-0.09	3.49
Wool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other livestock	0.00	0.00	-0.28	-0.02	-0.00	0.00	-0.32	2.98
Processed Rice	-79.51	388.12	0.00	7.57	-76.55	326.36	0.00	2.11
Meat	-44.69	94.14	-3.92	-0.05	-9.32	33.43	-4.89	61.74
Dairy	-79.80	395.09	-12.61	-21.28	-53.74	116.11	-5.56	121.09
Other food	-0.42	1.27	-0.07	0.14	-0.20	0.66	0.00	0.00

[a] A negative tax is interpreted as a subsidy.
[b] *Source:* OECD (1990).
[c] *Source:* USDA (1988, 1990).
[d] *Source:* Saxon, Anderson and Tyers (1986).
[e] *Source:* Tormey (1993a).

Table 2.11: **Assistance to agriculture and food by region**[a] (continued)

	Export tax %	*Import tax* %	*Production tax* %	*User tax* %	*Export tax* %	*Import tax* %	*Production tax* %	*User tax* %
	European Community[b]				Indonesia[d]			
Paddy Rice	-35.46	54.95	-5.86	0.00	1.11	-1.10[c]	-8.46[c]	0.00
Wheat	-30.98	44.88	-4.84	-0.50	0.00	0.00	0.00	0.00
Other grains	-1.52	47.36	-1.39	26.63	-23.08	30.00	0.00	0.00
Non-grain crops	0.00	0.00	-0.86	0.00	0.00	0.00	0.00	0.00
Wool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other livestock	0.00	0.00	-0.22	0.00	0.00	0.00	0.00	0.00
Processed Rice	-35.46	54.95	0.00	-0.66	1.11	-1.10[c]	0.00	0.00
Meat	-46.60	78.52	-9.68	0.00	-47.76	91.93	0.00	0.00
Dairy	-61.21	157.78	-5.63	-5.50	-37.50	60.00	0.00	0.00
Other food	-1.52	10.35	0.12	1.19	0.00	0.00	0.00	0.00
	Malaysia[e]				Philippines[d]			
Paddy Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other grains	0.00	0.20	0.00	0.00	-13.04	15.00	0.00	0.00
Non-grain crops	0.00	7.70	0.00	0.00	0.00	0.00	0.00	0.00
Wool	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Other livestock	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00
Processed Rice	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Meat	0.00	5.60	0.00	0.00	-30.23	43.73	0.00	0.00
Dairy	0.00	13.80	0.00	0.00	-41.18	70.00	0.00	0.00
Other food	0.00	8.20	0.00	0.00	0.00	0.00	0.00	0.00
	Singapore[e]				Thailand[d]			
Paddy rice	0.00	0.00	0.00	0.00	11.11	-10.00	-4.77[c]	0.00
Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-grain crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Livestock	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Processed rice	0.00	0.00	0.00	0.00	11.11	-10.00	0.00	0.98
Meat products	0.00	0.00	0.00	0.00	9.36	-8.50	0.00	0.00
Milk products	0.00	0.00	0.00	0.00	-37.50	60.00	0.00	0.00
Other food	0.00	4.70	0.00	0.00	0.00	0.00	0.00	0.00

[a] A negative tax is interpreted as a subsidy.
[b] *Source:* OECD (1990.)
[c] *Source:* USDA (1988, 1990)
[d] *Source*: Saxon, Anderson and Tyers (1986).
[e] *Source:* Tormey (1993a).

Table 2.11: **Assistance to agriculture and food by region**[a] (continued)

	Export tax %	*Import tax %*	*Production tax %*	*User tax %*	*Export tax %*	*Import tax %*	*Production tax %*	*User tax %*
	Hong Kong				Taiwan[c]			
Paddy Rice	0.00	0.00	0.00	0.00	-43.15	75.90	-2.62	0.00
Wheat	0.00	0.00	0.00	0.00	-73.00	270.37	-1.96	-65.75
Other grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
non-grain crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Processed Rice	0.00	0.00	0.00	0.00	-43.15	75.90	0.00	5.71
Meat	0.00	0.00	0.00	0.00	-43.15	46.91	-2.65	24.95
Dairy	0.00	0.00	0.00	0.00	-42.83	74.90	-6.52	-23.31
Other food	0.00	0.00	0.00	0.00	-1.15	1.58	-0.05	0.80
	China[fg]				ROW[h]			
Paddy Rice	0.00	58.00	0.00	-15.97	0.00	55.08	0.00	0.00
Wheat	0.00	58.00	0.00	19.05	0.00	68.36	0.00	0.00
Other grains	0.00	58.00	0.00	28.21	0.00	59.47	0.00	0.00
non-grain crops	0.00	58.00	0.00	14.94	0.00	5.45	0.00	0.00
Wool	0.00	58.00	0.00	-6.54	0.00	4.27	0.00	0.00
Other livestock	0.00	58.00	0.00	-25.37	0.00	4.05	0.00	0.00
Processed Rice	0.00	58.00	0.00	-15.97	0.00	57.50	0.00	0.00
Meat	0.00	58.00	0.00	-62.69	0.00	29.07	0.00	0.00
Dairy	0.00	58.00	0.00	-20.64	0.00	74.95	0.00	0.00
Other food	0.00	58.00	0.00	-20.64	0.00	5.22	0.00	0.80

[a] A negative tax is interpreted as a subsidy.
[b] *Source:* OECD (1990).
[c] *Source:* USDA (1988, 1990).
[d] *Source:* Saxon, Anderson and Tyers (1986).
[e] *Source:* Tormey (1993).
[f] *Sources*: Lin (1991), Yang (1992).
[g] User taxes are applied to domestically produced commodities only.
[h] *Source:*Tormey (1993b).

Similarly, estimates of New Zealand nominal rates of assistance are provided by Syntec Economic Services (1988) and are aggregated to the individual SALTER commodity level using ISIC production data.

Estimates of the tariff equivalents of non-tariff barriers applying to non-food manufacturing in all SALTER regions except for Australia, New Zealand and China are adapted from Deardorff and Stern (1989). These non-tariff barrier estimates are added to corresponding tariff estimates to obtain a set of import duties capturing tariff and non-tariff protection on non-food manufacturing.

Table 2.12: Ad valorem equivalents of tariff and non-tariff barriers on non-food manufacturing by region[a]

	Australia[b]	*New Zealand*[c]	*Canada*[d]	*USA*[d]	*Japan*[d]	*Korea*[d]	*European Community*[d]	*Indonesia*[d]
Beverages and tobacco	10.52	28.00	13.50	5.80	29.10	37.10	34.00	49.50
Textiles	30.57	20.00	17.20	11.30	8.80	14.90	9.70	41.90
Wearing apparel	47.25	54.00	21.80	12.80	12.70	19.60	12.3	56.10
Leather and fur products	22.77	18.70	18.46 (3.00)	16.96 (2.50)	26.36 (3.00)	13.30	8.97 (0.90)	53.10
Lumber and wood products	14.29	12.80	7.60	4.40	4.10	13.60	5.70	26.30
Pulp, paper and printing	10.11	12.00	5.70	13.38 (11.30)	2.10	10.90	8.52 (1.20)	21.40
Petroleum and coal products	17.50	7.50	5.20	1.40	24.20 (1.30)	10.70	15.36 (12.9)	0.00
Chemicals, rubber and plastic	13.88	16.40	8.80	5.40	5.41 (0.05)	14.60	7.84	24.90
Non-metallic mineral products	3.14	11.00	7.30	5.20	4.20 (1.10)	13.30	6.08	29.60
Primary iron and steel	26.07	6.00	7.60	16.30	4.10	8.80	18.93 (14.0)	16.70
Non-ferrous metals	0.53	6.00	6.10	3.50	12.00	10.40	4.50	0.00
Fabricated metal products	16.64	23.00	9.10	4.90	3.30	15.30	6.44 (0.08)	27.20
Transport equipment	24.17	31.00	7.80	2.90	1.00	17.40	7.80	68.10
Other machinery	19.65	22.00	7.00 (0.70)	4.10 (0.01)	1.60	15.40	6.23 (1.30)	18.10
Other manufacturing	20.72	24.00	7.72 (0.50)	5.69 (0.01)	3.40	14.70	5.85 (1.20)	35.90

[a] Figures in parentheses are the non-tariff barrier component of the aggregate tariff equivalent.

[b] *Source:* The aggregate import duty equivalents are provided by the Assistance Evaluation Branch of the Industry Commission and comprise both the tariff and non-tariff barrier component. No separate estimate of the non-tariff component is provided.

[c] *Source*: The aggregate import duty equivalents are provided by Syntec (1988) and comprise both the tariff and non-tariff barrier component. No separate estimate of the non-tariff component is provided.

[d] *Source*: Tormey (1993a), Deardorff and Stern (1989).

Table 2.12: **Ad valorem equivalents of tariff and non-tariff barriers on non-food manufacturing by region**[a] (continued)

	Malaysia[d]	*Philippines*[d]	*Singapore*[d]	*Thailand*[d]	*Taiwan*[d]	*China*[e]	*Hong Kong*	*ROW*[f]
Beverages and tobacco	30.30	42.50	5.30	36.50	28.60	58.00	0.00	25.47
Textiles	26.40	39.90	0.50	48.40	18.20	91.00	0.00	24.83
Wearing apparel	27.30	0.00	0.50	10.60	15.10	115.00	0.00	26.73
Leather and fur products	28.50	41.50	0.50	34.20	34.30	115.00	0.00	28.54
Lumber and wood products	21.10	36.70	0.50	3.10	34.80	40.00	0.00	14.81
Pulp, paper and printing	16.00	33.00	0.00	17.30	19.30	80.00	0.00	16.38
Petroleum and coal products	6.60	0.00	1.10	13.50	6.60	5.00	0.00	7.08
Chemicals, rubber and plastic	20.20	25.10	0.30	27.60	26.45	38.00	0.00	15.29
Non-metallic mineral products	19.40	27.30	0.00	29.70	28.90	40.00	0.00	14.69
Primary iron and steel	16.50	0.00	0.00	9.50	8.30	60.00	0.00	12.34
Non-ferrous metals	6.20	0.00	0.00	12.50	19.40	60.00	0.00	9.26
Fabricated metal products	19.50	28.70	0.50	28.10	20.50	30.00	0.00	15.30
Transport equipment	21.60	30.20	2.80	25.90	8.70	30.00	0.00	18.27
Other machinery	20.80	30.30	0.50	30.90	8.50	30.00	0.00	14.11
Other manufacturing	13.90	35.90	0.50	26.60	18.10	70.00	0.00	18.70

[a] Figures in parentheses are the non-tariff barrier component of the aggregate tariff equivalent.
[b] *Source:* The aggregate import duty equivalents are provided by the Assistance Evaluation Branch of the Industry Commission and comprise both the tariff and non-tariff barrier component. No separate estimate of the non-tariff component is provided.
[c] *Source*: The aggregate import duty equivalents are provided by Syntec (1988) and comprise both the tariff and non-tariff barrier component. No separate estimate of the non-tariff component is provided.
[d] *Source*: Tormey (1993a), Deardorff and Stern (1989).
[e] *Source* Yang (1992).
[f] *Source*: Tormey (1993b).

The resulting estimates of assistance to non-food manufacturing are shown in Table 2.12.

Assistance to non-food manufacturing in China is treated differently, as before. Table 2.12 shows the import duties applied to imports of non-food manufactures into China. Estimates of world to domestic price ratios are used to calculate user subsidies that are imposed on the domestic use of domestically produced non-food manufactures in China.

Table 2.13: **Ad valorem production taxes and user taxes on non-food manufacturing in China**

	Production taxes	*User taxes*[a]
	%	%
Beverages and tobacco	30.96	16.28
Textiles	8.50	-20.00
Wearing apparel	8.35	-20.00
Leather, fur & products	7.60	-20.00
Lumber & wood products	8.68	-60.32
Pulp, paper & printing	11.38	-26.47
Petroleum and coal products	26.45	-66.10
Chemicals, rubber & plastic	12.79	5.26
Non-metallic mineral products	11.77	-57.98
Primary iron & steel	14.88	-52.61
Primary non-ferrous metals	9.65	-39.02
Fabricated metal products	10.66	-54.13
Transport industries	10.02	5.26
Other machinery and equipment	11.42	5.26
Other manufacturing	9.50	0.00

[a] User taxes are applied to domestically produced commodities only.
Sources: Lin (1991), Hambley (1993).

Subsidies of this kind are financed in part by production taxes which are particularly heavy in the industrial sector. Estimates of these production tax rates are available from the original Chinese input-output data, and are retained as target rates in the final SALTER database. The resulting user subsidies and production taxes on non-food manufacturing in China are shown in Table 2.13.

Tables 2.12 and 2.13 show the relatively high levels of import protection afforded non-food manufacturing in China, Taiwan, Korea, four of the ASEAN economies, Australia and New Zealand.

Voluntary export restraints

Export taxes are the instruments used to model voluntary export restraints (VERs). The following VER agreements are covered:

- bilateral agreements restricting Japanese exports of transport equipment; and
- the Multifibre Arrangement (MFA) which limits the volume of textiles and wearing apparel exports from developing to developed countries.

VERs are modelled as export taxes because of the general belief that the exporting regions retain the quota rents (Deardorff and Stern 1989).

Generally VERs do not apply to all products within a SALTER commodity aggregate. To incorporate available estimates of the export tax equivalents of VERs into the database, the export tax equivalent must be weighted by a product coverage ratio. Coverage ratios are calculated by finding the value of restricted exports as a percentage of total exports within a SALTER commodity category.

According to GATT (1989), Japan has bilateral agreements to restrict exports of selected categories of transport equipment to the United States, the European Community and Canada. The effects of VERs are estimated for Japan's exports of transport equipment to these three regions. Estimates of the export tax equivalent of VERs and corresponding product coverage ratios on Japanese transport equipment are found in Deardorff and Stern (1989).

The export taxes representing the effects of the MFA are estimated for the following SALTER regions based on information provided by Yang (1992) and Saad (forthcoming). The details are given in Gotch (1993). The countries imposing the VERs are the EC, the United States and Canada. Each of these countries is recognised as having a bilateral agreement with the following exporters — Indonesia, Malaysia, Philippines, Singapore, Thailand, Korea, Hong Kong, Taiwan and China.

The resulting estimates of the export tax equivalents of these voluntary export restraints are shown in Tables 2.14, 2.15 and 2.16.

Assistance to resources

Import duty estimates for all resource commodities, with the exception of all resources in Australia and China and coal in the EC and Japan, are obtained from tariff schedules and are weighted by production data using the SINTIA program (Tormey 1993a).

Australian nominal rates of assistance to resources are provided by the Assistance Evaluation Branch of the Industry Commission. The assistance data provided at the HS level are aggregated to the individual SALTER commodity level using value of domestic production weights. Note that these assistance estimates incorporate both tariff and non-tariff protection.

Assistance to the resources sector in China is calculated in the same way as for non-food manufacturing.

Table 2.14: Export tax equivalents of voluntary export restraints on Japanese transport equipment

Destination	*Source* *Japan* %
US	3.90
EC	5.05
Canada	3.90

Source: Deardorff and Stern (1989).

Table 2.15: Export tax equivalents of voluntary export restraints on textiles under the Multifibre Arrangement

Source	*Destination* *US* %	*EC* %	*Canada* %
Indonesia	11.95	17.46	17.50
Malaysia	9.50	11.70	15.17
Philippines	8.57	10.03	11.52
Singapore	7.93	10.10	11.89
Thailand	9.07	12.85	13.71
Korea	14.77	15.13	14.44
Hong Kong	11.51	12.15	11.44
Taiwan	12.24	17.46	14.15
China	18.41	27.35	23.21

Sources: Saad (forthcoming), Yang (1992).

Table 2.16: Export tax equivalents of voluntary export restraints on clothing under the Multifibre Arrangement

Source	*Destination* *US* %	*EC* %	*Canada* %
Indonesia	46.74	48.37	41.13
Malaysia	37.14	32.40	35.66
Philippines	33.52	27.79	27.08
Singapore	31.01	27.98	27.94
Thailand	35.46	35.58	32.23
Korea	35.00	29.05	29.31
Hong Kong	27.29	23.32	23.23
Taiwan	29.02	33.53	28.72
China	40.32	36.11	42.00

Sources: Saad (forthcoming), Yang(1992).

The EC and Japan provide high levels of assistance to their domestic coal mining industries. The arguments used by the governments of these countries for maintaining assistance include energy security, high short term social costs of closing down regionally concentrated mining operations, and a need for adjustment and restructuring programs to make local coal more competitive with imported coal (Jolly et al. 1990). The assistance is in a form akin to producer price support. The method used to calculate assistance to coal in Japan and the EC is therefore the same as the procedure used to calculate agriculture and food assistance from PSEs. As a result, the SALTER model includes target values for import duties, export taxes and production taxes on coal in Japan and the EC.

Th resulting estimates of assistance to the resources sectors in each region are shown in Tables 2.17, 2.18 and 2.19.

Assistance to services

There are no good estimates of assistance to services available from external sources. The original input-output tables for some regions report duties and export taxes on services, but because the regional coverage is patchy these are deemed to provide an unreliable guide to global service protection. For this reason, import duties and export taxes on services have been set to zero in all regions. Assistance to the services sector in China is nevertheless recorded through production taxes and user taxes, reflecting China's internal pricing regime. These estimates are shown in Table 2.20.

Table 2.17: **Ad valorem taxes and subsidies for coal in Japan and the EC**

	Japan[a]	*European Community*[b]
	%	%
Import tax	157.99	4.29
Export tax	-61.24	-4.10
Production tax	-9.54	-18.81

[a] *Source*: Jolly et al. (1990).
[b] *Source*: International Energy Agency (1988).

Table 2.18: Ad valorem tariff equivalents for resources by region

	Australia[a]	*New Zealand*[b]	*Canada*[b]	*USA*[b]	*Japan*[b]	*Korea*[b]	*European Community*[b]	*Indonesia*[b]
Forestry	0.00	0.00	0.00	0.30	0.00	2.00	0.00	13.50
Fishing	0.00	3.30	0.30	0.10	7.40	13.80	6.80	9.20
Coal	0.00	0.00	0.00	0.00	157.99	1.00	4.29	5.00
Oil	0.00	0.00	0.00	0.60	20.10	5.00	0.00	0.00
Gas	0.00	9.70	2.70	0.00	0.00	5.00	0.01	0.00
Other minerals	0.00	1.80	0.30	0.30	0.00	2.20	0.00	3.60

	Malaysia[b]	*Philippines*[b]	*Singapore*[b]	*Thailand*[b]	*China*[c]	*Hong Kong*	*Taiwan*[b]	*ROW*[d]
Forestry	17.30	10.10	0.00	0.50	0.00	0.00	0.00	2.91
Fishing	3.50	11.20	0.00	20.40	0.00	0.00	0.00	4.88
Coal	4.50	10.20	0.00	14.70	35.00	0.00	0.00	15.45
Oil	0.10	10.00	0.00	0.00	0.00	0.00	0.00	2.39
Gas	0.40	0.00	0.00	0.00	0.00	0.00	0.00	1.19
Other minerals	3.30	27.20	0.00	9.70	0.00	0.00	0.00	3.22

[a] *Source:* Assistance Evaluation Branch of the Industry Commission.
[b] *Source:*Tormey (1993a).
[c] *Source:* Yang (1992).
[d] *Source:*Tormey (1993b).

Table 2.19: Ad valorem production taxes and user taxes on resources in China

SALTER industries	*Production Taxes*	*UserTaxes*[a]
	%	%
Forestry	10.34	0.00
Fishing	4.71	0.00
Coal	1.47	-64.66
Oil	12.94	-71.99
Gas	6.71	-71.99
Other minerals	16.56	0.00

[a] User taxes are applied to domestically produced commodities only.
Sources: Lin (1991), Hambley (1993).

Table 2.20: Ad valorem production taxes and user taxes on services in China

SALTER Industries	*Production Taxes*	*User Taxes*[a]
	%	%
Electricity,Water and Gas	28.65	-30.56
Construction	2.51	-31.04
Trade and transport	6.67	-14.53
Private services	31.74	33.33
Government services	0.00	33.33
Ownership of Dwellings	0.00	33.33

[a] User taxes are applied to domestically produced commodities only.
Sources: Lin (1991), Hambley (1993).