INDUSTRY COMMISSION

The SALTER Model of the World Economy

Model Structure, Database and Parameters

A study undertaken by the Industry Commission
on behalf of the Department of Foreign Affairs and Trade

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PREFACE

In December 1988 the Department of Foreign Affairs and Trade approached the then Industries Assistance Commission to conduct an analysis of the economic effects of alternative trade liberalisation scenarios. The analysis was to be based on a version of the WALRAS world trade model developed by the Organisation for Economic Co-operation and Development.

While the WALRAS model could provide valuable insights into the effects of trade liberalisation, to be of maximum policy relevance the country coverage and commodity detail contained in the original WALRAS model needed to be extended. In particular, given the Prime Minister's initiative to enhance the interchange of views between Australia and its near trading partners through the Asia-Pacific Economic Cooperation (APEC) Group, it was considered essential that the original model include the ASEAN region and the Republic of Korea. It was also considered necessary that the model identify commodities such as wheat and wool that are of special concern to Australia, and commodities such as rice and textiles that are important to Australia's regional partners.

The Department of Foreign Affairs and Trade commissioned the Industries Assistance Commission to develop a model which covered eight countries or groups of countries and up to 34 industries and commodities. The model was named SALTER (**S**ectoral **A**nalysis of **L**iberalising **T**rade in the **E**ast Asian **R**egion) after the distinguished Australian economist Wilfred Salter. The original version of the model was documented in Jomini et al. (1991).

In June 1991 the Department of Foreign Affairs and Trade again approached the Industry Commission to extend the SALTER model in various ways. The regional coverage was to be extended to reflect the growing membership of the APEC group. The new model therefore includes five ASEAN economies separately, as well as the economies of China, Hong Kong and Taiwan. The commodity coverage has also been extended slightly. On the theoretical front, the model is now a fully closed global model with a symmetric treatment of the Rest of the World. Most significantly, it also has a treatment of international capital flows. Finally, the model's database has been significantly improved.

This volume documents the theoretical structure of the new SALTER model, its database and parameters. It is being provided to enable scrutiny of the work undertaken so far. It is hoped that this process will enable the model to be refined as more information is incorporated in the database and the model's structure is further improved.

The SALTER model has the potential to significantly affect trade debates. It can highlight the economic and social effects of continued protection policies in the world economy. Having such a tool available at the present time is most opportune.

Philippa Dee

Project Leader

ACKNOWLEDGMENTS

The development of the SALTER model was made possible by substantial contributions from a number of specialists. The cooperation and encouragement provided by John Martin and his team at the OECD's Growth Studies Division has been greatly appreciated.

Several consultants were employed to assist in developing the model. Ken Pearson at Melbourne University extended the GEMPACK modelling software to enable the model's database to be updated and to obtain large change solutions of the model. Cillian Ryan of the University of North Wales constructed the database for the European Community component of the model. The Institute of Applied Economic and Social Research provided a review of existing multicountry models. Marinos Tsigas, Mark Gehlhar, James Binkley and Thomas Hertel provided crucial research skills in the estimation of international trade margins. Peter Warr facilitated access to input-output data for Thailand, the Philippines and China. Finally, Thomas Hertel undertook a pilot study introducing imperfect competition into the SALTER model.

Top class clerical support for the project was provided by Roberta Wise, Christine Hryhoriak and Malcolm Fisher.

WILFRED EDWARD GRAHAM SALTER

Wilfred Salter was born in Western Australia in 1929. He graduated with first-class honours from the University of Western Australia in 1952, and gained his PhD from Clare College, Cambridge, in 1955 for his thesis *A Consideration of Technological Change with Special Reference to Labour Productivity*. His research continued at Johns Hopkins and the Australian National University, culminating in the publication in 1960 of his most important work, *Productivity and Technical Change* — 'one of the finest — and earliest — examples of the embodiment hypothesis' (Harcourt 1972). Also while at the Australian National University, he developed with T.W. Swan the dependent economy (small country) model of stabilisation policy, indicating the role played by changes in the real exchange rate (Salter 1959). In 1960 he left the University to become Assistant Secretary in the Economic Section of the Prime Minister's Department. Taking leave from the public service in 1962, he joined the Harvard Advisory Group as Economic Adviser to the Government of West Pakistan. He died in Lahore in 1963.

> The activities of the last four years of his life show Salter's view of what an economist should be. Not content with even the most thorough academic training, with spinning theories, or with analysing cold statistics, he believed that an economist should learn his trade by responsible experience in varied fields. His decisions to join the Commonwealth Service and to work in Pakistan were part of a deliberate plan to fit himself for an economist's job, whether his future might lie in academic or in government service. (Swan 1963)

> Salter's work [on productivity and technical change] is a model which all aspiring (and established) economists could profitably have before them. Its characteristics are a flair for formulating relevant theory which, clearly, neatly and excitingly expressed, is carried no further than the requirements of the problem in hand — and is immediately tested against the facts. (Harcourt 1972)

The world trade model developed for the Department of Foreign Affairs and Trade has been given the acronym SALTER (Sectoral Analysis of Liberalising Trade in the East Asian Region) in his honour.

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1 THE SALTER MODEL STRUCTURE

The SALTER (Sectoral Analysis of Liberalising Trade in the East Asian Region) model is a computable general equilibrium model in the tradition of Whalley's (1985) models of world trade. Other models of this type include the WALRAS (World Agricultural Liberalisation Study) model used to analyse the economic implications of reducing agricultural assistance in member countries of the Organisation for Economic Co-operation and Development (Burniaux, Delorme, Lienert and Martin 1990), and the Michigan model of North–South trade relations between developed and developing countries (Deardorff and Stern 1986).

Like these models, the SALTER model is composed of regional submodels that describe the economic activities of firms, households and governments. The regional submodels are linked through international trade flows to form a general equilibrium model in which prices and quantities supplied and demanded are determined simultaneously in all primary factor markets and domestic and international commodity markets.

The SALTER model is normally used to simulate the effects of policy changes on equilibrium prices and quantities. Because it is general equilibrium in nature, it accounts for the feedback effects of a policy change throughout an economy and its effects on trading partners.

The model is comparative static. It reflects the completed adaptations that would occur as a result of a simulated policy change, subject to the constraints under which agents can make their decisions, relative to the position the economy would be in at the same point in time had the policy change not occurred. In this sense, the model is not dynamic, and the time path from the initial equilibrium to the new, policy-induced equilibrium cannot be followed.

The equations underlying the SALTER model can be classified as behavioural equations and accounting equations. Although the underlying behavioural equations are mostly non-linear, the entire model is linearised, as a first order approximation to the underlying model. As in the Johansen (1974) linearised model, most variables in the model are the percentage changes in quantities and prices that arise from the simulated policy change. A few variables are expressed in absolute change form. Although the model is specified as being approximately linear, it is possible to solve it in multiple steps, thus allowing any linearisation error to be made arbitarily small.

1.1 Regions and commodities

The SALTER model consists of sixteen countries or groups of countries centered on the Pacific Rim (Box 1.1). The world's major market oriented economies — Japan, the United States and the European Community — are explicitly modelled. The rapidly growing countries of Asia are represented by including the ASEAN countries, Hong Kong, Taiwan and the Republic of Korea (hereafter Korea). The People's Republic of China (hereafter China) is included because of its increasing importance in world trade and very large potential market for imports. The close economic ties Australia has with New Zealand are captured by including these two economies. Remaining regions are included in a 'rest of the world' aggregate. This aggregate region is composed of Africa, Latin America, the Pacific nations, Western European countries that do not belong to the European Community, nations classified until recently as 'centrally planned economies' (except China), the Middle-East, and Asian countries not already specified.

Box 1.1: **Regions in the SALTER model**

1	Australia	
2	New Zealand	
3	Canada	
4	United States	
5	Japan	
6	Republic of Korea	
7	European Community	(United Kingdom, France, Federal Republic of Germany, Italy, Belgium, Netherlands, Luxemburg, Denmark, Ireland, Greece, Spain, Portugal)
8	Indonesia	
9	Malaysia	
10	Philippines	
11	Singapore	
12	Thailand	
13	People's Republic of China	
14	Hong Kong	
15	Taiwan	
16	Rest of the world	

In each region, 37 commodities and industries are distinguished (Box 1.2). Concordances between standard commodity and industry classifications and the commodities in Box 1.2 are found in Hambley (1993). The amount of commodity detail was chosen so as to be able to model issues of concern to Australia and its trading partners. The model thus explicitly recognises the production of key

agricultural commodities of importance to some countries in the Asian region, such as paddy rice and non-grain crops, and identifies separately Australia's major resource-based exports — wool, wheat and coal. Labour-intensive manufacturing industries such as textiles, wearing apparel and leather products (including footwear) are identified separately, as are the resource-based industries of lumber and wood products and pulp, paper and printing. The heavy manufacturing industries which have formed the basis of the rapid growth of several European economies, Japan and Korea are also recognised explicitly, as are several types of service activity.

Box 1.2: **Industry and commodity groupings in the SALTER model**

Agriculture
1 Paddy rice
2 Wheat
3 Other grains
4 Non-grain crops
5 Wool
6 Other livestock products

Resources
7 Forestry
8 Fishing
9 Coal
10 Oil
11 Gas
12 Other minerals

Food manufacturing
13 Processed rice
14 Meat products
15 Milk products
16 Other food products

Non-food manufacturing
17 Beverages and tobacco
18 Textiles
19 Wearing apparel
20 Leather products (including footwear)
21 Lumber and wood products
22 Pulp, paper and printing
23 Petroleum and coal products
24 Chemicals, rubber and plastic
25 Non-metallic mineral products
26 Primary iron and steel
27 Non-ferrous metal products
28 Fabricated metal products
29 Transport equipment
30 Other machinery and equipment
31 Other manufacturing

Services
32 Electricity, gas and water
33 Construction
34 Trade and transport
35 Other services (private)
36 Other services (government)
37 Other services (ownership of dwellings)

The model recognises three primary factors of production: labour, capital and farm land. While capital and labour are used by all industries, farm land is used only in agricultural industries. Each primary factor of production can be treated as mobile between the industries in which it is used. In contrast to capital and intermediate inputs, labour and farm land are not traded between regions in the model. The aggregate quantity of farm land available in each economy is fixed, but the level of employment in each region can be determined by the model. Capital can be traded internationally through an international market for debt.

1.2 The economic structure of the SALTER model

The SALTER model depicts the behaviour of households, firms, governments and investors in each of the regions listed in Box 1.1. Changes in equilibrium quantities and prices are determined by the specified behaviour of economic agents and the structure of international trade.

As already noted, the SALTER model is not dynamic, but rather a comparative static model. Reactions to a change in the economic conditions facing economic agents are represented by the adaptations they make in order to achieve a new equilibrium. The rate at which these adaptations occur is not determined by the model; rather the changes observed in a simulation are those that would result given enough time to attain a new equilibrium.

The remainder of the chapter provides a description of the SALTER model's theoretical structure. The discussion refers to equations found in Appendix A (Table A1). These equations are written in their linearised percentage or absolute change form, but the discussion in this chapter is couched in terms of the underlying level forms. Appendix A provides the reader with tools to convert an equation expressed in levels to its corresponding linear expression in terms of percentage or absolute changes.

Microeconomic behaviour

Households are assumed to maximise the utility derived from the consumption of commodities, while producers minimise production costs under perfectly competitive conditions. The government is assumed to minimise the cost of acquiring commodities for public consumption. Similarly, given an aggregate level of investment (also determined within the model), the cost of acquiring investment goods is minimised by choosing the least-cost sources of each commodity.

These microeconomic activities generate commodity flows within and between regions. The importance of international trade flows in the SALTER model is reflected in the detailed specification of the choices available to economic agents over the regional sources of commodities. The general equilibrium framework integrates the behaviour of these decision makers into a consistent framework in which macroeconomic identities are respected within each region and globally.

Overview of the model's equations

The equations listed in Appendix A are grouped by main topic:

SA: microeconomic behavioural equations defining demands for commodities;

SB: zero pure profit conditions at all levels of transactions;

SC: market clearing conditions;

SD: household income aggregates, supply of primary factors and savings;

SE: government budget;

SF: international trade equations;

SG: equations governing international capital mobility;

SH: national macroeconomic indicators;

SI: instruments to define different economic environments; and

SJ: global macroeconomic indicators.

Equation group SA uses the microeconomic choice framework outlined above to define firms' demands for primary factors and intermediate inputs for production purposes. The SA equation group also defines household, government and investment demands for commodities by source (ie. domestically produced or imported from a particular source country) as well as aggregate commodity prices for each demand category.

Equation group SB defines the zero pure profit conditions linking the price of goods at all stages to the cost of inputs. The basic price of a firm's production links the cost of intermediate inputs and the total returns to primary factors to the total market value of production. The prices of traded commodities are linked to production costs (basic prices) plus the relevant internal and border taxes and international transport costs.

Equation group SC equates supply to demand for domestically produced and imported commodities as well as making provision to equate the supply to demand for labour.

The SD equation group defines several household income aggregates, including gross income, disposable income, and disposable income net of transfer payments. Various aggregates covering the sources of household income are given, such as labour, property, equity and net interest income. Equation group SD also shows how household disposable income is split between consumption and saving and how population growth feeds through to labour supply.

The SE equation group similarly defines the sources of government income, with a breakdown of revenue by primary factor and commodity tax revenue by type of tax and commodity use. It also gives the disposition of government revenue among current expenditure, transfer payments and government saving.

The SF equation group gives an analysis of the terms of trade. This group also includes equations defining various indexes of volume, value and price of traded commodities. The SF equation group therefore defines several aggregates of nominal and real exports and imports, trade by each country, and trade by commodity including separate equations for trade in freight services.

Equation group SG models international capital mobility. It describes wealth accumulation by households and governments, given their saving behaviour. It also describes the resulting world capital stock and the allocation of this capital, along with investment spending, across industries and regions. The international allocation of capital and investment is governed by a series of international parity conditions on rates of return to various real and financial assets.

Equation group SH defines production, income and expenditure aggregates, both real and nominal, and gross and net of taxes, with relevant accompanying price indexes. The SH equation group also defines national aggregates of each final demand catagory, as well as price indexes for each final demand catagory.

The SI group of equations define several ratios, such as the public consumption to private consumption ratio, and ratios of various fiscal and external balance measures to gross domestic product. These ratios can be used to specify different closures to the model.

Finally the SJ equation group defines a number of world macroeconomic indicators such as world income and world gross product, along with a world factor price index which is used as the numeraire in the model.

Demands for commodities

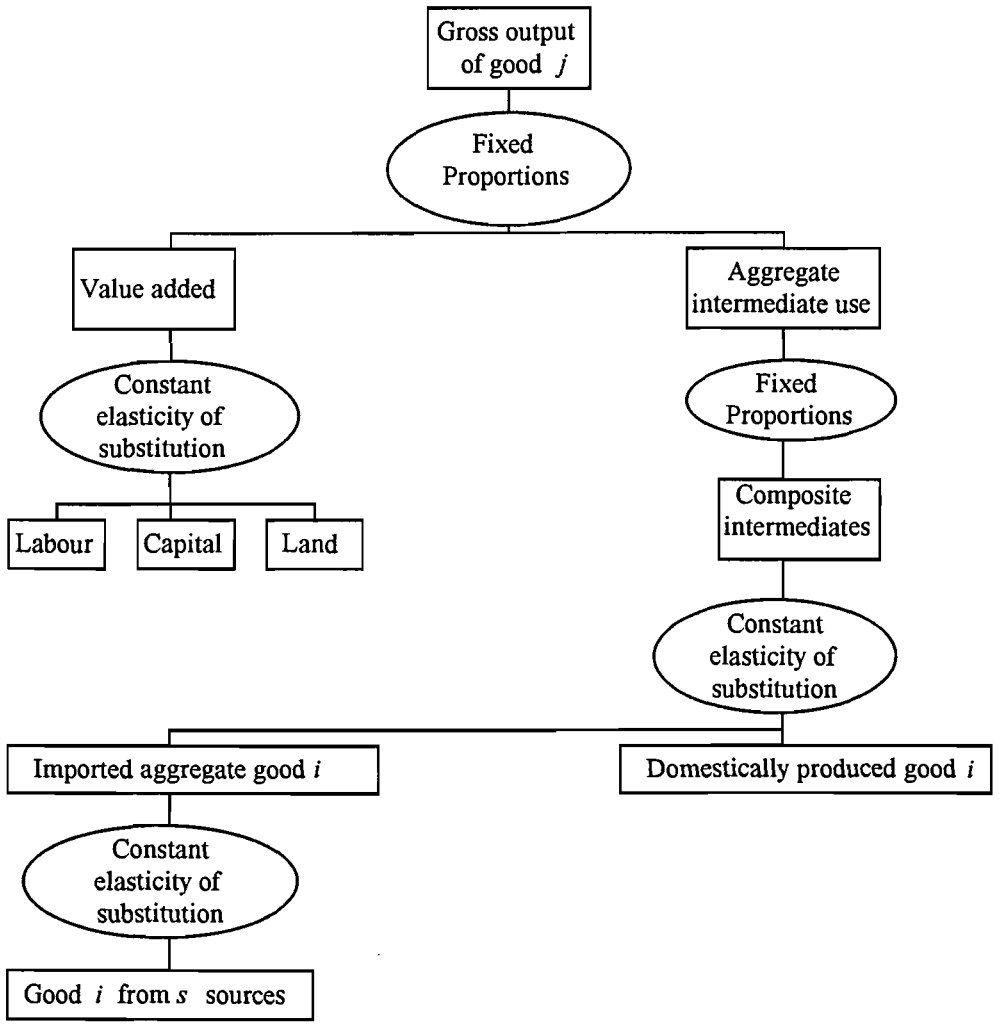
Firms' demands for inputs

Firms use primary factors along with intermediate inputs to produce output. In each region, single-output firms use a constant returns to scale technology. Given a level of output and technology to produce it, a representative firm for each industry is assumed to minimise the cost of acquiring inputs. Equations SA1–8 describe firms' derived demands for inputs. The figure in Box 1.3 is used to illustrate the structure of demand for inputs.

Individual firms are assumed to combine a bundle of intermediate inputs in fixed proportion with a bundle of primary factors. The demand for each separate intermediate input is also assumed to vary in fixed proportion with a firm's output. Hence, the demand for each intermediate input is determined once the level of output is determined. The Leontief structure implies that production processes are relatively inflexible in their use of intermediate inputs. However, firms are assumed to minimise the cost of acquiring each intermediate input by purchasing it domestically or from different foreign suppliers. This choice is constrained by the 'Armington assumption' (Armington 1969a,b) which governs the trade structure in the SALTER model. Domestic and imported commodities are imperfect substitutes and are substituted according to a constant elasticity of substitution. Similarly, an elasticity of substitution captures the degree of substitutability between imports from different sources.

This structure requires just two parameters. They are the elasticity of substitution constraining choices between a domestically produced commodity and an aggregate of the same imported commodity from different sources, along with the elasticity of substitution constraining choices among imports of a commodity from different sources.

Box 1.3: **Structure of production in a single-output industry of the SALTER model**



IC Chart

This nested structure of input demand is reflected by equations SA1–3. The nested demand equations use an average price of the commodity aggregate, with which the price of a particular commodity in the aggregate is compared. The average price calculations are found in equation SA4 for the average price of domestic and imported varieties, and in SA5 for the average price of imports from different sources.

A firm combines intermediate inputs with a bundle of primary factors. The bundle of primary factors (value added) comprises labour, capital and farm land. Farm land is used only in agricultural activities. The primary factors are combined to form value added according to a constant elasticity of substitution function. Thus if a particular primary factor becomes cheaper, firms have the opportunity to substitute it for other primary factors, to thereby reduce their production costs (equations SA6–8).

Changes in the production efficiency of inputs can also change a firm's demand for primary factors. In equations SA1–8, technical change variables are used to model a neutral, output-increasing technical change, a change affecting the use of a particular primary factor, a change affecting the use of all primary factors, or a change affecting the use of all intermediate inputs. Primary factors can be substituted for each other. Thus for a given level of output, for example, a technical improvement in the use of labour (a negative change in the labour productivity variable) may reduce or increase the demand for labour, depending on the share of labour in value added and the ease of substitution between labour and other primary factors. However, it will unambiguously reduce the demand for other primary inputs (capital and farm land).

Aggregate demand for primary factors is the sum of factor demands in individual industries (equations SA9–11). Since the supply of farm land within a region is fixed, only its reallocation among industries is possible; no growth in aggregate farm land use can occur. The aggregate demands for other factors in each region can be made to agree with the corresponding supplies.

Consumer demand

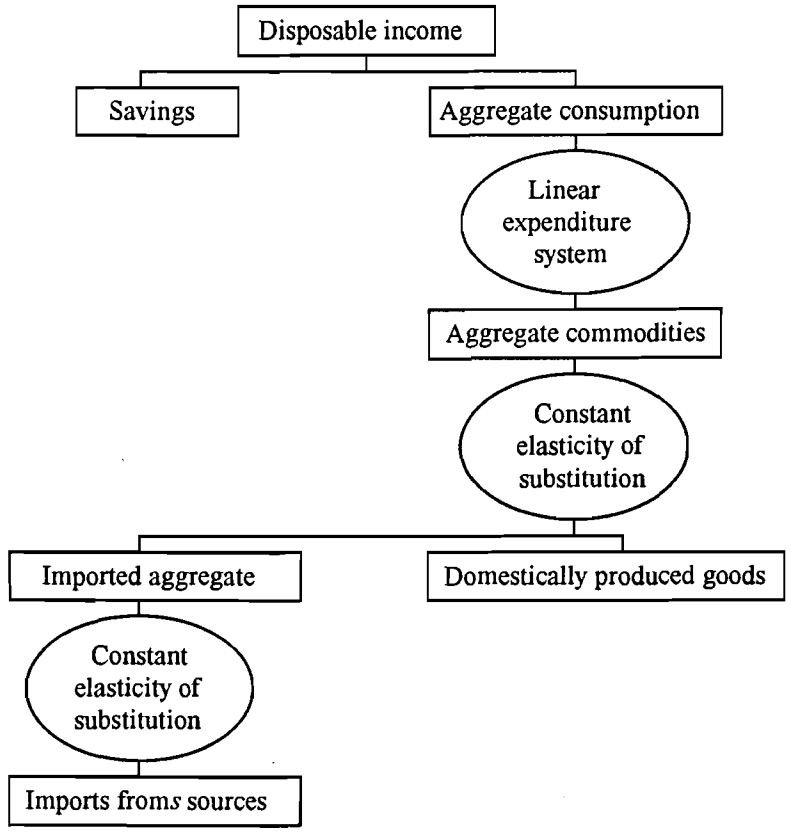
Consumer demand is determined by assuming that a single representative consumer in each region maximises the utility derived from consuming a bundle of commodities. Equations SA12–17 describe consumer behaviour. The form of the utility function results in a linear expenditure system (Phlips 1974), expressed by equation SA12. Consumer demand for a commodity is a function of the price of the commodity paid by consumers, the prices of other commodities, and aggregate consumption expenditure. The linear expenditure system in equation SA12 expresses consumer demand in per capita terms, then aggregates over the population. The parameters in the system are the own-price and cross-price elasticities of household demand which reflect consumers' attitudes to a change in the relative prices of the components of the consumption bundle. The expenditure elasticity describes how household consumption of a commodity changes with a change in a household's aggregate consumption expenditure. With this system, assuming no change in the number of households, the consumption level of each commodity in each region can be determined once aggregate consumption expenditure and prices are known.

Commodities in the SALTER model are differentiated in terms of their origin. Thus, once consumers have determined the level of consumption of a commodity, they are

assumed to minimise the cost of acquiring this commodity aggregate by choosing among different sources. These choices are constrained by the same type of Armington structure as the demand for intermediate inputs discussed above.

The schematic representation in Box 1.4 summarises how the representative household first allocates disposable income between savings and aggregate consumption expenditure (described later), and then follows a three-step procedure to determine the optimal quantity of each commodity, optimal quantities of imported and domestically produced commodities, and optimal quantities of imports from different sources. The latter choices are constrained by the Armington structure.

Box 1.4: **Structure of consumer expenditure and savings in the SALTER model**



IC Chart

In addition to supplying private savings and consuming commodities, households are assumed to own primary factors — labour, capital and farm land. Households receive the returns paid to primary factors in return for their services. This, and transfers from the government, provides households with income on which direct taxes are paid and out of which savings and consumption expenditures are allocated. The sources and disposition of household income are discussed in more detail below.

Other final demands

The theoretical structure of the SALTER model does not contain a detailed behavioural explanation of aggregate government final demand. Provision has been made to hold real aggregate government spending on commodities fixed, or to allow it to move in line with real aggregate household consumption (equation SI1). Government spending on each commodity within the aggregate moves in fixed proportions with aggregate government final demand. Government sourcing of commodities follows the same type of nested Armington structure as for household consumption and intermediate input demands (equations SA18–22).

In addition to demanding inputs and primary factors for current production, firms in aggregate demand resources for investment purposes. The amount of each commodity needed to satisfy investment purposes is assumed to vary in fixed proportions with the aggregate level of real investment in the region. The sourcing of each commodity used for investment purposes is determined using the same nested Armington structure as for household consumption and intermediate input demands (equations SA23–27).

The way in which aggregate real investment is determined in each region is discussed in more detail later. Briefly, global investment is determined within the model and is equal to global saving (via Walras law). Since in the long run, rates of return on capital are equated across regions, to maintain this equality over time global investment must be allocated across regions in such a manner that the rate of change in the rate of return on capital is equated across regions. This in turn determines aggregated real investment in each region.

The foreign demand for exports of each commodity from each source region is determined implicitly by the import demands for each commodity by each destination region.

The SALTER model differentiates between non-margins exports demanded in their own right in other regions, and margins exports used to facilitate the international shipment of the non-margins exports between regions. The theoretical structure makes provision for margins exports of all types of commodities, but the database records margins exports for one commodity only, namely, trade and transport services. Demand for these freight services is discussed later in the section on international trade.

Zero pure profit conditions

The prices for individual and composite commodities are used to define the zero pure profits conditions in equation group SB. Perfect competition is assumed to prevent firms from receiving excess profits. Alternatively, a firm with losses is assumed to withdraw from production. Thus the price received for a commodity is exactly equal to the sum of all costs of production (including returns to primary factors) plus indirect taxes levied on the value of industry production (equation SB1).

Competition also forces firms to reduce the price of their output in response to technological improvements. This is reflected by the last term in equation SB1, which is expanded in equation SB2: a 1 per cent technological gain in overall production reduces the price of output proportionally; a 1 per cent improvement in the use of intermediate inputs or primary factors reduces the price of output by the share of these inputs in the value of output.

The ex-factory price of output defined in equation SB1 is called the basic price, in the sense of United Nations (1990). The corresponding price of an import (the basic price of an import) is calculated as the sum of a 'world price' (defined further in equation SB14) and the relevant duty paid, expressed in local currency (equation SB3). Since commodities are defined in terms of their region of origin, an average price for a commodity aggregate composed of imports from all sources is calculated as a weighted average of the basic import prices paid for imports from all sources (equation SB4).

Equations SB5–SB12 calculate purchasers' prices for various users in each region as the product of the basic price and the *power* of a user-specific commodity tax, where the power of a tax is defined as one plus the tax rate. For a domestically produced commodity, the basic price is the ex-factory price. For an imported commodity, the basic price includes duties. Equation SB13 defines the fob export price of each commodity from each region as the product of the basic price of the domestically produced commodity and the power of a destination-specific export tax.

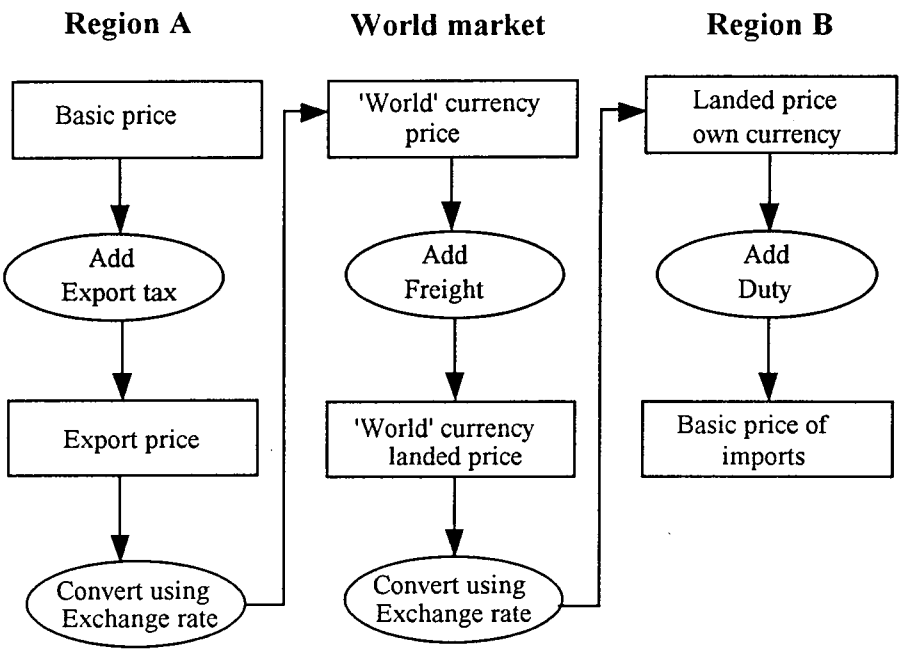
The 'world price' of a commodity exported from a particular region is calculated as the sum of the export price from that region, expressed in a common 'world' currency unit, and the cost of freight (equation SB14). Note that the model does not keep track of a full range of bilateral nominal exchange rates, but rather contains variables that measure each region's domestic currency price of a unit of some single neutral or 'world' currency (eg. the currency unit of some unchartered rock in the middle of the Pacific). This is the currency in which 'world' prices of exports from each region are expressed. The cost of freight (in world currency) which is also included in the 'world price' valuation of exports is calculated as the average price of margin commodities, with each region providing part of these freight services (equation SB15).

Box 1.5 summarises how prices are linked internationally when a product from region A is exported to region B.

Market clearing conditions

In each region, the sum of all demands for commodities is required to equal the supplies of each commodity. Provision is also made for the sum of demands for labour to equal supplies. These market clearing conditions are listed in equation group SC.

Box 1.5: **The international system of price transmission**



Domestic production of each commodity is required to equal the sum of all demands for the commodity (equation SC1). The relevant demands are for use as intermediate inputs, in household consumption, for investment purposes, by government and for export.

Market clearing of international commodity flows is ensured through equation SC2. The sum of all uses of an imported commodity from a specified source is required to equal imports of that commodity from that source.

Equilibrium in the labour market is expressed in equation SC3 in terms of the rate of employment. The employment rate is calculated as the ratio of labour demand to labour supply. Equation SC3 enables the change in a region's employment rate to be held exogenously fixed in some simulations, thus imposing labour market clearing at some 'natural' rate of unemployment. Alternatively, a region's employment rate may be allowed to vary endogenously (with the region's wage rate fixed exogenously in either real or nominal terms).

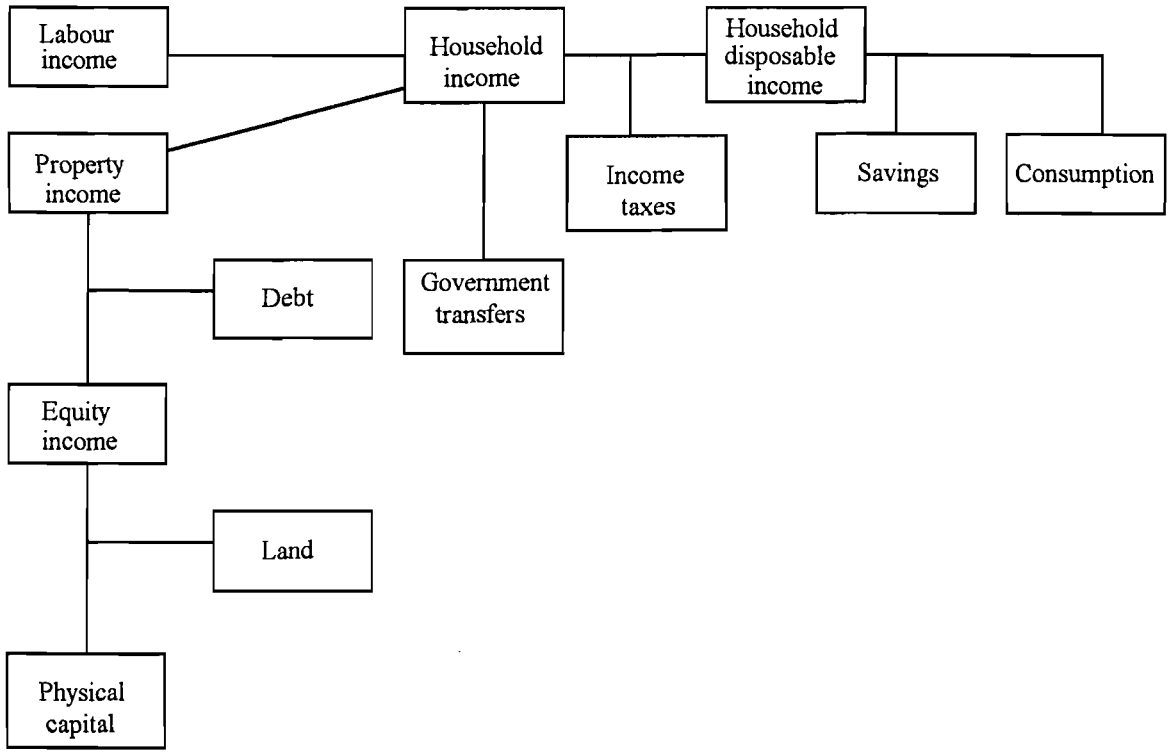
Full employment of farm land and capital is nevertheless assumed. Market equilibrium for farm land is modelled by setting aggregate demand for farm land in each region as exogenously fixed. Demand for capital is also required to equal supply. Capital supplies may in turn change in long-run simulations because of international capital mobility, while in short-run simulations the supply of capital in each industry in each

region can be held exogenously fixed. This aspect of capital markets is discussed further in the section on international capital mobility.

Sources and disposition of household income

As owners of primary factors, households receive the income generated by the primary factors' involvement in production. They also receive transfers from government and pay income tax. The disposable income remaining is allocated between savings and consumption. This part of the model linking consumption and savings to disposable income is one of the main characteristics of a general, as opposed to partial, equilibrium model. Box 1.6 summarises the sources and disposition of household income in each region.

Box 1.6: **Sources and disposition of household income**



IC Chart

Households are paid a rental price for the primary factor services they provide. The rental price of labour is the wage rate. Provision has been made to hold the wage rate exogenously fixed in each region in either real or nominal terms (equation SD11). Labour income earned by housholds in each region is determined by the wage rate and the amount of labour employed (equation SD2). Note that because employment rates in

each region need not equal 100 per cent initially, and may vary endogenously in some simulations, labour demand need not fully equal labour supply. Labour supply is modelled as being potentially wage-responsive (equation SD10), although in current versions of the model the wage elasticity of labour supply is set to zero.

The combined return on capital and land (net of depreciation on capital) provides household income from equity, since equity in each region's productive assets is assumed to be owned entirely by the household sector in that region (equation SD4–5). The interest rate on debt and household net bond holdings determine household net interest income (equation SD6). Household property income is defined as the sum of equity income and net interest income (equation SD3).

Note that the net interest income and net bond holding variables have been defined in absolute rather than percentage change form, and as ratios of household net interest income and net bond holding to household disposable income. Expressing these variables in absolute change form allows the model to handle the possibility that household net interest income and net bond holding may be positive or negative initially, and may change sign in response to some shock. For similar reasons, all rate of return variables, including the interest rate on debt, have been defined in absolute rather than percentage change form. This is discussed more fully in the section on international capital mobility.

The sum of labour and property incomes and transfers from the government constitutes aggregate household income (equation SD1).

Households then pay income taxes. Subtracting income taxes from household income yields household disposable income (equation SD7). A pre-transfer measure of household disposable income is also defined (equation SD9).

Households allocate disposable income in fixed proportions between consumption and savings. A savings-to-income ratio is defined (equation SD8), and normally set exogenously fixed. The household saving-income ratio is another variable that has been defined in absolute rather than percentage change form.

Thus aggregate household consumption expenditure is determined and can be allocated using the linear expenditure system and nested structure found in equations SA12–15. Once household savings are determined, they are allocated between changes in household asset positions, that is, between stocks of bonds and equity. This allocation is discussed further under international capital mobility.

Government budget

Transfers of various kinds occur between the private and government sectors. The government collects taxes from households in the form of income taxes and ad valorem

commodity taxes on consumer purchases. In return, it redistributes income by distributing transfer payments to households.

Ad valorem commodity taxes are also levied on all other domestic uses of commodities — that is, on purchases by producers and the government and for investment purposes. In each region, governments also collect taxes on international trade, in the form of duties on imports and export taxes on exports. The government also collects industry taxes (net of subsidies) by taxing the value of industry production. Finally, the government receives net interest receipts from its net bond holdings, which are determined in the section on international capital mobility.

Government receipts are used to fund the transfers to households, along with government's expenditure on commodities. The difference between these outlays and government receipts constitutes the net government surplus.

The calculation of government receipts and outlays in each region is made in equation group SF. The government budget in each region is also described in Box 1.7. Government receipts are composed of the revenue from income taxes and indirect taxes, along with net interest receipts (equation SE1). Income tax revenues are the sum of tax revenues on labour and property incomes (equation SE2), which are calculated in turn as the product of an average tax rate specific to the type of income and the corresponding taxable income (equations SE3, 4 and SE16, 17).

Indirect tax revenues are the sum of tax revenues generated by industry taxes (net of subsidies) and each type of commodity tax (equation SE15). The model in turn calculates the contribution of each of these taxes to aggregate indirect tax revenues net of industry subsidies (equations SE6–12). These contributions are defined as the ratios of revenues from the particular tax to total government indirect tax revenue. The contribution of a particular tax has two components: a contribution due to an autonomous change in the tax rate and a feedback effect. The feedback effect comes from changes in the tax base: changing the tax schedule results in a reallocation of resources and expenditures which changes the value on which the tax is levied.

The government may borrow from or lend to the international bond market. Part of its income therefore comprises net interest receipts. These net receipts contribute to government receipts, and are calculated in each region as the product of the rate of return on bonds and government net bond holdings (equation SE5). If the government is a net lender, net bond holdings are positive and interest is added as part of receipts. Conversely if the government is a net borrower (as is normally the case), government net bond holdings are negative and interest payments on government debt reduce aggregate government receipts. As in the case of households, the government net interest receipt and net bond holding variables have been defined in absolute rather than percentage change form, and as ratios to government total receipts.

Box 1.7: **The government budget in each region**

Sources of funds	*Uses of funds*
Income taxes Tax on labour income Tax on property income	Government outlays Current consumption expenditure Transfers to households
Commodity taxes (net of subsidies) on imported and domestically produced commodities for: – consumer demand – government demand – investment demand – demand for intermediate inputs	Net government surplus
International trade taxes – export taxes – import duties	
Industry taxes (net of subsidies)	
Net interest receipts	
Total government receipts	Disposition of government receipts

Government receipts are allocated between current outlays and net government saving (equation SE13). Current outlays are composed of current government expenditure on goods and services and transfer payments to households (equation SE14). Transfer payments to households normally move in line with household pre-transfer disposable income, although provision is also made for autonomous changes in transfers (equation SE18).

Changes in government saving will feed through into government net bond holding, as discussed further in the section on international capital mobility. As for households, the government saving-to-income variable has been defined in absolute rather than percentage change form.

Public capital expenditures are excluded from the government's current account. They appear in investment expenditures along with private investment.

International trade flows

Trade in the SALTER model is created by the demands made by households, firms and governments for commodities from different sources. For a single region, exports are part of final demands. Imports are composed of final and intermediate demands for imports.

Several trade aggregates are calculated in the SALTER model. These different measures of trade flows are useful in interpreting model simulation results. Equations group SF summarises the trade flows in the model.

Equation SF1 establishes the notation for trade flows when they are described from the exporting region and the importing region. It simply states that the volume of non-margins exports of a particular commodity from region *z* to region *s* must equal the volume of imports of the same commodity by region *s* from region *z*. Equations SF2–7 specify trade indices. For each region, equation SF2 gives a value, and equation SF4 gives a volume index for imports of a given commodity from all sources, while equation SF3 gives a value of imports of all commodities from a given source. Both value aggregates are calculated at duty-free prices. These duty-free valuations allow the user to evaluate trade effects that are due to decisions in other regions, and are not clouded by a region's change in protection structure. Similarly, equation SF5 gives an fob value and SF7 gives a volume index for margin plus non-margin exports of a given commodity to all sources, while equation SF6 gives an fob value of non-margin exports of all commodities to a given destination.

The model also defines single-valued indexes of aggregate trade which are used in the standard macroeconomic identities in equation group SH. These indexes are for aggregate imports cif and exports (margin plus non-margin) fob. The corresponding volume indexes are obtained by deflating nominal values by the appropriate price indexes (equations SF8–11).

In the SALTER model, regions can exercise market power in both exporting and importing. This means that terms of trade effects can be important in explaining the gains or losses a region experiences as a result of changes in policies. Terms of trade effects can be analysed with equations SF12–22. McDougall (1993a) provides a thorough exposition and derivation of this terms of trade decomposition.

The ratio of export prices to import prices defines the terms of trade. The import prices used are evaluated net of duties and both prices are in the common 'world' currency. The overall change in the terms of trade of a region can be decomposed into contributions from three sources:

- the change in the average world prices of traded commodities, and whether a region is initially a net importer or a net exporter of those commodities (equations SF13–14);
- the change in the prices of exports from the particular region, relative to the changes in average world prices of those commodities (equations SF15–16); and
- the change in the prices of imports into the particular region, relative to the changes in average world prices of those commodities (equations SF17–18).

The first contribution can be measured by the covariation between average world price changes for commodities and a region's initial net export position. If a region is either a net exporter of commodities whose prices rise, or a net importer of commodities whose prices fall, its terms of trade would tend to improve and the contribution from this source would be positive.

Because traded commodities are distinguishable by source in SALTER, and because commodities from different sources are imperfect substitutes, the prices which a particular region receives for its exports or pay for its imports may deviate from the average world prices. If a region has a particularly large expansion in exports of a commodity to a particular destination, the price it receives is likely to rise by less, or fall by more, than the average world price. In this case the covariation between the export price received by the region and the average world price of the commodity would be negative, and would in turn contribute negatively to the overall terms of trade change.

Similarly, a region which experiences a particularly large expansion in imports from a particular source may be able to pay a price which rises less than the world average price, or falls by more. In this case, the covariation between the import price paid by the region and the average world price of the commodity would be negative, and would in turn contribute positively to the overall terms of trade change.

The three components of the terms of trade change are therefore defined by measures of covariation, firstly for each commodity individually and then in aggregate across all commodities. For purposes of interpretation, it is only necessary to note, for example, that if the three aggregate components are called C_1, C_2 and C_3, the overall change in the terms of trade is measured by $C_1 + C_2 - C_3$. Equations S19–22 define the relevant region-specific and world average price indexes used in the terms of trade decomposition.

Recall that in the earlier section describing final demands, it was noted that regions supply margins exports which are used to facilitate the international shipment of the goods and service exports demanded in their own right by users in other countries. Equations SF23 and SF24 specify implicitly (by choice of notation) that the supply of margins exports from each region must equal the demand for those services, and

specify explicitly the nature of those so-called freight demands. Global demand for freight services moves in strict proportion to the global total volume of all goods and services being shipped (equation SF24). The demand for a particular freight service from a particular region depends on the global demand for all freight services from all regions, but also has a price-responsive component (equation SF23). A single elasticity of substitution governs the price sensitivity of a particular freight service from a particular region, relative to the global average price of all freight services from all regions.

Finally, equation SF25 defines a volume index of non-margins exports of a given commodity to all sources (excluding intra-regional exports) while equations SF26 and SF27 make provision for changes in import duty rates to be uniform across all source regions, and for changes in export tax rates to be uniform across all destinations.

International capital mobility

This section is a summary of McDougall (1993b), which describes the international capital mobility extension of the SALTER model in more detail. Equation group SG describes the system by which international investment decisions are made, capital is accumulated, and capital transferred from one region or industry to another.

The financial capital market in the SALTER model has two types of financial assets, bonds and equity in productive assets. Only debt in the form of bonds is traded internationally, since equity in each region's productive assets is owned entirely by the household sector in that region. However, because the net interest payments made by one region to another must be paid for out of the equity income generated in the region (see equation group SD), agents in one region can gain an indirect stake in the productive assets of another region by lending to that region.

The model keeps track of net foreign bond holding positions, not gross bond holdings or gross bond issues. Similarly, the model keeps track of net interest income flows rather than gross flows. This treatment avoids the need for a full accounting of portfolio allocation under uncertainty.

As a consequence, the model assumes that income taxes are levied on the net interest and property income accruing to domestic residents, but assumes no domestic taxes are levied on net interest payments to foreigners. Modelling the taxation of international capital flows more realistically would require a treatment of gross rather than net international interest income flows. This is because governments do not generally balance taxation of gross interest income payments to foreigners with subsidisation of gross interest income receipts from foreigners.

To model international capital mobility, SALTER has equations governing:

- the international allocation of capital;

- the world stock of capital;
- wealth accumulation; and
- the international allocation of investment.

Financial capital mobility is captured directly, and physical capital mobility indirectly, by a number of parity conditions.

Equilibrium in international financial markets requires international interest parity on bonds (equation SG11). Rate of return maximisation by households imposes parity between the interest rate on bonds and the rate of return on equity in each region, although provision has been made for the imposition of an exogenous equity premium (equation SG12).

The required or normal rate of return on physical capital in each industry in a region must equal the rate of return on equity in that region. The actual rate of return on physical capital in each industry in a region may include an abnormal return component (equation SG13). The actual rate of return on physical capital in each industry in a region is defined in turn as the rental price of capital services relative to the replacement cost of capital goods (equation SG14).

In the long run, physical capital mobility would ensure that the actual rate of return on capital was equal to the required rate. This is captured in long-run simulations by making the rate of abnormal return to capital in each industry in each region exogenously fixed. In short-run simulations, the capital stocks in each industry in each region would instead be held exogenously fixed, with the rates of abnormal return to capital allowed to vary.

Similarly, the required or normal rate of return on land in each region must equal the rate of return on equity in that region (equation SG15). However, in the case of land this equality is ensured in both short-run and long-run simulations by endogenous adjustment in the stock price of land.

Thus in the short run, abnormal returns may be earned on capital, but not on land. The reason is that the capital goods are produced, while land is not. So the stock price of capital goods is tied to their replacement cost, while the stock price of land is free to vary. Land prices accordingly adjust to maintain normal rates of return even over the short run, but capital goods prices do not. So capital typically earns some short-run abnormal return (which may be either positive or negative), but land does not.

As the functional forms of equations SG14 and SG15 make clear, all rate of return variables in the model are expressed in absolute rather than percentage change form. This allows the model to handle the possibility that rates of return may be positive or negative initially, and may change sign in response to some shock. A sign change is most likely to occur in the rates of abnormal return to capital, but could also occur in

overall rates of return to capital, in short-run simulations in which there were particularly adverse effects on profitability in some industries.

Note that the international interest parity condition in equation SG11 does not include changes in the rates of currency depreciation in each region. Hence it does not appear to make provision for exchange gains or losses as part of the return on foreign bond holding. The reason is that the model is comparative static, capable of giving results in the form of 'deviations from control' at some future point in time (the terminal instant), but not of tracing the time paths of variables over the simulation period between initial and terminal instants. Thus the model cannot trace the actual rate of currency depreciation over the simulation interval. Instead, an assumption is simply made that at the terminal instant, the rate of currency depreciation in each region exactly offsets the domestic rate of inflation. Under this assumption, uncovered interest parity and purchasing power parity imply parity in real interest rates. This is the form in which equation SG11 is written.

Because of the assumption that international interest income flows are not taxed at source, the international interest parity condition applies to pre-tax interest rates. Similarly, because the model applies a common tax rate on household equity income and household net interest income, the domestic bond-equity parity condition could be applied to either pre-tax or post-tax rates of return, but is written in pre-tax form.

Finally, although provision has been made for the introduction of a non-zero equity premium in each region's bond-equity parity condition, the theoretical structure of the model is not conducive to interpreting this premium as a risk premium. This is because the model does not contain a full treatment of risk. Thus a positive premium could capture higher returns to risky assets, but the model would not capture the impact of the risk itself which would reduce the certainty-equivalent rate of return on equity to a level matching the return on bonds. For this reason, the model's database also records real rates of return on equity that are equal to the world real bond rate (Brown, Strzelecki and Watts 1993).

Equation group SG also contains a number of stock asset accounting relations. World net ownership of bonds is equal to the sum over regions of net ownership of bonds in each region (equation SG1). Net ownership of bonds in each region is equal to the sum of new ownership by households and by governments (equation SG2). Household wealth is equal to the sum of equity in that region's productive assets and net household ownership of bonds (equation SG3). Equity in a region's productive assets is equal to the stock value of capital plus the stock value of land (equation SG4), where these stock values are defined in equations SG6 and SG7 as the product of the prices and quantities of the stocks of capital and land, and a corresponding equity price index is defined in equation SG5.

These asset accounting equations for net bond ownership, both globally and by region, specify net bond ownership as the product of global or regional disposable income and a corresponding net bond-to-income ratio (where the latter are defined in absolute rather than percentage change form). This specification does not imply that net bond-to-income ratios are held constant, either by households or governments in each region. Instead, net bond holding by households and governments is determined by wealth accumulation equations, where wealth accumulation is in turn governed by the assumption that households and governments save a constant proportion of their disposable income. These accumulation relations are discussed shortly.

It is the case, however, that in long-run simulations, the world bond-income ratio is held exogenously fixed. This is to ensure that an initial database condition continues to be met, namely, that the world net ownership of bonds is zero. The world bond-income ratio is held fixed by allowing the world bond interest rate to vary.

The short run is a length of run over which stock variables do not change. The asset stock and wealth accumulation equations in the model ensure that if the stocks of capital and land are held fixed, as they are in short-run simulations, then the world stock of bonds will also be fixed. The initial database condition that world net ownership of bonds is zero is therefore maintained endogenously via the asset stock and wealth accumulation accounting; the world bond-income ratio no longer needs to be held fixed exogenously to ensure the condition is met. Thus the world bond-income ratio is endogenous in the short run, with the world bond interest rate being exogenously fixed.

Household and government wealth are modelled as the outcome of a wealth accumulation process whereby households and governments save or dissave some predetermined fraction of their net disposable income. Although the model is not explicitly intertemporal, the intrinsic dynamics of wealth accumulation out of disposable income can nevertheless be captured by assuming that the underlying growth path of disposable income is 'smooth'. The changes in wealth by households or governments in each region can then be described as quasi-intertemporal functions of changes in their savings ratio and changes in their disposable income, as well as changes in an asset price index capturing capital gains or losses. These household and government wealth accumulation equations are shown in equations SG8 and SG10, and the asset price index relevant for households is defined in equation SG9.

Given that equilibrium in the markets for capital and land as productive assets determine the level of equity in each region, the accumulation equations showing changes in total wealth by households and governments in each region determine their changes in bond holdings, and therefore the changes in their net interest income from abroad.

The household asset price index defined in equation SG9 is an index of the prices of equity and bonds, expressed in local currency. Stock prices for capital and land are readily available in the model. Under the assumption that equity prices reflect the prices of these underlying physical assets, the equity price index is just an index of the stock prices of capital and land. The construction of bond prices requires further comment.

The asset accounting discussed above was written entirely in value terms. The construction of a bond price index requires bond values to be split into a price and a quantity component. Since one region's lendings are another's borrowings, a common quantity unit is required to ensure consistency in the net bond holdings of all regions. A common quantity unit can be constructed by assuming that all bonds are denominated in the neutral 'world' currency. A further assumption is made that bond prices are indexed to the world consumption price index. These assumptions preserve the price homogeneity properties of the model: an increase in the world price level, or an increase in the domestic price level accompanied by a currency depreciation, confers no benefit on debtor regions, and imposes no cost on creditor regions. Thus the model abstracts from the redistributive effects of unanticipated price changes. The assumptions jointly imply that a local bond price index can be defined as the world consumption price index converted to local currency.

The form of the wealth accumulation equations also requires some comment. The term on the left hand side of each equation represents the change in nominal wealth at the terminal instant, relative to the control solution. The first term on the right hand side represents that part of the total change in wealth which is due to changes in the prices of assets held at the beginning of the simulation period. For households, the relevant price change is the change in the household asset price index just discussed. Since governments hold bonds but not equity, the price change relevant for governments is just the change in the price of bonds.

The second term on the right hand side of each wealth accumulation equation gives the change in nominal wealth which is due to (exogenous) changes in household or government savings ratios.

The third and fourth terms on the right hand side of these equations give the changes in nominal wealth arising from changes in nominal disposal incomes. The changes in total wealth from this source are split into the impact of changes in real disposable incomes and changes in prices. The reason that the coefficients on the price and real income components differ from each other is because of the assumption that real disposable incomes adjust smoothly over the simulation interval, but that price changes are concentrated at the beginning of the simulation period. Given the observed tendency of prices to overshoot in the short term in response to economic shocks, but for real activity to respond in a direction in the short term that may be the opposite to the longer term impact, the model's assumptions concerning the dynamic behaviour of

prices and real incomes are more realistic than alternative characterisations of 'smooth' adjustment.

Finally, equation group SG contains equations governing the international allocation of investment. Global investment is equal to global savings, via Walras law. The international allocation of global investment across regions is based on the same parity conditions as the international allocation of physical capital.

In the long run, capital is allocated to equalise its rate of return across industries and regions. To maintain this equality over time, investment must be allocated across regions so as to equalise expected *time rates of change* in rates of return. The associated international interest parity and bond-equity parity conditions in expected rate of change form are shown in equations SG20 and SG21.

In the short run, however, it needs to be recognised that rates of return on capital in individual industries may deviate from parity. In the short run, the model assumes that investment is concentrated in regions with abnormally high rates of return, away from regions with abnormally low rates of return, so that abnormal returns would be gradually eliminated over time. This is discussed in more detail shortly.

The treatment of investment just outlined requires a treatment of the way expectations are formed over rates of return. Because the model is not explicitly intertemporal, fully consistent forward-looking expectations cannot be imposed exactly. Functional forms and parameter settings are nevertheless chosen so that expected rates of return are broadly consistent with the behaviour of actual rates of return in the model. The resulting expression for the expected time rates of change in rates of return on capital across regions is shown in equation SG16.

The expression in equation SG16 embodies the following assumptions about the way in which investors form their expectations (McDougall 1993b). The expected rate of return on capital at any point of time in the future depends only on the size of the capital stock at that point in time. Because the world economy grows over time, investors expect that capital stocks can also grow at some fixed positive rate without a decline in the rate of return. In parameterising the model, this fixed constant-expected-rate-of-return rate of growth in the capital stock is set equal to the actual rate of growth in the capital stock, as implied by the data on net investment and initial capital stocks embedded in the model's database.

The model then assumes a particular functional form showing how investor expectations of future rates of return vary around the 'steady state' rate of return, as the size of the future capital stock varies around that implied by the 'steady state' or constant-expected-rate-of-return growth rate. The functional form chosen is one in which the elasticity of the expected gross rate of return on capital with respect to the expected size of the capital stock, α^z, is fixed. In parameterising the model, a value is chosen for this elasticity that is consistent with the actual behaviour of the model. The

value is found by performing a model simulation. A change in the required rate of return is introduced into the model through a shift in the equity premium, and the observed changes in actual returns and capital stocks are used to derive an initial value for the elasticity. This value is then inserted into the model's database, the simulation repeated, and the procedure iterated until the value of the elasticity converges. The resulting values for α^z are negative, but vary from region to region.

The first term on the right hand side of the equation SG16 therefore indicates that, the higher the level of investment in a region, relative to its capital stock, the more rapid the expected *decline* in the rate of return on capital. Equation SG16 therefore specifies a downward sloping investment schedule for each region. The second term on the right hand side of equation SG16 appears as a consequence of the constant-elasticity form of the underlying expected-rate-of-return equation. Because of this form, the greater the actual rate of return, for any given rate of growth of the capital stock, the greater the expected rate of change in the rate of return. The average actual rate of return across industries in each region, appearing in the second term of equation SG16, is defined in turn in equation SG17.

The remaining two equations in the SG group specify the process by which investment is allocated in the short term to equilibrate rates of return over time. The expected return on capital in each region can be written as the sum of an expected normal and an expected abnormal component. Thus the expected rate of change in the rate of return on capital is the sum of the expected rate of change in the normal component, equal to the expected rate of change in the return on equity, and the expected rate of change in the abnormal component. On the assumption that the abnormal component regresses to zero over time according to a Koyck process, the rate of change in the abnormal component will be inversely proportional to the size of the abnormal component, with an adjustment parameter reflecting the speed of adjustment. The size of the abnormal component, averaged across industries in each region, is defined in equation SG19. The resulting expression for the expected rate of change in the return on capital is shown in equation SG18. This becomes the expected-rate-of-change counterpart to the levels parity condition of equation SG13, except that the abnormal return to capital is now predetermined in expected-rate-of-change form via the Koyck adjustment process.

Now consider how the downward sloping investment schedule in equation SG16 interacts with the expected-rate-of-change parity condition for capital in equation SG18. In the long run, when abnormal returns to capital do not change, equation SG16 will determine the level of real investment in each region required to ensure that the expected rate of change in the return on capital equals, via equation SG18, the expected rate of change in the rate of return on equity.

In the short run, however, regions experiencing an increase in abnormal returns to capital will need, via equation SG18, an expected future rate of change in the overall

return to capital that is more negative than the expected future rate of change in the return on equity. This requirement will ensure that abnormal returns are driven to zero over time. The requirement is met, via equation SG16, by having a higher rate of real investment than in the long run. Thus the two equations SG16 and SG18 ensure that in the short run, regions with higher abnormal returns receive a greater share of world investment.

Macroeconomic indicators

Equation group SH defines macroeconomic indicators of welfare and other regional aggregates. The macroeconomic aggregates are of three types: nominal values, aggregate price indices and real quantities. The latter are used as indicators of welfare and resource availability. Relations between the main aggregates are summarised in Box 1.8. The box also gives the equation references in which the corresponding nominal, real and price index components of each macroeconomic aggregate are defined.

Box 1.8: **Definitions of main regional macroeconomic aggregates**

Item		*Description*	*Equation reference* *Nominal*	*Real*	*Price index*
Income side					
GDP at factor cost	=	Sum of value added paid to primary factors (primary factor income)	SH2	SH21	SH18
GDP at market prices	=	GDP at factor cost + indirect taxes	SH22		
Net factor income	=	GDP at factor cost – depreciation	SH4		
National income (NNP)	=	Net factor income + indirect taxes + net interest income from overseas	SH24	SH29	SH28
GNP	=	GDP at factor cost + net interest income from overseas	SH23		
Expenditure side					
Expenditure on GDP	=	Household consumption + gross investment + government spending + exports – imports	SH1	SH5	SH19
GNE	=	Household consumption + gross investment + government spending	SH3	SH6	SH20
NNE	=	GNE – depreciation		SH7	
National consumption expenditure	=	Household consumption + government spending	SH26		SH28

Real national income is the preferred welfare measure in SALTER. Note from Box 1.8 that it is obtained by deflating net national product by the national consumption price deflator. The real income results reported in the model are calculated exactly, but for purposes of interpretation it is useful to note that real national income can also be approximated as follows:

$$\%\Delta \text{ (real income)} \cong \%\Delta \text{ (real GDP)} + S_T.\ \%\Delta \text{ (terms of trade)}$$
$$+ \Delta \text{ (net interest income from abroad as percentage of national income)}$$

where S_T is the share of exports (or imports) in GDP, the terms of trade variable was defined in equation group SF and the net interest income to national income variable is defined (in absolute change form, as required) in equation SH25.

The above approximation is derived from the underlying macroeconomic identities but makes the following simplifying assumptions: it ignores the distinction between NNP and GNP, it assumes trade is balanced initially, it assumes the share of net interest income in national income is initially small, and that the consumption price deflator is approximately equal to the GNE deflator. It is therefore a better approximation for some regions and in some simulations than in others.

Equation SH27 defines the national saving-income ratio in each region, in absolute change form. Although household and government saving-income ratios are normally held fixed individually, the national (household plus government) saving-income ratio may still change endogenously because of compositional shifts which change the relative sizes of the household and government income in each region.

Finally, equations SH9–17 define the nominal, real or price index components not elsewhere defined for some of the building blocks of the major macroeconomic aggregates, including household consumption, investment, government spending, exports, imports and depreciation. Equation SH8 defines real household disposable income in each region by deflating nominal disposable income by the consumer price index.

Note that the price indexes defined throughout the model use value shares derived from the initial database as the weights for each individual price in an index. However, in the multiple-step solutions, which are used in order to reduce linearisation error, an updated database is used to calculate the index weights at each step of the solution procedure. This means the index weights change at each step of the solution procedure and the price indexes so derived are similar to Divisia indexes, which take into account changes in weights over a period of observation.

Equations for defining economic environments

Equations SI1 to SI5 define a number of ratios that may be used to specify different closures to the model. Equation SI1 defines the ratio of private consumption to public consumption expenditures. By holding the shift term in this equation exogenously fixed, a common rate of growth in private and public expenditures on goods and services can be maintained.

The remaining equations in this group define a region's fiscal surplus and various measures of its external surplus, all expressed in absolute change form and as ratios to regional GDP. While these measures would normally be allowed to vary endogenously, they could be made the targets of government policy by being held exogenously fixed, while endogenising some corresponding policy instrument variable.

Global macroeconomic indicators

The final group of equations defines a number of world macroeconomic indicators, including nominal world gross product (equation SJ1), nominal world income (equation SJ2), a world consumption price index (equation SJ3), world real income (equation SJ4), world net interest income from abroad (equation SJ5) and world net capital inflow (equation SJ6), with both these latter variables expressed in absolute change form and as ratios of world gross product, the world capital stock (equation SJ7) and world real investment (equation SJ8). Finally, equations SJ9 defines a world factor price index which is normally used as the model's numeraire.

1.3 Solving the linear system of equations

The SALTER model is specified as a linear approximation in terms of the percentage or absolute changes in its variables. Although the underlying relationships are highly nonlinear, it is assumed that a linear approximation can be a good approximation to the true outcome of a policy change — provided the policy change is small. The advantage of specifying the model as a linear approximation is that it can be solved by the relatively simple process of matrix inversion, rather than by more complex non-linear techniques. The SALTER model is implemented and solved in this fashion using the GEMPACK software suite. Codsi and Pearson (1988) give an overview of the software while Harrison and Pearson (1993a,b) describe its use in more detail.

The accuracy of the linear solutions depends on the degree of nonlinearity of the underlying model in the neighbourhood of the initial equilibrium, and the size of the policy shock being examined. The difference between the linearised solution and the (unknown) solution to the nonlinear problem is called linearisation error. Keller (1980) indicates 'that static general equilibrium systems are only moderately non-linear' when

compared with dynamic systems. Linearisation errors limit the magnitude of changes that can be simulated, but Keller suggests that a 10 per cent change in taxes does not impair the accuracy of the linearised solution.

When policy changes being simulated are large, the Euler solution procedure can be used to obtain a more accurate solution of the model. The Euler procedure involves dividing a large policy change into a number of small changes in order to reduce linearisation error. A first simulation is performed using a fraction of the large change. This results in a certain number of linear changes in the endogenous variables. These changes are applied to the original database to obtain a new updated database on which a second simulation is performed applying a second small policy shock to obtain new linear responses with respect to the data resulting from the previous simulation. This process is repeated until the entire large change has been performed through the small changes.

The accuracy of such multi-step solutions increases with the number of small changes made, but increasing the number of steps also increases the time needed to obtain a solution. Dixon et al. (1982) indicate that a significantly improved solution can be obtained through an extrapolation based on two or three solutions obtained through Euler procedures with different numbers of steps. The Richardson extrapolation procedure (Dahlquist, Bjorck and Anderson 1974) uses the fact that increasing the number of steps in a Euler procedure improves the solution. The rate of improvement as the number of steps increases is used to extrapolate a new solution. Dixon et al. note that only small numbers of steps are necessary to obtain significantly improved solutions over those obtained through a Euler procedure without extrapolation.

Before such solution methods can be applied, the linearised model must be specified in a way that can be solved.

As in other general equilibrium models, the number of variables in SALTER exceeds the number of equations specified. Variables include policy instruments through which shocks can be applied to the model — that is, naturally exogenous variables — as well as variables whose behaviour is determined within the model — naturally endogenous variables. But in order to solve the system of equations, the number of endogenous variables must *exactly* equal the number of equations. The formal partitioning of variables into exogenous and endogenous subsets can be partially guided by which variables are naturally endogenous or exogenous, but the partitioning also has a critical role to play in determining the economic environments in which the simulated policy changes are assumed to take place. Two alternative partitionings, or closures, of the model are discussed in more detail shortly.

However, solving such a large linear system still requires a substantial amount of computational resources. By *condensing* variables out, the linear system to be solved can be made smaller. Condensation involves substituting out *endogenous* variables of

relatively minor importance prior to solving the model. This is done by choosing an equation in which the variable appears, using this equation to express the endogenous variable as a function of other endogenous and exogenous variables appearing in that equation, then replacing the endogenous variable everywhere it appears in the model by this corresponding algebraic expression. This reduces both the number of endogenous variables to be solved for and the number of equations simultaneously, and can be performed by the computer using the GEMPACK software suite. The endogenous variables that are normally condensed out of the SALTER model are flagged with a '#' mark in Table A2 of Appendix A.

Another way of reducing the dimensions of the linear system is by simply *omitting* those *exogenous* variables which are not going to be shocked, since in this instance they essentially have no role to play. Once again, this procedure can be done by the computer using the GEMPACK software suite, but it is not normally performed on SALTER prior to solving.

1.4 Economic environments

It is possible to specify two broad economic environments for the SALTER model based on the ability of decision makers to adapt their resources in response to the simulated policy changes. In a *short-run* environment, adaptations that could be made within a one or two year time frame are assumed to be possible. A *long-run* environment would produce results of simulated changes around ten years hence. Recall that the SALTER model is not a dynamic model in that it does not track the time path by which these changes occur. It is a comparative static model in which a new equilibrium resulting from adaptations to new conditions can be compared to the outcome which would have arisen at the same point in time had the simulated policy change not occurred.

Defining the environment in which decision makers operate is necessary in order to be able to solve the model. The SALTER model is composed of a large number of equations, and an even larger number of variables. Solving a system of equations requires that the number of unknowns (endogenous variables) equal the number of equations used to specify the model. In order to obtain this, a number of variables need to be treated as exogenous to the model. Natural candidates are the policy instruments such as taxes, duties and subsidies, through which most shocks are modelled, as well as variables, such as the population in each region, whose behaviour is not determined within the model.

Choosing which variables are exogenous defines the closure of the model, but also determines the constraints faced by decision makers in adapting to new conditions. Usually, the SALTER model is used with a long-run closure, reflecting adaptations that can be made within ten years after a policy change. The list of variables treated as exogenous in a long-run closure is shown in Table A4 of Appendix A. The rationale

for this list is now discussed, along with the closure changes required to give a short-run closure.

Adaptations in the long run

A constant rate of employment is assumed to prevail in each region in the long run. This means that percentage changes in labour supply and labour demand are equal in response to some shock (although the levels need not be equal initially). This is modelled by setting the change in the employment rate exogenously to zero. Wages in each region need to be sufficiently flexible to ensure this condition can be met. In particular, money wages need to be able to vary independently of the consumer price index. This requires setting the shift term relating nominal wages to the consumer price index in equation SD11 as endogenous.

Since the domestic supply of farm land is assumed to be fixed in each region, there is therefore a fixed supply of services from this primary factor of production. Hence the change in the aggregate supply (and by choice of notation, demand) for land is set exogenously to zero.

In the long run it is assumed that industries have the ability to change the size of their capital stock through investment, and that capital is mobile internationally. As discussed earlier, in long-run simulations the ratio of world net ownership of bonds to world income is held exogenously fixed to ensure continuity of the initial database condition that net global debt is zero. The change in the ratio of world net ownership of bonds to world income variable can indeed be held fixed by allowing the world bond interest rate variable to vary endogenously.

In long-run equilibrium, there is also full parity between the world bond rate and the rate of return on capital in each industry in each region. This is ensured by setting the absolute change in the rate of abnormal return on capital exogenously to zero in each industry in each region. The equity premium and its expected rate of change are also set exogenously to zero in each region.

Consumers are assumed to allocate a constant proportion of their disposable income to consumption and savings. In terms of the model's closure, this requires that the change in the household saving ratio be set exogenously to zero.

In the long run, the government is assumed to increase its current expenditure on goods and services and its transfers to households in line with increases in aggregate income. Thus the change in the ratio of private to public consumption expenditure is set exogenously equal to zero. Similarly, the change in the ratio of factor incomes to government transfers is set exogenously equal to zero. Governments are assumed to adjust budgets to meet these expenditure commitments while maintaining a constant savings ratio by adjusting labour and property income tax rates equiproportionately.

This is achieved by setting the change in the government saving ratio and the separate tax rate shifters for labour and property income exogenously to zero, but allowing the overall income tax rate shift variable (h^z_{YTR} in equations SE16 and 17) to vary endogenously.

Box 1.9: **Main elements of the long-run closure in the SALTER model**

1 Resource supply
- fixed labour employment rate in each region
- fixed supply of land in each region
- variable supply of capital in each region

2 Returns to capital
- fixed world bond to income ratio (zero world net ownership of bonds)
- fixed ratio of returns to equity to returns to debt (fixed equity premium)
- fixed rate of abnormal return to capital used in each industry in each region

3 Savings behaviour
- fixed saving-income ratios for households and governments in each region

4 Government spending and taxation
- fixed ratio of real government to private expenditures
- fixed ratio of government transfers to households and household income
- tax rates on labour and property income vary equipropertionately to preserve fixed government saving ratio

5 Technology
- no technological change

6 Population
- no change in population

Other exogenous variables are used to model shifts in policies or exogenous changes in conditions facing decision makers. Thus all the tax variables are set exogenously, as well as variables used to model technical changes and changes in population in each region.

Finally, nominal exchange rates in each region are set exogenously to zero, as is the world primary factor price index. The latter serves as the model's numeraire. Since the model's theoretical structure determines only relative prices and not absolute price levels, the model needs a numeraire price against which all other prices are measured. The world primary factor price index is deemed to be a relatively 'neutral' choice of numeraire.

The exogeneity of nominal exchange rates requires further comment. The SALTER model is well equipped to model changes in real exchange rates in each region. The real exchange rate of a region can be measured by eP^*/P, where e is the nominal exchange rate, P is some index of domestic prices and P^* some index of foreign prices. SALTER contains a full accounting of the price and cost structures in each region, and so captures real exchange rate changes through changes in P and P^*.

However, the model's theoretical structure is one in which nominal exchange rate changes will not normally feed through into real exchange rate changes without some accompanying change in a region's underlying relative cost structure. The reason is that in the absence of some nominal price rigidity in a region, a rise in e (a nominal depreciation) will feed fully through into a corresponding rise in P (domestic price increase), with no impact on the real exchange rate or other real variables in the model. Thus a real exchange rate depreciation cannot be engineered by a nominal depreciation without an element of domestic nominal price rigidity or some other mechanism (such as productivity or tax changes) which can generate a change in a region's cost structure relative to other regions. For this reason, holding the nominal exchange rate in each region constant simply removes one extraneous source of price level variation in each region, but does not affect the real results of the model in any way.

Adaptations in the short run

In a typical short-run closure it is assumed that producers have insufficient time to adjust capital stocks in each industry. Thus movements in the profitability of employing capital are reflected in movements in its rental price rather than adjustments in each industry's use of capital services. In order to model this, the industry-specific demands for capital services are made exogenous and industry-specific abnormal returns to capital are made endogenous.

As noted earlier, the change in the world net ownership of bonds to world income variable can also be allowed to vary endogenously in the short run, since in this case the requirement that net world ownership of bonds be zero is ensured by the model's internal accounting. In its place, the world real bond rate is set exogenously to zero. Note that in short-run simulations, the parameter measuring the length of the simulation interval should also be given a value of zero (McDougall 1993b).

In the short run, it may be appropriate to assume an element of wage rigidity in some or all regions. Real wage rigidity may be modelled by giving the parameter for indexing wages to the consumer price index (in equation SD11) a value of unity, and by setting the wage shift variable exogenously to zero, with the rate of employment instead being endogenous. Thus the rate of employment would adjust (equation SC3) to reflect the relative changes in labour demand and labour supply at the going real wage rate.

A further component of the short-run closure is the treatment of public sector savings rates. In the short term, the government in each region could have two options. First, it could allow income tax rates to vary to keep fixed the ratio of its net surplus to total receipts, as in the long run. Alternatively, it could hold income tax rates constant and allow the government savings ratio to vary. In a short-run closure, the latter assumption is often used.

Over the short run, however, households are still assumed to allocate disposable income in fixed proportions between consumption and savings. In all other respects as well, the short-run closure is the same as in the long run.

These two model closures are not the only two that are possible. As illustrated here, however, changing the environment in which decisions are assumed to be made involves carefully swapping between endogenous and exogenous variables in order to maintain the equality between the number of equations in the model and the number of endogenous variables.

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).

3 PARAMETER SETTINGS

In addition to input-output, national accounts and assistance data, the SALTER model requires estimates of a number of behavioural parameters. These parameters describe cost minimising opportunities available to producers and utility maximising opportunities available to consumers in each modelled region.

The behavioural parameters required are listed and described in Table 3.1. This chapter provides the rationale behind the choice of values for these parameters.

As seen in Chapter 1, the length of the planning period may affect the choices available to producers and consumers. To allow for this, the SALTER model can be used in either a short-term (around 2 years) or a long-term (around 10 years) mode, and behavioural parameters for these alternative planning horizons are supplied. Little information is available on the relation between long- and short-run parameters, and estimates presented here are by necessity largely the result of synthetic procedures and value judgments.

Since a whole system is being modelled, it would be desirable to estimate a consistent set of parameters. However, this is impractical due to the large number of parameters to estimate and the lack of reliable data (Mansur and Whalley 1984). Modellers have in general relied on previous research to obtain parameter values that are then calibrated to fit the initial equilibrium data set. In the remainder of this chapter, relevant econometric evidence and practices followed by general equilibrium modellers are reviewed before sets of parameter values to be used in the numerical specifications of the SALTER model are chosen. This review is based in part on a recent survey of parameter specifications in a number of general equilibrium models (Adams, Dixon, Meagher, Parmenter and Peter 1990).

3.1 Elasticities of substitution among primary factors

The SALTER model's production structure assumes producers substitute among primary factors (labour, capital and farm land) to form a value added aggregate, although farm land is assumed to be used only in the agricultural sectors. The primary factor aggregate is combined in fixed proportions with aggregate intermediate inputs to form gross output. The substitution among primary factors is ruled by a constant elasticity of substitution function in which the only parameter to be specified is the (constant) elasticity of substitution. An estimate of this parameter is required for each of the j industries in the z modelled countries.

Table 3.1: **Behavioural parameters in the SALTER model**

Parameter	*Description*	*Range*
η^z_{2j}	Elasticity of substitution between primary factors in industry j	$j = 1,...,J$ $z = 1,...,S$
η^z_i	Elasticity of substitution in production between domestic commodity i and imported aggregate commodity i	$i = 1,...,J$ $z = 1,...,S$
β^z_i	Elasticity of substitution in household consumption between domestic commodity i and imported aggregate commodity i	$i = 1,...,J$ $z = 1,...,S$
β^z_{Gi}	Elasticity of substitution in government consumption between domestic commodity i and imported aggregate commodity i	$i = 1,...,J$ $z = 1,...,S$
β^z_{Ki}	Elasticity of substitution in investment demand between domestic commodity i and imported aggregate commodity i	$i = 1,...,J$ $z = 1,...,S$
η^{Iz}_i	Elasticity of substitution in production between commodities imported from different sources	$i = 1,...,J$ $z = 1,...,S$
β^{Iz}_i	Elasticity of substitution in household consumption between commodities imported from different sources	$i = 1,...,J$ $z = 1,...,S$
β^{Iz}_{Gi}	Elasticity of substitution in government consumption between commodities imported from different sources	$i = 1,...,J$ $z = 1,...,S$
β^{Iz}_{Ki}	Elasticity of substitution in investment demand between commodities imported from different sources	$i = 1,...,J$ $z = 1,...,S$
β_F	Elasticity of substitution between freight sources	
μ^z_i	Elasticity of demand for commodity i with respect to aggregate consumption expenditure	$i = 1,...,J$ $z = 1,...,S$
χ^z_{ih}	Price elasticity of demand for commodity i with respect to the price of commodity h	$i = 1,...,J$ $h = 1,...,J$ $z = 1,...,S$
χ^z_L	Elasticity of labour supply to real after-tax wages	$z = 1,...,S$

Econometric evidence

Caddy (1976) reviews 21 cross-section and 13 time series studies of empirical estimates of primary factor substitution elasticities covering a variety of industries. The estimates reviewed are the product of estimating a production function directly or equations derived from the first-order conditions assuming the producer maximises profits.

Estimates of substitution elasticities are found to vary dramatically depending on the level of aggregation, the particular functional form or parameter restrictions imposed,

and whether the estimation is based on cross-section or time series data. There are many potential biases and little is known of their magnitude or direction.

In general, cross-section estimates tend to be larger than those obtained in time series analyses. Cross-section studies typically cover a wide variety of economic circumstances found by individual firms. The variation in these circumstances is typically larger than the year-to-year variations observed in the data used in time series studies. Because elasticities of substitution derived from cross-section studies have been estimated using data with greater variation, they are more likely to produce estimates of long-run substitution possibilities. The time series estimates provided by Caddy are thus typically lower than the cross-section estimates of primary factor substitution, reflecting relatively short-run substitution opportunities.

Quantitative restrictions such as supply management policies affect the estimates of substitutability between inputs, as they limit firms' access to specific inputs. For example, land set-aside programs in the United States are expected to reduce farmers' ability to use farm land and thus bias estimates of substitution possibilities in agriculture that would be available when such programs were not in effect (Burniaux, Delorme, Lienert, Martin and Hoeller 1988).

Rimmer (1990) has estimated elasticities of substitution between labour and capital using a cost function approach. The estimation procedure was adapted for each broad industry group to account for estimation problems or an industry's peculiarity (for example, performance in agriculture can be heavily influenced by weather conditions). The time series estimation based on Australian data from 1962 to 1985 accounts for different wage regimes. Values estimated by Rimmer for the more recent periods are compared in Table 3.2 with those synthesised by Whalley (1985) from Caddy's (1976) compilation.

The values obtained by Rimmer are similar to those used by Whalley in spite of their very different origin. They show that substitution opportunities are highest in the services industries, but lower in manufacturing and agriculture. The lower value for agriculture may reflect the relative importance of, and lack of substitutes for, farm land in agricultural production in which substitution possibilities for this factor have been largely exhausted. The low value obtained by Rimmer for manufacturing may reflect the high degree of aggregation and heterogeneity of this sector.

Previous modelling practice

In their search for parameter values, researchers have also supplemented the econometric estimates reviewed above with their own judgments about the value that parameters should have. For example, Mercenier and Waelbroeck (1986) believe efforts in estimating parameters are inconclusive and incorporate subjective estimates

Table 3.2: **Elasticities of substitution between capital and labour in various industries obtained from two studies**

	Whalley	*Rimmer*
Agriculture	0.6	0.4
Mining	0.8	0.8
Manufacturing	0.6 – 0.9	0.5
Construction	0.9	1.0
Services	1.0[a]	0.9
Electricity, gas and water	1.0[a]	0.9
Transport and communications	1.0[a]	1.2
Retail and distribution	na	0.9

a Values assumed by Whalley (1985). na Not available.
Sources: Whalley (1985), Rimmer (1990).

formulated by World Bank staff, advocating that the end user of their model might have a preferred set of parameter values.

It is typical in general equilibrium models to apply the same elasticities of substitution among primary factors for all countries involved (for example, Whalley 1985, Burniaux et al. 1990). This may seem reasonable when the countries modelled are similar, but substitution opportunities may be affected by the technologies used.

Early econometric studies suggest some differences exist in the substitution opportunities of developed and developing economies (Fuchs 1963). It is expected that the largest differences between technologies that might affect substitution elasticities will arise from differences in the degree of development of a country. While a large part of industrial and extractive production processes might be assumed to be relatively homogeneous across countries, this may not be the case for agricultural industries, as technologies in this sector may vary widely from industrialised to developing countries.

Yotopoulos and Nugent (1976) indicate that several studies (including Arrow, Chenery, Minhas and Solow 1961) find larger opportunities for substitution in agriculture than in manufacturing, but claim that modern technology tends to decrease substitution opportunities. This would point to the need to specify larger elasticities of substitution in agriculture in lesser developed countries, such as the ASEAN economies included in the SALTER model. However, the lack of reliable estimates makes it difficult to use differentiated sets of elasticities. The common practice of imposing a single set of substitution elasticities on all modelled countries is followed in specifying production parameters in the SALTER model.

Preferred parameter values

The elasticities of substitution among primary factors selected for the SALTER model are presented in Table 3.3. The short-run estimates are based on Rimmer (1990), except in manufacturing. Since the industry specification in SALTER is more disaggregated, the synthetic estimates of Whalley (1985) are used for the manufacturing industries.

In the long run, there is more opportunity to adjust the mix of primary factors in response to changes in their relative prices. To reflect this, long-run elasticities of substitution are assumed to be higher than those affecting decisions in the short run.

Caddy (1976) indicates that time series elasticities are centred around 0.5, while cross-section estimates are centred around 1.0. Dixon et al. (1982) agree that the 'cross-sectional estimates should be interpreted as applying to an adjustment period considerably longer than one or two years' (pp. 189–90). Assuming that cross-section estimates apply to a ten-year period, the long-run estimates used in the SALTER model are taken to be double those in the short run.

3.2 Trade elasticities in the SALTER model

In the SALTER model, it is assumed that domestically produced and imported commodities are imperfect substitutes for each other and that imports from different sources are likewise only partial substitutes. This applies to all categories of aggregate demand — intermediate input demands, consumer demands, government and investment demands.

Given this specification, two sets of trade elasticities are required to model international trade in the SALTER model. These are:

— elasticities of substitution between domestic and imported commodities; and

— elasticities of substitution between imports from different sources.

The numerical specification of these parameters is the object of the following sections.

Substitution between domestic and imported commodities

Import price elasticities available from the literature are usually not differentiated by use. They are estimated for aggregate commodity imports or total imports (Stern, Francis and Schumacher 1976). The builders of the ORANI model of the Australian economy point out that most of Australia's major imports are used predominantly by one end user, and thus justify using the same substitution parameter for all end uses (Dixon et al. 1982). Assuming that the share of imports in each user's demand is not too different, the substitution elasticity estimated by commodity but for all uses can be

Table 3.3: **Elasticities of substitution between primary factors assumed in the SALTER model**

No.	*SALTER commodities*	*Short run*	*Long run*[a]
	Agriculture and primary non–extractive industries		
1	Paddy rice	0.40	0.80
2	Wheat	0.40	0.80
3	Other grains	0.40	0.80
4	Non-grain crops	0.40	0.80
5	Wool	0.40	0.80
6	Livestock products	0.40	0.80
7	Forestry	0.40	0.80
8	Fishing	0.40	0.80
	Mining industries		
9	Coal	0.80	1.60
10	Oil	0.80	1.60
11	Gas	0.80	1.60
12	Other minerals	0.80	1.60
	Food processing industries		
13	Processed rice	0.80	1.60
14	Meat products	0.80	1.60
15	Milk products	0.80	1.60
16	Other food products	0.80	1.60
	Non-food manufacturing		
17	Beverages and tobacco	0.80	1.60
18	Textiles	0.90	1.80
19	Wearing apparel	0.90	1.80
20	Leather and fur	0.80	1.60
21	Lumber and wood products	0.90	1.80
22	Pulp, paper and printing	0.80	1.60
23	Petroleum and coal products	0.90	1.80
24	Chemicals, rubber and plastic	0.90	1.80
25	Non-metallic mineral products	0.90	1.80
26	Primary iron and steel	0.90	1.80
27	Non ferrous metals	0.80	1.60
28	Fabricated metal products	0.80	1.60
29	Transport industries	0.90	1.80
30	Other machinery and equipment	0.90	1.80
31	Other manufacturing	0.90	1.80
	Services		
32	Electricity, gas and water	0.90	1.80
33	Construction	1.00	2.00
34	Trade and transport	1.20	2.40
35	Private services	0.90	1.80
36	Government services	0.90	1.80
37	Ownership of dwellings	0.90	1.80

a Double the short term values.

applied uniformly across users (that is, demand for intermediate inputs, consumer, investment and government demands). These two assumptions are used in specifying the import-domestic substitution parameters for the SALTER model. If the shares of imports in each use are actually similar, this results in similar price elasticities of demand for imports and domestic products by all end users.

Econometric evidence

Common sources for assigning values to the substitution elasticity between imports and domestic products are the Stern et al. (1976) survey of about 130 estimations of import and export elasticities for a variety of countries, and the Alaouze (1977) and Alaouze, Marsden and Zeitsch (1977) studies of substitution elasticities between domestic and imported commodities in Australia. The import price elasticities reviewed by Stern et al. (1976) are either for:

— aggregate imports for a number of countries; or

— large but disaggregated commodity group imports (usually for a single country).

Burniaux et al. (1988) expect that disaggregated price elasticities are higher than estimates at more aggregated levels owing to greater substitution possibilities among homogeneous products. As a consequence, agricultural product estimates are expected to be higher than estimates for manufactures. This is not, however, borne out by empirical results. Quantitative trade restrictions are presumed to affect the estimates of import price elasticities, and therefore opportunities for substitution.

Stern et al. (1976) indicate that import price elasticities are centred around 1.0, while export price elasticities are higher, at around 1.25. However, a number of researchers (for example, Orcutt 1950, Kemp 1962) have argued that biases toward unity are inherent to the estimation procedure used in many cases.

Alaouze et al. (1977) provide estimates of substitution elasticities for 32 commodities imported into Australia. They use a 'rapid adjustment model' to estimate immediate response to price changes and a 'partial adjustment model' to account for lags in changing the relative shares of imports and domestic products as a result of a change in relative import prices. Elasticities for a number of time frames are obtained with the partial adjustment model. Alaouze (1977, p. 12) indicates:

> the infinite period elasticity obtained from the partial adjustment model is taken as an unbiased estimate of the long run elasticity of substitution and the three period elasticity as the approximate estimate of the annual response.

The difference between the two estimates varies from nearly zero for beer and soap (small value consumables) to about 150 per cent for underwear and refrigerators. Intermediate inputs such as raw textiles have relatively low differences in substitution elasticities, while in more processed textile products (for example, apparel) the

differences are larger. The smallest differences between the one-year and the infinite period estimates are found in inputs used by the construction industry, indicating that all adjustments to price changes are made by buyers of such products within the year. Simple averages of the percentage difference between long- and short-run elasticities for broad commodity groups are shown in Table 3.4, indicating significant differences among groups in their ability to adjust to changing conditions.

Table 3.4: **Average long-run and short-run elasticities of substitution between domestic and imported products for broad commodity groups**

Commodity group	*ASIC*[a]	*Short-run elasticity*	*Long-run elasticity*
Food	2132, 2140	1.4	1.4
Beverages	2192	2.2	2.2
Textiles	2314, 2315, 2317, 2318, 2331	1.1	1.4
Apparel	2411, 2423, 2424, 2425, 2426	2.2	4.0
Pulp and paper	2611	0.8	1.1
Chemicals	2711, 2713, 3432	1.2	1.2
Construction	3324, 2821, 2831, 2835, 2914	1.2	1.2
Vehicles	3211, 3212	3.2	5.5
Manufactured products	2927, 2725, 2522, 3322, 3323, 3325	1.4	1.9

a Australian Standard Industrial Classification.

Source: Adapted from Alaouze et al. (1977).

Previous modelling practice

Modellers have often used the link between compensated price elasticities and substitution elasticities to specify the latter. Mansur and Whalley (1984) detail the assumptions and approximations involved. Basically, expansion effects are assumed to be small, and imports are assumed to be a relatively small proportion of total use. In this case, substitution elasticities can be approximated by uncompensated price elasticities. Models may require the specification of import price elasticities and expansion (income) elasticities, or a set of substitution elasticities from which price elasticities can be derived.

Using the Stern et al. (1976) review, Whalley (1985) indicates that estimates of price elasticities of import demand for aggregate commodity groups and aggregate imports have a central tendency around unity for a number of countries. Whalley specifically uses import price elasticities to specify substitution elasticities between domestic and imported commodities in both his four-region and seven-region models. This practice results in relatively low substitution elasticities, centred around unity.

Burniaux et al. (1988) argue that 'implicit estimates of import elasticities derived from domestic demand and supply elasticities give much higher values than direct estimates based on time series analysis', and consequently in the WALRAS model price elasticities are increased substantially to reflect long-run substitution opportunities among disaggregated commodity groups. The values used in specifying the WALRAS model are significantly higher than the price elasticities of aggregate imports used in Whalley's (1985) models. Values range between 5 and 7, and are different by country although no justification is given to support this pattern.

Rejecting the low results found in direct econometric estimation is a common practice. Abbott (1988) lists a number of potential sources of bias which include the standard problems encountered in econometrics (for example, specification error, identification error, aggregation, and so on). He advocates a synthetic approach to 'estimate' parameters based on previous research and the use of components in the behaviour of trade patterns. That is, rather than estimating a relatively simple econometric trade model, behavioural parameter estimates are derived from the trade behaviour of different components resulting in the net trade flows (that is, adjustments in domestic production and use, price transmissions, and stocks). Abbott shows that such synthetic estimates for wheat and coarse grains tend to provide larger estimates than those directly estimated econometrically. The synthetic estimates of substitution elasticities reported in this study range between 1.0 and 4.7, depending on the importing country. These are significantly higher than the values obtained through direct estimation that Abbott cites (all are less than 1.0) and other econometric estimates reviewed above.

This example illustrates that evidence other than from strict econometric estimation may prove useful in setting parameter values. This approach based on heterogeneous sources is used in the next section to choose the elasticities of substitution between imported and domestic commodities for the SALTER model.

Preferred parameter values

Because of the intercountry linkages in the SALTER model, the import substitution elasticities in each region of the model help to determine not only the elasticity of demand for imports by the region, but also the elasticity of demand for exports by other regions.

For a small country supplying only a small share of its trading partners' imports of any particular commodity, the export demand elasticity for this commodity is approximately equal to the elasticity of substitution between imports from different sources in the importing regions. This is because the expansion effects in importing countries of changes in a small country's export price are negligible, while the elasticity of a small country's market share is approximately equal to the substitution elasticity among imports (Box 3.1). Furthermore, as described below, we have chosen

Box 3.1: **Relation between import substitution and export demand elasticities**

This box provides an explanation of the relation between import substitution elasticities and export demand elasticities in the SALTER model.

Consider a range of countries s exporting a commodity to a range of countries z for a particular purpose k ($k = 1$ intermediate usage, 2 investment, 3 government consumption, 4 household consumption). Let p_s^{Iz} denote the (percentage change in) the price of imports from a particular source. Then we may define an import price index in a particular destination country z for purpose k as

$$p^{Iz}(k) = \sum_s S_s^{Iz}(k)\, p_s^{Iz}$$

where $S_s^{Iz}(k)$ denotes the share of source s in the total value of imports for purpose k. Let p^{Dz} denote the price of domestically produced goods of the same description. Then we may define a price index for all goods of this description

$$p^z(k) = S^{Dz}(k)\, p^{Dz} + S^{Iz}(k)\, p^{Iz}(k)$$

where $S^{Dz}(k)$ denotes the share of domestic products and $S^{Iz}(k)$ the share of imports in total purchases of goods of this description in destination country z for purpose k.

For the first three purposes (intermediate usage, investment, government consumption) the demand in country z for imports from a particular source s has the form

$$x_s^{Iz}(k) = x^{Iz}(k) - \eta^{Iz}\left[p_s^{Iz} - p^{Iz}(k)\right]$$

$$x^{Iz}(k) = \textit{scale variable} - \eta^{z}\left[p^{Iz}(k) - p^{z}(k)\right]$$

where $x^{Iz}(k)$ denotes demand for the composite imported variety for purpose k, η^{Iz} is the elasticity of substitution between imports from different sources and η^z is the elasticity of substitution between the domestically produced and the composite imported variety. Combining all these relations, we obtain demand in county z for imports from a particular source s for purpose k ($k = 1,2,3$) as

$$x_s^{Iz}(k) = \textit{scale variable} - \eta^{z}\left[p^{Iz}(k) - p^{z}(k)\right] - \eta^{Iz}\left[p_s^{Iz} - p^{Iz}(k)\right]$$

$$= -\left[\eta^z S^{Dz}(k) S_s^{Iz}(k) + \eta^{Iz}\left(1 - S_s^{Iz}(k)\right)\right] p_s^{Iz} - \sum_{s' \neq s}\left[\eta^z S^{Dz}(k) S_{s'}^{Iz}(k) - \eta^{Iz} S_{s'}^{Iz}(k)\right] p_{s'}^{Iz}$$

$$+ \eta^z S^{Dz}(k)\, p^{Dz} + \textit{scale variable}$$

For the last purpose (household consumption) the demand in country z for imports from a particular source s has the form

$$x_s^{Iz}(k) = x^{Iz}(k) - \eta^{Iz}\left[p_s^{Iz} - p^{Iz}(k)\right]$$

$$x^{Iz}(k) = x^{z}(k) - \eta^{z}\left[p^{Iz}(k) - p^{z}(k)\right]$$

$$x^{z}(k) = \textit{scale variable} - \lambda^z p^z(k) - \textit{terms involving prices of other goods}$$

(Continued on next page)

Box 3.1 *(continued)*

where $x^z(k)$ is household demand for goods of this variety and λ^z is the absolute magnitude of the own-price elasticity of household demand for these goods. Combining these relations, we obtain demand in country z for imports from a particular source s for household demand ($k = 4$) as

$$x_s^{Iz}(k) = -\lambda^z p^z(k) - \eta^z\left[p^{Iz}(k) - p^z(k)\right] - \eta^{Iz}\left[p_s^{Iz} - p^{Iz}(k)\right] + other\ terms$$

$$= -\left[\lambda^z S^{Iz}(k) S_s^{Iz}(k) + \eta^z S^{Dz}(k) S_s^{Iz}(k) + \eta^{Iz}\left(1 - S_s^{Iz}(k)\right)\right] p_s^{Iz}$$

$$-\sum_{s' \neq s}\left[\lambda^z S^{Iz}(k) S_{s'}^{Iz}(k) + \eta^z S^{Dz}(k) S_{s'}^{Iz}(k) - \eta^{Iz} S_{s'}^{Iz}(k)\right] p_{s'}^{Iz}$$

$$-\left[\lambda^z S^{Dz}(k) - \eta^z S^{Dz}(k)\right] p^{Dz} + other\ terms$$

Total demand in country z for imports from a particular source s is given by

$$x_s^{Iz} = \sum_k S_{su}^{Iz}(k) x_s^{Iz}(k)$$

where $S_{su}^{Iz}(k)$ is the share of total imports from country s to country z accounted for by particular usage k. Inserting the expressions for demand for particular uses and collecting the terms involving the price from a particular source s gives the following expression for the own-price elasticity of import demand in country z for a particular commodity from country s.

$$Import\ demand\ elasticity = -\sum_{k=1,2,3} S_{su}^{Iz}(k)\left[\eta^z S^{Dz}(k) S_s^{Iz}(k) + \eta^{Iz}\left(1 - S_s^{Iz}(k)\right)\right]$$

$$- S_{su}^{Iz}(k=4)\left[\lambda^z S^{Iz}(k) S_s^{Iz}(k) + \eta^z S^{Dz}(k) S_s^{Iz}(k) + \eta^{Iz}\left(1 - S_s^{Iz}(k)\right)\right]$$

If the exporting country s is small, its share of the import market in country z for any particular purpose $S_s^{Iz}(k)$ is approximately equal to zero. Then the expression for the own-price demand elasticity reduces to be equal in magnitude to the elasticity of substitution between imports from different sources η^{Iz}.

There are several reasons why this approximation may not hold exactly in the actual model. First, even for small exporters, market shares are not exactly zero. Second, when exports are sold into several markets, even if the substitution elasticity is the same in all individual markets, the true aggregate substitution elasticity is in general smaller (James and McDougall 1993b). Finally, import demand elasticities are defined with respect to purchasers' prices, but export demand elasticities with respect to fob prices. Trade and transport margins tend to make export demand elasticities lower than import demand elasticities.

Even where all these effects are present, the elasticities of substitution between imports from different sources are likely to give a good indication of the export demand elasticities facing small exporting countries.

to set elasticities of substitution between imports from different sources at twice the values of the corresponding domestic-import substitution elasticities. So the export demand elasticity for a small country is approximately twice the domestic-import substitution elasticity.

Thus, if we chose import-domestic substitution elasticities centring around unity, as proposed by Whalley (1985), then we would obtain export demand elasticities for small countries of about 2.0. In this case, even small countries would exercise a considerable degree of market power in international markets, and could greatly improve their terms of trade by taxing exports. With export demand elasticities of about 2.0, the optimal export tax rate would be about 100 per cent.

We find this account of the international trading environment facing small countries hard to believe. But if we reject it, then we must also reject the underlying import-import substitution elasticities. To do this, we must either set import-import substitution elasticities almost an order of magnitude higher than the domestic-import substitution elasticities, or set domestic-import substitution elasticities considerably higher than most econometric estimates. As explained below, we take the latter course.

Our preferred values for the domestic-import substitution elasticities represent a compromise between the econometric estimates on import substitution elasticities, and our prior beliefs about export demand elasticities.

For the econometric evidence on domestic-import substitution elasticities, we take the estimates of Alaouze et al. (1977) as representative. We accept the evidence from Corado and de Melo (1983) discussed below, that import-import substitution elasticities are typically about twice as great as domestic-import substitution elasticities — we have no evidence suggesting that they are much more than twice as great. We postulate a typical value for the export demand elasticity facing a small country of about 10, similar to the apparent aggregate export demand elasticity facing Australia in long-run ORANI simulations. By the previous argument, this implies a typical value for domestic-import substitution elasticities of about 5.0, whereas the Alaouze et al. estimates fall mostly in the range 1.0 to 2.0 (Table 3.4).

To derive our preferred values, we use a loss function minimisation approach to set the long-run elasticities between the values in Table 3.4 and the value of 5.0 implied by our prior beliefs on the elasticity of export demand. The problem consists of determining the value of a parameter based on the information found in the econometric estimate and the prior value above. The loss function is defined so as to be increasing in the difference between the preferred value of the parameter and the econometric estimate on the one hand, and the prior value of 5.0 on the other. When such a function is minimised with respect to the preferred value, we obtain a preferred

Table 3.5: **Elasticities of substitution between imported and domestic commodities assumed in the SALTER model**

No.	*SALTER commodities*	*Broad categories for correspondence with Table 3.4*	*Short-run elasticity*	*Long-run elasticity*
1	Paddy rice	Food	2.2	2.2
2	Wheat	Food	2.2	2.2
3	Other grains	Food	2.2	2.2
4	Non-grain crops	Food	2.2	2.2
5	Wool	Textiles	1.7	2.2
6	Livestock products	Manufactures	2.1	2.8
7	Forestry	Manufactures	2.1	2.8
8	Fishing	Manufactures	2.1	2.8
9	Coal	Manufactures	2.1	2.8
10	Oil	Manufactures	2.1	2.8
11	Gas	Manufactures	2.1	2.8
12	Other minerals	Manufactures	2.1	2.8
13	Processed rice	Food	2.2	2.2
14	Meat products	Food	2.2	2.2
15	Milk products	Food	2.2	2.2
16	Other food products	Food	2.2	2.2
17	Beverages and tobacco	Beverages	3.1	3.1
18	Textiles	Textiles	1.7	2.2
19	Wearing apparel	Apparel	2.4	4.4
20	Leather and fur	Apparel	2.4	4.4
21	Lumber and wood products	Manufactures	2.1	2.8
22	Pulp, paper and printing	Pulp and paper	1.3	1.8
23	Petroleum and coal products	Chemicals	1.9	1.9
24	Chemicals, rubber and plastic	Chemicals	1.9	1.9
25	Non-metallic mineral products	Manufactures	2.1	2.8
26	Primary iron and steel	Manufactures	2.1	2.8
27	Non ferrous metals	Manufactures	2.1	2.8
28	Fabricated metal products	Manufactures	2.1	2.8
29	Transport industries	Vehicles	3.0	5.2
30	Other machinery and equipment	Manufactures	2.1	2.8
31	Other manufacturing	Manufactures	2.1	2.8
32	Electricity, gas and water	Manufactures	2.1	2.8
33	Construction	Construction	1.9	1.9
34	Trade and transport	Construction	1.9	1.9
35	Private services	Construction	1.9	1.9
36	Government services	Construction	1.9	1.9
37	Ownership of dwellings	Construction	1.9	1.9

estimate which takes into account the information contained in both the econometric estimate and the prior value. For the particular loss function chosen, this approach generates preferred values equal to the harmonic mean of the econometric estimate and

the prior value of 5.0. The long-run elasticities in Table 3.5 are determined according to this method.

The preferred short-run elasticities are derived from the long-run elasticities. The ratios of the preferred long-run values (from Table 3.5) to the econometric long-run estimates (from Table 3.4) are applied to the econometric short-run estimates from Table 3.4.

Following Deardorff and Stern (1986) the same elasticities of substitution are applied to all regions in the model. Differences in import sensitivity to price changes between the regions modelled are assumed to be captured by:

— regional differences in production and final demand structures, that is, the differences in share parameters; and

— regional differences in consumer demand parameters.

Similarly, assuming the proportion of imports in the use of a commodity by all users is similar, the parameters for aggregate imports of that commodity are applied to all user classes.

The elasticity of substitution among imports from different sources

The nested structure used to model imports from different sources is a common feature in trade models. This requires the specification of substitution elasticities among imports from different sources. In the SALTER model, these parameters need to be specified for each of four end users and commodity imports (I) in each country.

Corado and de Melo (1983) estimate elasticities of substitution between imports from the European Community and non-European Community countries for Portugal. Their estimates range from a theoretically inconsistent –0.7 for mining and petroleum products to 3.3 for metal products. In general, they observe that the elasticity of substitution estimates among imports are larger than elasticities of substitution between imports and domestic products. The simple average of their estimates of substitution between imports and domestic commodities is about 0.8, while that of substitution among imports is 1.5. The authors find their estimates to be reasonable and in broad agreement with estimates for substitution elasticities for aggregate imports found by Hickman and Lau (1973).

Wear (1990) has estimated price and substitution elasticities for New Zealand imports. In this study, import sources are divided into five groups: Australia, the European Community, North America (Canada and the United States), selected Asian countries (Japan, Malaysia, Indonesia, Thailand and Singapore) and the rest of the world. Share equations derived from a cost function were estimated for 17 of the 37 commodity classifications in the SALTER model. These estimates are given in Table 3.6, where

Table 3.6: **Import substitution elasticity estimates for New Zealand and Portugal[a]**

	New Zealand[b]	*Portugal*[c]
Non-grain crops	1.00	1.67
Other minerals	1.81	–0.66
Meat products	1.13	1.50
Other food products	2.02	0.64
Beverages and tobacco	0.46	3.02
Textiles	0.96	1.09
Wearing apparel	0.55	1.18
Leather fur and their products	1.05	1.57
Lumber and wood products	0.94	2.85
Pulp, paper and printing	2.18	0.75
Chemicals, plastics and rubber	1.44	0.99
Petroleum and coal products	3.15	0.14
Non-metallic mineral products	1.08	0.66
Primary iron and steel	1.61	1.89
Other metal and metal products	1.06	3.27
Transport equipment	0.52	2.58
Other manufacturing	0.63	1.20

[a] The classification used in this table is as used in Wear (1990). The commodity categories were closely matched with those used by Corado and de Melo.
[b] *Source*: Wear (1990).
[c] *Source*: Corado and de Melo (1983).

they are compared with the estimates obtained for Portuguese imports by Corado and de Melo (1983).

In general, the estimates from Wear (1990) are smaller than the Portuguese estimates. The simple average of the New Zealand estimates (1.3) represents 80 per cent of the average of the consistent (positive) estimates for Portugal (1.6) reported in Table 3.6. In both studies, the authors tend to think of these estimates as applying to the short term, reflecting the fact that existing contracts make it difficult for importers to adapt their sources for imports very quickly in response to relative price changes.

Previous modelling practice

Whalley (1985) and Harrison, Rutherford and Wooton (1989) assume a constant elasticity of substitution form in specifying the substitution between imports from different sources, allowing imports to shift in reaction to relative price changes. Whalley sets these elasticities to 1.5 and Harrison et al. set them to 2.0 for all commodities in all countries.

Preferred parameter values

The elasticities of substitution among imports specified in the SALTER model are calculated by multiplying the elasticities of substitution between domestic and imported products by a factor of 2.0, the approximate ratio of the average elasticities of substitution among imports and the average elasticities between domestic and imported commodities obtained by Corado and de Melo (1983). Two main reasons have guided this choice:

— there is a lot more information about substitution between domestic and imported products; this led to the choice of parameters in Table 3.5; and

— it is important for modelling purposes (and expected on theoretical grounds) that substitution elasticities in the lower level nests (import-import substitution) are higher than those in higher level nests (import-domestic substitution).

The resulting elasticities of substitution among import sources are found in Table 3.7. Preferred long-run values for this parameter range from 3.6 to 10.4.

As noted earlier, the export demand elasticity for a commodity is approximately equal to the elasticity of substitution between imports from different sources in the importing regions. A more general formula was derived in Box 3.1. Appendix B lists the implied long-run export demand elasticities for each commodity to each destination, calculated using this more general formula.

As expected, for most small exporters the export demand elasticities are close in value to the elasticities of substitution between imports from different sources. The export demand elasticities are noticeably smaller in magnitude than the import-import substitution elasticities where exporters are not small. For example, the long-run export demand elasticity for Australian wool is –1.4 in the US market and –3.0 in the Chinese market, whereas the long-run import-import substitution elasticity for wool in those markets is 4.4. Appendix B also presents approximate aggregate export demand elasticities for each commodity from each region, obtained as export-weighted averages of the elasticities to individual destinations. Finally, it presents aggregate export demand elasticities for four broad sectors and for each region as a whole, obtained using a similar export weighting procedure.

Elasticity of substitution among freight sources

A single elasticity of substitution guides substitution possibilities among freight sources. The value is set equal to 2.0, lower than the long-run elasticity of substitution among import sources for the trade and transport commodity. This is to capture the impact of regulations which are difficult to capture in direct measures of industry assistance, but which nevertheless restrict freight substitution possibilities (Wigle and Perroni 1991).

Table 3.7: **Elasticities of substitution among imports from different sources assumed in the SALTER model**

No.	*SALTER commodities*	*Broad categories for correspondence with Table 3.4*	*Short-run elasticity*	*Long-run elasticity*
1	Paddy rice	Food	4.4	4.4
2	Wheat	Food	4.4	4.4
3	Other grains	Food	4.4	4.4
4	Non-grain crops	Food	4.4	4.4
5	Wool	Textiles	3.4	4.4
6	Livestock products	Manufactures	4.2	5.6
7	Forestry	Manufactures	4.2	5.6
8	Fishing	Manufactures	4.2	5.6
9	Coal	Manufactures	4.2	5.6
10	Oil	Manufactures	4.2	5.6
11	Gas	Manufactures	4.2	5.6
12	Other minerals	Manufactures	4.2	5.6
13	Processed rice	Food	4.4	4.4
14	Meat products	Food	4.4	4.4
15	Milk products	Food	4.4	4.4
16	Other food products	Food	4.4	4.4
17	Beverages and tobacco	Beverages	6.2	6.2
18	Textiles	Textiles	3.4	4.4
19	Wearing apparel	Apparel	4.8	8.8
20	Leather and fur	Apparel	4.8	8.8
21	Lumber and wood products	Manufactures	4.2	5.6
22	Pulp, paper and printing	Pulp and paper	2.6	3.6
23	Petroleum and coal products	Chemicals	3.8	3.8
24	Chemicals, rubber and plastic	Chemicals	3.8	3.8
25	Non-metallic mineral products	Manufactures	4.2	5.6
26	Primary iron and steel	Manufactures	4.2	5.6
27	Non ferrous metals	Manufactures	4.2	5.6
28	Fabricated metal products	Manufactures	4.2	5.6
29	Transport industries	Vehicles	6.0	10.4
30	Other machinery and equipment	Manufactures	4.2	5.6
31	Other manufacturing	Manufactures	4.2	5.6
32	Electricity, gas and water	Manufactures	4.2	5.6
33	Construction	Construction	3.8	3.8
34	Trade and transport	Construction	3.8	3.8
35	Private services	Construction	3.8	3.8
36	Government services	Construction	3.8	3.8
37	Ownership of dwellings	Construction	3.8	3.8

3.3 Consumer demand parameters

In the SALTER model the demand for intermediate inputs is determined by the production structure. Government and investment demands for commodities are

determined as fixed proportions of real aggregate levels of government expenditure and investment. Consumer demands are determined assuming a representative consumer maximises a separable utility function subject to a budget constraint. The consumer is assumed to allocate a fixed proportion of disposable income to consumption expenditure; this is his/her budget allowance. The allocation among different commodities is assumed to be described by a linear expenditure system.

Reducing the number of parameters to be specified

Expenditure systems are notorious for requiring a large number of parameters to characterise them. In the SALTER model, relations between expenditure and price elasticities are used to minimise the number of parameters needed to specify each region's consumer expenditure system.

The homogeneity and adding-up restrictions of the linear expenditure system imply that price and expenditure elasticities in the system are not independent. Frisch (1959) shows that if preferences are independent, the price elasticities can be obtained by:

$$(3.1) \qquad \lambda_{ij} = -S_{Cj}\mu_i\left(1+\frac{\mu_j}{\omega}\right)+\delta_{ij}\frac{\mu_i}{\omega}$$

where

λ_{ij} is the elasticity of commodity i with respect to price j;

μ_i is the expenditure elasticity of commodity i;

S_{Cj} is the average budget share of commodity j;

ω is the 'Frisch parameter', the reciprocal of the marginal utility of income, or the flexibility of the marginal utility of money; and

δ_{ij} is the Kronecker delta and is equal to zero when $i \neq j$ and unity when $i = j$.

Hence the own-price and cross-price elasticities for each country can be determined from a set of expenditure elasticities compatible with the benchmark equilibrium database share parameters obtained from the database and the Frisch parameter. This greatly reduces the number of parameters that must be specified and guarantees consistency between parameters and the database.

The SALTER commodity disaggregation is finer than the disaggregation typically used in estimating consumer demand systems. When estimating consumer demand systems, researchers typically assume preference independence. This allows them to specify a separable and additive utility function in which it is assumed that consumers' aggregate utility is the sum of the levels of utility derived from the consumption of broad commodity aggregates. But the assumption of additive preferences is only appropriate when commodity groups are broadly defined (Peter 1990). Hence,

estimates of consumer demand price and expenditure elasticities are typically available for a small number of broadly defined commodity groups. When the commodity disaggregation is finer, the estimates from the more aggregate consumption studies must be allocated to the disaggregated commodity specification.

Tulpulé and Powell (1978) show how estimates for expenditure elasticities derived from a small system (eight commodities) can be expanded to a larger system (109 commodities) using external information on expenditure elasticities and the equilibrium database. Tulpulé and Powell show that the expenditure elasticity for commodity i can be obtained by:

$$(3.2) \qquad \mu_i = \sum_{j=1}^{J} \frac{C_{ij}}{C_i} \mu_j^o$$

where

μ_i is the expenditure elasticity of commodity i;

C_{ij} is the level of commodity i in aggregate commodity group j;

C_i is the aggregate consumption of commodity i; and

μ_j^o is the expenditure elasticity of commodity group j.

In the SALTER model, each disaggregated commodity is assumed to be part of a single group of commodities. In this case, the consumption of commodity $i (C_i)$ is equal to the consumption of commodity i from group $j (C_{ij})$, and the share parameter equals one. The disaggregated expenditure elasticity μ_i is therefore equal to the expenditure elasticity that applied to the aggregate commodity group (μ_i^o).

Econometric evidence and previous modelling practice

In surveying the econometric literature on income elasticities for specifying the demand parameters of the WALRAS model, Burniaux et al. (1990) produced the synthetic estimates shown in Table 3.8. Using estimates from Weisskoff (1971) and Lluch, Powell and Williams (1977), Mercenier and Waelbroeck (1986) produced the expenditure elasticities reported in Table 3.9, differentiating between urban and rural consumer behaviour. Such differences are very small for most commodities and even values across regions do not seem to vary much except in the case of food for which estimates are, as expected, higher in less developed regions.

More recently, Selvanathan (1988) has produced estimates for 18 developed countries based on a ten-commodity classification, which are in broad agreement with the Lluch et al. (1977) results. In general, the tendency is for estimates for food to be lower than estimates for other items in consumers' budgets and estimates for services to be higher. Estimates less than unity indicate the commodity is a 'necessity' (for example, food,

Table 3.8: **Income elasticities used in the WALRAS model**

	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*European Community*
Grains and cereals	0.1	0.0	0.0	0.0	0.0	0.1
Meat	0.3	0.2	0.5	0.4	0.7	0.4
Milk, cheese and eggs	0.2	0.2	0.2	0.2	0.7	0.3
Other food	0.5	0.6	0.3	0.3	0.6	0.5
Alcoholic beverages	0.4	1.1	0.5	0.3	0.5	0.5
Tobacco	0.4	1.1	0.5	0.3	0.5	0.5
Clothing and footwear	0.6	0.7	0.6	0.6	0.5	0.6
Gross rents, fuel and power	1.4	1.3	1.1	1.2	1.3	1.2
Household equipment and operation	1.5	0.9	1.4	1.4	1.3	1.5
Medical use	1.7	1.4	0.6	1.1	1.2	0.6
Transport and communication	1.5	1.2	1.3	1.0	1.1	1.5
Education and recreation	0.8	1.3	1.0	1.0	1.1	1.2
Other consumer goods and services	1.2	1.3	1.2	1.4	1.2	1.4

Source: Burniaux et al. (1990).

Table 3.9: **Income elasticities used in the Varuna model**

	Agriculture		*Manufactured products*	*Energy*	*Services*
	Food	*Non-food*			
Rural sector					
South Asia	0.730	0.731	0.950	1.122	1.125
East Asia	0.679	0.679	0.950	1.013	1.017
OECD	0.524	0.524	0.949	0.630	1.050
Urban sector					
South Asia	0.736	0.738	0.949	1.163	1.164
East Asia	0.684	0.685	0.950	1.046	1.049
OECD	0.499	0.500	0.949	0.599	0.999

Source: Mercenier and Waelbroeck (1986).

beverages, clothing, housing) whereas expenditure elasticities above unity make a commodity a 'luxury' (for example, durables and recreation).

Yet another more recent collection of elasticities was derived by Theil, Chung and Seal (1989). These estimates result from the International Comparisons Project currently conducted by the United Nations Statistical Office. Consumption data for 51 countries in 1980 were fitted to a Working (1943) model of consumption expenditure assuming preference independence. The estimates obtained reflect expectations about the sensitivity of 'necessity' and 'luxury' goods to income changes relative to the initial level of income. By pooling the data across countries, the estimates obtained are consistent across countries.

Consumption expenditure elasticities in the SALTER model

Instead of specifying a full set of own-price and cross-price elasticities that would be consistent with the linear expenditure system, these parameters are derived from expenditure elasticities based on values provided by Theil et al. (1989) and the flexibility of the marginal utility of money. The Theil estimates are preferred because they are internally consistent across countries and are based on relatively recent (1980) consumption information.

Of the expenditure elasticity estimates obtained by Theil et al. (1989) for 10 composite commodities, 7 of these composite commodities were applicable to the SALTER commodity classification. The estimated expenditure elasticities declined without exception as per capita income increased. The authors maintain that expenditure elasticities are much more dependent on real income than on relative prices. The set of countries in the study included 8 SALTER regions, listed in Table 3.10. Expenditure elasticities for the European Community are per capita income-weighted averages of the corresponding elasticities for Belgium, Luxembourg, Denmark, West Germany, Greece, Spain, France, the Netherlands, Italy, Portugal, United Kingdom and the Republic of Ireland.

Table 3.10: **Selected income elasticities from Theil et al. study**

	Food	*Beverages and tobacco*	*Clothing*	*Durables*	*Transport*	*Recreation*	*Miscellaneous*
Canada	0.15	1.02	0.96	1.16	1.24	1.26	1.25
United States	0.14	1.02	0.96	1.16	1.24	1.26	1.25
Japan	0.39	1.02	0.96	1.18	1.27	1.30	1.28
Korea	0.64	1.02	0.96	1.22	1.38	1.45	1.40
EC	0.32	1.02	0.96	1.17	1.26	1.29	1.27
Indonesia	0.72	1.02	0.96	1.27	1.55	1.70	1.59
Philippines	0.66	1.02	0.96	1.23	1.41	1.49	1.44
Hong Kong	0.35	1.02	0.96	1.17	1.26	1.29	1.27

Source: Adapted from Theil et al. (1989).

The remaining SALTER regions use Theil et al. estimates from countries of similar per capita income. Table 3.11 lists the 1980 per capita incomes for all SALTER regions. It also shows the countries from which Theil et al. estimates were taken to provide income elasticities for SALTER regions other than those shown in Table 3.10.

Table 3.12 then lists the full set of expenditure elasticity estimates used in the SALTER model.

Table 3.11: **Per capita incomes by SALTER region, 1980**

	Per capita income 1980 $US	*Per capita income US = 1.00*	*Country from Theil et al. study with closest per capita income*
Australia	10 282	0.90	Canada
New Zealand	7 659	0.67	Hong Kong
Canada	10 815	0.94	
United States	11 446	1.00	
Japan	8 907	0.78	
Korea	1 634	0.14	
EC	10 410	0.91	
Indonesia	495	0.04	
Malaysia	1 773	0.15	Bolivia
Philippines	733	0.06	
Singapore	4 707	0.41	Venezuela
Thailand	720	0.06	Madagascar
China	246	0.02	Tanzania
Hong Kong	5 445	0.48	
Taiwan	2 347	0.21	Ecuador
Rest of World	960	0.08	Senegal

Source: United Nations (1991), Council for Economic Planning and Development (1990).

Table 3.12: **Expenditure elasticities for the SALTER model**

	Food	*Beverages and tobacco*	*Clothing*	*Durables*	*Transport*	*Recreation*	*Miscellaneous*
Australia	0.15	1.02	0.96	1.16	1.24	1.26	1.25
New Zealand	0.35	1.02	0.96	1.17	1.26	1.29	1.27
Canada	0.15	1.02	0.96	1.16	1.24	1.26	1.25
United States	0.14	1.02	0.96	1.16	1.24	1.26	1.25
Japan	0.39	1.02	0.96	1.18	1.27	1.30	1.28
Korea	0.64	1.02	0.96	1.22	1.38	1.45	1.40
EC	0.32	1.02	0.96	1.17	1.26	1.29	1.27
Indonesia	0.72	1.02	0.96	1.27	1.55	1.70	1.59
Malaysia	0.68	1.02	0.96	1.24	1.44	1.53	1.47
Philippines	0.66	1.02	0.96	1.23	1.41	1.49	1.44
Singapore	0.51	1.02	0.96	1.19	1.30	1.34	1.31
Thailand	0.74	1.02	0.96	1.29	1.68	1.92	1.74
China	0.78	1.02	0.96	1.37	2.27	3.48	2.50
Hong Kong	0.35	1.02	0.96	1.17	1.26	1.29	1.27
Taiwan	0.64	1.02	0.96	1.22	1.38	1.45	1.40
Rest of World	0.73	1.02	0.96	1.28	1.61	1.79	1.65

Source: Adapted from Theil et al. (1989).

Table 3.13: **Classification concordance for allocating expenditure elasticities**

No.	*37-commodity classification*	*7-commodity classification*
1	Paddy rice	Food
2	Wheat	Food
3	Other grains	Food
4	Non-grain crops	Food
5	Wool	Miscellaneous
6	Livestock products	Miscellaneous
7	Forestry	Miscellaneous
8	Fishing	Miscellaneous
9	Coal	Miscellaneous
10	Oil	Miscellaneous
11	Gas	Miscellaneous
12	Other minerals	Miscellaneous
13	Processed rice	Food
14	Meat products	Food
15	Milk products	Food
16	Other food products	Food
17	Beverages and tobacco	Beverages
18	Textiles	Clothing
19	Wearing apparel	Clothing
20	Leather and fur	Miscellaneous
21	Lumber and wood products	Miscellaneous
22	Pulp, paper and printing	Miscellaneous
23	Petroleum and coal products	Miscellaneous
24	Chemicals, rubber and plastic	Miscellaneous
25	Non-metallic mineral products	Miscellaneous
26	Primary iron and steel	Miscellaneous
27	Non ferrous metals	Miscellaneous
28	Fabricated metal products	Miscellaneous
29	Transport equipment	Durables
30	Other machinery and equipment	Durables
31	Other manufacturing	Durables
32	Electricity, gas and water	Miscellaneous
33	Construction	Miscellaneous
34	Trade and transport	Transport
35	Private services	Recreation
36	Government services	Miscellaneous
37	Ownership of dwellings	Miscellaneous

The 37 SALTER commodities are allocated among the 7 commodity groups in Table 3.12 for which expenditure elasticities are available. The concordance between the 7-commodity and 37-commodity classifications is shown in Table 3.13. Through the Tulpulé and Powell (1978) argument presented earlier, the expenditure elasticities in the 37-commodity classification correspond directly to those in the 7-commodity classification. Thus, for each modelled region, there is a set of 37 expenditure

elasticities. These elasticities are further normalised using the benchmark data set so that they satisfy the property of Engle aggregation. The final values used in the SALTER model are found in Appendix B.

Consumption price elasticities of demand in the SALTER model

Once normalised, the expenditure elasticities are used with the Frisch parameter to generate the own-price and cross-price elasticities of demand in consumption using the method shown above. A complete set of demand parameters is therefore determined for each region modelled.

The ORANI model of the Australian economy uses a Frisch parameter value of –1.82 (Dixon et al. 1982), a weighted average of values obtained by Williams (1978) for different Australian consumer groups. Frisch (1959) had originally conjectured that higher (absolute) values of this parameter would be characteristic of lower income consumers and that the parameter would decrease as a function of consumers' incomes. In testing this conjecture, Selvanathan (1988) concludes that:

— the Frisch parameter is not related to real income; and

— estimates of the marginal utility of income for 18 countries are centred around –0.5, which results in an estimate for the Frisch parameter of –2, close to the value used in the ORANI model.

In these conclusions, based on consumption patterns in a variety of developed countries, Selvanathan joins Theil (1987) who concludes on the basis of consumption patterns in 30 developed and developing countries that evidence in favour of the Frisch conjecture is not sufficient to support it.

However, this evidence is based largely on the estimation of demand systems using data from developed affluent countries. There may not be sufficient variation in the data in this respect to obtain significantly different estimates of the Frisch parameter. Peter (1990) cites Frisch parameters derived by Lluch et al. (1977) for several SALTER regions, along with the following relationship between Frisch parameters and per capita incomes also derived by Lluch et al. (1977).

$$-\omega \approx 36X^{-0.36} \tag{3.3}$$

where ω is the Frisch parameter and X is GNP per capita in 1970 US dollars.

The final set of Frisch parameters used in the SALTER model is shown in Table 3.14. Lluch et al. (1977) provide estimates of Frisch parameters for some SALTER regions and Peter (1990) provides an estimate of the Frisch parameter for Australia. The remaining Frisch estimates are calculated using equation (3.3) and 1970 per capita

income in US dollars. The exception is Taiwan, which is given the same Frisch parameter estimate as Korea for want of better data. Note that the Lluch estimate of the Frisch parameter for Korea was discarded in favour of the estimate shown in Table 3.14. The Lluch estimate, $\omega = -10.34$, was considered to be too high in absolute value relative to the other estimates.

Table 3.14: **Frisch parameters for the SALTER model**

	Per capita income 1970 $US	*Estimates using equation (3.3)*	*Frisch parameters used in SALTER*	*Source of parameters used*
Australia	3133	-1.98	-1.46	Peter (1990)
New Zealand	2233	-2.24	-2.24	Equation (3.3)
Canada	3973	-1.82	-1.82	Equation (3.3)
United States	4922	-1.69	-1.85	Lluch et al. (1977)
Japan	1953	-2.35	-2.35	Equation (3.3)
Korea	279	-4.74	-4.74	Equation (3.3)
EC	2278	-2.23	-2.07	Lluch et al. (1977)
Indonesia	79	-7.47	-7.88	Lluch et al. (1977)
Malaysia	319	-4.52	-4.24	Lluch et al. (1977)
Philippines	182	-5.53	-5.76	Lluch et al. (1977)
Singapore	914	-3.09	-3.10	Lluch et al. (1977)
Thailand	198	-5.36	-2.14	Lluch et al. (1977)
China	96	-6.96	-6.96	Equation (3.3)
Hong Kong	916	-3.09	-3.09	Equation (3.3)
Taiwan	same as Korea		-4.74	Equation (3.3)
Rest of World	860	-3.16	-3.16	Equation (3.3)

Source: Per capita income data is from United Nations (1991).

From these values of the Frisch parameter and the earlier values of expenditure elasticities, a complete set of consumer demand elasticities is generated relatively economically. This system tends to generate low cross-price effects. The resulting own-price elasticities are found in Appendix B.

3.4 The elasticity of labour supply

Changes in labour supply are specified as linear functions of changes in the real after-tax wage rate in the SALTER model. This requires the specification of an elasticity of labour supply with respect to the real after-tax wage for each region modelled. The SALTER model includes Western developed economies, developed economies such as Japan where a different work ethic has been observed, middle income countries such as Korea and Taiwan (presumably with an oriental work ethic) and ASEAN members

who in large part are developing, mainly agricultural economies. It is expected that labour supply elasticities would vary in these different types of region.

Recent studies of labour supply in developed countries have attempted to separate income from substitution effects and concentrate on either male or female labour supply (Pencavel 1986). Most studies of male labour supply measure the response of the male working force to wage changes and do not account for labour participation rates. Studies of female labour supply are also available, but tend to concentrate on the labour supply of particular groups.

Econometric evidence

In his recent review of econometric evidence in Anglo–Saxon countries, Pencavel (1986) places the elasticity of male labour supply to wage increases at about –0.1. This means that as wages increase by 10 per cent, the labour supply of working males *decreases* by 1 per cent. This points to the existence of a backward bending supply curve in which large income effects reduce male workers' incentives to work as they devote more time to leisure.

In analysing women's decision to work and supply labour, Luskin (1990) suggests with Mroz (1987) that estimates are very low, centred around zero. The low estimates for women's labour obtained by Mroz are based on married white US women aged 30–60.

In both cases, income effects are argued to have a strong depressing effect on the amount of labour supplied. This income effect is expected to affect elasticity estimates at the relatively high levels of income and economic development observed in the United States and the United Kingdom. These studies exclude the participation decision and groups such as young women and the decision by elderly people to work or not. Mansur and Whalley (1984) indicate that 'estimates on this elasticity vary sharply by the group involved, with prime-age males having low if not negative elasticities and secondary and older workers having higher elasticities (around 0.5)'.

Labour supply in agricultural developing economies

Due to the lower income levels prevailing in some SALTER regions, labour supply is expected not to be affected by the negative income effect observed in more developed countries. In China and a large part of the ASEAN region, a significant part of the labour force is found in agriculture. A significant part of this force is expected to work in a semi-subsistence setting in which consumption and production decisions are made simultaneously. Household models have been used to analyse farmers' allocation decisions. Singh, Squire and Strauss (1986) provide a review of these models.

By taking into account the effects of price changes on total farm income, household models yield elasticities that are significantly different from those obtained from demand and supply studies that are not integrated. In the case of labour supply

elasticities, estimates obtained with the household model tend to be larger. Elasticities assuming constant profits simulate results from a non-integrated model. Such low estimates reflect the negative income effects usually observed in labour supply studies. However, farm income is composed of labour income, income from management and profits. The effect of higher labour income (wages) is to *decrease* profits. This negative effect on profits and aggregate farm income results in a higher supply of labour than was estimated assuming constant profits. Thus the elasticity of labour supply in this framework is positive and of the order of 0.1 to 0.3, as shown in Table 3.15.

Table 3.15: **Elasticities of labour supply to wages assuming constant and varying profits**

	Taiwan	*Malaysia*	*Korea*	*Thailand*
Constant profits	–0.12	–0.07	0.00	0.08
Varying profits	0.17	0.11	0.11	0.26

Source: Singh et al. (1986).

Previous modelling practice

Labour supply elasticities are found mostly in tax models to capture labour taxation effects. Fullerton, Shoven and Whalley (1980) and Ballard, Fullerton, Shoven and Whalley (1985) use an elasticity of 0.15 for the supply of labour by the whole workforce in the United States. This value is obtained as an average of male and female labour supply elasticities, weighted by the respective wage bill of each group. In an extension of the ORANI model of the Australian economy, the influence of wages on labour force participation is specified as slightly positive, and tempered by negative effects of non-labour income and unemployment (Dee 1989).

Preferred parameter values

Based on the evidence mentioned above, Luskin (1990) suggests that a weighted average of male and female elasticities be used in the SALTER model. Assuming 60 per cent of the labour force is male, an elasticity of labour supply of –0.1 for men and 0.0 for women, this yields a value of –0.06 for the wage elasticity of aggregate labour supply.

Luskin (1990) suggests that only pure wage effects should be reflected in the SALTER model parameterisation. Thus, based on estimates of the elasticity of labour supply to off-farm wages in Thailand and Malaysia, he suggests a value of zero, making the supply of labour effectively exogenous.

In the light of the low estimates of aggregate labour supply elasticities, this parameter is set to zero for all regions in most simulations conducted with the SALTER model. The possibility of specifying a non-zero elasticity is, however, left to the user.

APPENDIX A: THEORETICAL SPECIFICATION OF THE SALTER MODEL

This appendix provides more technical information on the SALTER model's theoretical structure described in Chapter 1. A complete list of equations, variables, and coefficients and parameters is included. Equations are found in Table A1, variables in Table A2 and coefficients and parameters in Table A3. The equations of the SALTER model are numbered with a letter S prefix and are grouped by major topic with an additional letter.

A primer for linearising the SALTER model is also provided, along with examples of how particular classes of equations are derived.

A.1 Notation

All lower case variables are measured in percentage or absolute changes. Upper case symbols correspond to the actual levels of variables.

As discussed in Chapter 1, the set of variables is partitioned into an exogenous subset and an endogenous subset. The exogenous variables in a typical long run closure are listed separately in Table A4.

Unless specified otherwise, items described in the tables are indexed by country z = 1,...,S. The model structure is the same for all S regions modelled.

In general, geographical references are confined to superscripts. Most variables and parameters are specific to one of the S modelled regions and are superscripted z (z = 1,...,S). Other possible superscripts are D ('domestically produced' — shortened to 'domestic'), I ('imported'), and W ('world').

Geographical references are of necessity more complex when a traded entity needs to be distinguished by both source and destination. The letters z = 1,...,S and s = 1,...,S have been used to differentiate source from destination regions. A superscript z is used to index import variables where the imports are coming *into* region z. The source of these imports is indexed by a subscript s. A superscript z is also used to index export variables where the exports are being sent *from* region z. The destination of those exports is indexed by a subscript s.

Thus, when looking at variables describing bilateral trade, in which a regional reference appears in both the superscript and subscript, it is useful to remember that exported goods are sent from 'top to bottom' while imported goods are sent from 'bottom to top'.

A matching convention is used in the TABLO code used to implement the model. In the TABLO names (also listed in Table A2) for bilateral trade variables, two regional index letters need to appear side by side. An example from Table A2 is ES(I,Z,S), the TABLO name for the export volume of good i from region z to region s. In interpreting these names, it is useful to remember that exported goods are sent from 'left to right' (outwards, in some sense) while imported goods are sent from 'right to left' (inwards).

Subscripts are also used to specify the commodity (i), factor of production (k) and/or industry (j) characterising the main symbol.

Upper case subscripts generally indicate a particular use in final demand or another macroeconomic aggregate — that is, X ('intermediate demand'), C ('household consumption'), G ('government consumption'), K ('investment demand'), E ('export demand') and Q ('aggregate supply'). An A stands for 'aggregate' and F for 'international transport' or 'freight'.

A.2 Writing SALTER model equations as linear approximations in percentage changes

Most equations in the SALTER model are linear first-order approximations to an underlying level function, and in which the variables are expressed in percentage changes. An underlying production function may be written:

$$Y = f(X_1, X_2)$$

where Y is output and X_1 and X_2 are the levels of inputs 1 and 2 used in production. The above relation may be written as a linear first-order approximation by a process of logarithmic differentiation:

$$y = \varepsilon_1 x_1 + \varepsilon_2 x_2$$

where $y = 100\,dY/Y$, $x_1 = 100\,dX_1/X_1$ and $x_2 = 100\,dX_2/X_2$ are the percentage changes in output, input 1 and input 2, respectively. Parameters ε_1 and ε_2 are the elasticities of output with respect to the use of inputs 1 and 2, respectively. The

linear expression, which treats ε_1 and ε_2 as constant, involves an element of approximation in the event that ε_1 and ε_2 in fact vary as production varies.

Two rules are used extensively in deriving the SALTER system of equations. Using logarithmic differentiation, a product expressed in levels is translated into the sum of the percentage changes in the components of the product. Thus an expression for the value of commodity X such as:

$$V = PX$$

where X is the quantity of a commodity, P its price and V its value, results in the following expression after taking log differentials:

$$\mathrm{d} \log V = \mathrm{d} \log P + \mathrm{d} \log X$$

$$\frac{\mathrm{d}V}{V} = \frac{\mathrm{d}P}{P} + \frac{\mathrm{d}X}{X}$$

and multiplying through by 100 gives

$$v = p + x$$

where v, p and x are the percentage changes in V, P and X, the variables expressed in level terms.

An additive relation in the levels of the variables results in a share-weighted expression when expressed in percentage changes. For example, differentiating the following simple relation between income, consumption and savings:

$$Y = C + S$$

where Y is income, C is consumption and S is savings, yields:

$$\mathrm{d}Y = \mathrm{d}C + \mathrm{d}S$$

Taking relative changes, results in:

$$Yy = Cc + Ss$$

where y, c and s are percentage changes in the level variables Y, C and S respectively. Such a relation is sometimes expressed in the SALTER equation system in this form. Alternatively, it may be written as

$$y = S_C c + S_S s$$

where $S_C = C/Y$ and $S_S = S/Y$ are the shares of each component of the levels sum in the levels total.

This rule applies to many national accounting equations; sums of aggregates expressed in levels become share-weighted sums of the percentage changes in the aggregates. This principle applies to aggregations such as that of primary factors (equations SA9–11), many of the national accounting identities (SD group of equations), and even the zero pure profit and market clearing conditions (equations SB1 and SC1).

Calculating changes in demand resulting from a CES aggregating function

A simple example is used to illustrate how the linearised demand functions in equation group SA are derived. In these equations, the decision-maker is assumed to minimise the cost of acquiring a quantity $\overline{X}$ of a commodity by choosing among different sources or varieties of this good(X_1 and X_2). The problem can be written:

$$\min Y = P_1X_1 + P_2X_2$$

$$\text{s.t. } \overline{X} = (\beta_1X_1^{\alpha} + \beta_2X_2^{\alpha})^{1/\alpha}$$

The Lagrangian function is written

$$L = Y + \lambda\left[\overline{X} - \left(\beta_1X_1^{\alpha} + \beta_2X_2^{\alpha}\right)^{1/\alpha}\right]$$

where λ is the shadow cost to the objective of an extra unit of the aggregate X defined in the constraint. The first order conditions are:

$$\frac{\partial L}{\partial X_i} = P_i - \lambda\beta_i\, X_i^{\alpha-1}\, X^{1-\alpha} = 0$$

Multiplying through by X_i and summing over i gives:

$$Y - \lambda\, X^{1-\alpha}\left[\beta_1X_1^{\alpha} + \beta_2X_2^{\alpha}\right] = 0$$

Since the square bracket term is equal to X^{α} this simplifies to:

$$\lambda = \frac{Y}{X} = P$$

where P is the price of aggregate X, since it is the expenditure on X divided by the quantity commodity aggregate. Dividing the first order condition by $P = \lambda$ and rearranging, we get:

$$\frac{P_i}{P} = \beta_i \, X_i^{\alpha-1} \, X^{1-\alpha}$$

Let $\sigma = (1-\alpha)^{-1}$ be the elasticity of substitution between X_1 and X_2. Taking logarithms, we have

$$\sigma(\ln P_i - \ln P) = \sigma \ln \beta_i + \ln X - \ln X_i$$

Holding σ and β_i constant and differentiating yields the following expression in percentage changes:

$$x_i = x - \sigma(p_i - p)$$

where lower case letters are the percentage change equivalents of the corresponding upper case variables. The Armington part of the intermediate and final demand equations follow this structure.

Calculating price indexes

We use the price of an imported aggregate for consumption to illustrate how price indexes are derived. We want to show:

(SA16) $$p_{Ci}^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz} p_{Cis}^{Iz}$$

We start with the calculation of an aggregate in terms of levels:

(1) $$P_{Ci}^{Iz} \, C_i^{Iz} = \sum_{s=1}^{S} P_{Cis}^{Iz} \, C_{is}^{Iz}$$

The total value of imports for consumption is equal to the sum of imports from all sources. The corresponding percentage change expression is:

(2) $$p_{Ci}^{Iz} + c_i^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz} \left(p_{Cis}^{Iz} + c_{is}^{Iz} \right)$$

We now show that

(3) $$c_i^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz} \, c_{is}^{Iz}$$

Using the demands for each disaggregated commodity in equation SA15:

(4) $$c_{is}^{Iz} = c_i^{Iz} - \beta_i^{Iz} \left(p_{Cis}^{Iz} - p_{Ci}^{Iz} \right)$$

(5) $$\sum_{s=1}^{S} S_{Cis}^{Iz} \, c_{is}^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz} \left[c_i^{Iz} - \beta_i^{Iz} \left(p_{Cis}^{Iz} - \sum_{s=1}^{S} S_{Cis}^{Iz} \, c_{is}^{Iz} \right) \right]$$

Upon distributing the first sum operator in the right hand side, the round parenthesis term disappears, leaving c_i^{Iz} which we required in equation (3).

Equation (2) can be rewritten by distributing the sum operator:

$$(6) \qquad p_{Ci}^{Iz} + c_i^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz}\ p_{Cis}^{Iz} + \sum_{s=1}^{S} S_{Cis}^{Iz}\ c_{is}^{Iz}$$

The second terms on each side of equation (6) are equal; therefore

$$p_{Ci}^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz}\ p_{Cis}^{Iz}$$

Calculating the change in the contribution of a tax to government revenues

We use the contribution of export taxes to government revenues from commodity taxes as an example of how to derive the contribution equations in group SE. The contribution to government revenues of the export tax on commodity i to region s can be written (in levels):

$$R_{GEis}^{z} = \frac{E_{Eis}^{z}\ T_{Eis}^{z}}{R_{GT}}$$

where E_{Eis}^{z} is the taxable value of commodity i exported to region s; T_{Eis}^{z} is the corresponding export tax rate; R_{GEis}^{z} is the contribution of export taxes on commodity i to region s; and R_{GT} is aggregate commodity tax revenue.

Lower case letters in the following expression are percentage changes in the corresponding level variables except for t_{Eis}^{z} which is the percentage change in *power* of the export tax applied by region z. The linear expression is:

$$r_{GEis}^{z} = \frac{E_{Eis}^{z}\ T_{Eis}^{z}}{R_{GT}} \left[exp_{is}^{z} + p_i^{Dz} + \left(\frac{1 + T_{Eis}^{z}}{T_{Eis}^{z}} \right) t_{Eis}^{z} \right]$$

However, this expression is undefined for $T_{Eis}^{z} = 0$, so the term $E_{Eis}^{z}\ T_{Eis}^{z}$ is distributed, yielding an expression like equation SE11, where the contribution of all export taxes is calculated as the simple sum of the contribution of taxes on individual commodities. This principle is applied to all equations describing the contribution of taxes to government revenues.

Using shift terms and ratios

Some behavioural rules in the SALTER model are determined using ratios. In many cases, these ratios are used with the closure to define the economic environment under which adaptations are made.

For example, the wage rate in a region may be free to vary or may be held fixed in real or nominal terms. This is captured in equation SD11 as

$$w_L^z = h_W^z cpi^z + h_{WL}^z$$

If the parameter h_W^z is assigned a value of unity and if the shift term h_{WL}^z is set exogenously to zero, the equation simply states that the percentage change in the nominal wage w_L^z equals the percentage change in the consumer price index cpi^z. Thus the wage is held fixed in real terms, by being indexed to the consumer price index. If the parameter h_W^z is assigned a value of zero and if the shift term h_{WL}^z is set exogenously to zero, the equation states instead that the nominal wage is held fixed.

Alternatively, if the parameter h_W^z is assigned a value of unity and if the shift term h_{WL}^z is left free to vary endogenously, this cuts the link between nominal wages and the consumer price index. This is typically used to model wage flexibility in long-run closures of the model.

Technical change

Technical change is allowed to affect the efficiency of:

1. intermediate inputs as a whole;
2. value added as a whole;
3. individual components of value added; and
4. all inputs to production as a whole.

Technical change is modelled through variables a_{tj} where t indicates the type of technical change and j indicates the industry in which technical change occurs. Setting variables $a_{Xj}^z = -1 (t = X$ for intermediate inputs) results in a 1 per cent decrease in the requirements for all intermediate inputs per unit of output in industry j (whether domestic or imported). Setting $a_P^z = -1$ ($t = P$ for primary factors) results

in a 1 per cent decrease in the requirements for all primary factors per unit of output in all industries. Setting $a_j^z = -1$ results in a 1 per cent decrease in the requirements for both intermediate inputs and primary factors per unit of output in industry j (see equations SA1–2 and SA6–8).

Technical change is also assumed to affect the use of individual primary factors. As seen in equation SA8, a technical change improving the efficiency of labour in industry j by 1 per cent results in a decrease in labour requirements per unit of output by $1 - \eta_{2j}^z(1 - S_{Lj}^z)$. This value may turn out to be positive or negative, depending on the primary factor substitution elasticities and factor shares. At the same time, however, the use of capital per unit of output in industry j decreases by $\eta_{2j}^z \, S_{Lj}^z$ according to equation SA7. As the efficiency of labour is increased, labour becomes relatively cheaper than capital in efficiency units, so there is substitution away from capital.

Absolute change variables and ratios

Some variables are defined as the absolute change of a ratio. For example Q_B^{YGz} is the ratio of government held bonds (A_B^{Gz}) to total government receipts (R_D^{Gz}), multiplied by 100, and dQ_B^{YGz} is the absolute change in this ratio variable, measured in percentage points.

Government net interest receipts are equal to the product of the bond rate and government bond ownership. In level form, this can be written as

$$R_D^{Gz} Q_I^{RGz} = R_B^z R_D^{Gz} Q_B^{YGz} = 100. R_B^z A_B^{Gz}$$

where Q_I^{RGz} is the ratio of net interest income to total government receipts, multiplied by 100, and R_B^z is the rate of return of bonds, measured as a fraction rather than a percentage (eg. where 0.035 denotes a 3.5 per cent real return on bonds).

Differentiating the above equation gives:

$$R_D^{Gz} dQ_I^{RGz} + Q_I^{RGz} dR_D^{Gz} = 100. A_B^{Gz} dR_B^z + R_B^z Q_B^{YGz} dR_D^{Gz} + R_B^z R_D^{Gz} dQ_B^{YGz}$$

Since $Q_I^{RGz} = R_B^z Q_B^{YGz}$, the second terms on both sides of the equation are equal; simplifying yields equation SE5, where the level of the bond rate R_B in that equation is still measured as a fraction, but where the variable representing the absolute change in the bond rate dR_B^z in that equation is equal to $100.dR_B^z$ above, and hence is denominated in percentage points. The principles demonstrated in this example are applied in equations SD3, 6, 8, SE1, 5, 13, SG1–3, 8 and 10.

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*

SA Demands for commodities

Firm demand for domestic intermediate inputs

SA1	INT_DEM_DOM	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	$x_{ij}^{Dz} = q_j^z - \eta_i^z\left(p_{Pij}^{Dz} - p_{Pij}^z\right) + a_j^z + a_{Xj}^z$

Firm demand for imported intermediate inputs

SA2	INT_DEM_IMP	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	$x_{ij}^{Iz} = q_j^z - \eta_i^z\left(p_{Pij}^{Iz} - p_{Pij}^z\right) + a_j^z + a_{Xj}^z$

Intermediate demand for imported intermediate inputs, by source

SA3	INT_DEM_SEC	$i = 1,...,I$ $j = 1,...,J$ $s = 1,...,S$ $z = 1,...,S$	$x_{isj}^{Iz} = x_{ij}^{Iz} - \eta_i^{Iz}\left[p_{Pisj}^{Iz} - p_{Pij}^{Iz}\right]$

Producer price of commodity *i*

SA4	PR_INT_TOT	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	$p_{Pij}^z = S_{Pij}^{Dz}\, p_{Pij}^{Dz} + S_{Pij}^{Iz}\, p_{Pij}^{Iz}$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Producer price of imported commodity *i*			
SA5	PR_INT_IMP	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	$p^{Iz}_{Pij} = \sum_{s=1}^{S} S^{Iz}_{Pisj}\, p^{Iz}_{Pisj}$
Industry demand for land			
SA6	DEMAND_LAND	$j = 1,...,J$ $z = 1,...,S$	$f^z_{Mj} = q^z_j - \eta^z_{2j}\left[w^z_M - \sum_{\ell=K,M,L} S^z_{\ell j} w^z_{\ell j}\right] + a^z_j + a^z_P + a^z_{Mj} - \eta^z_{2j}\left[a^z_{Mj} - \sum_{\ell=K,M,L} S^z_{\ell j} a^z_{\ell j}\right]$
Industry demand for capital			
SA7	DEM_CAPITAL	$j = 1,...,J$ $z = 1,...,S$	$f^z_{Kj} = q^z_j - \eta^z_{2j}\left[w^z_{Kj} - \sum_{\ell=K,M,L} S^z_{\ell j} w^z_{\ell j}\right] + a^z_j + a^z_P + a^z_{Kj} - \eta^z_{2j}\left[a^z_{Kj} - \sum_{\ell=K,M,L} S^z_{\ell j} a^z_{\ell j}\right]$
Industry demand for labour			
SA8	DEM_LABOUR	$j = 1,...,J$ $z = 1,...,S$	$f^z_{Lj} = q^z_j - \eta^z_{2j}\left[w^z_L - \sum_{\ell=K,M,L} S^z_{\ell j} w^z_{\ell j}\right] + a^z_j + a^z_P + a^z_{Lj} - \eta^z_{2j}\left[a^z_{Lj} - \sum_{\ell=K,M,L} S^z_{\ell j} a^z_{\ell j}\right]$
Aggregate demand for land			
SA9	AGGLAND	$z = 1,...,S$	$f^z_{DM} = \sum_{j=1}^{J} S^z_{DMj} f^z_{Mj}$
Aggregate demand for capital			
SA10	AGGCAP	$z = 1,...,S$	$f^z_{DK} = \sum_{j=1}^{J} S^z_{DKj} f^z_{Kj}$

Aggregate demand for labour

SA11 AGGLAB $z = 1,...,S$

$$f_{DL}^{z} = \sum_{j=1}^{J} S_{DLj}^{z} f_{Lj}^{z}$$

Household demand for commodity aggregates

SA12 HH_DEMAND $i = 1,...,I$; $z = 1,...,S$

$$c_i^z = \sum_{h=1}^{I} \lambda_{ih}^{z} p_{Ch}^{z} + \mu_i^z \left(c_T^z - h_D^z \right) + h_D^z$$

Household demand for domestic commodities

SA13 CON_DEM_DOM $i = 1,...,I$; $z = 1,...,S$

$$c_i^{Dz} = c_i^z - \beta_i^z \left(p_{Ci}^{Dz} - p_{Ci}^z \right)$$

Household demand for imported commodity aggregates

SA14 CON_DEM_IMP $i = 1,...,I$; $z = 1,...,S$

$$c_i^{Iz} = c_i^z - \beta_i^z \left(p_{Ci}^{Iz} - p_{Ci}^z \right)$$

Household demand for imported commodities, by source

SA15 CON_DEM_SEC $i = 1,...,I$; $s = 1,...,S$; $z = 1,...,S$

$$c_{is}^{Iz} = c_i^{Iz} - \beta_i^{Iz} \left(p_{Cis}^{Iz} - p_{Ci}^{Iz} \right)$$

Consumer price of composite imported commodities

SA16 PR_CON_IMP $i = 1,...,I$; $z = 1,...,S$

$$p_{Ci}^{Iz} = \sum_{s=1}^{S} S_{Cis}^{Iz} p_{Cis}^{Iz}$$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Price paid by consumers for commodity *i*			
SA17	PR_CON_TOT	$i = 1,...,I$ $z = 1,...,S$	$p_{Ci}^{z} = S_{Ci}^{Iz} p_{Ci}^{Iz} + S_{Ci}^{Dz} p_{Ci}^{Dz}$
Government demand for domestic commodities			
SA18	GOV_USE_DOM	$i = 1,...,I$ $z = 1,...,S$	$gov_{i}^{Dz} = g^{z} - \beta_{Gi}^{z}\left(p_{Gi}^{Dz} - p_{Gi}^{z}\right)$
Government demand for imported commodity aggregates			
SA19	GOV_USE_IMP	$i = 1,...,I$ $z = 1,...,S$	$gov_{i}^{Iz} = g^{z} - \beta_{Gi}^{z}\left(p_{Gi}^{Iz} - p_{Gi}^{z}\right)$
Government demand for imported commodities, by source			
SA20	GOV_USE_SEC	$i = 1,...,I$ $s = 1...,S$ $z = 1,...,S$	$gov_{is}^{Iz} = gov_{i}^{Iz} - \beta_{Gi}^{Iz}\left(p_{Gis}^{Iz} - p_{Gi}^{Iz}\right)$
Price paid by the government for composite imported commodities			
SA21	PR_GOV_IMP	$i = 1,...,I$ $z = 1,...,S$	$p_{Gi}^{Iz} = \sum_{s=1}^{S} S_{Gis}^{Iz} p_{Gis}^{Iz}$

Price paid by the government for composite commodities

SA22 PR_GOV_TOT

$i = 1,...,I$
$i = 1,...,I$
$i = 1,...,I$

$$p^{z}_{Gi} = S^{Iz}_{Gi}\, p^{Iz}_{Gi} + S^{Dz}_{Gi}\, p^{Dz}_{Gi}$$

Investment demand for domestic commodities

SA23 INV_USE_DOM

$i = 1,...,I$
$z = 1,...,S$

$$inv^{Dz}_{i} = inv^{z}_{TR} - \beta^{z}_{Ki}\left(p^{Dz}_{Ki} - p^{z}_{Ki}\right)$$

Investment demand for imported commodity aggregates

SA24 INV_USE_IMP

$i = 1,...,I$
$z = 1,...,S$

$$inv^{Iz}_{i} = inv^{z}_{TR} - \beta^{z}_{Ki}\left(p^{Iz}_{Ki} - p^{z}_{Ki}\right)$$

Investment demand for imported commodities, by source

SA25 INV_IMP_SEC

$i = 1,...,I$
$s = 1,...,S$
$z = 1,...,S$

$$inv^{Iz}_{is} = inv^{Iz}_{i} - \beta^{Iz}_{Ki}\left(p^{Iz}_{Kis} - p^{Iz}_{Ki}\right)$$

Price of imported commodities used in investment

SA26 PR_INV_IMP

$i = 1,...,I$
$z = 1,...,S$

$$p^{Iz}_{Ki} = \sum_{s=1}^{S} S^{Iz}_{Kis}\, p^{Iz}_{Kis}$$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Price of composite commodities used in investment			
SA27	PR_INV_TOT	$i = 1,...,I$ $z = 1,...,S$	$p^z_{Ki} = S^{Iz}_{Ki}\, p^{Iz}_{Ki} + S^{Dz}_{Ki}\, p^{Dz}_{Ki}$

SB Zero pure profit conditions

Zero profit condition for each industry

SB1	ZEROPROFITS	$j = 1,...,J$ $z = 1,...,S$	$p^{Dz}_j = s^z_{Qj} + \sum_{i=1}^{I} H^{Dz}_{ij}\, p^{Dz}_{Pij} + \sum_{i=1}^{I} H^{Iz}_{ij}\, p^{Iz}_{Pij} + \sum_{k=1}^{K} H^z_{kj}\, w^z_{kj} + a^z_{Tj}$

Aggregated technical change

SB2	TECHNICAL_CH	$j = 1,...,J$ $z = 1,...,S$	$a^z_{Tj} = a^z_j + H^z_{Xj} a^z_{Xj} + H^z_{Pj} a^z_P + \sum_{k=1}^{K} H^z_{kj} a^z_{kj}$

Landed duty-paid price of commodity i imported from source s by region z

SB3	BASICPIMP	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	$p^{Iz}_{is} = p^{Wz}_{is} + e^z + d^z_{is}$

Landed duty-paid price of imported commodity aggregate i

SB4	AGIMPRICE	$i = 1,...,I$ $z = 1,...,S$	$p^{Iz}_i = \sum_{s=1}^{S} S^{Iz}_{Mis}\, p^{Iz}_{is}$

Producer price of imported intermediate commodities

SB5 PR_INT_SEC

$i = 1,...,I$
$j = 1,...,J$
$s = 1,...,S$
$z = 1,...,S$

$$p_{Pisj}^{Iz} = p_{is}^{Iz} + t_{ij}^{Iz}$$

Producer price of domestic intermediate commodities

SB6 PR_INT_DOM

$i = 1,...,I$
$j = 1,...,J$
$z = 1,...,S$

$$p_{Pij}^{Dz} = p_{i}^{Dz} + t_{ij}^{Dz}$$

Consumer price of imported commodities, by source

SB7 PR_CON_SEC

$i = 1,...,I$
$s = 1,...,S$
$z = 1,...,S$

$$p_{Cis}^{Iz} = p_{is}^{Iz} + t_{Ci}^{Iz}$$

Consumer price of domestic commodities

SB8 PR_CON_DOM

$i = 1,...,I$
$z = 1,...,S$

$$p_{Ci}^{Dz} = p_{i}^{Dz} + t_{Ci}^{Dz}$$

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Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Price paid by the government for imported commodities, by source			
SB9	PR_GOV_SEC	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	$p_{Gis}^{Iz} = p_{is}^{Iz} + t_{Gi}^{Iz}$
Price paid by the government for domestic commodities			
SB10	PR_GOV_DOM	$i = 1,...,I$ $z = 1,...,S$	$p_{Gi}^{Dz} = p_{i}^{Dz} + t_{Gi}^{Dz}$
Price of imported commodities used in investment, by source			
SB11	PR_INV_SEC	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	$p_{Kis}^{Iz} = p_{is}^{Iz} + t_{Ki}^{Iz}$
Price of domestic commodities used in investment			
SB12	PR_INV_DOM	$i = 1,...,I$ $z = 1,...,S$	$p_{Ki}^{Dz} = p_{i}^{Dz} + t_{Ki}^{Dz}$
Export price (fob) of commodity *i* exported by *z* to *s*			
SB13	PREXPORT	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	$p_{Eis}^{z} = p_{i}^{Dz} + t_{Eis}^{z}$

World currency landed duty-free price of imported commodities into region z, by source

SB14 FORCURRLDFPR

$i = 1,...,I$
$s = 1,...,S$
$z = 1,...,S$

$$p_{is}^{Wz} = S_{Vis}^{Wz}\left(p_{Eiz}^{s} - e^{s}\right) + S_{Fis}^{Wz}\, p_{F}$$

Price of international freight (in world currency)

SB15 PRFREIGHT —

$$p_{F} = \sum_{i=1}^{I}\sum_{s=1}^{S} S_{Fis}\left(p_{i}^{Ds} - e^{s}\right)$$

SC Market clearing conditions

Market clearing condition for domestic commodities

SC1 EQDOMCOM

$i = 1,...,I$
$z = 1,...,S$

$$q_{i}^{z} = \sum_{j=1}^{J} S_{QXij}^{Dz}\, x_{ij}^{Dz} + S_{QKi}^{Dz}\, inv_{i}^{Dz} + S_{QCi}^{Dz}\, c_{i}^{Dz} + S_{QEi}^{Dz}\, exp_{i}^{z} + S_{QGi}^{Dz}\, gov_{i}^{Dz}$$

Imports of commodity i from region s

SC2 IMPORTDEMAND

$i = 1,...,I$
$s = 1,...,S$
$z = 1,...,S$

$$imp_{is}^{z} = \sum_{j=1}^{J} S_{MXisj}^{Iz}\, x_{isj}^{Iz} + S_{MKis}^{Iz}\, inv_{is}^{Iz} + S_{MCis}^{Iz}\, c_{is}^{Iz} + S_{MGis}^{Iz}\, gov_{is}^{Iz}$$

Labour employment rate

SC3 EMP_RATES

$z = 1,...,S$

$$em_{L}^{z} = f_{DL}^{z} - f_{SL}^{z}$$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*		*Equation*
SD Household income aggregates, supply of primary factors				
Aggregate household income				
SD1	HHOLD_INCOME	$z = 1,...,S$		$Y^{Hz}y^{Hz} = Y_L^z y_L^z + Y_P^{Hz} y_P^{Hz} + T_G^z t_G^z$
Labour income				
SD2	LABR_INCOME	$z = 1,...,S$		$y_L^z = w_L^z + f_{DL}^z$
Property income				
SD3	PROPY_INCOME	$z = 1,...,S$		$Y_P^{Hz} y_P^{Hz} = Y_E^z y_E^z + Y_D^{Hz} dQ_I^{YHz} + Y_I^{Hz} y_D^{Hz}$
Equity income				
SD4	EQY_INCOME	$z = 1,...,S$		$Y_E^z y_E^z = F_{DKV}^z \; f_{DKV}^z + F_{DMV}^z \left(w_M^z + f_{DM}^z \right) - DEP^z dep^z$
Gross fixed capital earnings				
SD5	FIXD_CAPL_EARNINGS	$z = 1,...,S$		$F_{DKV}^z \; f_{DKV}^z = \sum_{j=1}^{J} F_{DKVj}^z (w_{Kj}^z + f_{Kj}^z)$
Household interest income				
SD6	HHOLD_INTT_INCOME	$z = 1,...,S$	(M.5.6)	$Y_D^{Hz} dQ_I^{YHz} = A_B^{Hz} dR_B^z + R_B Y_D^{Hz} dQ_B^{YHz}$
Household disposable income				
SD7	HHOLD_DISPBLE_INCOME	$z = 1,...,S$		$Y_D^{Hz} y_D^{Hz} = Y^{Hz} y^{Hz} - R_{GY}^z r_{GY}^z$

Disposition of household disposable income

SD8 DISPN_HHOLD_INCOME $z = 1,...,S$

$$Y_D^{Hz} y_D^{Hz} = C_T^z c_T^z + Y_D^{Hz} dQ_S^{YHz} + S^{Hz} y_D^{Hz}$$

Pre-transfer household disposable income

SD9 HHOLD_PRIVTE_INCME $z = 1,...,S$

$$Y_V^{Hz} y_V^{Hz} = Y_L^z y_L^z + Y_P^{Hz} y_P^{Hz} - R_{GY}^z r_{GY}^z,$$

Labour supply

SD10 LAB_SUPPLY $z = 1,...,S$

$$f_{SL}^z = \chi_L^z \left[w_L^z - cpi^z - R_{TY}^z t_{YL}^z \right] + h_D^z$$

Wage equation

SD11 WAGES $z = 1,...,S$

$$w_L^z = h_W^z cpi^z + h_{WL}^z$$

SE Government budget

Government receipts

SE1 GOVT_RECTS $z = 1,...,S$

$$R_D^{Gz} y_{GT}^z = R_{GY}^z r_{GY}^z + R_{GT}^z r_{GT}^z + R_D^{Gz} dQ_I^{RGz} + Y_I^{Gz} y_{GT}^z$$

Income tax

SE2 INCOME_TAX $z = 1,...,S$

$$R_{GY}^z r_{GY}^z = T_{YL}^z r_{GYL}^z + T_{YNL}^z r_{GYP}^z$$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Revenue from tax on labour income			
SE3	TAX_LABR_INCOME	$z = 1,...,S$	$r^z_{GYL} = t^z_{YL} + y^z_L$
Revenue from tax on property income			
SE4	TAX_PROPY_INCOME	$z = 1,...,S$	$r^z_{GYP} = t^z_{YP} + y^{Hz}_P$
Government net interest receipts			
SE5	GOVT_INTT_RECTS	$z = 1,...,S$	$R^{Gz}_D dQ^{RGz}_I = A^{Gz}_B dR^z_B + R_B R^{Gz}_D dQ^{YGz}_B,$
Contribution of taxes on intermediate commodity use to commodity tax revenue			
SE6	REVINT	$z = 1,...,S$	$r^z_{GX} = \frac{1}{R^z_{GT}} \sum_{j=1}^{J}\sum_{i=1}^{I}\left[E^{Dz}_{ij} t^{Dz}_{ij} + T^{Dz}_{ij}\left(x^{Dz}_{ij} + p^{Dz}_i\right) + \sum_{s=1}^{S}\left[E^{Iz}_{isj} t^{Iz}_{ij} + T^{Iz}_{ijs}\left(x^{Iz}_{isj} + p^{Iz}_{is}\right)\right]\right]$
Contribution of consumption taxes to commodity tax revenue			
SE7	REVCON	$z = 1,...,S$	$r^z_{GC} = \frac{1}{R^z_{GT}} \sum_{i=1}^{I}\left[E^{Dz}_{Ci} t^{Dz}_{Ci} + T^{Dz}_{Ci}\left(c^{Dz}_i + p^{Dz}_i\right) + \sum_{s=1}^{S}\left[E^{Iz}_{Cis} t^{Iz}_{Ci} + T^{Iz}_{Cis}\left(c^{Iz}_{is} + p^{Iz}_{is}\right)\right]\right]$
Contribution of taxes on government commodity purchases to commodity tax revenue			
SE8	REVGOV	$z = 1,...,S$	$r^z_{GG} = \frac{1}{R^z_{GT}} \sum_{i=1}^{I}\left[E^{Dz}_{Gi} t^{Dz}_{Gi} + T^{Dz}_{Gi}\left(gov^{Dz}_i + p^{Dz}_i\right) + \sum_{s=1}^{S}\left[E^{Is}_{Gis} t^{Iz}_{Gi} + T^{Iz}_{Gis}\left(gov^{Iz}_{is} + p^{Iz}_{is}\right)\right]\right]$
Contribution of investment taxes to commodity tax revenue			

SE9 REVINV $z = 1,...,S$ $$r_{GK}^{z} = \frac{1}{R_{GT}^{z}} \sum_{i=1}^{I} \left[E_{Ki}^{Dz} \, t_{Ki}^{Dz} + T_{Ki}^{Dz} \left(inv_{i}^{Dz} + p_{i}^{Dz} \right) + \sum_{s=1}^{S} \left[E_{Kis}^{Is} \, t_{Ki}^{Iz} + T_{Kis}^{Iz} \left(inv_{is}^{Iz} + p_{is}^{Iz} \right) \right] \right]$$

Contribution of industry taxes net of subsidies to commodity tax revenue

SE10 REVINDT $z = 1,...,S$ $$r_{GI}^{z} = \frac{1}{R_{GT}^{z}} \sum_{j=1}^{J} \left[E_{Qj}^{z} \, s_{Qj}^{z} + S_{Qj}^{z} \left(q_{j}^{z} + p_{j}^{Dz} \right) \right]$$

Contribution of export taxes on commodity *i* exported to region *s* to commodity tax revenue

SE11 REVEXP $z = 1,...,S$ $$r_{GE}^{z} = \frac{1}{R_{GT}^{z}} \sum_{i=1}^{I} \sum_{s=1}^{S} \left[E_{Eis}^{z} \, t_{Eis}^{z} + T_{Eis}^{z} \left(exp_{is}^{z} + p_{i}^{Dz} \right) \right]$$

Contribution of import duties to commodity tax revenue

SE12 REVIMP $z = 1,...,S$ $$r_{GD}^{z} = \frac{1}{R_{GT}^{z}} \sum_{i=1}^{I} \sum_{s=1}^{S} \left[E_{Mis}^{z} \, d_{is}^{z} + D_{is}^{z} \left(imp_{is}^{z} + p_{is}^{Wz} + e^{z} \right) \right]$$

Disposition of government receipts

SE13 DISPN_GOVT_RECTS $z = 1,...,S$ $$R_{D}^{Gz} y_{GT}^{z} = O_{G}^{z} o_{G}^{z} + R_{D}^{Gz} dQ_{S}^{YGz} + S^{Gz} y_{GT}^{z}$$

Current government outlays

SE14 GOVT_CURRNT_OUTLS $z = 1,...,S$ $$O_{G}^{z} o_{G}^{z} = Z_{G}^{z} z_{G}^{z} + T_{G}^{z} t_{G}^{z},$$

Commodity tax revenue net of industry subsidies

SE15 GOVREVCOMM $z = 1,...,S$ $$r_{GT}^{z} = r_{GC}^{z} + r_{GX}^{z} + r_{GG}^{z} + r_{GK}^{z} + r_{GI}^{z} + r_{GE}^{z} + r_{GD}^{z}$$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Labour income tax rate			
SE16	RATE_TAX_LABR_INCOME	$z = 1,...,S$	$t^z_{YL} = h^z_{YTR} + h^z_{LYT}$
Property income tax rate			
SE17	RATE_TAX_PROPY_INCOME	$z = 1,...,S$	$t^z_{YP} = h^z_{YTR} + h^z_{PYT}$
Transfer payments from governments to households			
SE18	TRANSFERS_GOVT_HHOLD	$z = 1,...,S$	$t^z_G = h^z_{GHT} + y^{Hz}_V$

SF International trade

Demand by region *s* for commodity exports of region *z*

SF1	EMPREGSEC	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	$exp^z_{is} = imp^S_{iz}$

Aggregate imports, by commodity, at landed duty-free prices in world currency

SF2	IMPFOBCOMM	$i = 1,...,I$ $z = 1,...,S$	$imp^z_i = \sum_{s=1}^{S} S^z_{Mis}\left(p^{Wz}_{is} + imp^z_{is}\right)$

Aggregate imports, from region *s* to region *z*, at landed duty-free prices in world currency

SF3 IMP_FOB_SEC $s = 1,...,S$ $z = 1,...,S$

$$imps_s^z = \sum_{i=1}^{I} S_{MSis}^z (p_{is}^{Wz} + imp_{is}^z)$$

Import volume index, basic value weights

SF4 IMPT_VOLE_INDX $i = 1,...,I$ $z = 1,...,S$

$$imp_{IVi}^z = \sum_{s=1}^{S} S_{MERis}^z \, imp_{is}^z$$

Aggregate exports in value from region z at fob prices, by commodity

SF5 EXPFOBCOMM $i = 1,...,I$ $z = 1,...,S$

$$expi_i^z = \sum_{s=1}^{S} S_{EIis}^z (p_{Eis}^z + exp_{is}^z) + S_{EIFi}^z \left(p_i^{Dz} + F_i^z \right)$$

Aggregate exports by region z to region s at fob prices, by destination

SF6 EXPFOBSEC $s = 1,...,S$ $z = 1,...,S$

$$exps_s^z = \sum_{i=1}^{I} S_{ESis}^z (p_{Eis}^z + exp_{is}^z)$$

Region z export volume of commodity i

SF7 EXPORTDEMAND $i = 1,...,I$ $z = 1,...,S$

$$exp_i^z = \sum_{s=1}^{S} S_{Eis}^z \, exp_{is}^z + \left(S_{EFi}^z F_i^z \right)$$

Aggregate imports at landed duty-free prices in world currency

SF8 IMPFOB $z = 1,...,S$

$$imp_A^z = \sum_{i=1}^{I} \sum_{s=1}^{S} S_{MTis}^z (p_{is}^{Wz} + imp_{is}^z)$$

Real aggregate imports

SF9 REALIMP $z = 1,...,S$

$$imp_{AR}^z = imp_A^z - ipi^z$$

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Aggregate exports at fob prices			
SF10	EXPFOBZ	$z = 1,...,S$	$exp_A^z = \sum_{i=1}^{I} \sum_{s=1}^{S} S_{EAis}^z (p_{Eis}^z + exp_{is}^z) + \sum_{i=1}^{I} S_{EAFi}^z \left(p_i^{Dz} + F_i^z \right)$
Real aggregate exports			
SF11	REALEXP	$z = 1,...,S$	$exp_{AR}^z = exp_A^z - epi^z$
Terms of trade			
SF12	TERMS_OF_TRADE	$z = 1,...,S$	$tt^z = epi^z - e^z - ipi^z$
Contribution to terms of trade of price variation between commodities			
SF13	CONTRN_TTRADE_COMMY	$z = 1,...,S$	$C_1^z = \sum_{i=1}^{I} C_{1i}^z$
Contribution to cttcr of commodity *i*			
SF14	CTTCR_REG_COM	$i = 1,...,I$ $z = 1,...,S$	$C_{1i}^z = \left(S_{ETi}^z - S_{MTi}^z \right) \left(wepi_i - wpi \right)$
Contribution to terms of trade of export variety price variation			
SF15	CONTRN_TTRADE_VAR_X	$z = 1,...,S$	$C_2^z = \sum_{i=1}^{I} C_{2i}^z$
Contribution to cttvxr of commodity *i*			
SF16	CTTVXR_REG_COM	$i = 1,...,I$ $z = 1,...,S$	$C_{2i}^z = S_{ETi}^z \left(epi_i^z - wepi_i \right)$

Contribution to terms of trade of import variety price variation

SF17 CONTRN_TTRADE_VAR_M $z = 1,...,S$

$$C_3^z = \sum_{i=1}^{I} C_{3i}^z$$

Contribution to cttvmr of commodity *i*

SF18 CTTVMR_REG_COM $i = 1,...,I$, $z = 1,...,S$

$$C_{3i}^z = S_{MTi}^z \left(mpi_i^z - wepi_i \right)$$

Price index for exports, by region and commodity

SF19 EXPT_PRICE_REG_COM $i = 1,...,I$, $z = 1,...,S$

$$epi_i^z = \sum_{s=1}^{S} S_{EIis}^z p_{Eis}^z + S_{EIFi}^z p_i^{Dz} - e^z$$

World price index for exports, by commodity

SF20 EXPT_PRICE_COM $i = 1,...,I$

$$wepi_i = \sum_{z=1}^{S} S_{ERi}^z epi_i^z$$

World export price index

SF21 WORLD_EXPT_PRINDEX —

$$WEXP_T wpi = \sum_{z=1}^{S} EXP_{CC}^z \left(epi^z - e^z \right)$$

Price index for imports of non-margin commodities, by region and commodity

SF22 IMPRINDEX_NONTRD $i = 1,...,I$, $z = 1,...,S$

$$mpi_i^z = \sum_{s=1}^{S} S_{MPiz}^s \left(p_{Eiz}^s - e^s \right) + S_{MFi}^z p_F$$

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Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Demand for freight			
SF23	DEMAND_FREIGHT	$i = 1,...,I$ $z = 1,...,S$	$F_i^z = F_W + \beta_F\left[p_F - \left(p_i^{Dz} - e^z\right)\right]$
Total demand for world freight			
SF24	WORLD_FREIGHT	—	$F_W = \sum_{i=1}^{I}\sum_{s=1}^{S}\sum_{z=1}^{Z} S_{Fis}^z exp_{is}^z$
Export volume index, basic value weights, excluding intra-region exports and margins exports			
SF25	EXPT_VOLE_INDX	$i = 1,...,I$ $z = 1,...,S$	$exp_{IVi}^z = \sum_{s=1}^{S} S_{EERis}^z exp_{is}^z$
Duty rate			
SF26	DUTY_RATE	$i = 1,...,I$ $z = 1,...,S$ $s = 1,...,S$	$d_{is}^z = h_{MDAi}^z + h_{MDis}^z$
Export tax rate			
SF27	EXPORT_TAX_RATE	$i = 1,...,I$ $z = 1,...,S$ $s = 1,...,S$	$t_{Eis}^z = h_{XTAi}^z + h_{XTis}^z$

SG International capital mobility

World net ownership of bonds

SG1 OWNP_BONDS —

$$Y^W dQ_B^Y + A_B y^W = \sum_{z=1}^{S} \left(\frac{Y^z}{E^z} dQ_B^{Yz} + \frac{A_B^z}{E^z} y^z - \frac{A_B^z}{E^z} e^z \right)$$

Net ownership of bonds in region z

SG2 OWNP_BONDS_REG $z = 1,...,S$

$$Y^z dQ_B^{Yz} + A_B^z y^z = Y_D^{Hz} dQ_B^{YHz} + A_B^{Hz} y_D^{Hz} + R_D^{Gz} dQ_B^{YGz} + A_B^{Gz} y_{GT}^z$$

Household wealth composition

SG3 HHOLD_OWNP_BONDS_REG $z = 1,...,S$

$$A^{Hz} a^{Hz} = A_E^{Hz} a_E^{Hz} + Y_D^{Hz} dQ_B^{YHz} + A_B^{Hz} y_D^{Hz}$$

Equity in productive assets

SG4 EQY $z = 1,...,S$

$$A_E^{Hz} a_E^{Hz} = S_K^{Az} a_K^z + S_M^{Az} a_M^z$$

Equity price index

SG5 EQY_PRICE_INDX $z = 1,...,S$

$$A_E^{Hz} p_E^z = S_K^{Az} pci^z + S_M^{Az} pmr^z$$

Value of physical capital

SG6 VALUE_CAPL $z = 1,...,S$

$$a_K^z = pci^z + f_{DK}^z$$

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Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Value of farm land			
SG7	VALUE_LAND	$z = 1,...,S$	$a_M^z = pmr^z + f_{DM}^z$
Household wealth accumulation			
SG8	HHOLD_WEALTH_ACCN	$z = 1,...,S$	$A^{Hz}a^{Hz} = (A^{Hz} - C_1^{Hz}S^{Hz}T)p_A^{Hz} + C_1^{Hz}Y_D^{Hz}T\,dQ_S^{YHz} + C_1^{Hz}S^{Hz}T\,cpi^z + C_2^{Hz}S^{Hz}T(y_D^{Hz} - cpi^z)$
Household asset price index			
SG9	HHOLD_ASST_PRINDX	$z = 1,...,S$	$A^{Hz}p_A^{Hz} = A_E^{Hz}p_E^z + A_B^{Hz}(wcpi + e^z)$
Government wealth accumulation			
SG10	GOVT_WEALTH_ACCN	$z = 1,...,S$	$R_D^{Gz}dQ_B^{YGz} + A_B^{Gz}y_{GT}^z = (A_B^{Gz} - C_1^{Gz}S^{Gz}T)\left(wcpi + e^z\right) + C_1^{Gz}R_D^{Gz}T\,dQ_S^{YGz} + C_1^{Gz}S^{Gz}T\,zpi^z + C_2^{Gz}S^{Gz}T(y_{GT}^z - zpi^z)$
International interest parity			
SG11	INTERNL_INTT_PARY	$z = 1,...,S$	$dR_B^z = dR_B$
Equity bond parity			
SG12	EQY_BOND_PARY	$z = 1,...,S$	$dR_E^z = dR_B^z + dF_{RE}^z$

Abnormal rate of return on capital

SG13 ABNL_RETN_CAPL $j = 1,...,J$ $z = 1,...,S$

$$dR^z_{Kj} = dR^z_E + dR^z_{Aj}$$

Rental price of capital

SG14 RENTL_PRICE_CAPL $j = 1,...,J$ $z = 1,...,S$

$$dR^z_{Kj} = R^z_{Kj}\left(w^z_{Kj} - pci^z\right)$$

Rental price of land

SG15 PRICE_LAND $z = 1,...,S$

$$dR^z_E = R_B\left(w^z_M - pmr^z\right)$$

Expected rate of change in average rate of return on capital

SG16 EXPD_RATE_RETN_CAPL $z = 1,...,S$

$$d\dot{R}^{Ez}_K = \alpha^z R^z_{KG} J^z (inv^z_{TR} - f^z_{DK}) + \alpha^z (J^z - R^z_D - H^z_K) dR^z_K$$

Average rate of return on capital

SG17 AVGE_RATE_RETN_CAPL $z = 1,...,S$

$$dR^z_K = \sum_{j=1}^{J} S^z_{DKj} dR^z_{Kj} + \sum_{j=1}^{J} R^z_{Kj} S^z_{DKj} f^z_{Kj} - R^z_{KG} f^z_{DK}$$

Equilibrating rates of return on capital

SG18 EQN_RATE_RETN_CAPL $z = 1,...,S$

$$d\dot{R}^{Ez}_K = d\dot{R}^{Ez}_E - \lambda^z_K dR^z_A$$

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Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Average rate of abnormal return on capital			
SG19	AVGE_ABNL_RETN_CAPL	$z = 1,...,S$	$dR_A^z = \sum_{j=1}^{J} S_{DKj}^z dR_{Aj}^z + \sum_{j=1}^{J} R_{Aj}^z S_{DKj}^z f_{Kj}^z - R_A^z f_{DK}^z$
Expected rate of change in rate of return on equity			
SG20	EXPD_RATE_RETN_EQY	$z = 1,...,S$	$d\dot{R}_E^{Ez} = d\dot{R}_B^{Ez} + d\dot{F}_{RE}^z$
Expected rate of change in bond rate			
SG21	EXPD_BOND_RATE	$z = 1,...,S$	$d\dot{R}_B^{Ez} = d\dot{R}_B^E$

SH National macroeconomic indicators

Expenditure on gross domestic product			
SH1	EXPRE_GDP	$z = 1,...,S$	$GDP_E^z \; gdp_E^z = C_T^z \; c_T^z + Z_G^z \; z_G^z + INV_T^z \; inv_T^z + EXP_A^z exp_A^z - IMP_A^z (e^z + imp_A^z)$
Gross domestic product at factor cost			
SH2	GDPFACTCOST	$z = 1,...,S$	$gdp_F^z = S_{GDPL}^z (w_L^z + f_{DL}^z) + \sum_{j=1}^{J} S_{GDPKj}^z (w_{Kj}^z + f_{Kj}^z) + S_{GDPM}^z (w_M^z + f_{DM}^z)$
Gross national expenditure			
SH3	GROSS_NATL_EXPRE	$z = 1,....,S$	$NE_G^z \; ne_G^z = C_T^z \; c_T^z + Z_G^z \; z_G^z + INV_T^z \; inv_T^z$
Aggregate net primary factor income			

SH4 NET_FACT_INC $z = 1,...,S$

$$y_F^z = S_{YL}^z\left(w_L^z + f_{DL}^z\right) + \sum_{j=1}^{J} S_{YKj}^z(w_{Kj}^z + f_{Kj}^z) + S_{YM}^z\left(w_M^z + f_{DM}^z\right) - S_{YD}^z\, dep^z$$

Real GDP

SH5 REAL_GDP $z = 1,...,S$

$$GDP_E^z\ gdp_R^z = C_T^z\ c_{TR}^z + Z_G^z\ g^z + INV_T^z\ inv_{TR}^z + EXP_A^z\ exp_{AR}^z - IMP_A^z imp_{AR}^z$$

Real gross national expenditure

SH6 REAL_GNE $z = 1,...,S$

$$NE_G^z ne_{GR}^z = C_T^z\ c_{TR}^z + Z_G^z g^z + INV_T^z\ inv_{TR}^z$$

Real net national expenditure

SH7 R_NAT_EXP $z = 1,...,S$

$$ne_{NR}^z = S_{CNE}^z c_{TR}^z + S_{INE}^z inv_{TR}^z - S_{DNE}^z(dep^z - pci^z) + S_{GNE}^z g^z$$

Real aggregate household disposable income

SH8 REALDISPY $z = 1,...,S$

$$y_{dR}^z = y_D^{Hz} - cpi^z$$

Real aggregate household consumption expenditure

SH9 REALCONS $z = 1,...,S$

$$c_{TR}^z = c_T^z - cpi^z$$

Aggregate nominal investment

SH10 AGGINV $z = 1,...,S$

$$inv_T^z = inv_{TR}^z + pci^z$$

Depreciation of the capital stock

SH11 DEP_CAPITAL $z = 1,...,S$

$$dep^z = f_{DK}^z + pci^z$$

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Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
Real government purchases of commodities			
SH12	GOVDEMCOM	$z = 1,...,S$	$g^z = z_G^z - zpi^z$
Consumer price index			
SH13	WALCPI	$z = 1,...,S$	$cpi^z = \sum_{i=1}^{I} S_{CTi}^{Dz} p_{Ci}^{Dz} + \sum_{i=1}^{I}\sum_{s=1}^{S} S_{CTis}^{Iz} p_{Cis}^{Iz}$
Price index for investment goods			
SH14	PURPCAP	$z = 1,...,S$	$pci^z = \sum_{i=1}^{I} S_{KTi}^{Dz} p_{Ki}^{Dz} + \sum_{i=1}^{I} S_{KTi}^{Iz} p_{Ki}^{Iz}$
Price index for government purchases			
SH15	GOVPRCOM	$z = 1,...,S$	$zpi^z = \sum_{i=1}^{I} S_{GTi}^{Dz} p_{Gi}^{Dz} + \sum_{i=1}^{I} S_{GTi}^{Iz} p_{Gi}^{Iz}$
Price index for exports (fob)			
SH16	EXPPRIND	$z = 1,...,S$	$epi^z = \sum_{i=1}^{I}\sum_{s=1}^{S} S_{EAis}^{z} p_{Eis}^{z} + \sum_{i=1}^{I} S_{EAFi}^{z} p_i^{Dz}$
Landed duty-free price index for imports (cif, world currency)			
SH17	IMPPRIND	$z = 1,...,S$	$ipi^z = \sum_{i=1}^{I}\sum_{s=1}^{S} S_{MTis}^{z} p_{is}^{Wz}$
Primary factor price index			
SH18	FACTR_PRICE_INDEX	$z = 1,...,S$	$gpi_F^z = S_{GDPL}^{z} w_L^z + \sum_{j=1}^{J} S_{GDPKj}^{z} w_{Kj}^{z} + S_{GDPM}^{z} w_M^z$

Gross domestic product price index

SH19 PRICE_INDEX_GDP $z = 1,...,S$

$$GDP_E^z \; gpi_E = C_T^z \; cpi^z + Z_G^z \; zpi^z + INV_T^z \; pci^z + EXP_A^z \; epi^z - IMP_A^z (e^z + ipi^z)$$

Price index for gross national expenditure

SH20 PRICE_INDX_GNE $z = 1,...,S$

$$NE_G^z \; gnepi^z = C_T^z \; cpi^z + Z_G^z \; zpi^z + INV_T^z \; pci^z$$

Primary factor employment

SH21 PRIMY_FACTR_EMPLT $z = 1,...,S$

$$gdp_{FR}^z = gdp_F^z - gpi_F^z$$

Gross domestic product, nominal

SH22 GROSS_DOMC_PRODT $z = 1,...,S$

$$GDP_E^z \; gdp_N^z = Y_L^z \left(w_L^z + f_{DL}^z \right) + F_{DKV}^z \; f_{DKV}^z + F_{DMV}^z \left(w_M^z + f_{DM}^z \right) + R_{GT}^z \; r_{GT}^z$$

Gross national product

SH23 GROSS_NATL_PRODT $z = 1,...,S$

$$NP_G^z \; gnp_N^z = GDP_E^z \; gdp_N^z + GDP_E^z dQ_{GDP}^{YAz} + Y_I^z gdp_N^z$$

National income

SH24 NATL_INCOME $z = 1,...,S$

$$Y^z y^z = Y_F^z y_F^z + Y^z dQ_I^{Yz} + Y_I^z y^z + R_{GT}^z r_{GT}^z$$

Net interest income

SH25 INTT_INCOME_REGN $z = 1,...,S$

$$Y^z dQ_I^{Yz} = A_B^z dR_B^z + R_B Y^z dQ_B^{Yz}$$

National consumption expenditure

(Continued on next page)

Table A1: **Equations in the SALTER model**

No	*TABLO name*	*Range*	*Equation*
SH26	NATL_CONSN_EXPRE	$z = 1,...,S$	$C_N^z c_N^z = C_T^z c_T^z + Z_G^z z_G^z$
National saving			
SH27	NAT_SAVINGS	$z = 1,...,S$	$Y^z dQ_S^{Yz} + SAV^z y^z = Y_D^{Hz} dQ_S^{YHz} + S^{Hz} y_D^{Hz} + R_D^{Gz} dQ_S^{YGz} + S^{Gz} y_{GT}^z$
National consumption price index			
SH28	NATL_CONSN_PRINDX	$z = 1,...,S$	$C_N^z ncpi^z = C_T^z cpi^z + Z_G^z zpi^z$
Real national income in region *z*			
SH29	REAL_NATL_INCOME	$z = 1,...,S$	$y^z = ncpi^z + y_R^z$

SI Instruments to define different economic environments

Ratio of public to private expenditure			
SI1	PRIV_PUB	$z = 1,...,S$	$c_{TR}^z = g^z - h_{GPE}^z$
Ratio of net income from abroad to GDP			
SI2	RATIO_YCAB_GDP	$z = 1,...,S$	$GDP_E^z \; dQ_{GDP}^{YAz} + Y_I^z \; gdp_N^z = Y^z dQ_I^{Yz} + Y_I^z y^z$
Ratio of government current account surplus to GDP			
SI3	RATIO_GCUAS_GDP	$z = 1,...,S$	$GDP_E^z \; dQ_{GDP}^{CAz} + S^{Gz} \; gdp_N^z = R_D^{Gz} dQ_S^{YGz} + S^{Gz} y_{GT}^z$

Ratio of net capital inflow to GDP

SI4 RATIO_NET_CAPL_INFLW $z = 1,...,S$

$$DEP^z dep^z + Y^z dQ_S^{Yz} + SAV^z y^z + GDP_E^z dQ_{GDP}^{KAz} + KA^z gdp_N^z = INV_T^z inv_T^z$$

Ratio of balance of trade to GDP

SI5 RATIO_BAL_TRADE_GDP $z = 1,...,S$

$$GDP_E^z \; dQ_{GDP}^{BTz} + TB^z \; gdp_N^z = EXP_A^z \; exp_A^z - IMP_A^z \left(e^z + imp_A^z \right)$$

SJ Global macroeconomic indicators

World gross product

SJ1 WORLD_GROSS_PRODUCT —

$$WGP \; wgp_N = \sum_{z=1}^{S} GDP_E^z \; gdp_N^z$$

World income

SJ2 WORLD INCOME —

$$Y^W y^W = \sum_{z=1}^{S} \frac{Y^z}{E^z} y^z$$

World consumption price index

SJ3 WORLD_CONSN_PRINDX —

$$C^W \; wcpi = \sum_{z=1}^{S} \frac{C_N^z}{E^z} (ncpi^z - e^z)$$

Real world income

SJ4 WORLD_REAL_INCOME —

$$y^W = wcpi + y_R^W$$

(Continued on next page)

Table A1: Equations in the SALTER model

No	*TABLO name*	*Range*	*Equation*
World net income from abroad			
SJ5	WORLD_NET_Y_ABROAD	—	$WGP\, dW^{YB}_{GDP} + WBY\, wgp_N = \sum_{z=1}^{S} GDP^z_E\, dQ^{YAz}_{GDP} + \sum_{z=1}^{S} Y^z_I\, gdp^z_N$
World net capital inflow			
SJ6	WORLD_NET_CAPL_INFLOW	—	$WGP\, dW^{KA}_{GDP} + WKA\, wgp_N = \sum_{z=1}^{S} GDP^z_E\, dQ^{KAz}_{GDP} + \sum_{z=1}^{S} KA^z\, gdp^z_N$
World capital stock			
SJ7	WORLD_CAPL_STOCK	—	$WKS\, wks_R = \sum_{z=1}^{S} \frac{S^{Az}_K}{E^z} f^z_{DK}$
World real investment			
SJ8	WORLD_REAL_INVT	—	$WIE\, winv_R = \sum_{z=1}^{S} \frac{INV^z_T}{E^z} inv^z_{TR}$
World factor price index			
SJ9	WGDPFEQ	–	$gpi^W_F = \sum_{z=1}^{S} S^z_{WGDP} gpi^z_F$

Table A2: **Variables in the SALTER model**

Variable		*Range*	*TABLO name*	*Description*
Disaggregated quantities				
c_i^z		$i = 1,...,I$ $z = 1,...,S$	CONT(I,Z)	Consumer demand for aggregate commodity i in region z (real)
c_i^{Dz}	#	$i = 1,...,I$ $z = 1,...,S$	COND(I,Z)	Consumer demand for domestic commodity i in region z (real)
c_i^{Iz}	#	$i = 1,...,I$ $z = 1,...,S$	CONI(I,Z)	Consumer demand for imported aggregate commodity i in region z (real)
c_{is}^{Iz}	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	CONIS(I,Z,S)	Consumer demand for imported commodity i from source s in region z (real)
exp_i^z		$i = 1,...,I$ $z = 1,...,S$	E(I,Z)	Aggregate exports of commodity i from region z (real)
exp_{is}^z	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	ES(I,Z,S)	Export demand for commodity i from region z, by region s (real)
F_i^z		$i = 1,...,I$ $z = 1,...,S$	FZD(I,Z)	Demand for freight services of commodity i from region z (real)
f_{Kj}^z		$j = 1,...,J$ $z = 1,...,S$	K(J,Z)	Demand by industry j in region z for capital (real)
f_{Lj}^z		$j = 1,...,J$ $z = 1,...,S$	L(J,Z)	Demand by industry j in region z for labour (real)
f_{Mj}^z		$j = 1,...,J$ $z = 1,...,S$	M(J,Z)	Demand by industry j in region z for land (real)
gov_i^{Dz}	#	$i = 1,...,I$ $z = 1,...,S$	GOVD(I,Z)	Government demand for domestic commodity i in region z (real)
gov_i^{Iz}	#	$i = 1,...,I$ $z = 1,...,S$	GOVI(I,Z)	Government demand for aggregate imported commodity i in region z (real)
gov_{is}^{Iz}	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	GOVIS(I,Z,S)	Government demand for imported commodity i from source s in region z (real)
imp_{is}^z		$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	IMPS(I,Z,S)	Imports of commodity i from source s to region z (real)
inv_i^{Dz}	#	$i = 1,...,I$ $z = 1,...,S$	INVD(I,Z)	Investment demand for domestic commodity i in region z (real)

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
inv_i^{Iz}	#	$i = 1,...,I$ $z = 1,...,S$	INVI(I,Z)	Investment demand for imported aggregate commodity i in region z (real)
inv_{is}^{Iz}	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	INVIS(I,Z,S)	Investment demand for imported commodity i from source s in region z (real)
q_j^z		$j = 1,...,J$ $z = 1,...,S$	Q(J,Z)	Supply of commodity j in region z (real)
x_{ij}^{Dz}	#	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	INTD(I,J,Z)	Demand by industry j in region z for domestic commodity i (real)
x_{ij}^{Iz}	#	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	INTI(I,J,Z)	Demand by industry j in region z for imported aggregate commodity i (real)
x_{isj}^{Iz}	#	$i = 1,...,I$ $j = 1,...,J$ $s = 1,...,S$ $z = 1,...,S$	INTIS(I,J,Z,S)	Demand by industry j in region z for imported commodity i from source s (real)
Prices and price indices				
cpi^z		$z = 1,...,S$	CPI(Z)	Consumer price index in region z
e^z		$z = 1,...,S$	ER(Z)	Exchange rate (local currency price of world currency)
epi^z		$z = 1,...,S$	EPI(Z)	Export price index (fob) in region z
epi_i^z		$i = 1,...,I$ $z = 1,...,S$	PXRC(I,Z)	Price index for exports, by source and commodity
$gnepi^z$		$z = 1,...,S$	GNEPI(Z)	Price index for gross national expenditure in region z
gpi_E^z		$z = 1,...,S$	GDPPI(Z)	Price index for expenditure on gross domestic product in region z
gpi_F^z		$z = 1,...,S$	PFPI(Z)	Primary factor price index in region z
ipi^z		$z = 1,...,S$	IMPPI(Z)	Price index of imports (cif) in region z (landed duty-free in world currency)
mpi_i^z		$i = 1,...,I$ $z = 1,...,S$	PMRC(I,Z)	Price index for imports of commodity i into region z, at source weights
$ncpi^z$		$z = 1,...,S$	IPCR(Z)	National consumption price index in region z

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
p_E^z	#	$z = 1,...,S$	IPER(Z)	Equity price index for productive assets in region z
p_F		–	PT	Price of freight (in world currency)
p_A^{Hz}		$z = 1,...,S$	IPAHR(Z)	Price index for household sector financial assets in region z
p_i^{Dz}		$i = 1,...,I$ $z = 1,...,S$	PD(I,Z)	Basic price of domestic commodity i in region z
p_i^{Iz}		$i = 1,...,I$ $z = 1,...,S$	PII(I,Z)	Landed duty-paid price of aggregate imported commodity i in region z
p_{is}^{Iz}		$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	PI(I,Z,S)	Landed duty-paid price of commodity i from source s in region z
p_{Ci}^z	#	$i = 1,...,I$ $z = 1,...,S$	PCONT(I,Z)	Price of aggregate commodity i paid by consumers in region z
p_{Ci}^{Dz}	#	$i = 1,...,I$ $z = 1,...,S$	PCOND(I,Z)	Price of domestic commodity i paid by consumers in region z
p_{Ci}^{Iz}	#	$i = 1,...,I$ $z = 1,...,S$	PCONI(I,Z)	Price of imported commodity i paid by consumers in region z
p_{Cis}^{Iz}	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	PCONIS(I,Z,S)	Price of imported commodity i from source s paid by consumers in region z
p_{Eis}^z	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	PES(I,Z,S)	Export price of commodity i from source z to destination s (fob basis)
p_{Gi}^z	#	$i = 1,...,I$ $z = 1,...,S$	PGOVT(I,Z)	Price of commodity i paid by the government in region z
p_{Gi}^{Dz}	#	$i = 1,...,I$ $z = 1,...,S$	PGOVD(I,Z)	Price of domestic commodity i purchased by the government in region z
p_{Gi}^{Iz}	#	$i = 1,...,I$ $z = 1,...,S$	PGOVI(I,Z)	Price of imported aggregate commodity i purchased by the government in region z
p_{Gis}^{Iz}	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	PGOVIS(I,Z,S)	Price of imported commodity i from source s purchased by the government in region z
p_{Ki}^z	#	$i = 1,...,I$ $z = 1,...,S$	PINVT(I,Z)	Price of commodity i used for investment in region z

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
p_{Ki}^{Dz}	#	$i = 1,...,J$ $z = 1,...,S$	PINVD(I,Z)	Price of domestic commodity i used for investment in region z
p_{Ki}^{Iz}	#	$i = 1,...,J$ $z = 1,...,S$	PINVI(I,Z)	Price of imported aggregate commodity i used for investment in region z
p_{Kis}^{Iz}	#	$i = 1,...,J$ $s = 1,...,S$ $z = 1,...,S$	PINVIS(I,Z,S)	Price of imported commodity i from source s used for investment in region z
p_{Pij}^{z}	#	$i = 1,...,J$ $j = 1,...,J$ $z = 1,...,S$	PINTT(I,J,Z)	Price of aggregate commodity i paid by industry j in region z
p_{Pij}^{Dz}	#	$i = 1,...,J$ $j = 1,...,J$ $z = 1,...,S$	PINTD(I,J,Z)	Price of domestic commodity i paid by industry j in region z
p_{Pij}^{Iz}	#	$i = 1,...,J$ $j = 1,...,J$ $z = 1,...,S$	PINTI(I,J,Z)	Price of imported commodity i paid by industry j in region z
p_{Pisj}^{Iz}	#	$i = 1,...,J$ $j = 1,...,J$ $s = 1,...,S$ $z = 1,...,S$	PINTIS(I,J,Z,S)	Price of imported commodity i from source s paid by industry j in region z
p_{is}^{Wz}	#	$i = 1,...,J$ $s = 1,...,S$ $z = 1,...,S$	PWS(I,Z,S)	World price of commodity i from source s imported by region z
pci^{z}		$z = 1,...,S$	PCAP(Z)	Price index of capital in region z
pmr^{z}		$z = 1,...,S$	PNR(Z)	Stock price of land in region z
w_{L}^{z}		$z = 1,...,S$	W(Z)	Nominal wage rate in region z
w_{M}^{z}		$z = 1,...,S$	RM(Z)	Rental price of land in region z
w_{Kj}^{z}		$j = 1,...,J$ $z = 1,...,S$	RP(J,Z)	Rental price of capital in industry j in region z
zpi^{z}		$z = 1,...,S$	PG(Z)	Price index for government expenditure in region z
National macroeconomic aggregates				
c_{N}^{z}		$z = 1,...,S$	ECR(Z)	National consumption expenditure in region z (nominal)

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Table A2: **Variables in the SALTER model** *(continued)*

Variable	*Range*	*TABLO name*	*Description*
c_T^z	$z = 1,...,S$	CT(Z)	Aggregate nominal household consumption expenditure in region z
c_{TR}^z	$z = 1,...,S$	CTR(Z)	Real aggregate household consumption in region z
C_1^z	$z = 1,...,S$	CTTCR(Z)	Contribution to terms of trade in region z of price variation between commodities
C_{1i}^z	$i = 1,...,I$ $z = 1,...,S$	CTTCRC(I,Z)	Contribution to cttcr of commodity i in region z
C_2^z	$z = 1,...,S$	CTTVXR(Z)	Contribution to terms of trade in region z of export variety price variation
C_{2i}^z	$i = 1,...,I$ $z = 1,...,S$	CTTVXRC(I,Z)	Contribution to cttvxr of commodity i in region z
C_3^z	$z = 1,...,S$	CTTVMR(Z)	Contribution to terms of trade in region z of import variety price variation
C_{3i}^z	$i = 1,...,I$ $z = 1,...,S$	CTTVMRC(I,Z)	Contribution to cttvmr of commodity i in region z
dQ_I^{Yz}	$z = 1,...,S$	QYIR(Z)	Ratio of net interest income to national income in region z (absolute change measured in percentage points)
dQ_I^{RGz}	$z = 1,...,S$	QRGIR(Z)	Ratio of government net interest receipts to total government receipts in region z (absolute change measured in percentage points)
dQ_I^{YHz}	$z = 1,...,S$	QYHIR(Z)	Ratio of household net interest income to household disposable income in region z (absolute change measured in percentage points)
dQ_S^{Yz}	$z = 1,...,S$	QYSR(Z)	National saving-income ratio in region z (absolute change measured in percentage points)
dQ_{GDP}^{BTz}	$z = 1,...,S$	BTS(Z)	Ratio of balance of trade to gdp in region z
dQ_{GDP}^{CAz}	$z = 1,...,S$	GCASS(Z)	Ratio of government current account surplus to gdp in region z (absolute change measured in percentage points)
dQ_{GDP}^{KAz}	$z = 1,...,S$	NKIS(Z)	Ratio of net capital inflow to gdp in region z (absolute change measured in percentage points)
dQ_{GDP}^{YAz}	$z = 1,...,S$	NYAS(Z)	Ratio of net income from abroad to gdp in region z (absolute change measured in percentage points)

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
dep^z		$z = 1,...,S$	DEPR(Z)	Depreciation of capital in region z (nominal)
em_L^z		$z = 1,...,S$	EM(Z)	Rate of employment in region z
f_{DK}^z		$z = 1,...,S$	KT(Z)	Aggregate demand for capital in region z
f_{DL}^z		$z = 1,...,S$	LT_(Z)	Aggregate demand for labour in region z
f_{DM}^z		$z = 1,...,S$	MT(Z)	Aggregate demand for land in region z
f_{SL}^z		$z = 1,...,S$	LS(Z)	Aggregate labour supply in region z
f_{DKV}^z		$z = 1,...,S$	FKE(Z)	Aggregate fixed capital earnings in region z (nominal)
gdp_E^z		$z = 1,...,S$	GDPE(Z)	Expenditure on gross domestic product in region z (nominal)
gdp_F^z		$z = 1,...,S$	GDPFC(Z)	Gross domestic product at factor cost in region z (nominal)
gdp_N^z		$z = 1,...,S$	GDP(Z)	Gross domestic product in region z (nominal)
gdp_R^z		$z = 1,...,S$	GDPR(Z)	Real gdp in region z
gdp_{FR}^z		$z = 1,...,S$	PFE(Z)	Real primary factor employment in region z
inv_T^z		$z = 1,...,S$	INVT(Z)	Aggregate nominal investment in region z
inv_{TR}^z		$z = 1,...,S$	INVTR(Z)	Real aggregate investment in region z
ne_G^z		$z = 1,...,S$	GNE(Z)	Gross national expenditure in region z (nominal)
ne_{GR}^z		$z = 1,...,S$	GNER(Z)	Real gross national expenditure in region z
ne_{NR}^z		$z = 1,...,S$	NEXPR(Z)	Real net national expenditure in region z
tt^z		$z = 1,...,S$	TT(Z)	Terms of trade of region z
y^z		$z = 1,...,S$	Y_R(Z)	Nominal income in region z
y_E^z		$z = 1,...,S$	YER(Z)	Equity income in region z (nominal)
y_F^z		$z = 1,...,S$	YFN(Z)	Aggregate net primary factor income in region z (nominal)
y_L^z	#	$z = 1,...,S$	YLR(Z)	Labour income in region z (nominal)
y_R^z		$z = 1,...,S$	YR_R(Z)	Real income in region z

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
y_{dR}^{z}		$z = 1,...,S$	YDR(Z)	Real aggregate household disposable income in region z
y^{Hz}		$z = 1,...,S$	YHR(Z)	Aggregate nominal household income in region z
y_{D}^{Hz}		$z = 1,...,S$	YHDR(Z)	Household disposable income in region z (nominal)
y_{P}^{Hz}		$z = 1,...,S$	YHPR(Z)	Household property income in region z (nominal)
y_{V}^{Hz}	#	$z = 1,...,S$	YHVR(Z)	Household pre-transfer income in region z
Government budget aggregates				
g^{z}		$z = 1,...,S$	GC(Z)	Aggregate real government spending on commodities in region z
o_{G}^{z}		$z = 1,...,S$	OGR(Z)	Government current outlays in region z (nominal)
r_{GC}^{z}		$z = 1,...,S$	GRCON(Z)	Contribution of consumption taxes to aggregate revenue from commodity taxes in region z
r_{GD}^{z}		$z = 1,...,S$	GRDUT(Z)	Contribution of import duties to aggregate revenue from commodity taxes in region z
r_{GE}^{z}		$z = 1,...,S$	GREXP(Z)	Contribution of export taxes to aggregate revenue from commodity taxes in region z
r_{GG}^{z}		$z = 1,...,S$	GRGOV(Z)	Contribution of taxes on government commodity purchases to aggregate revenue from commodity taxes in region z
r_{GI}^{z}		$z = 1,...,S$	GRSUB(Z)	Contribution of indirect industry taxes net of subsidies to aggregate government revenue in region z
r_{GK}^{z}		$z = 1,...,S$	GRINV(Z)	Contribution of investment taxes to aggregate revenue from commodity taxes in region z
r_{GT}^{z}		$z = 1,...,S$	RC(Z)	Aggregate commodity tax revenues in region z
r_{GX}^{z}		$z = 1,...,S$	GRINT(Z)	Contribution of taxes on intermediate commodity use to aggregate revenue from commodity taxes in region z
r_{GY}^{z}		$z = 1,...,S$	RTYR(Z)	Income tax revenue in region z (nominal)
r_{GYL}^{z}	#	$z = 1,...,S$	RTYLR(Z)	Tax revenue on labour income in region z (nominal)
r_{GYP}^{z}	#	$z = 1,...,S$	RTYPR(Z)	Tax revenue on property income in region z (nominal)
t_{G}^{z}		$z = 1,...,S$	UGHR(Z)	Government transfer payments to households in region z (nominal)

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
y_{GT}^{z}		$z = 1,...,S$	RGR(Z)	Government receipts in region z (nominal)
z_{G}^{z}		$z = 1,...,S$	ZG(Z)	Government spending on goods and services in region z (nominal)
Trade aggregates				
exp_{A}^{z}		$z = 1,...,S$	ET(Z)	Aggregate exports at fob prices in region z
exp_{AR}^{z}		$z = 1,...,S$	ETR(Z)	Real aggregate exports in region z
$expi_{i}^{z}$		$i = 1,...,I$ $z = 1,...,S$	EI(I,Z)	Aggregate exports of commodity i at fob prices from region z
$exps_{s}^{z}$		$s = 1,...,S$ $z = 1,...,S$	ETS(S,Z)	Aggregate exports (fob prices) from region z to region s
exp_{IVi}^{z}		$i = 1,...,I$ $z = 1,...,S$	IVXSC(I,Z)	Exports volume index in region z, basic value weights excluding intra-region exports and margin exports
imp_{A}^{z}		$z = 1,...,S$	IMPT(Z)	Aggregate imports at landed duty-free prices in world currency in region z
imp_{AR}^{z}		$z = 1,...,S$	IMPTR(Z)	Real aggregate imports in region z
imp_{i}^{z}		$i = 1,...,I$ $z = 1,...,S$	IMPI(I,Z)	Aggregate imports of commodity i by region z (landed duty-free in world currency)
$imps_{s}^{z}$		$s = 1,...,S$ $z = 1,...,S$	IMPTS(Z,S)	Aggregate imports from region s to region z (landed duty-free in world currency)
imp_{IVi}^{z}		$i = 1,...,I$ $z = 1,...,S$	IVMDC(I,Z)	Import volume index in region z, basic value weights excluding intra-region imports
National asset holdings and rates of return				
a_{K}^{z}	#	$z = 1,...,S$	AKR(Z)	Value of physical capital in region z
a_{M}^{z}	#	$z = 1,...,S$	ANR(Z)	Value of land in region z
a^{Hz}		$z = 1,...,S$	AHR(Z)	Household wealth in region z (nominal)
a_{E}^{Hz}		$z = 1,...,S$	AER(Z)	Equity in productive assets in region z
dQ_{B}^{Yz}		$z = 1,...,S$	QYBR(Z)	Bond-income ratio in region z (absolute change measured in percentage points)

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
dQ_B^{YGz}		$z = 1,...,S$	QRGBR(Z)	Government bond-income ratio in region z (absolute change measured in percentage points)
dQ_B^{YHz}		$z = 1,...,S$	QYHBR(Z)	Household bond-income ratio in region z (absolute change measured in percentage points)
$d\dot{R}_B^E$			ERCRB	Expected rate of change in world bond rate (absolute change measured in percentage points per year)
dR_A^z		$z = 1,...,S$	RAR(Z)	Average rate of abnormal return on capital in region z (absolute change measured in percentage points)
dR_{Aj}^z		$j = 1,...,J$ $z = 1,...,S$	RARI(J,Z)	Rate of abnormal return on capital in industry j in region z (absolute change measured in percentage points)
$d\dot{R}_B^{Ez}$	#	$z = 1,...,S$	ERCRBR(Z)	Expected rate of change in world bond rate in region z (absolute change measured in percentage points per year)
$d\dot{R}_E^{Ez}$	#	$z = 1,...,S$	ERCRER(Z)	Expected rate of change in required rate of return on equity in region z (absolute change measured in percentage points per year)
$d\dot{R}_K^{Ez}$		$z = 1,...,S$	ERCRKR(Z)	Expected rate of change in rate of return on capital in region z (absolute change measured in percentage points per year)
dF_{RE}^z		$z = 1,...,S$	FRER(Z)	Equity premium in region z (absolute change measured in percentage points)
$d\dot{F}_{RE}^z$		$z = 1,...,S$	ERCFRER(Z)	Expected rate of change in equity premium in region z (absolute change measured in percentage points per year)
dR_B^z	#	$z = 1,...,S$	RBR(Z)	Real bond rate in region z (absolute change measured in percentage points)
dR_E^z	#	$z = 1,...,S$	RER(Z)	Normal rate of return on equity in region z (absolute change measured in percentage points)
dR_K^z		$z = 1,...,S$	RKR(Z)	Average rate of return on capital in region z (absolute change measured in percentage points)
dR_{Kj}^z	#	$j = 1,...,J$ $z = 1,...,S$	RKRI(J,Z)	Rate of return on capital in industry j in region z (absolute change measured in percentage points)
Policy instruments				
d_{is}^z	#	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	D(I,Z,S)	Power of the duty applied to imported commodity i from source s in all uses in region z

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Table A2: **Variables in the SALTER model** *(continued)*

Variable		*Range*	*TABLO name*	*Description*
dQ_S^{YGz}		$z = 1,...,S$	QRGSR(Z)	Government saving ratio in region z (absolute change measured in percentage points)
dQ_S^{YHz}		$z = 1,...,S$	QYHSR(Z)	Household saving ratio in region z (absolute change measured in percentage points)
h_{GHT}^z		$z = 1,...,S$	FUGHR(Z)	Government-to-household transfer shift term in region z
h_{LYT}^z		$z = 1,...,S$	FTYLR(Z)	Labour income tax rate shift in region z
h_{PYT}^z		$z = 1,...,S$	FTYPR(Z)	Property income tax rate shift in region z
h_{YTR}^z		$z = 1,...,S$	FTYR(Z)	Income tax rate shift in region z
h_{MDAi}^z		$i = 1,...,I$ $z = 1,...,S$	FDDC(I,Z)	Import duty rate shift for destination z and commodity i
h_{MDis}^z		$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	FDDCS(I,Z,S)	Import duty rate shift for destination z, commodity i and source s
h_{XTAi}^z		$i = 1,...,I$ $z = 1,...,S$	FTESC(I,Z)	Export tax shift for source z and commodity i
h_{Xtis}^z		$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	FTESCD(I,Z,S)	Export tax shift for source z, commodity i and destination s
s_{Qj}^z		$j = 1,...,J$ $z = 1,...,S$	SQ(J,Z)	Power of industry indirect taxes net of subsidies on industry j in region z
t_{YL}^z	#	$z = 1,...,S$	TYLR(Z)	Rate of tax on labour income in region z
t_{YP}^z	#	$z = 1,...,S$	TYPR(Z)	Rate of tax on property income in region z
t_{ij}^{Dz}		$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	TINTD(I,J,Z)	Power of the ad valorem tax applied to domestic commodity i purchased by industry j in region z
t_{ij}^{Iz}		$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	TINTI(I,J,Z)	Power of the ad valorem tax applied to imported commodity i purchased by industry j in region z
t_{Ci}^{Dz}		$i = 1,...,I$ $z = 1,...,S$	TCOND(I,Z)	Power of the ad valorem tax applied to household consumption of domestic commodity i in region z
t_{Ci}^{Iz}		$i = 1,...,I$ $z = 1,...,S$	TCONI(I,Z)	Power of the ad valorem tax applied to household consumption of imported commodity i in region z

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Table A2: **Variables in the SALTER model** *(continued)*

Variable	*Range*	*TABLO name*	*Description*
t^{z}_{Eis}	$i = 1,...,I$ $s = 1,...,S$ $z = 1,...,S$	TE(I,Z,S)	Power of the ad valorem tax applied to domestic commodity i from region z when exported to destination s
t^{Dz}_{Gi}	$i = 1,...,I$ $z = 1,...,S$	TGOVD(I,Z)	Power of the ad valorem tax applied to domestic commodity i purchased by the government in region z
t^{Iz}_{Gi}	$i = 1,...,I$ $z = 1,...,S$	TGOVI(I,Z)	Power of the ad valorem tax applied to imported commodity i purchased by the government in region z
t^{Dz}_{Ki}	$i = 1,...,I$ $z = 1,...,S$	TINVD(I,Z)	Power of the ad valorem investment tax applied to domestic commodity i in region z
t^{Iz}_{Ki}	$i = 1,...,I$ $z = 1,...,S$	TINVI(I,Z)	Power of the ad valorem investment tax applied to imported commodity i in region z
Modelling instruments			
a^{z}_{j}	$j = 1,...,J$ $z = 1,...,S$	B1(J,Z)	Output augmenting technical change in industry j in region z
a^{z}_{P}	$z = 1,...,S$	BP(Z)	Primary factor augmenting technical change in region z
a^{z}_{Kj}	$j = 1,...,J$ $z = 1,...,S$	BK(J,Z)	Capital-augmenting technical change in industry j in region z
a^{z}_{Lj}	$j = 1,...,J$ $z = 1,...,S$	BL(J,Z)	Labour-augmenting technical change in industry j in region z
a^{z}_{Mj}	$j = 1,...,J$ $z = 1,...,S$	BM(J,Z)	Land-augmenting technical change in industry j in region z
a^{z}_{Tj} #	$j = 1,...,J$ $z = 1,...,S$	BJ(J,Z)	Aggregate technical change in industry j in region z
a^{z}_{Xj}	$j = 1,...,J$ $z = 1,...,S$	BI(J,Z)	Aggregate intermediate input augmenting technical change in industry j in region z
h^{z}_{D}	$z = 1,...,S$	H(Z)	Population in region z
h^{z}_{WL}	$z = 1,...,S$	H4(Z)	Variable used to disconnect wages from the consumer price index in region z
h^{z}_{GPE}	$z = 1,...,S$	HG(Z)	Shift term for ratio of real public to private expenditure in region z
Global variables			
dQ^{Y}_{B}		QYB	World bond-income ratio (absolute change measured in percentage points)

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Table A2: **Variables in the SALTER model** (*continued*)

Variable	*Range*	*TABLO name*	*Description*
dR_B		RB	World real bond rate (absolute change measured in percentage points)
dW_{GDP}^{KA}		WNKIS	Ratio of world net capital inflow to world gdp (absolute change measured in percentage points)
dW_{GDP}^{YB}		WNYAS	Ratio of world net interest income to world gdp (absolute change measured in percentage points)
F_W		FW	World demand for freight
gpi_F^W		WPFPI	World primary factor price index
$wcpi$		IPC	World consumption price index
$wepi_i$	$i = 1,...,I$	PXC(I)	World price index for exports, by commodity
wgp_N		WGP	World gross product (nominal)
$winv_R$		WINVTR	World investment (real)
wks_R		WKT	World capital stock (real)
wpi		WEPI	World price index
y^W		Y	World nominal income
y_R^W		YR	World real income

Variable normally condensed out

Table A3: Coefficients and parameters in the SALTER model

Equation	*Parameter*	*TABLO name*	*Description*
SA1,2	η_i^z	ETA(I,Z)	Elasticity of substitution in production between domestic commodity *i* and imported aggregate commodity *i* in region *z*
SA3	η_i^{Iz}	ETAI(I,Z)	Elasticity of substitution in production between commodity *i* imported from different sources in region *z*
SA4	S_{Pij}^{Dz}	SD(I,J,Z)	Share of domestic commodity *i* in the aggregate use of commodity *i* by industry *j* in region *z*
SA4	S_{Pij}^{Iz}	SI(I,J,Z)	Share of imported commodity *i* in the aggregate use of commodity *i* by industry *j* in region *z*
SA5	S_{Pisj}^{Iz}	SIS(I,J,Z,S)	Share of imported commodity *i* from source *s* in the aggregate use of imports of the commodity by industry *j* in region *z*
SA6,7,8	η_{2j}^z	SIGMA(J,Z)	Elasticity of substitution between primary factors in industry *j* in region *z*
SA6,7,8	S_{mj}^z	SM(J,Z) SR(J,Z) SW(J,Z)	Share of primary factor *m* in all primary factors used by industry *j* in region *z*
SA9,10,11, SG17,19	S_{Dkj}^z	SMT(J,Z) SKT(J,Z) SLT(J,Z)	Share of industry *j*'s use of primary factor *k* in the aggregate use of factor *k* in region *z*
SA12	λ_{ih}^z	LAMBDA(I,H,Z)	Elasticity of household demand for commodity *i* with respect to the price of commodity *h* in region *z*
SA12	μ_i^z	MU(I,Z)	Elasticity of household demand for commodity *i* with respect to aggregate household consumption expenditure in region *z*
SA13,14	β_i^z	BETA(I,Z)	Elasticity of substitution in household consumption in region *z* between domestic commodity *i* and imported aggregate commodity *i*
SA15	β_i^{Iz}	BETAI(I,Z)	Elasticity of substitution in household consumption in region *z* between commodities imported from different sources
SA16	S_{Cis}^{Iz}	SCIGIS(I,Z,S)	Share of imported commodity *i* from source *s* in household demand for aggregate imported commodity *i* in region *z*
SA17	S_{Ci}^{Dz}	SCIGD(I,Z)	Share of domestic commodity *i* in household demand for aggregate commodity *i* in region *z*

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Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SA17	S_{Ci}^{Iz}	SCIGI(I,Z)	Share of imported commodity aggregate *i* in household demand for aggregate commodity *i* in region *z*
SA18,19	β_{Gi}^{z}	GRHO(I,Z)	Elasticity of substitution in government consumption in region *z* between domestic commodity *i* and imported aggregate commodity *i*
SA20	β_{Gi}^{Iz}	GETAI(I,Z)	Elasticity of substitution in government consumption in region *z* between commodities imported from different sources
SA21	S_{Gis}^{Iz}	SGVI(I,Z,S)	Share of imported commodity *i* from source *s* in government demand for aggregate imported commodity *i* in region *z*
SA22	S_{Gi}^{Dz}	SGD(I,Z)	Share of domestic commodity *i* in government consumption of aggregate commodity *i* in region *z*
SA22	S_{Gi}^{Iz}	SGI(I,Z)	Share of imported aggregate commodity *i* in government consumption of aggregate commodity *i* in region *z*
SA23,24	β_{Ki}^{z}	RHO(I,Z)	Elasticity of substitution in investment demand in region *z* between domestic commodity *i* and imported aggregate commodity *i*
SA25	β_{Ki}^{Iz}	IETAI(I,Z)	Elasticity of substitution in investment demand in region *z* between commodities imported from different sources
SA26	S_{Kis}^{Iz}	SINI(I,Z,S)	Share of imported commodity *i* from source *s* in investment use of imported commodity *i* in region *z*
SA27	S_{Ki}^{Dz}	SDINV(I,Z)	Share of domestic commodity *i* in investment use of aggregate commodity *i* in region *z*
SA27	S_{Ki}^{Iz}	SIINV(I,Z)	Share of imported aggregate commodity *i* in investment use of aggregate commodity *i* in region *z*
SB1	H_{ij}^{Dz}	HXD(I,J,Z)	Share of domestic intermediate commodity *i* in total costs of industry *j* in region *z*
SB1	H_{ij}^{Iz}	HXI(I,J,Z)	Share of imported intermediate commodity aggregate *i* in total costs of industry *j* in region *z*
SB1,2	H_{kj}^{z}	HL(J,Z) HK(J,Z) HM(J,Z)	Share of primary factor *k* in total costs of industry *j* in region *z*

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Table A3: **Coefficients and parameters in the SALTER model** *(continued)*

Equation	*Parameter*	*TABLO name*	*Description*
SB2	H^{z}_{Xj}	HX(J,Z)	Share of aggregate intermediate input use in total costs of industry *j* in region *z*
SB2	H^{z}_{Pj}	HP(J,Z)	Share of aggregate primary factor use in total costs of industry *j* in region *z*
SB4	S^{Iz}_{Mis}	SIT2(I,Z,S)	Share of imported commodity *i* from source *s* in imports of aggregate commodity *i* by region *z* (landed duty-paid basis)
SB14	S^{Wz}_{Vis}	SWB(I,Z,S)	Share of the fob value in the landed duty-free value of commodity *i* from source *s* in region *z*
SB14	S^{Wz}_{Fis}	SWM(I,Z,S)	Share of the international freight cost in the landed duty-free value of commodity *i* from source *s* in region *z*
SB15	S_{Fis}	SMF(I,S)	Share of international freight services of commodity *i* supplied by region *s* in the total world value of all international freight services
SC1	S^{Dz}_{QXij}	SXD(I,J,Z)	Share of intermediate use by industry *j* in aggregate demand for domestically produced commodity *i* in region *z*
SC1	S^{Dz}_{QCi}	SCID(I,Z)	Share of household consumption in aggregate demand for domestically produced commodity *i* in region *z*
SC1	S^{Dz}_{QEi}	SED(I,Z)	Share of exports in aggregate demand for domestically produced commodity *i* in region *z*
SC1	S^{Dz}_{QGi}	SGOVD(I,Z)	Share of government use in aggregate demand for domestically produced commodity *i* in region *z*
SC1	S^{Dz}_{QKi}	SINVD(I,Z)	Share of investment use in aggregate demand for domestically produced commodity *i* in region *z*
SC2	S^{Iz}_{MXisj}	SXI(I,J,Z,S)	Share of intermediate demand by industry *j* in imports of commodity *i* from source *s* in region *z*
SC2	S^{Iz}_{MKis}	SINVI(I,Z,S)	Share of investment demand in imports of commodity *i* from source *s* in region *z*
SC2	S^{Iz}_{MCis}	SCII(I,Z,S)	Share of consumption demand in imports of commodity *i* from source *s* in region *z*
SC2	S^{Iz}_{MGis}	SGOVI(I,Z,S)	Share of government demand in imports of commodity *i* from source *s* in region *z*

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Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SD1,3,9	Y_P^{Hz}	YCHHPPR(Z)	Household property income, by region
SD1,3,SE14	T_G^z	URGVHHR(Z)	Government transfers to private households in region *z* (level)
SD1,7	Y^{Hz}	YCHHR(Z)	Aggregate household income, by region
SD1,9,SH22	Y_L^z	LTT(Z)	Labour income, by region
SD3	Y_I^{Hz}	YCHHITR(Z)	Net interest income of households, by region
SD3,4	Y_E^z	YCEQR(Z)	Equity income, by region
SD4,5,SH22	F_{DKV}^z	KTT(Z)	Aggregate fixed capital earnings, by region
SD4,SH22	F_{DMV}^z	MTT(Z)	Aggregate returns to land, by region
SD4,SI4	DEP^z	DEPRL(Z)	Value of depreciation, by region
SD5	F_{DKVj}^z	CAP(J,Z)	Fixed capital earnings, by region and industry
SD6,SG2,3,9	A_B^{Hz}	ASHHBDR(Z)	Net household ownership of bonds, by region
SD6,SE5, SG15,SH25	R_B	RTBD	World real bond rate
SD7,9,SE1,2	R_{GY}^z	RVTXYCR(Z)	Income tax revenue, by region
SD8,SH1,3,5,6, 19,20,26,28	C_T^z	CTT(Z)	Aggregate household consumption expenditure, by region
SD8,SG8,SH27	S^{Hz}	SVT(Z)	Household savings, by region
SD9	Y_V^{Hz}	YCHHPVR(Z)	Household pre-transfer income, by region
SD10	χ_L^z	DL(Z)	Elasticity of labour supply to real after-tax wages in region *z*
SD10	R_{TY}^z	RTYYD(Z)	Ratio of income tax on labour to after-tax labour income in region *z*
SD11	h_W^z	H3(Z)	Wage indexation parameter in region *z*
SE1,5,13,SG2, 10,SH27,SI3	R_D^{Gz}	RCGVR(Z)	Government receipts, by region

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Table A3: **Coefficients and parameters in the SALTER model** *(continued)*

Equation	*Parameter*	*TABLO name*	*Description*
SE1	Y_I^{Gz}	RCGVITR(Z)	Government net interest receipts, by region
SE1,6-12, SH22,24	R_{GT}^{z}	GRCOMT(Z)	Total government revenue from commodity taxes, by region
SE2	T_{YNL}^{z}	RVTXYCPPR(Z)	Tax on property income, by region
SE2	T_{YL}^{z}	RVTXYCLBR(Z)	Tax on labour income, by region
SE5,SG2,10	A_B^{Gz}	ASGVR(Z)	Net government ownership of bonds, by region
SE6	E_{ij}^{Dz}	DINT(I,J,Z) + TRD (I,J,Z)	Tax-inclusive expenditure on intermediate use of domestic commodity *i* by industry *j* in region *z* (level)
SE6	E_{isj}^{Iz}	IINTS(I,J,Z,S) + TNRIS(I,J,Z,S)	Tax-inclusive expenditure on intermediate use of commodity *i* imported from source *s* by industry *j* in region *z* (level)
SE6	T_{ij}^{Dz}	TRD(I,J,Z)	Taxes paid on intermediate use of domestic commodity *i* by industry *j* in region *z* (level)
SE6	T_{ijs}^{Iz}	TNRIS(I,J,Z,S)	Taxes paid on intermediate use of imported commodity *i* from source *s* by industry *j* in region *z*
SE7	E_{Ci}^{Dz}	DCON(I,Z) + TCRD(I,Z)	Tax-inclusive household consumption expenditure on domestic commodity *i* in region *z* (level)
SE7	E_{Cis}^{Iz}	ICONS(I,Z,S) + TCRIS(I,Z,S)	Tax-inclusive household consumption expenditure on commodity *i* imported from source *s* in region *z* (level)
SE7	T_{Ci}^{Dz}	TCRD(I,Z)	Taxes paid on household consumption of domestic commodity *i* in region *z* (level)
SE7	T_{Cis}^{Iz}	TCRIS(I,Z,S)	Taxes paid on household consumption of imported commodity *i* from source *s* in region *z* (level)
SE8	E_{Gi}^{Dz}	DGOV(I,Z) + TGRD(I,Z)	Tax-inclusive government expenditure on domestic commodity *i* in region *z* (level)
SE8	E_{Gis}^{Iz}	IGOVS(I,Z,S) + TGRIS(I,Z,S)	Tax-inclusive government expenditure on commodity *i* imported from source *s* in region *z* (level)
SE8	T_{Gi}^{Dz}	TGRD(I,Z)	Taxes paid on domestic commodity *i* purchased by the government in region *z* (level)
SE8	T_{Gis}^{Iz}	TGRIS(I,Z,S)	Taxes paid on imported commodity *i* from source *s* purchased by the government in region *z* (level)

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Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SE9	E^{Dz}_{Ki}	INV(I,Z) + TIRD(I,Z)	Tax-inclusive investment expenditure on domestic commodity *i* in region *z* (level)
SE9	E^{Iz}_{Kis}	IINVS(I,Z,S) + TIRIS(I,Z,S)	Tax-inclusive investment expenditure on commodity *i* imported from source *s* in region *z* (level)
SE9	T^{Dz}_{Ki}	TIRD(I,Z)	Taxes paid on domestic commodity *i* used in investment in region *z* (level)
SE9	T^{Iz}_{Kis}	TIRIS(I,Z,S)	Taxes paid on imported commodity *i* from source *s* used in investment in region *z* (level)
SE10	E^{z}_{Qj}	COSTINP(J,Z)	Total costs of industry *j* in region *z* (level)
SE10	S^{z}_{Qj}	TSR(J,Z)	Indirect taxes net of subsidies provided by industry *j* in region *z* (level)
SE11	E^{z}_{Eis}	VALEXP(I,Z,S)	Tax-inclusive value of exports of commodity *i* from region *z* to destination *s* (level)
SE11	T^{z}_{Eis}	TER(I,Z,S)	Taxes paid on exports of commodity *i* from region *z* to destination *s* (level)
SE12	E^{z}_{Mis}	IMPLS(I,Z,S) + DR(I,Z,S)	Tax-inclusive value of imports of commodity *i* from source *s* to region *z* (level)
SE12	D^{z}_{is}	DR(I,Z,S)	Duty paid on imported commodity *i* from source *s* in region *z* (level)
SE13,14	O^{z}_{G}	OLGVR(Z)	Government current outlays, by region
SE13,SG10, SH27,SI3	S^{Gz}	SPGVR(Z)	Government surplus on current account, by region
SE14,SH1,3,5, 6,19,20,26,28	Z^{z}_{G}	AG(Z)	Government current spending on goods and services in region *z* (level)
SF2	S^{z}_{Mis}	SITI(I,Z,S)	Share of imports of commodity *i* from source *s* in total imports of commodity *i* by region *z*
SF3	S^{z}_{MSis}	SITS(I,Z,S)	Share of imports of commodity *i* from region *s* in total imports from region *s* by region *z*
SF4	S^{z}_{MERis}	SMPBVETDC_S(I,Z,S)	Share of imports of commodity *i* from source *s* in total imports of commodity *i* by region *z* (in basic values)
SF5,19	S^{z}_{Elis}	SES(I,Z,S)	Share of non-margins exports of commodity *i* from region *z* to region *s* in total exports of commodity *i* from region *z* (fob basis)

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Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SF5,19	S^z_{EIFi}	SESM(I,Z)	Share of margins exports of commodity *i* from region *z* in total exports of commodity *i* from region *z* (fob basis)
SF6	S^z_{ESis}	SETTS(I,Z,S)	Share of exports of commodity *i* in total exports from region *z* to region *s*
SF7	S^z_{Eis}	STES(I,Z,S)	Share of non-margins exports of commodity *i* to region *s* in total aggregate exports of commodity *i* by region *z* (in basic values)
SF7	S^z_{EFi}	SFES(I,Z)	Share of margins exports of commodity *i* from region *z* in total exports of commodity *i* from region *z* (in basic values)
SF8,SH17	S^z_{MTis}	SIT(I,Z,S)	Share of imports of commodity *i* from region *s* in total imports by region *z* (at landed duty-free prices in world currency)
SF10,SH16	S^z_{EAis}	SETTNM(I,Z,S)	Share of non-margins exports (fob) of commodity *i* from region *z* to region *s* in total exports (fob) of region *z*
SF10,SH16	S^z_{EAFi}	SETTM(I,Z)	Share of margins exports (fob) of commodity *i* from region *z* in total exports (fob) from region *z*
SF14,16	S^z_{ETi}	S_XPBDR_C(I,Z)	Share of exports of commodity *i* from region *z* in total exports from region *z* (fob basis)
SF14,18	S^z_{MTi}	S_MPSCR_C(I,Z)	Share of imports of commodity *i* in total imports into region *z* (computed of source)
SF20	S^z_{ERi}	S_XPBDC_R(I,Z)	Share of exports of commodity *i* from region *z* in total world exports of commodity *i* (in world currency)
SF21	EXP^z_{CC}	XPBDR(Z)	Total exports (fob) from region *z*, expressed in world currency
SF21	$WEXP_T$	XPBD	Total exports (fob) from all regions, expressed in world currency
SF22	S^s_{MPiz}	S_MPSCRC_S(S,I,Z)	Share of imports of commodity *i* from source *s* in total imports of commodity *i* by region *z* (computed at source)
SF22	S^z_{MFi}	S_MPSCRC_T(I,Z)	Share of freight in imports of commodity *i* by region *z* (computed at source)

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Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SF23	β_F	BT	Elasticity of substitution between freight sources
SF24	S^z_{Fis}	SFS(I,Z,S)	Share of freight services of commodity *i* exported from region *z* to region *s* in total freight services on exports
SF25	S^z_{EERis}	SXPBVETSC_D(I,Z,S)	Share of exports (excluding margin exports and intra-region exports) of commodity *i* from region *z* to region *s* in total extra-region non-margin exports of commodity *i* from region *z* (basic values)
SG1	A_B	ASBD	World net ownership of bonds
SG1,2,SH25	A^z_B	ASBDR(Z)	Net ownership of bonds in region *z*
SG1,SJ2	Y^W	YC	World nominal income
SG1,2,SH24, 25,27,SI2,4, SJ2	Y^z	YCR(Z)	Nominal income in region *z*
SG1,SJ2,3,7,8	E^z	ECRT(Z)	Exchange rate in region *z* (local currency price of world currency)
SG2,3,8,SH27	Y^{Hz}_D	YCHHDPR(Z)	Household disposable income, by region
SG3,4,5,8	A^{Hz}_E	ASEQR(Z)	Equity in productive assets in region *z*
SG3,8,9	A^{Hz}	ASHHR(Z)	Household wealth in region *z*
SG4,5,SJ7	S^{Az}_K	ASKPR(Z)	Value of capital in region *z*
SG4,5	S^{Az}_M	ASLNR(Z)	Value of land in region *z*
SG8	C^{Hz}_1	CEACWTHH01R(Z)	Coefficient capturing quasi-dynamics in household wealth accumulation, defined in McDougall (1993b)
SG8	C^{Hz}_2	CEACWTHH02R(Z)	Coefficient capturing quasi-dynamics in household wealth accumulation, defined in McDougall (1993b)
SG8,10	T	LGPRSM	Length of the simulation interval
SG10	C^{Gz}_1	CEACWTGV01R(Z)	Coefficient capturing quasi-dynamics in government wealth accumulation, defined in McDougall (1993b)
SG10	C^{Gz}_2	CEACWTGV02R(Z)	Coefficient capturing quasi-dynamics in government wealth accumulation, defined in McDougall (1993b)

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Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SG14,17	R^z_{Kj}	RTKPGRRI(J,Z)	Gross rate of return on capital in industry *j* in region *z*
SG16	α^z	EL_ERCRK_K_R(Z)	Elasticity of expected rate of return on capital with respect to capital stock in region *z* (a general equilibrium elasticity calculated by model simulation (McDougall 1993b), the value for which is negative)
SG16	J^z	RTIVKPR(Z)	Ratio of gross investment to the existing capital stock, by region
SG16	R^z_D	RTDPR(Z)	Depreciation rate, by region
SG16	H^z_K	GTSSKPR(Z)	Steady state capital stock growth rate (measured as actual growth rate of capital stock)
SG16,17	R^z_{KG}	RTKPGRR(Z)	Average gross rate of return on capital in region *z*
SG18	λ^z_K	CEAJRTKPR(Z)	Coefficient of adjustment in returns to capital, by region
SG19	R^z_{Aj}	RTKPANRI(J,Z)	Rate of abnormal return on capital, by region and industry
SG19	R^z_A	RTKPANR(Z)	Average rate of abnormal return on capital, by region
SH1,5,19,22, 23,SI2,3,4,5, SJ1,5,6	GDP^z_E	GDPL(Z)	Gross domestic product, by region
SH1,3,5,6,19, 20,SI4,SJ8	INV^z_T	INVTT(Z)	Aggregate investment spending, by region
SH1,5,19,SI5	IMP^z_A	IMPTT(Z)	Total imports (cif), by region
SH1,5,19,SI5	EXP^z_A	EXPFOB(Z)	Total exports (fob), by region
SH2,18	S^z_{GDPKj}	SKGDP(J,Z)	Share of capital in industry *j* in gross domestic product at factor cost in region *z*
SH2,18	S^z_{GDPL}	SLGDP(Z)	Share of labour in gross domestic product at factor cost in region *z*
SH2,18	S^z_{GDPM}	SMGDP(Z)	Share of land in gross domestic product at factor cost in region *z*
SH3,6,20	NE^z_G	GNEL(Z)	Gross national expenditure, by region

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Table A3: **Coefficients and parameters in the SALTER model** *(continued)*

Equation	*Parameter*	*TABLO name*	*Description*
SH4	S^z_{YL}	SLYF(Z)	Share of labour in aggregate net factor income in region *z*
SH4	S^z_{YKj}	SKYF(J,Z)	Share of gross capital earnings in industry *j* in aggregate net factor income in region *z*
SH4	S^z_{YM}	SMYF(Z)	Share of land in aggregate net factor income in region *z*
SH4	S^z_{YD}	SDDDF(Z)	Ratio of depreciation to aggregate net factor income in region *z*
SH7	S^z_{CNE}	SCNEXP(Z)	Share of household expenditure in net national expenditure in region *z*
SH7	S^z_{INE}	SINEXP(Z)	Share of gross investment spending in net national expenditure in region *z*
SH7	S^z_{DNE}	SDNEXP(Z)	Ratio of depreciation to net national expenditure in region *z*
SH7	S^z_{GNE}	SGNEXP(Z)	Share of government expenditure in net national expenditure in region *z*
SH13	S^{Dz}_{CTi}	SCTD(I,Z)	Share of domestic commodity *i* in aggregate household demand in region *z*
SH13	S^{Iz}_{CTis}	SCTI(I,Z,S)	Share of imported commodity *i* from source *s* in aggregate household demand in region *z*
SH14	S^{Dz}_{KTi}	SIDT(I,Z)	Share of domestic commodity *i* in aggregate investment expenditure in region *z*
SH14	S^{Iz}_{KTi}	SIIT(I,Z)	Share of imported aggregate commodity *i* in aggregate investment expenditure in region *z*
SH15	S^{Dz}_{GTi}	SGDT(I,Z)	Share of domestic commodity *i* in aggregate government purchases of commodities in region *z*
SH15	S^{Iz}_{GTi}	SGIT(I,Z)	Share of imported aggregate commodity *i* in aggregate government purchases of commodities in region *z*
SH23	NP^z_G	GNPL(Z)	Gross national product, by region
SH23,24,SI2, SJ5	Y^z_I	YCITR(Z)	Net interest income, by region
SH24	Y^z_F	YFNT(Z)	Net factor income in region *z*

(Continued on next page)

Table A3: **Coefficients and parameters in the SALTER model** (*continued*)

Equation	*Parameter*	*TABLO name*	*Description*
SH26,28,SJ3	C_N^z	EPCSR(Z)	National consumption expenditure, by region
SH27,SI4	SAV^z	SVR(Z)	Saving, by region
SI4,SJ6	KA^z	NCIL(Z)	Net capital inflow, by region
SI5	TB^z	BTL(Z)	Domestic currency value of the trade surplus, by region
SJ1,5,6	WGP	WGPL	World gross product
SJ3	C^W	EPCS	World consumption expenditure
SJ5	WBY	YCIT	World net interest income
SJ6	WKA	WNCIL	World net capital inflow
SJ7	WKS	ASKP	World capital stock
SJ8	WIE	WINVTT	World investment expenditure
SJ9	S_{WGDP}^z	SWGDPFC(Z)	Share of region z in world gross product at factor cost

Table A4: **Exogenous variables in a long-run closure of the SALTER model**

Variable	*Range*	*TABLO name*	*Description*
em_L^z	$z = 1,...,S$	EM(Z)	Rate of employment in region z
f_{DM}^z	$z = 1,...,S$	MT(Z)	Aggregate demand for land in region z
dQ_B^Y	—	QYB	World bond-income ratio (absolute change measured in percentage points)
dR_{Aj}^z	$j = 1,...,S$ $z = 1,...,S$	RARI(J,Z)	Rate of abnormal return on capital in industry j in region z (absolute change measured in percentage points)
dF_{RE}^z	$z = 1,...,S$	FRER(Z)	Equity premium in region z (absolute change measured in percentage points)
$d\dot{F}_{RE}^{Ez}$	$z = 1,...,S$	ERCFRER(Z)	Expected rate of change in the equity premium in region z (absolute change measured in percentage points per year)
dQ_S^{YHz}	$z = 1,...,S$	QYHSR(Z)	Ratio of household saving to disposable income in region z (absolute change measured in percentage points)
h_{GPE}^z	$z = 1,...,S$	HG(Z)	Shift term for ratio of real public to private expenditure in region z
h_{GHT}^z	$z = 1,...,S$	FUGHR(Z)	Government-to-household transfer shift term in region z
dQ_S^{YGz}	$z = 1,...,S$	QRGSR(Z)	Ratio of government savings to aggregate government receipts in region z (absolute change measured in percentage points)
h_{LYT}^z	$z = 1,...,S$	FTYLR(Z)	Labour income tax rate shift in region z
h_{PYT}^z	$z = 1,...,S$	FTYPR(Z)	Property income tax rate shift in region z
h_{MDAi}^z	$i = 1,...,I$ $z = 1,...,S$	FDDC(I,Z)	Import duty rate shift for commodity i imported by region z (irrespective of source)
h_{MDis}^z	$i = 1,...,I$ $z = 1,...,S$ $s = 1,...,S$	FDDCS(I,Z,S)	Import duty rate shift for commodity i imported by region z from region s

(*Continued on next page*)

Table A4: **Exogenous variables in a long-run closure of the SALTER model** (*continued*)

Variable	*Range*	*TABLO name*	*Description*
h^z_{XTAi}	$i = 1,...,I$ $z = 1,...,S$	FTESC(I,Z)	Export tax shift for commodity i exported by region z (irrespective of destination)
h^z_{Xtis}	$i = 1,...,I$ $z = 1,...,S$ $s = 1,...,S$	FTESCD(I,Z,S)	Export tax shift for commodity i exported by region z to region s
s^z_{Qj}	$j = 1,...,J$ $z = 1,...,S$	SQ(J,Z)	Power of industry indirect taxes net of subsidies on industry j in region z
t^{Dz}_{ij}	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	TINTD(I,J,Z)	Power of the ad valorem tax applied to domestic commodity i purchased by industry j in region z
t^{Iz}_{ij}	$i = 1,...,I$ $j = 1,...,J$ $z = 1,...,S$	TINTI(I,J,Z)	Power of the ad valorem tax applied to imported commodity i purchased by industry j in region z
t^{Dz}_{Ci}	$i = 1,...,I$ $z = 1,...,S$	TCOND(I,Z)	Power of the ad valorem tax applied to the consumption of domestic commodity i in region z
t^{Iz}_{Ci}	$i = 1,...,I$ $z = 1,...,S$	TCONI(I,Z)	Power of the ad valorem tax applied to the consumption of imported commodity i in region z
t^{Dz}_{Gi}	$i = 1,...,I$ $z = 1,...,S$	TGOVD(I,Z)	Power of the ad valorem tax applied to domestic commodity i purchased by the government in region z
t^{Iz}_{Gi}	$i = 1,...,I$ $z = 1,...,S$	TGOVI(I,Z)	Power of the ad valorem tax applied to imported commodity i purchased by the government in region z
t^{Dz}_{Ki}	$i = 1,...,I$ $z = 1,...,S$	TINVD(I,Z)	Power of the ad valorem investment tax applied to domestic commodity i in region z
t^{Iz}_{Ki}	$i = 1,...,I$ $z = 1,...,S$	TINVI(I,Z)	Power of the ad valorem investment tax applied to imported commodity i in region z
a^z_j	$j = 1,...,J$ $z = 1,...,S$	B1(J,Z)	Output augmenting technical change in industry j in region z
a^z_P	$z = 1,...,S$	BP(Z)	Primary factor augmenting technical change in region z
a^z_{Lj}	$j = 1,...,J$ $z = 1,...,S$	BL(J,Z)	Labour-augmenting technical change in industry j in region z
a^z_{Kj}	$j = 1,...,J$ $z = 1,...,S$	BK(J,Z)	Capital-augmenting technical change in industry j in region z

(*Continued on next page*)

Table A4: **Exogenous variables in a long-run closure of the SALTER model** *(continued)*

Variable	*Range*	*TABLO name*	*Description*
a^z_{Mj}	$j = 1,...,J$ $z = 1,...,S$	BM(J,Z)	Land-augmenting technical change in industry j in region z
a^z_{Xj}	$j = 1,...,J$ $z = 1,...,S$	BI(J,Z)	Aggregate intermediate input augmenting technical change in industry j in region z
h^z_D	$z = 1,...,S$	H(Z)	Population in region z
e^z	$z = 1,...,S$	ER(Z)	Exchange rate (local currency price of world currency)
gpi^W_F	–	WPFPI	World primary factor price index

APPENDIX B: CONSUMER DEMAND AND TRADE ELASTICITIES

The consumer demand elasticities used in the SALTER model are listed in Tables B1 and B2. Their origin is outlined in Section 3.3 of Chapter 3. The expenditure elasticities are those obtained after normalisation. The price elasticities are calculated using the Frisch parameter and the assumptions underlying the linear expenditure system. The cross-price elasticities (not reported here) generated by this system are all negative (the linear expenditure system does not allow for complementarity between commodities). In general, they are very small and the larger values do not exceed 30 per cent of the own-price elasticities.

The export demand elasticities implicit in the SALTER model are listed in Table B3. Their origin is outlined in Section 3.2 of Chapter 3. The export demand elasticity for a commodity to a particular region is at most equal to the elasticity of substitution between imports from different sources in the destination region. If the exporting region accounts for a large share of all imports into the destination region, the export demand elasticity it faces will be less than the import-import substitution elasticity in the destination region.

The first part of Table B3 lists each region's export demand elasticities for each commodity exported to each destination region, taking into account the size of the exporting region in total imports of that commodity by the destination region. Table B1 then presents approximate aggregate export demand elasticities for each commodity from each region, obtained as export-weighted averages of the elasticities to individual destinations. Finally, it presents aggregate export demand elasticities for four broad sectors and for each region as a whole, obtained using a similar export weighting procedure.

Table B1: **Normalised expenditure elasticities in the SALTER model**

	Region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Wheat	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Other grains	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Non-grain crops	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Wool	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Livestock	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Forestry	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Fishing	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Coal	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Oil	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Gas	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Other minerals	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Processed rice	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Meat products	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Milk products	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Other food products	0.13	0.30	0.13	0.12	0.34	0.56	0.28	0.57
Beverages and tobacco	0.90	0.87	0.90	0.87	0.88	0.89	0.90	0.81
Textiles	0.85	0.82	0.85	0.82	0.83	0.84	0.84	0.76
Wearing apparel	0.85	0.82	0.85	0.82	0.83	0.84	0.84	0.76
Leather & fur	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Lumber & wood products	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Paper & printing	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Petroleum & coal products	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Chemicals, plastic, rubber products	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Non-metallic mineral products	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Iron & steel	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Non-ferrous metals	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Fabricated metal products	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Transport equipment	1.03	1.00	1.02	0.99	1.02	1.07	1.03	1.01
Machinery & equipment	1.03	1.00	1.02	0.99	1.02	1.07	1.03	1.01
Other manufacturing	1.03	1.00	1.02	0.99	1.02	1.07	1.03	1.01
Electricity, gas & water	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Construction	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Trade and transport	1.10	1.08	1.09	1.06	1.10	1.21	1.11	1.23
Private services	1.11	1.10	1.11	1.08	1.12	1.27	1.13	1.35
Government services	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26
Ownership of dwellings	1.11	1.09	1.10	1.07	1.10	1.22	1.11	1.26

Table B1: **Normalised expenditure elasticities in the SALTER model** (continued)

	Region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Wheat	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Other grains	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Non-grain crops	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Wool	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Livestock	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Forestry	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Fishing	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Coal	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Oil	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Gas	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Other minerals	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Processed rice	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Meat products	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Milk products	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Other food products	0.54	0.56	0.45	0.52	0.51	0.31	0.53	0.57
Beverages and tobacco	0.81	0.87	0.90	0.71	0.67	0.90	0.84	0.79
Textiles	0.76	0.82	0.85	0.67	0.63	0.85	0.79	0.75
Wearing apparel	0.76	0.82	0.85	0.67	0.63	0.85	0.79	0.75
Leather & fur	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Lumber & wood products	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Paper & printing	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Petroleum & coal products	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Chemicals, plastic, rubber products	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Non-metallic mineral products	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Iron & steel	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Non-ferrous metals	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Fabricated metal products	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Transport equipment	0.98	1.05	1.05	0.90	0.90	1.03	1.01	0.99
Machinery & equipment	0.98	1.05	1.05	0.90	0.90	1.03	1.01	0.99
Other manufacturing	0.98	1.05	1.05	0.90	0.90	1.03	1.01	0.99
Electricity, gas & water	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Construction	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Trade and transport	1.14	1.21	1.15	1.17	1.48	1.11	1.14	1.25
Private services	1.21	1.27	1.18	1.34	2.28	1.14	1.20	1.39
Government services	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28
Ownership of dwellings	1.16	1.23	1.16	1.22	1.63	1.12	1.16	1.28

Table B2: **Own-price elasticities in the SALTER model**

	Region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-0.0909	-0.1337	-0.0727	-0.0648	-0.1432	-0.1181	-0.1357	-0.0739
Wheat	-0.0909	-0.1337	-0.0727	-0.0648	-0.1432	-0.1181	-0.1360	-0.0734
Other grains	-0.0909	-0.1337	-0.0727	-0.0648	-0.1432	-0.1183	-0.1361	-0.0790
Non-grain crops	-0.0922	-0.1355	-0.0739	-0.0654	-0.1475	-0.1518	-0.1376	-0.1308
Wool	-0.7576	-0.4854	-0.6060	-0.5785	-0.4701	-0.2584	-0.5386	-0.1604
Livestock	-0.7591	-0.4863	-0.6072	-0.5792	-0.4711	-0.2648	-0.5437	-0.1764
Forestry	-0.7576	-0.4852	-0.6067	-0.5788	-0.4701	-0.2605	-0.5390	-0.1654
Fishing	-0.7582	-0.4853	-0.6061	-0.5787	-0.4729	-0.2726	-0.5393	-0.1900
Coal	-0.7576	-0.4853	-0.6060	-0.5786	-0.4701	-0.2724	-0.5390	-0.1604
Oil	-0.7576	-0.4853	-0.6060	-0.5785	-0.4701	-0.2584	-0.5389	-0.1604
Gas	-0.7576	-0.4853	-0.6079	-0.5785	-0.4701	-0.2585	-0.5390	-0.1610
Other minerals	-0.7576	-0.4853	-0.6061	-0.5786	-0.4701	-0.2585	-0.5386	-0.1604
Processed rice	-0.0910	-0.1338	-0.0727	-0.0648	-0.1464	-0.1458	-0.1358	-0.1405
Meat products	-0.0929	-0.1382	-0.0749	-0.0662	-0.1467	-0.1424	-0.1441	-0.0884
Milk products	-0.0924	-0.1361	-0.0745	-0.0656	-0.1446	-0.1345	-0.1403	-0.0735
Other food products	-0.0960	-0.1466	-0.0777	-0.0684	-0.1633	-0.1576	-0.1475	-0.0964
Beverages and tobacco	-0.6345	-0.4029	-0.5045	-0.4812	-0.3933	-0.2259	-0.4493	-0.1418
Textiles	-0.5868	-0.3777	-0.4688	-0.4465	-0.3556	-0.1830	-0.4208	-0.1049
Wearing apparel	-0.5890	-0.3766	-0.4782	-0.4543	-0.3684	-0.1950	-0.4142	-0.0989
Leather & fur	-0.7596	-0.4892	-0.6090	-0.5813	-0.4740	-0.2624	-0.5435	-0.1617
Lumber & wood products	-0.7603	-0.4913	-0.6104	-0.5816	-0.4723	-0.2616	-0.5460	-0.1669
Paper & printing	-0.7609	-0.4952	-0.6125	-0.5844	-0.4741	-0.2662	-0.5447	-0.1639
Petroleum & coal products	-0.7668	-0.4964	-0.6143	-0.5901	-0.4731	-0.2609	-0.5576	-0.1856
Chemicals, plastic, rubber products	-0.7629	-0.5006	-0.6137	-0.5865	-0.4831	-0.2924	-0.5494	-0.1865
Non-metallic mineral products	-0.7579	-0.4863	-0.6070	-0.5791	-0.4712	-0.2599	-0.5403	-0.1616
Iron & steel	-0.7576	-0.4853	-0.6060	-0.5817	-0.4701	-0.2584	-0.5390	-0.1604
Non-ferrous metals	-0.7576	-0.4853	-0.6060	-0.5786	-0.4711	-0.2584	-0.5390	-0.1604
Fabricated metal products	-0.7588	-0.4876	-0.6070	-0.5795	-0.4716	-0.2607	-0.5402	-0.1629
Transport equipment	-0.7107	-0.4634	-0.5834	-0.5543	-0.4422	-0.2326	-0.5090	-0.1429
Machinery & equipment	-0.7110	-0.4652	-0.5757	-0.5452	-0.4464	-0.2504	-0.5051	-0.1390
Other manufacturing	-0.7077	-0.4533	-0.5669	-0.5412	-0.4387	-0.2315	-0.5009	-0.1302
Electricity, gas & water	-0.7636	-0.4985	-0.6192	-0.5952	-0.4871	-0.2732	-0.5476	-0.1702
Construction	-0.7576	-0.4863	-0.6063	-0.5786	-0.4701	-0.2584	-0.5428	-0.1604
Trade and transport	-0.8279	-0.6205	-0.7313	-0.6986	-0.6370	-0.4061	-0.6315	-0.4455
Private services	-0.7861	-0.5861	-0.6673	-0.7253	-0.6580	-0.4054	-0.6941	-0.3282
Government services	-0.7854	-0.5391	-0.6207	-0.6321	-0.5202	-0.3255	-0.5534	-0.1948
Ownership of dwellings	-0.8046	-0.5684	-0.6913	-0.5788	-0.4704	-0.3237	-0.5948	-0.1610

Table B2: **Own-price elasticities in the SALTER model** (continued)

	Region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-0.1328	-0.0981	-0.1454	-0.2419	-0.0965	-0.0997	-0.1114	-0.1805
Wheat	-0.1271	-0.0981	-0.1454	-0.2418	-0.0878	-0.0998	-0.1125	-0.1797
Other grains	-0.1273	-0.0995	-0.1454	-0.2422	-0.1136	-0.0998	-0.1119	-0.1801
Non-grain crops	-0.1330	-0.1204	-0.1731	-0.2557	-0.1472	-0.1055	-0.1245	-0.2156
Wool	-0.2740	-0.2139	-0.3736	-0.5685	-0.2403	-0.3619	-0.2438	-0.4054
Livestock	-0.2861	-0.2258	-0.3899	-0.5822	-0.3526	-0.3777	-0.2504	-0.4103
Forestry	-0.2748	-0.2159	-0.3736	-0.5762	-0.2380	-0.3621	-0.2438	-0.4084
Fishing	-0.3074	-0.2790	-0.3829	-0.5777	-0.2661	-0.3691	-0.2652	-0.4170
Coal	-0.2739	-0.2139	-0.3736	-0.5685	-0.2378	-0.3632	-0.2437	-0.4487
Oil	-0.2741	-0.2139	-0.3746	-0.5685	-0.2348	-0.3632	-0.2437	-0.4056
Gas	-0.2775	-0.2165	-0.3736	-0.5685	-0.2349	-0.3619	-0.2437	-0.4062
Other minerals	-0.2740	-0.2150	-0.3736	-0.5686	-0.2348	-0.3625	-0.2439	-0.4055
Processed rice	-0.1351	-0.1264	-0.1472	-0.2522	-0.0839	-0.1006	-0.1185	-0.1866
Meat products	-0.1382	-0.1210	-0.1481	-0.2653	-0.0762	-0.1022	-0.1374	-0.1995
Milk products	-0.1353	-0.1064	-0.1499	-0.2450	-0.0740	-0.1013	-0.1136	-0.1947
Other food products	-0.1498	-0.1622	-0.1666	-0.2622	-0.0966	-0.1085	-0.1449	-0.2339
Beverages and tobacco	-0.2169	-0.1931	-0.3091	-0.3560	-0.1463	-0.3032	-0.2186	-0.2733
Textiles	-0.1966	-0.1483	-0.3036	-0.3215	-0.1174	-0.3343	-0.1682	-0.2529
Wearing apparel	-0.1883	-0.1556	-0.2951	-0.3476	-0.1011	-0.3171	-0.1874	-0.2497
Leather & fur	-0.2753	-0.2175	-0.3887	-0.5744	-0.2424	-0.3758	-0.2507	-0.4108
Lumber & wood products	-0.2797	-0.2182	-0.3847	-0.5715	-0.2381	-0.3686	-0.2478	-0.4075
Paper & printing	-0.2871	-0.2170	-0.3839	-0.5696	-0.2422	-0.3710	-0.2565	-0.4093
Petroleum & coal products	-0.3084	-0.2260	-0.3929	-0.5733	-0.2358	-0.3717	-0.2549	-0.4414
Chemicals, plastic, rubber products	-0.3312	-0.2474	-0.3957	-0.5863	-0.2699	-0.3814	-0.2622	-0.4323
Non-metallic mineral products	-0.2766	-0.2148	-0.3743	-0.5701	-0.2355	-0.3627	-0.2460	-0.4062
Iron & steel	-0.2740	-0.2143	-0.3736	-0.5686	-0.2349	-0.3620	-0.2437	-0.4055
Non-ferrous metals	-0.2740	-0.2139	-0.3810	-0.5685	-0.2349	-0.3683	-0.2437	-0.4055
Fabricated metal products	-0.2774	-0.2153	-0.3772	-0.5696	-0.2393	-0.3667	-0.2478	-0.4068
Transport equipment	-0.2931	-0.1853	-0.3418	-0.4289	-0.1303	-0.3341	-0.2431	-0.3601
Machinery & equipment	-0.3322	-0.1960	-0.4298	-0.4377	-0.1792	-0.3808	-0.2403	-0.3282
Other manufacturing	-0.2414	-0.1849	-0.3745	-0.4282	-0.1289	-0.3562	-0.2173	-0.3205
Electricity, gas & water	-0.2920	-0.2300	-0.3826	-0.5745	-0.2386	-0.3721	-0.2674	-0.4186
Construction	-0.2739	-0.2145	-0.3736	-0.5701	-0.2349	-0.3619	-0.2437	-0.4064
Trade and transport	-0.4149	-0.4561	-0.5360	-0.7149	-0.2996	-0.6031	-0.4567	-0.5152
Private services	-0.3391	-0.2902	-0.4546	-0.6940	-0.3874	-0.4312	-0.3184	-0.4954
Government services	-0.2913	-0.2519	-0.3942	-0.5854	-0.3069	-0.3643	-0.3018	-0.4147
Ownership of dwellings	-0.3297	-0.2866	-0.3914	-0.5688	-0.2743	-0.3980	-0.3575	-0.4612

Table B3: **Export demand elasticities in the SALTER model**

Australia

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-3.6	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-1.5	-4.4	-4.4	-3.8	-4.2	-4.4	-2.1
Other grains	-4.4	-3.3	-4.4	-4.4	-4.2	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-3.8	-4.4	-4.4	-4.4	-4.3	-4.4	-4.3
Wool	-4.4	-4.1	-3.2	-1.4	-0.7	-0.9	-2.1	-0.3
Livestock	-5.5	-4.3	-5.6	-5.6	-5.4	-5.5	-5.5	-5.0
Forestry	-5.6	-5.2	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.6	-5.3	-5.6	-5.5	-5.5	-5.6	-5.6	-5.6
Coal	-5.6	-4.4	-5.6	-5.1	-3.8	-4.4	-5.2	-1.0
Oil	-5.6	-4.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Gas	-5.6	-4.5	-5.6	-5.6	-5.5	-5.6	-5.6	-5.4
Other minerals	-5.6	-5.0	-5.5	-5.5	-4.9	-4.8	-5.4	-5.6
Processed rice	-4.4	-2.0	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-3.0	-4.0	-3.8	-3.9	-3.1	-4.4	-3.6
Milk products	-4.4	-3.5	-4.4	-4.3	-3.9	-4.2	-4.4	-3.7
Other food products	-4.4	-3.3	-4.3	-4.4	-4.3	-4.0	-4.4	-4.3
Beverages and tobacco	-6.2	-4.8	-6.1	-6.1	-6.1	-6.1	-6.2	-5.9
Textiles	-4.4	-3.9	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-7.0	-8.8	-8.8	-8.8	-8.8	-8.8	-8.7
Leather & fur	-8.8	-7.8	-8.8	-8.8	-8.8	-8.7	-8.8	-8.8
Lumber & wood products	-5.6	-4.8	-5.6	-5.6	-5.4	-5.6	-5.6	-5.5
Paper & printing	-3.6	-3.0	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.0	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7
Chemicals, plastic, rubber products	-3.8	-3.2	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7
Non-metallic mineral products	-5.6	-4.9	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Iron & steel	-5.6	-4.7	-5.6	-5.6	-5.6	-5.5	-5.6	-5.4
Non-ferrous metals	-5.6	-2.6	-5.3	-5.4	-4.9	-4.7	-5.5	-3.6
Fabricated metal products	-5.6	-4.5	-5.6	-5.6	-5.3	-5.4	-5.6	-5.4
Transport equipment	-10.4	-8.9	-10.4	-10.4	-10.4	-10.4	-10.4	-10.3
Machinery & equipment	-5.6	-4.9	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Other manufacturing	-5.4	-3.3	-5.6	-5.5	-5.5	-5.6	-5.5	-5.2
Electricity, gas & water	-2.8	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.6	-3.8	-3.8	-3.7	-3.7	-3.8	-3.7
Trade and transport	-3.8	-3.3	-3.8	-3.8	-3.7	-3.7	-3.8	-3.7
Private services	-3.8	-3.6	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.4	-3.8	-3.8	-3.6	-3.7	-3.8	-3.7
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Australia

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-1.7	-4.4	-2.1	-3.1	-4.1	-4.4	-4.4	-4.0
Other grains	-4.3	-4.1	-4.3	-2.9	-3.1	-4.4	-4.1	-4.4
Non-grain crops	-4.2	-4.1	-4.3	-4.3	-4.3	-4.2	-4.3	-4.4
Wool	0.0	-2.7	-0.8	-0.4	-3.0	-3.8	-0.4	-1.9
Livestock	-4.7	-4.8	-5.4	-5.4	-5.3	-5.6	-5.6	-5.4
Forestry	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.5	-5.6	-5.6	-5.3	-5.4	-5.6
Coal	-2.8	-4.6	-4.4	-3.7	-2.8	-4.2	-3.5	-5.0
Oil	-5.6	-5.2	-5.5	-5.6	-5.6	-5.6	-5.5	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-4.9	-5.5	-5.4	-5.4	-4.6	-5.5	-4.8	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-3.8	-4.4	-4.4
Meat products	-3.9	-3.6	-4.0	-4.1	-3.8	-4.2	-2.9	-4.3
Milk products	-3.8	-3.5	-3.0	-3.9	-4.1	-3.9	-3.4	-4.3
Other food products	-3.9	-4.2	-4.2	-4.3	-4.3	-4.2	-4.3	-4.4
Beverages and tobacco	-6.0	-5.8	-6.1	-6.2	-6.2	-6.1	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.7	-8.8
Leather & fur	-8.8	-8.8	-8.8	-8.8	-8.6	-8.8	-8.7	-8.8
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.7	-3.8	-3.7	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.7	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.5	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.4	-5.5	-5.4	-5.5	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-4.8	-4.4	-3.9	-3.9	-5.1	-2.6	-4.7	-5.6
Fabricated metal products	-5.5	-5.5	-5.5	-5.5	-5.6	-5.5	-5.6	-5.6
Transport equipment	-10.3	-10.3	-10.3	-10.4	-10.4	-10.0	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.3	-5.1	-5.2	-5.5	-5.6	-5.4	-5.5	-5.4
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.7	-3.8	-3.7	-3.8	-3.8	-3.7	-3.8	-3.8
Trade and transport	-3.7	-3.7	-3.7	-3.8	-3.7	-3.7	-3.7	-3.8
Private services	-3.7	-3.8	-3.7	-3.8	-3.8	-3.7	-3.8	-3.8
Government services	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

New Zealand

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-3.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.2	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Wool	-2.0	-4.4	-2.4	-3.7	-4.0	-4.0	-3.8	-4.1
Livestock	-3.5	-5.6	-5.5	-5.5	-5.5	-5.4	-5.5	-5.0
Forestry	-4.3	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6
Fishing	-4.4	-5.6	-5.6	-5.4	-5.5	-5.4	-5.6	-5.5
Coal	-4.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.4	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.4	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-3.2	-4.4	-4.0	-3.9	-4.3	-4.0	-4.3	-3.8
Milk products	-3.4	-4.4	-4.2	-4.1	-3.8	-4.2	-4.3	-2.4
Other food products	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3
Beverages and tobacco	-6.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.2	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.7	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.2	-8.8	-8.8	-8.8	-8.8	-8.7	-8.8	-8.8
Lumber & wood products	-5.1	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Paper & printing	-3.3	-3.6	-3.6	-3.6	-3.5	-3.5	-3.6	-3.4
Petroleum & coal products	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.2	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6
Fabricated metal products	-5.4	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-2.8	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

New Zealand

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wool	-4.4	-3.9	-3.8	-4.1	-1.8	-1.9	-4.1	-3.8
Livestock	-5.4	-5.6	-5.6	-5.4	-5.5	-5.6	-5.6	-5.6
Forestry	-5.6	-4.7	-5.6	-5.6	-5.2	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.6	-5.5	-5.3	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.2	-4.4	-3.9	-4.2	-4.3	-4.2	-4.0	-4.2
Milk products	-2.7	-3.6	-3.6	-3.8	-3.9	-4.2	-3.7	-4.1
Other food products	-4.3	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Paper & printing	-3.5	-3.5	-3.5	-3.5	-3.5	-3.6	-3.5	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.5	-5.6
Fabricated metal products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Canada

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.2	-4.4	-4.4	-4.1	-3.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-2.2	-3.4	-4.3	-4.1	-3.7
Other grains	-4.3	-4.4	-4.4	-3.0	-4.2	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.3	-4.2	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.4	-5.5	-5.6	-4.4	-5.5	-5.5	-5.6	-5.6
Forestry	-5.4	-4.6	-5.6	-3.3	-5.4	-5.5	-5.6	-5.6
Fishing	-5.5	-5.6	-5.6	-4.5	-5.4	-5.6	-5.5	-5.6
Coal	-5.0	-5.6	-5.6	-4.6	-4.5	-4.8	-5.5	-5.6
Oil	-5.6	-5.6	-5.6	-5.2	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-3.0	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.0	-5.0	-5.6	-5.2	-5.3	-5.2	-5.4	-5.1
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.1	-3.9	-4.4	-3.9	-4.3	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4
Other food products	-4.3	-4.3	-4.4	-4.1	-4.3	-4.3	-4.4	-4.2
Beverages and tobacco	-6.2	-6.2	-6.2	-5.7	-6.1	-6.2	-6.2	-6.2
Textiles	-4.4	-4.3	-4.4	-4.2	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.8	-8.7	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.8	-8.8	-8.8	-8.7	-8.8	-8.8	-8.8	-8.8
Lumber & wood products	-5.2	-5.3	-5.6	-4.2	-5.1	-5.5	-5.5	-5.6
Paper & printing	-3.4	-3.5	-3.6	-2.3	-3.1	-3.4	-3.5	-3.2
Petroleum & coal products	-3.8	-3.8	-3.8	-3.6	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.7	-3.8	-3.4	-3.7	-3.7	-3.8	-3.7
Non-metallic mineral products	-5.6	-5.5	-5.6	-5.2	-5.6	-5.5	-5.6	-5.6
Iron & steel	-5.6	-5.5	-5.6	-5.1	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.4	-5.6	-4.2	-5.4	-5.4	-5.5	-5.4
Fabricated metal products	-5.6	-5.6	-5.6	-4.9	-5.4	-5.5	-5.6	-5.6
Transport equipment	-10.3	-10.4	-10.4	-8.1	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.5	-5.5	-5.6	-5.3	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-2.8	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.6	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.6	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Canada

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-3.8	-4.2	-4.3	-3.8	-2.5	-3.8	-4.0	-3.7
Other grains	-4.4	-4.4	-4.4	-4.4	-3.5	-3.3	-4.4	-4.3
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.4	-5.6	-5.6	-5.5	-5.6	-5.0	-5.5
Forestry	-5.6	-5.6	-5.5	-5.6	-5.0	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.6	-5.6	-5.5	-5.5	-5.5	-5.5
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.2	-5.5
Oil	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.2	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.4	-5.4	-5.4	-5.3	-5.1	-5.6	-4.9	-5.5
Processed rice	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.3	-4.3	-4.4	-4.3	-4.4	-4.4	-4.4	-4.3
Other food products	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.8	-8.8	-8.8	-8.8	-8.8	-8.7	-8.8	-8.8
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.4	-5.5	-5.5	-5.6
Paper & printing	-3.4	-3.4	-3.5	-3.3	-3.1	-3.4	-3.3	-3.5
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.7	-3.7	-3.8	-3.7	-3.8	-3.7	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.4	-5.4	-5.4	-5.1	-5.5	-5.4	-5.3	-5.6
Fabricated metal products	-5.6	-5.6	-5.5	-5.5	-5.5	-4.6	-5.5	-5.5
Transport equipment	-10.3	-10.4	-10.3	-10.4	-10.3	-10.4	-10.2	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

United States

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-3.6	-1.1	-4.4	-3.4	-3.3	-3.4	-4.4
Wheat	-4.4	-4.4	-2.2	-4.4	-2.3	-1.7	-4.3	-4.0
Other grains	-4.3	-3.2	-2.1	-4.4	-1.3	-1.6	-3.9	-3.3
Non-grain crops	-3.9	-3.9	-2.7	-4.4	-3.5	-2.8	-4.1	-3.7
Wool	-4.4	-4.4	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.4	-5.3	-3.2	-5.6	-4.5	-3.6	-5.4	-4.2
Forestry	-5.5	-5.1	-2.7	-5.6	-4.2	-4.0	-5.4	-3.2
Fishing	-5.5	-5.6	-3.4	-5.6	-4.8	-3.4	-5.5	-5.4
Coal	-5.6	-5.5	-0.8	-5.6	-4.9	-4.9	-4.5	-5.5
Oil	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.0	-4.7	-2.8	-5.6	-5.5	-5.6	-5.6	-4.9
Other minerals	-5.3	-5.1	-3.8	-5.6	-5.3	-5.0	-5.4	-5.3
Processed rice	-4.1	-3.8	-2.1	-4.4	-4.3	-4.3	-3.9	-3.3
Meat products	-4.2	-4.2	-3.1	-4.4	-3.2	-3.8	-4.3	-3.7
Milk products	-4.3	-4.2	-4.1	-4.4	-4.3	-3.8	-4.4	-4.0
Other food products	-4.2	-4.2	-3.1	-4.4	-4.0	-4.1	-4.2	-4.2
Beverages and tobacco	-5.5	-5.8	-5.7	-6.2	-4.4	-4.1	-5.5	-5.5
Textiles	-4.1	-4.1	-3.1	-4.4	-4.2	-4.2	-4.3	-4.1
Wearing apparel	-8.6	-8.7	-8.5	-8.8	-8.5	-8.1	-8.7	-8.6
Leather & fur	-8.7	-8.7	-8.0	-8.8	-8.4	-7.9	-8.7	-8.5
Lumber & wood products	-5.0	-5.3	-3.4	-5.6	-4.9	-5.0	-5.4	-5.2
Paper & printing	-3.2	-3.3	-1.9	-3.6	-2.8	-2.4	-3.4	-2.9
Petroleum & coal products	-3.4	-3.4	-2.8	-3.8	-3.6	-3.3	-3.7	-3.6
Chemicals, plastic, rubber products	-3.1	-3.3	-2.0	-3.8	-3.1	-3.1	-3.6	-3.4
Non-metallic mineral products	-5.2	-5.2	-3.4	-5.6	-5.1	-5.1	-5.5	-5.5
Iron & steel	-5.4	-5.5	-4.0	-5.6	-5.4	-5.1	-5.5	-5.4
Non-ferrous metals	-5.2	-5.5	-3.0	-5.6	-5.2	-5.1	-5.5	-5.5
Fabricated metal products	-5.1	-5.2	-2.9	-5.6	-5.1	-4.4	-5.3	-5.2
Transport equipment	-8.2	-8.9	-3.2	-10.4	-7.7	-7.0	-9.8	-9.2
Machinery & equipment	-4.4	-4.4	-2.4	-5.6	-4.1	-4.5	-4.9	-4.6
Other manufacturing	-3.6	-5.1	-3.9	-5.6	-4.9	-4.6	-5.1	-5.4
Electricity, gas & water	-5.6	-5.6	-2.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.6	-3.7	-3.0	-3.8	-3.5	-3.4	-3.8	-3.7
Trade and transport	-3.0	-3.2	-2.1	-3.8	-3.3	-2.8	-3.4	-3.3
Private services	-3.1	-3.2	-2.3	-3.8	-3.2	-2.9	-3.6	-3.3
Government services	-3.3	-3.5	-2.4	-3.8	-3.1	-3.1	-3.6	-3.4
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

United States

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-2.2	-4.3	-2.2	-4.4	-3.5	-4.4	-3.7
Wheat	-4.1	-0.3	-3.5	-2.3	-3.4	-0.9	-1.1	-3.1
Other grains	-3.8	-2.3	-3.5	-3.9	-4.4	-4.4	-0.3	-2.8
Non-grain crops	-4.1	-3.6	-4.2	-3.8	-4.2	-3.2	-2.6	-4.1
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.2	-4.9	-5.5	-4.9	-4.8	-5.4	-4.2	-5.0
Forestry	-5.5	-5.6	-5.2	-5.6	-5.6	-5.5	-5.6	-5.6
Fishing	-5.6	-5.6	-5.5	-4.9	-5.5	-5.4	-5.3	-5.5
Coal	-5.6	-5.1	-4.9	-5.5	-5.6	-5.6	-3.8	-4.7
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6
Gas	-5.6	-5.6	-5.4	-5.6	-5.5	-5.6	-5.3	-5.2
Other minerals	-5.5	-5.1	-5.0	-5.1	-5.2	-5.0	-5.1	-5.5
Processed rice	-4.4	-2.2	-4.3	-4.4	-4.1	-4.3	-4.1	-3.6
Meat products	-4.3	-4.2	-3.4	-3.9	-4.2	-3.6	-4.1	-4.1
Milk products	-4.3	-3.8	-4.4	-4.1	-4.3	-4.0	-4.2	-4.2
Other food products	-4.2	-3.9	-4.2	-4.0	-4.3	-4.0	-3.9	-4.0
Beverages and tobacco	-5.3	-5.1	-4.2	-4.9	-5.0	-4.3	-4.1	-5.4
Textiles	-4.3	-4.0	-4.3	-4.3	-4.2	-4.3	-4.1	-4.2
Wearing apparel	-8.8	-6.3	-8.7	-8.6	-8.8	-8.7	-8.6	-8.2
Leather & fur	-8.6	-6.2	-8.5	-7.7	-8.1	-8.3	-7.7	-8.5
Lumber & wood products	-5.4	-4.1	-5.4	-5.5	-5.5	-5.3	-4.5	-5.3
Paper & printing	-3.2	-2.6	-3.2	-3.2	-3.1	-3.3	-2.6	-3.3
Petroleum & coal products	-3.8	-3.7	-3.6	-3.8	-3.7	-3.8	-2.8	-3.7
Chemicals, plastic, rubber products	-3.4	-3.2	-3.1	-3.4	-3.1	-3.3	-2.9	-3.5
Non-metallic mineral products	-5.3	-5.3	-5.3	-5.2	-5.4	-5.3	-5.2	-5.4
Iron & steel	-5.5	-5.5	-5.4	-5.5	-5.5	-5.5	-5.3	-5.4
Non-ferrous metals	-5.4	-5.4	-5.2	-5.4	-5.3	-5.4	-5.3	-5.4
Fabricated metal products	-5.2	-4.6	-5.1	-5.2	-4.9	-3.9	-0.9	-5.3
Transport equipment	-9.1	-9.3	-7.9	-8.4	-8.9	-9.2	-8.2	-9.2
Machinery & equipment	-4.3	-3.5	-4.4	-4.6	-5.1	-5.0	-4.4	-4.9
Other manufacturing	-5.4	-5.2	-3.6	-5.1	-5.4	-5.1	-4.8	-5.3
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.6	-3.6	-3.5	-3.6	-3.6	-3.7	-3.4	-3.8
Trade and transport	-3.2	-3.1	-3.0	-3.2	-3.1	-3.3	-2.4	-3.6
Private services	-2.8	-3.1	-2.7	-3.2	-3.1	-3.3	-2.3	-3.7
Government services	-3.2	-3.0	-3.1	-3.3	-3.2	-3.4	-2.7	-3.7
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Japan

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Fishing	-5.5	-3.8	-5.5	-5.5	-5.6	-5.4	-5.6	-4.6
Coal	-5.2	-5.6	-5.6	-5.0	-5.6	-5.6	-5.6	-5.1
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.5	-5.6	-5.6	-5.5	-5.6	-5.4	-5.6	-5.5
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.3	-4.3	-4.4	-4.3	-4.4	-4.3	-4.4	-4.3
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.1	-4.1	-4.3	-4.1	-4.4	-3.7	-4.3	-3.8
Wearing apparel	-8.7	-8.7	-8.7	-8.7	-8.8	-8.1	-8.8	-8.5
Leather & fur	-8.7	-8.7	-8.7	-8.8	-8.8	-7.6	-8.8	-8.7
Lumber & wood products	-5.6	-5.5	-5.6	-5.5	-5.6	-5.4	-5.6	-4.7
Paper & printing	-3.5	-3.4	-3.6	-3.5	-3.6	-3.4	-3.6	-3.4
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.4	-3.8	-3.7
Chemicals, plastic, rubber products	-3.5	-3.6	-3.7	-3.5	-3.8	-3.0	-3.7	-3.2
Non-metallic mineral products	-5.2	-5.3	-5.4	-5.1	-5.6	-4.0	-5.5	-4.8
Iron & steel	-4.2	-4.1	-5.3	-4.8	-5.6	-3.9	-5.5	-3.3
Non-ferrous metals	-5.0	-5.5	-5.5	-5.5	-5.6	-4.9	-5.6	-5.1
Fabricated metal products	-5.1	-5.3	-5.5	-5.2	-5.6	-4.6	-5.5	-4.6
Transport equipment	-7.4	-7.4	-9.6	-7.9	-10.4	-8.9	-9.6	-6.7
Machinery & equipment	-4.5	-4.7	-5.1	-4.4	-5.6	-3.4	-5.1	-3.8
Other manufacturing	-5.2	-5.2	-5.3	-4.9	-5.6	-4.2	-5.2	-4.3
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-2.8	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8
Trade and transport	-3.7	-3.7	-3.8	-3.6	-3.8	-3.5	-3.8	-3.6
Private services	-3.7	-3.7	-3.8	-3.7	-3.8	-3.6	-3.8	-3.6
Government services	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Japan

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.4	-4.2	-4.3	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.4	-5.6	-5.5	-5.6	-5.5	-5.2	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.4	-3.0	-5.2	-4.5	-5.0	-4.8	-5.2	-5.4
Coal	-5.6	-5.0	-3.9	-5.5	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.3	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6
Other minerals	-5.5	-5.5	-5.5	-5.6	-5.6	-5.5	-5.2	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.3	-4.2	-4.3	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4
Other food products	-4.3	-4.3	-4.2	-3.9	-4.3	-3.7	-3.5	-4.4
Beverages and tobacco	-6.2	-6.1	-6.1	-6.2	-6.2	-6.1	-6.0	-6.2
Textiles	-3.9	-3.9	-3.8	-4.0	-3.8	-3.8	-3.3	-4.3
Wearing apparel	-8.7	-8.6	-8.6	-8.4	-8.5	-8.4	-7.6	-8.8
Leather & fur	-8.6	-7.1	-8.5	-8.6	-8.3	-8.3	-7.9	-8.8
Lumber & wood products	-5.0	-5.3	-5.6	-5.5	-5.5	-5.4	-5.4	-5.6
Paper & printing	-3.4	-3.4	-3.2	-3.3	-3.4	-2.9	-3.2	-3.6
Petroleum & coal products	-3.8	-3.8	-3.7	-3.8	-3.7	-3.7	-3.6	-3.8
Chemicals, plastic, rubber products	-3.4	-3.3	-3.2	-3.1	-3.4	-3.3	-3.0	-3.7
Non-metallic mineral products	-5.1	-3.5	-4.2	-4.0	-4.1	-4.5	-3.8	-5.5
Iron & steel	-3.7	-4.3	-3.3	-3.1	-2.3	-4.0	-3.1	-5.2
Non-ferrous metals	-4.9	-4.8	-5.0	-4.9	-4.8	-5.1	-4.4	-5.6
Fabricated metal products	-5.1	-4.6	-4.6	-4.0	-4.7	-5.2	-5.2	-5.5
Transport equipment	-7.1	-3.9	-6.6	-6.1	-7.7	-6.9	-7.9	-9.2
Machinery & equipment	-4.3	-4.3	-4.0	-3.5	-4.2	-3.8	-3.2	-5.2
Other manufacturing	-5.0	-4.5	-4.8	-4.8	-4.9	-4.6	-3.7	-5.4
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8
Trade and transport	-3.6	-3.7	-3.6	-3.5	-3.5	-3.6	-3.5	-3.8
Private services	-3.6	-3.7	-3.6	-3.6	-3.6	-3.6	-3.5	-3.8
Government services	-3.8	-3.8	-3.7	-3.7	-3.7	-3.8	-3.7	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Korea

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-2.2
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.5	-5.5	-5.6	-5.4	-5.1	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.3	-4.4	-4.4	-4.3	-4.2	-4.4	-4.4	-4.3
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.1	-4.2	-4.2	-4.2	-4.1	-4.4	-4.4	-4.1
Wearing apparel	-8.4	-8.6	-8.2	-8.1	-6.9	-8.8	-8.6	-8.4
Leather & fur	-7.9	-8.2	-7.4	-6.6	-6.7	-8.8	-8.3	-5.4
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.5
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.8	-3.8	-3.7	-3.7	-3.8	-3.8	-3.7
Non-metallic mineral products	-5.5	-5.5	-5.6	-5.5	-4.8	-5.6	-5.6	-5.4
Iron & steel	-5.4	-5.3	-5.5	-5.4	-4.7	-5.6	-5.6	-5.0
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Fabricated metal products	-5.4	-5.5	-5.5	-5.4	-5.5	-5.6	-5.6	-5.4
Transport equipment	-10.3	-10.1	-10.3	-10.1	-10.2	-10.4	-10.4	-10.4
Machinery & equipment	-5.5	-5.5	-5.5	-5.4	-5.3	-5.6	-5.5	-5.4
Other manufacturing	-5.4	-5.3	-5.4	-5.2	-5.3	-5.6	-5.4	-5.4
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-2.8	-5.6	-5.6
Construction	-3.7	-3.7	-3.7	-3.6	-3.6	-3.8	-3.8	-3.7
Trade and transport	-3.7	-3.8	-3.8	-3.7	-3.7	-3.8	-3.8	-3.7
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.6	-3.7	-3.8	-3.8	-3.7
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Korea

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.3	-4.4	-4.4	-4.3	-4.3	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.5	-5.3	-5.6	-5.5	-5.1	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.2	-4.3	-4.4
Beverages and tobacco	-6.2	-6.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.2	-4.0	-4.0	-4.1	-4.1	-4.0	-4.1	-4.2
Wearing apparel	-8.8	-8.7	-8.7	-8.7	-8.8	-8.7	-8.5	-8.6
Leather & fur	-7.9	-8.4	-8.1	-8.1	-8.5	-8.1	-8.3	-8.5
Lumber & wood products	-5.6	-5.4	-5.6	-5.6	-5.6	-5.4	-5.5	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.3	-3.6	-3.6
Petroleum & coal products	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8
Chemicals, plastic, rubber products	-3.8	-3.7	-3.7	-3.7	-3.8	-3.7	-3.8	-3.8
Non-metallic mineral products	-5.5	-5.4	-5.5	-5.5	-5.5	-5.5	-5.5	-5.6
Iron & steel	-5.2	-4.8	-5.2	-5.2	-5.6	-5.3	-5.4	-5.5
Non-ferrous metals	-5.5	-5.2	-5.5	-5.5	-5.4	-5.4	-5.5	-5.6
Fabricated metal products	-5.5	-5.1	-5.5	-5.4	-5.6	-5.4	-5.6	-5.5
Transport equipment	-10.4	-10.3	-9.7	-10.1	-10.4	-9.7	-10.3	-10.3
Machinery & equipment	-5.4	-5.4	-5.4	-5.5	-5.5	-5.2	-5.5	-5.5
Other manufacturing	-5.4	-5.5	-5.4	-5.4	-5.6	-5.1	-5.3	-5.5
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.7	-3.7	-3.6	-3.7	-3.7	-3.6	-3.7	-3.8
Trade and transport	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7	-3.8
Private services	-3.7	-3.8	-3.7	-3.8	-3.8	-3.7	-3.8	-3.8
Government services	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

European Community

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-3.8	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-3.3	-2.4	-4.3
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-2.5	-4.4
Non-grain crops	-4.2	-4.3	-4.3	-4.2	-4.4	-4.4	-3.3	-4.4
Wool	-4.3	-3.4	-3.9	-4.2	-4.2	-4.3	-3.9	-4.4
Livestock	-5.2	-5.4	-5.4	-5.2	-5.4	-5.4	-3.9	-5.5
Forestry	-4.7	-5.6	-5.6	-5.4	-5.6	-5.6	-4.5	-5.6
Fishing	-5.4	-5.6	-5.4	-5.5	-5.5	-5.5	-4.2	-5.5
Coal	-4.8	-4.0	-5.6	-5.3	-5.6	-5.6	-5.0	-5.6
Oil	-5.6	-5.6	-3.9	-5.4	-5.6	-5.6	-5.1	-5.6
Gas	-5.5	-4.9	-5.6	-5.6	-5.6	-5.6	-3.8	-4.7
Other minerals	-5.4	-5.4	-5.3	-4.7	-5.3	-5.5	-4.7	-5.5
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-2.9	-4.4
Meat products	-4.2	-4.4	-4.3	-4.1	-4.0	-4.4	-2.7	-4.3
Milk products	-3.5	-3.5	-3.2	-3.4	-3.3	-3.2	-2.3	-3.6
Other food products	-4.0	-4.2	-4.1	-4.1	-4.2	-4.3	-3.0	-4.2
Beverages and tobacco	-4.3	-4.9	-3.9	-4.2	-5.3	-5.2	-3.8	-5.8
Textiles	-4.0	-4.0	-4.0	-3.8	-3.9	-4.2	-2.8	-4.2
Wearing apparel	-8.4	-8.5	-8.4	-8.4	-8.4	-6.2	-7.3	-8.6
Leather & fur	-7.9	-8.2	-7.3	-7.8	-7.7	-7.5	-5.9	-8.5
Lumber & wood products	-5.1	-5.2	-5.3	-5.3	-5.5	-5.5	-4.1	-4.7
Paper & printing	-3.1	-3.0	-3.4	-3.4	-3.5	-3.5	-2.6	-3.2
Petroleum & coal products	-3.7	-3.8	-3.3	-3.5	-3.8	-3.7	-2.8	-3.7
Chemicals, plastic, rubber products	-3.1	-3.1	-3.5	-3.1	-3.2	-3.4	-2.1	-3.2
Non-metallic mineral products	-4.2	-4.5	-5.0	-4.5	-4.8	-5.1	-3.2	-4.7
Iron & steel	-5.1	-5.1	-4.8	-4.8	-5.5	-5.3	-1.9	-5.1
Non-ferrous metals	-5.1	-5.5	-5.3	-5.2	-5.4	-5.4	-3.4	-5.4
Fabricated metal products	-4.9	-5.0	-5.3	-5.1	-5.3	-5.2	-3.7	-5.0
Transport equipment	-9.4	-9.4	-9.9	-9.4	-8.2	-9.4	-5.7	-8.5
Machinery & equipment	-4.7	-4.8	-5.2	-5.0	-5.1	-5.1	-3.5	-4.3
Other manufacturing	-4.4	-5.1	-5.3	-4.8	-4.6	-5.2	-3.9	-4.8
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-4.1	-5.6
Construction	-2.7	-2.8	-2.9	-2.4	-2.8	-2.7	-2.4	-2.4
Trade and transport	-3.6	-3.6	-3.7	-3.5	-3.7	-3.7	-3.0	-3.6
Private services	-3.3	-3.3	-3.6	-3.4	-3.6	-3.5	-2.6	-3.3
Government services	-3.3	-3.5	-3.5	-2.7	-3.4	-3.5	-2.3	-3.3
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

European Community

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3
Wheat	-4.4	-4.4	-4.4	-4.3	-4.4	-4.2	-4.4	-4.0
Other grains	-4.4	-4.4	-4.4	-4.2	-4.4	-4.4	-4.4	-3.9
Non-grain crops	-4.4	-4.4	-4.4	-4.3	-4.4	-4.3	-4.4	-4.1
Wool	-4.4	-4.4	-4.3	-4.4	-4.2	-3.7	-4.4	-4.3
Livestock	-5.4	-4.9	-5.5	-5.3	-5.3	-4.9	-5.5	-4.7
Forestry	-5.5	-5.3	-5.5	-5.6	-5.5	-5.6	-5.6	-4.9
Fishing	-5.6	-5.6	-5.6	-5.3	-5.4	-5.5	-5.4	-4.9
Coal	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.4
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4
Gas	-5.6	-5.6	-5.5	-5.6	-5.5	-5.6	-5.6	-5.1
Other minerals	-4.9	-5.5	-4.7	-4.2	-5.1	-4.5	-5.4	-5.0
Processed rice	-4.4	-4.4	-4.4	-2.3	-4.4	-4.4	-4.4	-4.3
Meat products	-4.3	-3.8	-3.9	-4.1	-3.6	-4.1	-4.4	-3.3
Milk products	-4.0	-3.6	-3.4	-3.0	-2.5	-3.2	-3.1	-2.9
Other food products	-4.2	-4.1	-4.2	-3.7	-4.2	-4.0	-4.2	-3.8
Beverages and tobacco	-4.8	-5.8	-4.1	-4.3	-5.7	-5.1	-5.5	-4.5
Textiles	-4.3	-4.3	-4.2	-4.3	-4.1	-4.3	-4.1	-3.6
Wearing apparel	-8.7	-8.5	-8.3	-8.3	-8.7	-8.0	-8.0	-8.0
Leather & fur	-8.0	-8.0	-6.1	-8.4	-8.1	-5.7	-7.4	-6.4
Lumber & wood products	-5.3	-5.1	-5.4	-5.4	-5.5	-5.1	-5.5	-4.4
Paper & printing	-3.4	-3.4	-3.3	-3.4	-3.4	-3.4	-3.5	-3.0
Petroleum & coal products	-3.8	-3.8	-3.7	-3.8	-3.7	-3.8	-3.7	-3.4
Chemicals, plastic, rubber products	-3.4	-3.3	-3.1	-3.2	-3.3	-3.2	-3.4	-2.8
Non-metallic mineral products	-4.9	-5.2	-4.2	-5.0	-5.2	-4.5	-5.0	-3.9
Iron & steel	-5.0	-5.3	-4.8	-5.1	-5.0	-4.9	-5.3	-4.5
Non-ferrous metals	-5.4	-5.3	-5.3	-5.3	-5.1	-5.3	-5.3	-4.8
Fabricated metal products	-4.5	-5.2	-4.9	-5.1	-5.2	-5.0	-5.5	-4.4
Transport equipment	-9.5	-8.5	-8.6	-8.7	-8.8	-8.6	-7.7	-7.9
Machinery & equipment	-5.2	-4.7	-5.1	-4.9	-4.8	-5.0	-5.1	-3.8
Other manufacturing	-5.4	-5.1	-5.2	-5.2	-5.4	-4.9	-5.3	-4.0
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-4.4
Construction	-2.8	-3.0	-2.6	-2.5	-2.2	-2.6	-2.6	-3.4
Trade and transport	-3.7	-3.7	-3.6	-3.6	-3.6	-3.6	-3.7	-3.8
Private services	-3.3	-3.5	-3.2	-3.3	-3.2	-3.3	-3.4	-3.6
Government services	-3.4	-3.4	-3.3	-3.2	-3.0	-3.2	-3.3	-3.3
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Indonesia

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.2	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.2	-4.2	-4.3	-4.1	-4.3	-4.3	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.5	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-4.8	-5.4	-5.6	-5.4	-4.9	-5.3	-5.6	-5.6
Gas	-3.8	-5.6	-5.6	-5.6	-4.1	-2.0	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.7	-8.7	-8.8	-8.8	-8.7	-7.8
Leather & fur	-8.7	-8.8	-8.8	-8.8	-8.8	-8.6	-8.8	-8.8
Lumber & wood products	-5.5	-5.6	-5.5	-5.5	-5.1	-4.2	-5.5	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.6	-3.7	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.5	-5.6	-5.6	-5.6	-5.5	-5.5	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6
Fabricated metal products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-2.8
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Indonesia

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.3	-4.3	-3.6	-4.4	-4.1	-4.4	-4.3	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.5	-5.4	-5.5	-5.6	-5.5	-5.6	-5.6
Forestry	-4.6	-5.6	-5.3	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.2	-5.5	-4.8	-5.4	-5.4	-5.4	-5.5	-5.6
Coal	-4.8	-5.6	-5.2	-4.7	-5.6	-5.6	-5.5	-5.6
Oil	-5.4	-5.6	-5.5	-5.6	-3.9	-2.7	-3.8	-5.6
Gas	-5.6	-5.6	-0.7	-4.7	-5.6	-5.4	-5.6	-5.6
Other minerals	-5.5	-5.2	-5.3	-5.6	-5.5	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.3	-4.4	-4.4	-4.3	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.2	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.1	-6.2	-6.1	-6.2	-6.2
Textiles	-4.3	-4.3	-4.1	-4.3	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.6	-8.8	-8.4	-8.8	-8.8	-8.7	-8.8	-8.8
Leather & fur	-8.8	-8.8	-8.6	-8.8	-8.8	-8.8	-8.7	-8.8
Lumber & wood products	-5.4	-5.6	-3.9	-4.7	-3.1	-4.6	-4.4	-5.5
Paper & printing	-3.5	-3.6	-3.5	-3.6	-3.6	-3.5	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.5	-5.4	-5.4	-5.6	-5.6	-5.6	-5.5	-5.6
Iron & steel	-5.5	-5.6	-5.5	-5.6	-5.6	-5.5	-5.6	-5.6
Non-ferrous metals	-5.6	-5.5	-4.9	-5.3	-5.6	-5.6	-5.6	-5.6
Fabricated metal products	-5.5	-5.6	-4.4	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.3	-10.4	-10.4	-10.4	-10.4	-10.3	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.2	-5.6	-5.6	-5.5	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Malaysia

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.2	-4.3	-4.4	-4.3	-4.3	-4.0	-4.3	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.5	-5.4	-5.6	-5.6	-4.5	-3.9	-5.6	-5.6
Fishing	-5.3	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.0	-5.6	-5.6	-5.6	-5.5	-5.1	-5.6	-5.2
Gas	-5.6	-5.6	-5.6	-5.6	-5.1	-5.6	-5.6	-5.5
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3
Other food products	-4.2	-4.3	-4.4	-4.3	-4.3	-4.2	-4.4	-3.7
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.7	-8.7	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.7	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Lumber & wood products	-5.2	-5.5	-5.6	-5.6	-5.5	-5.1	-5.5	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fabricated metal products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.3
Machinery & equipment	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Malaysia

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-2.7	-4.4	-3.8	-4.3	-4.1	-4.3
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4
Livestock	-5.6	-5.6	-3.2	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-4.7	-4.7	-4.0	-2.4	-2.5	-5.4
Fishing	-5.6	-5.6	-5.1	-5.5	-5.6	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-4.6	-4.5	-4.9	-4.4	-5.6	-5.1	-5.5
Gas	-5.6	-5.6	-5.5	-5.5	-5.6	-5.6	-5.4	-5.6
Other minerals	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-3.9	-4.4	-4.4	-4.3	-4.4	-4.4
Other food products	-4.4	-4.4	-2.8	-4.3	-3.9	-4.3	-4.3	-4.3
Beverages and tobacco	-6.2	-6.2	-5.9	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.3	-4.2	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-5.6	-8.7	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.8	-8.8	-8.3	-8.8	-8.8	-8.8	-8.8	-8.8
Lumber & wood products	-5.6	-5.6	-3.7	-4.1	-5.3	-5.4	-5.1	-5.6
Paper & printing	-3.6	-3.6	-3.4	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.7	-3.5	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.6	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.0	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.5	-5.3	-5.6	-5.6	-5.5	-5.6	-5.6
Non-ferrous metals	-5.6	-5.5	-5.4	-5.5	-5.6	-5.6	-5.5	-5.6
Fabricated metal products	-5.6	-5.6	-5.3	-5.5	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-9.9	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.6	-5.5	-5.1	-5.5	-5.6	-5.5	-5.6	-5.6
Other manufacturing	-5.6	-5.5	-5.3	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-2.8	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.5	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.6	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Philippines

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-3.3	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.3	-4.3	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.5	-5.6	-5.6	-5.5	-5.5	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.7	-8.7	-8.7	-8.6	-8.8	-8.8	-8.7	-8.7
Leather & fur	-8.7	-8.8	-8.7	-8.7	-8.8	-8.8	-8.8	-8.8
Lumber & wood products	-5.5	-5.5	-5.6	-5.5	-5.5	-5.6	-5.6	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6
Fabricated metal products	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Philippines

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6
Fishing	-5.6	-5.6	-5.6	-5.6	-5.4	-5.5	-5.5	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.4	-5.6	-5.4	-5.6	-4.8	-4.1	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.4	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.8	-8.6	-8.8	-8.8	-8.8	-8.8
Leather & fur	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.3	-5.6	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.3	-5.6
Fabricated metal products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.3	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.5	-5.6	-5.6	-5.5	-5.6	-5.5	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-2.8	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Singapore

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.2	-4.3	-4.4	-4.3	-4.4	-4.3	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.4	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.3	-5.5	-5.6	-5.5	-5.5	-5.5	-5.6	-5.5
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-4.8
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.2	-4.2	-4.4	-4.4	-4.4	-4.4	-4.4	-4.3
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.1	-6.2	-6.2	-6.2
Textiles	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.8	-8.8	-8.6	-8.6	-8.8	-8.8	-8.6	-8.7
Leather & fur	-8.7	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.7
Lumber & wood products	-5.5	-5.5	-5.6	-5.6	-5.5	-5.5	-5.6	-5.5
Paper & printing	-3.5	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.4
Petroleum & coal products	-3.2	-3.7	-3.8	-3.8	-3.4	-3.6	-3.8	-2.4
Chemicals, plastic, rubber products	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.5
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.5	-5.4	-5.6	-5.4
Fabricated metal products	-5.5	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.4
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.0
Machinery & equipment	-5.4	-5.5	-5.6	-5.4	-5.5	-5.5	-5.5	-5.3
Other manufacturing	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.3
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7
Trade and transport	-3.7	-3.7	-3.8	-3.7	-3.8	-3.7	-3.8	-3.5
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7
Government services	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.7
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Singapore

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-2.2	-4.4	-4.4	-4.4	-4.4	-4.4	-2.2	-4.4
Wheat	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-3.7	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-3.6	-4.1	-4.4	-4.4	-3.7	-4.1	-4.2	-4.3
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.0	-5.6	-5.6	-5.5	-5.5	-5.5	-5.5	-5.6
Forestry	-5.4	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6
Fishing	-5.2	-5.6	-5.6	-5.3	-5.5	-5.2	-5.5	-5.6
Coal	-5.4	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.1	-5.6	-5.6	-4.8	-5.6	-5.6	-5.6	-5.6
Gas	-2.7	-5.6	-5.6	-3.9	-4.0	-4.4	-5.6	-5.6
Other minerals	-5.0	-5.5	-5.6	-5.4	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-3.9	-4.1	-4.4	-3.5	-4.4	-4.3	-4.4	-4.4
Milk products	-4.3	-4.4	-4.4	-4.4	-4.4	-4.2	-4.1	-4.4
Other food products	-3.9	-4.3	-4.4	-4.2	-3.8	-4.2	-4.3	-4.4
Beverages and tobacco	-5.7	-6.2	-6.2	-6.1	-6.2	-5.8	-6.0	-6.1
Textiles	-3.3	-4.2	-4.4	-4.3	-4.4	-4.4	-4.2	-4.4
Wearing apparel	-6.8	-8.5	-8.8	-7.8	-8.8	-8.8	-8.7	-8.7
Leather & fur	-6.8	-8.8	-8.8	-8.8	-8.8	-8.7	-8.7	-8.8
Lumber & wood products	-4.6	-5.4	-5.6	-5.5	-5.5	-5.1	-5.3	-5.5
Paper & printing	-2.9	-3.5	-3.6	-3.4	-3.6	-3.5	-3.5	-3.6
Petroleum & coal products	-1.5	-2.7	-3.8	-1.7	-2.0	-1.3	-3.2	-3.8
Chemicals, plastic, rubber products	-2.8	-3.5	-3.8	-3.5	-3.7	-3.6	-3.7	-3.8
Non-metallic mineral products	-4.8	-5.4	-5.6	-5.5	-5.6	-5.5	-5.5	-5.6
Iron & steel	-4.8	-5.5	-5.6	-5.5	-5.6	-5.5	-5.6	-5.6
Non-ferrous metals	-3.9	-5.3	-5.6	-5.2	-4.9	-5.5	-5.4	-5.6
Fabricated metal products	-4.2	-5.1	-5.6	-5.3	-5.5	-5.5	-5.6	-5.6
Transport equipment	-9.6	-10.2	-10.4	-10.3	-10.4	-10.2	-10.1	-10.4
Machinery & equipment	-4.0	-5.3	-5.6	-4.9	-5.5	-5.2	-5.4	-5.6
Other manufacturing	-4.6	-5.2	-5.6	-5.4	-5.6	-5.3	-5.5	-5.6
Electricity, gas & water	-5.6	-5.6	-5.5	-2.3	-5.6	-5.6	-5.6	-5.6
Construction	-3.4	-3.8	-3.8	-3.7	-3.8	-3.7	-3.8	-3.8
Trade and transport	-2.8	-3.6	-3.8	-3.3	-3.6	-3.6	-3.7	-3.8
Private services	-3.0	-3.7	-3.8	-3.6	-3.7	-3.7	-3.7	-3.8
Government services	-3.2	-3.7	-3.8	-3.6	-3.7	-3.7	-3.7	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Thailand

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-2.9	-3.7	-4.3	-4.3	-4.4	-4.4	-4.1	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.0	-4.4	-4.0
Non-grain crops	-4.4	-4.4	-4.4	-4.3	-4.2	-4.3	-4.3	-4.3
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.0	-5.3	-5.5	-5.5	-5.4	-5.6	-5.5	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.5	-5.5	-5.6	-5.5	-5.5	-5.6	-5.6	-5.5
Processed rice	-2.6	-3.5	-3.8	-2.5	-2.4	-2.4	-4.1	-3.3
Meat products	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Milk products	-4.4	-4.2	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.2	-4.3	-4.3	-4.2	-4.3	-4.1	-4.4	-4.2
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.7	-8.8	-8.8	-8.7	-8.7	-8.8	-8.7	-8.6
Leather & fur	-8.5	-8.7	-8.7	-8.7	-8.8	-8.8	-8.7	-8.7
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.5	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fabricated metal products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.6	-5.6	-5.6	-5.5	-5.5	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Thailand

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-2.6	-4.4	-4.4	-2.9	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-3.0	-4.4	-3.4	-4.4	-4.4	-1.7	-4.4	-4.4
Non-grain crops	-4.2	-4.4	-4.1	-4.4	-4.3	-4.2	-4.2	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.4	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6
Forestry	-4.2	-5.6	-5.5	-5.6	-5.6	-4.6	-5.5	-5.6
Fishing	-4.3	-5.6	-4.9	-5.6	-5.5	-5.2	-5.5	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.2	-5.6	-5.6	-5.6	-5.6	-2.3	-5.6
Other minerals	-5.5	-5.6	-5.1	-5.6	-5.6	-5.4	-5.5	-5.6
Processed rice	-2.1	-4.4	-0.4	-4.4	-2.5	-2.0	-2.5	-3.2
Meat products	-4.4	-4.4	-4.2	-4.4	-4.3	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.1	-4.3	-4.2	-4.4	-4.4	-4.3	-4.3	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.3	-4.4	-4.2	-4.4	-4.4	-4.4	-4.4	-4.4
Wearing apparel	-8.3	-8.4	-7.9	-8.8	-8.8	-8.7	-8.7	-8.7
Leather & fur	-8.3	-8.8	-8.1	-8.8	-8.7	-8.5	-8.6	-8.8
Lumber & wood products	-5.5	-5.6	-5.5	-5.6	-5.6	-5.5	-5.6	-5.6
Paper & printing	-3.5	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.7	-3.8	-3.8	-3.7	-3.8	-3.8
Non-metallic mineral products	-5.4	-5.5	-5.4	-5.6	-5.6	-5.5	-5.6	-5.6
Iron & steel	-5.6	-5.5	-5.5	-5.6	-5.6	-5.5	-5.6	-5.6
Non-ferrous metals	-5.6	-5.5	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6
Fabricated metal products	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.3	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.5	-5.6	-5.4	-5.6	-5.6	-5.6	-5.6	-5.6
Other manufacturing	-5.5	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-2.8	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.7	-3.8	-3.6	-3.8	-3.8	-3.7	-3.8	-3.8
Private services	-3.7	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.7	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

China

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.3	-4.4	-4.4	-4.4	-4.0	-4.4	-4.4	-3.7
Non-grain crops	-4.3	-4.3	-4.3	-4.4	-4.1	-4.3	-4.4	-3.5
Wool	-4.4	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.5	-5.6	-5.6	-5.4	-4.9	-5.1	-5.4	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.4	-5.2	-5.4	-5.6	-5.6	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6	-5.5	-5.4
Oil	-5.6	-5.5	-5.6	-5.5	-5.0	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.5	-5.5	-5.6	-5.5	-5.5	-5.5	-5.6	-5.4
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.3	-4.4	-4.4	-4.3	-4.1	-4.4	-4.4	-4.1
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.1	-6.2	-6.2	-6.1
Textiles	-4.1	-4.2	-4.2	-4.1	-3.7	-3.8	-4.3	-4.3
Wearing apparel	-6.7	-8.5	-8.5	-8.1	-7.9	-8.7	-8.6	-8.6
Leather & fur	-7.9	-8.1	-8.1	-8.2	-8.4	-8.7	-8.5	-8.7
Lumber & wood products	-5.5	-5.4	-5.6	-5.6	-5.5	-5.6	-5.6	-5.5
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
Petroleum & coal products	-3.8	-3.7	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.7
Non-metallic mineral products	-5.4	-5.5	-5.6	-5.5	-5.5	-5.5	-5.6	-5.4
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.3	-5.6	-5.6	-5.4
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.5	-5.4	-5.6	-5.5
Fabricated metal products	-5.5	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.4
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Other manufacturing	-5.5	-5.4	-5.4	-5.2	-5.4	-5.5	-5.4	-5.4
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

China

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-3.9	-4.4	-4.0	-4.4	-4.4	-4.1	-4.4	-4.4
Non-grain crops	-3.8	-4.2	-4.0	-4.3	-4.4	-3.6	-4.0	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.4	-5.6	-5.3	-4.1	-5.6	-2.8	-5.2	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6
Fishing	-5.6	-5.6	-5.5	-5.6	-5.6	-4.5	-5.0	-5.6
Coal	-3.9	-3.7	-4.8	-5.6	-5.6	-4.7	-5.6	-5.6
Oil	-5.6	-5.2	-4.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6
Other minerals	-4.8	-5.6	-4.5	-5.6	-5.6	-5.4	-5.4	-5.6
Processed rice	-4.3	-4.4	-4.3	-4.4	-4.4	-3.2	-4.4	-4.4
Meat products	-4.1	-4.4	-3.4	-4.4	-4.4	-2.7	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.0	-4.4	-4.4
Other food products	-4.1	-3.7	-3.8	-4.4	-4.4	-3.7	-4.3	-4.4
Beverages and tobacco	-6.1	-6.2	-6.0	-6.2	-6.2	-4.8	-6.2	-6.2
Textiles	-4.2	-4.3	-3.8	-3.9	-4.4	-3.1	-4.2	-4.3
Wearing apparel	-8.2	-8.8	-8.4	-8.5	-8.8	-4.5	-8.4	-8.4
Leather & fur	-7.9	-8.8	-8.5	-8.3	-8.8	-8.3	-8.5	-8.7
Lumber & wood products	-5.5	-5.6	-5.5	-5.6	-5.6	-5.0	-5.6	-5.6
Paper & printing	-3.5	-3.6	-3.4	-3.6	-3.6	-3.3	-3.6	-3.6
Petroleum & coal products	-3.8	-3.7	-3.5	-3.8	-3.8	-3.0	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.8	-3.7	-3.8	-3.8	-3.3	-3.8	-3.8
Non-metallic mineral products	-5.4	-5.6	-5.3	-5.6	-5.6	-5.0	-5.6	-5.6
Iron & steel	-5.5	-5.5	-5.4	-5.6	-5.6	-4.8	-5.6	-5.6
Non-ferrous metals	-5.6	-5.5	-5.5	-5.5	-5.6	-5.0	-5.4	-5.6
Fabricated metal products	-5.4	-5.5	-5.3	-5.6	-5.6	-5.3	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.3	-10.4	-10.4	-9.3	-10.4	-10.4
Machinery & equipment	-5.6	-5.6	-5.6	-5.6	-5.6	-4.8	-5.6	-5.6
Other manufacturing	-5.4	-5.5	-5.4	-5.5	-5.6	-5.6	-5.5	-5.5
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-2.8	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.6	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Hong Kong

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.5
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.5	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-4.3	-4.2	-4.3	-4.3	-4.4	-4.4	-4.4	-4.1
Wearing apparel	-8.2	-8.0	-7.1	-7.8	-8.3	-8.7	-7.7	-8.1
Leather & fur	-8.6	-8.7	-8.6	-8.6	-8.3	-8.8	-8.7	-8.7
Lumber & wood products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.5
Paper & printing	-3.5	-3.5	-3.6	-3.6	-3.6	-3.6	-3.6	-3.5
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fabricated metal products	-5.5	-5.5	-5.6	-5.5	-5.5	-5.5	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.4	-10.4	-10.4	-10.3	-10.4	-10.4
Machinery & equipment	-5.5	-5.5	-5.6	-5.5	-5.6	-5.5	-5.6	-5.6
Other manufacturing	-5.5	-5.4	-5.4	-5.4	-5.4	-5.5	-5.5	-5.4
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Hong Kong

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.5	-5.6	-5.5	-5.6	-5.5	-5.6
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.5	-5.5	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.4	-4.3	-4.4	-4.3	-4.4	-4.4	-4.4
Beverages and tobacco	-5.9	-6.2	-6.0	-6.2	-4.9	-6.2	-6.1	-6.2
Textiles	-4.1	-3.9	-4.0	-4.2	-3.9	-4.4	-4.3	-4.4
Wearing apparel	-8.2	-8.3	-8.1	-7.8	-4.7	-8.8	-7.4	-8.4
Leather & fur	-8.6	-8.6	-8.2	-8.7	-7.6	-8.8	-8.6	-8.8
Lumber & wood products	-5.6	-5.5	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6
Paper & printing	-3.5	-3.5	-3.5	-3.5	-3.2	-3.6	-3.5	-3.6
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.8	-3.7	-3.7	-3.8	-3.6	-3.8	-3.8	-3.8
Non-metallic mineral products	-5.6	-5.6	-5.5	-5.6	-5.4	-5.6	-5.6	-5.6
Iron & steel	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Non-ferrous metals	-5.6	-5.5	-5.6	-5.6	-5.4	-5.6	-5.6	-5.6
Fabricated metal products	-5.5	-5.4	-5.5	-5.6	-4.7	-5.6	-5.6	-5.6
Transport equipment	-10.4	-10.4	-10.3	-10.4	-10.4	-10.4	-10.4	-10.4
Machinery & equipment	-5.5	-5.5	-5.5	-5.5	-5.2	-5.6	-5.5	-5.6
Other manufacturing	-5.4	-4.8	-5.3	-5.4	-3.5	-5.6	-5.5	-5.5
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-2.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.7	-3.8	-3.6	-3.8	-3.8	-3.8
Trade and transport	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8
Private services	-3.8	-3.8	-3.7	-3.8	-3.6	-3.8	-3.8	-3.8
Government services	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Taiwan

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-3.6	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.4	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.2	-4.4	-4.4
Livestock	-5.6	-5.6	-5.6	-5.6	-5.4	-5.5	-5.6	-5.6
Forestry	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Fishing	-5.6	-5.6	-5.6	-5.4	-5.3	-5.5	-5.6	-4.9
Coal	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-3.9	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.3	-4.4	-4.4	-4.3	-4.1	-4.4	-4.4	-4.1
Beverages and tobacco	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.1
Textiles	-4.1	-4.2	-4.3	-4.2	-4.2	-4.2	-4.4	-3.7
Wearing apparel	-8.3	-8.5	-8.4	-8.0	-8.4	-8.7	-8.7	-7.6
Leather & fur	-8.2	-7.5	-8.2	-7.7	-8.3	-8.3	-8.4	-6.9
Lumber & wood products	-5.4	-5.4	-5.4	-5.1	-5.3	-5.6	-5.6	-5.4
Paper & printing	-3.6	-3.6	-3.6	-3.6	-3.6	-3.5	-3.6	-3.5
Petroleum & coal products	-3.8	-3.8	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.7	-3.7	-3.6	-3.7	-3.8	-3.8	-3.7
Non-metallic mineral products	-5.4	-5.5	-5.5	-5.3	-5.3	-5.6	-5.6	-5.4
Iron & steel	-5.5	-5.6	-5.6	-5.6	-5.4	-5.5	-5.6	-5.4
Non-ferrous metals	-5.4	-5.4	-5.6	-5.6	-5.5	-5.4	-5.6	-5.5
Fabricated metal products	-5.2	-5.3	-5.4	-5.1	-5.5	-5.5	-5.5	-5.4
Transport equipment	-10.3	-10.3	-10.4	-10.3	-10.3	-10.3	-10.4	-10.3
Machinery & equipment	-5.4	-5.4	-5.5	-5.3	-5.4	-5.5	-5.5	-5.2
Other manufacturing	-5.4	-5.2	-5.3	-5.1	-5.1	-5.4	-5.4	-5.3
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.7	-3.7	-3.8	-3.6	-3.7	-3.8	-3.8	-3.7
Private services	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.7
Government services	-3.8	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Taiwan

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Wheat	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other grains	-4.4	-4.4	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4
Non-grain crops	-4.3	-4.4	-4.2	-4.4	-4.4	-4.2	-4.4	-4.4
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Livestock	-5.6	-5.6	-5.3	-5.5	-5.6	-5.6	-5.6	-5.6
Forestry	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6
Fishing	-5.5	-5.6	-3.8	-5.0	-5.5	-5.4	-5.6	-5.6
Coal	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Oil	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Gas	-5.6	-5.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Other minerals	-5.6	-5.6	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6
Processed rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Meat products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Milk products	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Other food products	-4.4	-4.3	-4.3	-4.3	-4.3	-4.3	-4.4	-4.4
Beverages and tobacco	-6.2	-5.7	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Textiles	-3.9	-3.5	-3.4	-3.8	-3.7	-3.7	-4.4	-4.4
Wearing apparel	-8.3	-8.6	-8.3	-8.4	-8.7	-8.6	-8.8	-8.8
Leather & fur	-7.7	-8.2	-7.5	-7.0	-7.4	-7.5	-8.8	-8.8
Lumber & wood products	-5.5	-5.5	-5.5	-5.6	-5.5	-5.1	-5.6	-5.6
Paper & printing	-3.5	-3.5	-3.5	-3.5	-3.5	-3.4	-3.6	-3.6
Petroleum & coal products	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8
Chemicals, plastic, rubber products	-3.7	-3.7	-3.6	-3.7	-3.7	-3.3	-3.8	-3.8
Non-metallic mineral products	-5.4	-5.5	-5.2	-5.4	-5.5	-4.9	-5.6	-5.6
Iron & steel	-5.4	-5.4	-5.5	-5.4	-5.6	-5.3	-5.6	-5.6
Non-ferrous metals	-5.5	-5.4	-5.5	-5.5	-5.4	-5.2	-5.6	-5.6
Fabricated metal products	-5.4	-5.4	-5.4	-5.4	-5.4	-5.4	-5.6	-5.6
Transport equipment	-10.3	-10.3	-10.3	-10.4	-10.2	-10.1	-10.4	-10.4
Machinery & equipment	-5.4	-5.4	-5.3	-5.3	-5.4	-5.0	-5.6	-5.6
Other manufacturing	-5.2	-5.2	-5.3	-5.1	-5.2	-5.1	-5.6	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Construction	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Trade and transport	-3.7	-3.7	-3.7	-3.7	-3.7	-3.6	-3.8	-3.8
Private services	-3.7	-3.7	-3.7	-3.7	-3.7	-3.6	-3.8	-3.8
Government services	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7	-3.8	-3.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Rest of the World

	Destination region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.1	-4.4	-4.3	-2.6	-4.4	-4.4	-3.4	-4.4
Wheat	-2.2	-4.4	-4.4	-4.4	-4.4	-4.2	-4.3	-3.6
Other grains	-4.4	-4.4	-4.4	-3.6	-4.2	-4.0	-4.2	-4.4
Non-grain crops	-3.7	-3.5	-3.6	-2.7	-3.9	-3.9	-3.3	-3.9
Wool	-4.3	-3.7	-4.1	-4.1	-4.4	-4.3	-3.7	-4.4
Livestock	-5.6	-4.7	-5.4	-4.8	-5.2	-5.0	-5.0	-5.6
Forestry	-5.4	-5.0	-5.6	-5.4	-5.0	-5.1	-3.8	-5.3
Fishing	-5.6	-5.5	-4.9	-3.6	-4.8	-5.0	-3.9	-5.0
Coal	-5.6	-5.6	-5.6	-5.1	-5.0	-4.6	-4.6	-5.6
Oil	-3.7	-3.1	-4.1	-3.1	-1.9	-1.0	-1.7	-2.9
Gas	-5.6	-5.4	-5.6	-5.3	-4.1	-3.7	-1.9	-5.6
Other minerals	-4.1	-4.4	-4.5	-3.7	-4.1	-4.0	-4.2	-4.0
Processed rice	-4.2	-4.4	-4.2	-4.1	-4.4	-4.4	-4.2	-4.4
Meat products	-4.3	-4.2	-4.2	-3.9	-4.3	-4.4	-3.9	-4.4
Milk products	-4.1	-4.3	-3.9	-3.7	-4.1	-4.4	-4.1	-4.1
Other food products	-3.8	-4.1	-4.0	-3.5	-4.1	-3.6	-3.7	-4.3
Beverages and tobacco	-5.9	-6.0	-5.9	-5.5	-6.1	-6.2	-6.0	-4.8
Textiles	-4.0	-4.1	-4.0	-3.8	-4.2	-3.8	-3.8	-4.4
Wearing apparel	-8.2	-8.1	-8.3	-7.4	-8.8	-8.7	-7.4	-8.8
Leather & fur	-8.0	-7.9	-7.6	-7.4	-8.6	-7.9	-7.2	-8.8
Lumber & wood products	-5.4	-5.4	-5.4	-5.2	-5.4	-5.5	-4.4	-5.6
Paper & printing	-3.2	-3.4	-3.5	-3.3	-3.3	-3.4	-2.7	-3.0
Petroleum & coal products	-2.9	-3.3	-3.2	-2.5	-2.9	-3.1	-2.9	-3.6
Chemicals, plastic, rubber products	-3.6	-3.5	-3.7	-3.5	-3.5	-3.5	-3.4	-3.3
Non-metallic mineral products	-5.3	-5.3	-5.4	-5.1	-5.4	-5.4	-5.2	-5.3
Iron & steel	-5.1	-5.3	-4.8	-4.9	-4.5	-5.1	-4.1	-5.1
Non-ferrous metals	-4.9	-5.5	-4.9	-4.4	-4.4	-4.9	-3.6	-4.7
Fabricated metal products	-5.3	-5.4	-5.3	-5.1	-4.5	-5.3	-4.6	-5.3
Transport equipment	-10.1	-10.3	-10.2	-9.9	-10.2	-9.6	-9.5	-10.1
Machinery & equipment	-5.3	-5.4	-5.3	-5.2	-5.4	-5.5	-5.0	-5.3
Other manufacturing	-5.1	-5.4	-5.4	-5.2	-5.4	-5.2	-5.0	-5.6
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-4.2	-5.6
Construction	-3.4	-3.4	-3.8	-3.7	-3.6	-3.6	-3.2	-3.7
Trade and transport	-3.4	-3.4	-3.7	-3.1	-2.8	-3.3	-3.0	-3.3
Private services	-3.4	-3.2	-3.5	-2.6	-2.9	-3.3	-3.2	-3.1
Government services	-3.2	-2.7	-3.6	-3.7	-3.4	-3.0	-3.4	-2.8
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Rest of the World

	Destination region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-3.0
Wheat	-3.8	-4.4	-3.3	-4.1	-4.4	-4.4	-4.4	-4.2
Other grains	-3.4	-4.4	-3.0	-4.4	-4.4	-4.2	-4.4	-4.0
Non-grain crops	-3.9	-3.9	-4.0	-3.0	-4.3	-3.5	-4.4	-3.0
Wool	-4.4	-4.4	-4.4	-4.4	-4.4	-4.0	-4.4	-3.6
Livestock	-5.6	-5.6	-5.2	-5.1	-4.6	-5.3	-5.6	-4.5
Forestry	-5.5	-4.0	-4.0	-3.5	-5.5	-4.9	-5.6	-3.8
Fishing	-5.2	-5.4	-5.0	-4.9	-4.9	-4.3	-5.6	-3.9
Coal	-5.6	-5.6	-5.3	-5.6	-5.6	-3.1	-5.6	-4.5
Oil	-3.3	-1.9	-2.4	-2.9	-5.6	-5.6	-5.6	-2.9
Gas	-5.6	-3.4	-5.4	-5.3	-5.2	-5.6	-5.6	-3.6
Other minerals	-4.8	-3.3	-4.3	-3.9	-5.4	-4.1	-5.6	-3.5
Processed rice	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.2
Meat products	-3.7	-4.4	-3.8	-4.4	-4.1	-3.6	-4.4	-3.8
Milk products	-4.3	-4.3	-4.2	-4.4	-4.3	-4.4	-4.4	-4.1
Other food products	-4.1	-4.2	-4.1	-4.3	-4.3	-4.3	-4.4	-3.3
Beverages and tobacco	-6.2	-5.7	-6.0	-6.2	-6.1	-6.2	-6.1	-5.5
Textiles	-4.3	-4.3	-4.2	-4.3	-4.3	-4.3	-4.4	-3.5
Wearing apparel	-8.7	-8.8	-8.0	-8.8	-8.7	-8.7	-8.7	-6.4
Leather & fur	-8.2	-8.7	-7.9	-8.6	-7.6	-8.0	-8.7	-6.1
Lumber & wood products	-5.5	-5.6	-5.5	-5.4	-5.4	-5.6	-5.6	-4.1
Paper & printing	-3.3	-3.4	-3.1	-3.0	-3.5	-3.4	-3.6	-2.5
Petroleum & coal products	-3.7	-3.4	-1.7	-3.8	-3.7	-3.8	-3.8	-2.4
Chemicals, plastic, rubber products	-3.6	-3.5	-3.5	-3.3	-3.7	-3.8	-3.8	-3.1
Non-metallic mineral products	-5.5	-5.5	-5.2	-5.5	-5.4	-5.3	-5.5	-4.8
Iron & steel	-5.2	-4.3	-4.9	-4.6	-5.5	-4.2	-5.6	-4.3
Non-ferrous metals	-4.8	-5.4	-4.7	-4.6	-5.3	-5.5	-5.5	-3.8
Fabricated metal products	-5.4	-5.5	-5.4	-5.3	-5.5	-5.6	-5.6	-4.2
Transport equipment	-10.1	-10.4	-10.0	-10.2	-10.3	-10.1	-10.4	-9.0
Machinery & equipment	-5.5	-5.5	-5.4	-5.4	-5.5	-5.5	-5.6	-4.6
Other manufacturing	-5.5	-5.6	-5.5	-5.3	-5.5	-5.5	-5.6	-4.5
Electricity, gas & water	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-3.9
Construction	-3.8	-3.1	-3.7	-3.8	-3.8	-3.4	-3.8	-2.3
Trade and transport	-3.8	-3.2	-3.8	-3.5	-3.8	-3.6	-3.8	-2.2
Private services	-3.7	-3.2	-3.3	-3.3	-3.7	-3.5	-3.8	-2.2
Government services	-3.7	-3.6	-3.6	-3.5	-3.8	-3.6	-3.8	-2.5
Ownership of dwellings	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8

Table B3: **Export demand elasticities in the SALTER model** (continued)

Aggregate

	Source region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Paddy rice	-4.0	0.0	-4.2	-3.3	-4.4	-3.9	-3.8	-4.2
Wheat	-3.7	-4.4	-3.2	-2.9	-4.4	-4.4	-3.0	0.0
Other grains	-4.2	-4.3	-3.9	-2.1	-4.4	-4.4	-3.0	-4.3
Non-grain crops	-4.3	-4.4	-4.3	-3.6	-4.3	-4.3	-3.5	-4.2
Wool	-1.6	-3.0	-4.4	-4.4	-4.4	-4.4	-4.0	-4.4
Livestock	-5.4	-5.1	-4.8	-4.4	-5.4	-5.6	-4.1	-5.5
Forestry	-5.5	-5.5	-4.9	-4.1	-5.6	-5.6	-4.6	-5.4
Fishing	-5.5	-5.4	-4.8	-4.7	-5.0	-5.2	-4.5	-5.4
Coal	-4.2	-5.4	-4.7	-3.8	-5.0	-5.6	-5.0	-5.4
Oil	-5.4	-5.4	-5.2	-5.5	-5.6	-5.6	-5.0	-5.0
Gas	-5.5	-5.4	-3.0	-4.8	-5.4	-5.6	-4.0	-3.9
Other minerals	-5.1	-5.6	-5.3	-5.1	-5.5	-5.6	-4.8	-5.4
Processed rice	-3.6	0.0	-4.4	-3.5	-4.4	-4.4	-3.2	-4.4
Meat products	-3.8	-4.1	-4.0	-3.5	-4.3	-4.4	-2.9	-4.4
Milk products	-3.8	-3.9	-4.3	-4.2	-4.3	-4.4	-2.5	-4.4
Other food products	-4.2	-4.3	-4.2	-3.9	-4.1	-4.3	-3.3	-4.4
Beverages and tobacco	-6.0	-6.1	-5.8	-5.1	-6.1	-6.2	-4.1	-6.2
Textiles	-4.3	-4.2	-4.3	-4.0	-4.0	-4.2	-3.1	-4.3
Wearing apparel	-8.3	-8.7	-8.8	-8.3	-8.6	-8.0	-7.8	-8.7
Leather & fur	-8.7	-8.6	-8.7	-8.3	-8.1	-7.1	-6.4	-8.8
Lumber & wood products	-5.4	-5.3	-4.5	-4.7	-5.5	-5.5	-4.3	-4.8
Paper & printing	-3.4	-3.5	-2.6	-2.9	-3.4	-3.5	-2.8	-3.5
Petroleum & coal products	-3.7	-3.8	-3.6	-3.5	-3.6	-3.7	-3.1	-3.6
Chemicals, plastic, rubber products	-3.7	-3.8	-3.5	-3.1	-3.4	-3.7	-2.5	-3.8
Non-metallic mineral products	-5.4	-5.6	-5.2	-4.6	-4.7	-5.2	-3.7	-5.5
Iron & steel	-5.5	-5.6	-5.2	-5.0	-3.9	-5.1	-3.1	-5.6
Non-ferrous metals	-4.5	-5.4	-4.5	-4.6	-5.0	-5.5	-4.0	-5.3
Fabricated metal products	-5.3	-5.5	-5.0	-3.5	-5.1	-5.4	-4.1	-4.5
Transport equipment	-10.0	-10.4	-8.1	-6.6	-8.4	-10.1	-6.9	-10.4
Machinery & equipment	-5.4	-5.6	-5.3	-4.3	-4.5	-5.4	-3.9	-5.6
Other manufacturing	-5.3	-5.5	-5.5	-4.6	-5.0	-5.3	-4.2	-5.4
Electricity, gas & water	-2.8	-2.8	-2.8	-2.6	-2.8	-2.8	-4.2	-2.8
Construction	-3.7	-3.8	-3.8	-3.7	-3.8	-3.7	-2.4	-3.8
Trade and transport	-3.7	-3.8	-3.7	-3.1	-3.6	-3.7	-3.2	-3.8
Private services	-3.7	-3.8	-3.7	-3.0	-3.7	-3.8	-2.8	-3.8
Government services	-3.6	-3.7	-3.7	-3.1	-3.8	-3.7	-2.6	-3.8
Ownership of dwellings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table B3: **Export demand elasticities in the SALTER model** (continued)

Aggregate

	Source region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Paddy rice	-4.1	-4.0	-2.2	-4.1	-4.4	-4.3	-4.4	-3.2
Wheat	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-4.4	-4.2
Other grains	-4.4	-4.4	-3.7	-3.6	-4.0	-4.4	-4.0	-4.0
Non-grain crops	-3.8	-4.3	-4.2	-4.3	-4.0	-4.4	-4.3	-3.1
Wool	-4.4	0.0	0.0	-4.4	-4.4	-4.4	-4.3	-3.7
Livestock	-3.3	-5.6	-5.5	-5.6	-4.7	-5.6	-5.4	-4.8
Forestry	-4.2	-5.6	-5.5	-5.1	-5.5	-5.6	-5.6	-4.2
Fishing	-5.4	-5.5	-5.5	-5.4	-5.2	-5.6	-5.2	-4.1
Coal	-5.6	0.0	-5.4	-5.6	-5.2	-5.6	-5.6	-4.6
Oil	-5.0	0.0	-4.9	-5.6	-5.0	0.0	-5.6	-2.3
Gas	-5.1	-4.7	-3.5	-4.9	-5.4	-5.6	-5.2	-2.9
Other minerals	-5.6	-5.4	-5.4	-5.5	-5.4	-5.6	-5.6	-3.8
Processed rice	-4.4	-4.4	-4.4	-2.9	-3.3	-4.4	-4.3	-4.2
Meat products	-4.3	-4.4	-4.2	-4.3	-3.4	-4.4	-3.9	-3.9
Milk products	-4.1	-4.4	-4.3	-4.3	-4.0	-4.4	-4.4	-4.1
Other food products	-4.0	-4.3	-4.2	-4.3	-4.1	-4.4	-4.2	-3.5
Beverages and tobacco	-6.1	-6.2	-6.0	-6.2	-5.2	-5.1	-6.0	-5.6
Textiles	-4.3	-4.4	-4.0	-4.4	-3.8	-4.1	-3.9	-3.7
Wearing apparel	-7.7	-8.6	-8.6	-8.6	-7.5	-7.7	-8.1	-7.1
Leather & fur	-8.6	-8.7	-8.6	-8.7	-8.3	-8.5	-7.9	-6.9
Lumber & wood products	-5.1	-5.5	-5.5	-5.6	-5.5	-5.6	-5.2	-4.4
Paper & printing	-3.5	-3.6	-3.4	-3.6	-3.5	-3.4	-3.5	-2.7
Petroleum & coal products	-3.7	-3.8	-2.6	-3.8	-3.5	-3.8	-3.8	-2.6
Chemicals, plastic, rubber products	-3.8	-3.8	-3.5	-3.8	-3.7	-3.7	-3.6	-3.3
Non-metallic mineral products	-5.3	-5.6	-5.4	-5.5	-5.4	-5.5	-5.3	-5.0
Iron & steel	-5.5	-5.6	-5.3	-5.6	-5.3	-5.6	-5.5	-4.4
Non-ferrous metals	-5.5	-5.4	-5.2	-5.6	-5.4	-5.5	-5.4	-3.9
Fabricated metal products	-5.5	-5.6	-5.3	-5.6	-5.5	-5.3	-5.2	-4.5
Transport equipment	-10.1	-10.3	-10.3	-10.4	-9.7	-10.4	-10.3	-9.4
Machinery & equipment	-5.4	-5.6	-5.3	-5.5	-5.3	-5.5	-5.4	-4.9
Other manufacturing	-5.5	-5.6	-5.5	-5.5	-5.3	-5.1	-5.2	-4.9
Electricity, gas & water	-2.8	-2.8	-2.3	-2.9	-2.8	-2.6	0.0	-4.2
Construction	-3.8	-3.8	-3.7	-3.8	-3.8	-3.8	-3.8	-3.0
Trade and transport	-3.8	-3.8	-3.6	-3.8	-3.7	-3.8	-3.7	-2.8
Private services	-3.7	-3.8	-3.6	-3.8	-3.8	-3.7	-3.7	-2.8
Government services	-3.8	-3.8	-3.4	-3.8	-3.8	-3.8	-3.8	-3.1
Ownership of dwellings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table B3: **Export demand elasticities in the SALTER model** (continued)

	Source region							
	Australia	*New Zealand*	*Canada*	*United States*	*Japan*	*Korea*	*EC*	*Indonesia*
Agriculture	-3.2	-3.9	-3.8	-3.4	-4.2	-4.3	-3.2	-4.2
Resources	-4.7	-5.4	-4.6	-4.4	-5.2	-5.2	-4.8	-4.7
Manufacturing	-5.1	-5.0	-5.6	-4.5	-5.4	-6.1	-4.1	-5.1
Services	-3.7	-3.8	-3.6	-3.0	-3.6	-3.7	-2.9	-3.8
Aggregate	-4.3	-4.3	-5.2	-4.1	-5.3	-5.8	-3.9	-4.8

	Source region							
	Malaysia	*Philippines*	*Singapore*	*Thailand*	*China*	*Hong Kong*	*Taiwan*	*Rest of world*
Agriculture	-3.9	-4.3	-4.2	-3.9	-4.2	-4.6	-4.2	-3.4
Resources	-4.7	-5.4	-5.1	-5.4	-5.1	-5.6	-5.2	-2.9
Manufacturing	-5.4	-6.1	-5.0	-5.8	-5.4	-5.9	-5.5	-4.6
Services	-3.8	-3.8	-3.5	-3.8	-3.7	-3.6	-3.7	-2.8
Aggregate	-4.7	-5.6	-4.7	-4.8	-5.1	-5.6	-5.2	-3.8

REFERENCES

Abbott, P.C. 1988, 'Estimating US agricultural export demand elasticities: econometric and economic issues', in Carter, C.A. and Gardiner, W.H. (eds), *Elasticities in international agricultural trade,* Westview Press, Boulder, Colorado.

Adams, P.D., Dixon, P.B., Meagher, G.A., Parmenter, B.R. and Peter, M.W. 1990, Survey of selected computable general equilibrium models as background for the Industry Commission's SALTER model, Institute of Applied Economic and Social Research, University of Melbourne.

Alaouze, C.M. 1977, *Estimates of the elasticity of substitution between imported and domestically produced goods classified at the input-output level of aggregation,* IMPACT Working Paper No. O-13, Industries Assistance Commission, Canberra.

Alaouze, C.M., Marsden, J.S. and Zeitsch, J. 1977, *Estimates of the elasticity of substitution between imported and domestically produced commodities at the four digit ASIC level,* IMPACT Working Paper No. O-11, Industries Assistance Commission, Canberra.

Armington, P.S. 1969a, 'A theory of demand for products distinguished by place of production', *IMF Staff Papers,* vol. 16, no. 1, pp. 159-78.

Armington, P.S. 1969b, 'The geographic pattern of trade and the effects of price changes', *IMF Staff Papers,* vol. 16, no. 2, pp. 179-201.

Arrow, K.J., Chenery, H.B., Minhas, B.S. and Solow, R.M. 1961, 'Capital labour substitution and economic efficiency', *Review of Economics and Statistics,* vol. 43, no. 3, pp. 225-50.

Ballard, C.L., Fullerton, D., Shoven, J.B. and Whalley, J. 1985, *A general equilibrium model for tax policy evaluation,* University of Chicago Press.

Bank of Korea 1988, *1985 Input-output tables of Korea,* Bank of Korea, Seoul.

Brown, S., Strzelecki, A. and Watts, G. 1993, *Matching input-output data to international trade data and assembling a SALTER database,* SALTER Working Paper No. 19, Industry Commission, Canberra.

Burniaux, J.M., Delorme, F., Lienert, I., Martin, J.P. and Hoeller, P. 1988, *Quantifying the economy-wide effects of agricultural policies: a general equilibrium approach,* OECD Working Paper No. 55, Department of Economics and Statistics, Paris.

Burniaux, J.M., Delorme, F., Lienert, I. and Martin, J.P. 1990, 'WALRAS — A multi-sector, multi-country applied general equilibrium model for quantifying the economy-wide effects of agricultural policies', *Modelling the effects of agricultural policies,* OECD Economic Studies No. 13, Paris.

Caddy, V. 1976, *Empirical estimation of the elasticity of substitution: a review,* IMPACT Preliminary Working Paper No. OP-09, Industries Assistance Commission, Canberra.

Calder, W., McDougall, R. and Strzelecki, A. 1993, *Procedures for later stage processing of single-region input-output data for SALTER,* SALTER Working Paper No. 18, Industry Commission, Canberra.

Central Bureau of Statistics 1989, *Asian international input-output series No. 7, some aspects of the 1985 Indonesian input-output table,* Central Bureau of Statistics, Indonesia.

Codsi, G. and Pearson, K.R. 1988, *Developing and implementing large economic models using GEMPACK: a general purpose software suite,* IMPACT Preliminary Working Paper No. IP-39, University of Melbourne.

Corado, C. and de Melo, J. 1983, *An ex-ante model for estimating the impact on trade flows of a country's accession to a customs union,* Discussion Paper No. DRD67, World Bank, Washington, DC.

Council of Economic Planning and Development 1990, *Taiwan statistical yearbook 1990,* Republic of China.

Dahlquist, G., Bjorck, A. and Anderson, N. (translator) 1974, *Numerical methods,* Prentice-Hall, Englewood Cliffs, New Jersey.

Deardorff, A.V. and Stern, R.M. 1986, *The Michigan model of world production and trade,* MIT Press, Cambridge, Massachusetts.

Deardorff, A.V. and Stern, R.M. 1989, *A computational analysis of alternative scenarios for multilateral trade liberalisation,* Discussion Paper No. 363, Economic Council of Canada, Ottawa.

Dee, P.S. 1989, *FH-ORANI: a fiscal ORANI with Horridge extension,* IMPACT Preliminary Working Paper No. OP-66, University of Melbourne.

Department of Balances of National Economy of the State Statistical Bureau and Office of the National Input-output Survey 1987, *Input-output table of China, 1987,* China Statistical Publishing House.

Department of Statistics 1987, *Singapore input-output tables 1983,* Department of Statistics, Singapore.

Department of Statistics 1988, *1983 Input-output tables*, Department of Statistics, Malaysia.

Department of Statistics 1991, *Inter-industry study of the New Zealand economy 1987*, Department of Statistics, New Zealand.

Directorate General of Budget, Accounting and Statistics 1986, *1986 Input-output tables, Taiwan Area, Republic of China*, Executive Yuan, Republic of China.

Dixon, P.B., Parmenter, B.R., Sutton, J. and Vincent, D.P. 1982, *ORANI: a multisectoral model of the Australian economy*, North-Holland, Amsterdam.

Frisch, R. 1959, 'A complete scheme for computing all direct and cross-demand elasticities in a model with many sectors', *Econometrica*, vol. 27, no. 1, pp. 177–96.

Fuchs, V.R. 1963, 'Capital–labour substitution: a note', *Review of Economics and Statistics*, vol. 45, no. 4, pp. 436–8.

Fullerton, D., Shoven, J.B. and Whalley, J. 1980, *Dynamic general equilibrium impacts of replacing the US income tax with a progressive consumption tax*, National Bureau of Economic Research Conference Paper No. 55, Washington, DC.

GATT (General Agreement on Tariffs and Trade) 1989, *Review of developments in the trading system*, GATT, Geneva.

Gehlhar, M.J., Binkley, J.K. and Hertel, T.W. 1992, *Estimation of trade margins: an application of the UN bilateral trade data*, SALTER Working Paper No. 11, Industry Commission, Canberra.

Gotch, M. 1993, *Industry assistance data for SALTER*, SALTER Working Paper No. 14, Industry Commission, Canberra.

Hambley, J. 1993, *Early stage processing of international trade and input-output data for SALTER*, SALTER Working Paper No. 15, Industry Commission, Canberra.

Hanslow, K. 1993, *Later stage processing of international trade data for SALTER*, SALTER Working Paper No. 16, Industry Commission, Canberra.

Harcourt, G.C. 1972, *Some Cambridge controversies in the theory of capital*, Cambridge University Press.

Harrison, G.W., Rutherford, T.F. and Wooton, I. 1989, *An empirical database for a general equilibrium model of the European Communities*, Centre for the Study of International Economic Relations Working Paper No. 8901C, Department of Economics, University of Western Ontario.

Harrison, J. and Pearson, K. 1993a, *An introduction to GEMPACK*, GEMPACK Document No. GPD–1, Monash University, Melbourne.

Harrison, J. and Pearson, K. 1993b, *Users' guide to TABLO and TABLO-generated programs*, GEMPACK Document No. GPD–2, Monash University, Melbourne.

Hickman, B.G. and Lau, L.J. 1973, 'Elasticities of substitution and export demands in a world trade model', *European Economic Review*, vol. 4, no. 4, pp. 347–80.

Institute for Developing Economies, Tokyo and Socio-Economic Policy and Forecasting Unit, Chulalongkorn University Social Research Institute, *Input-output table of Thailand, 1985*, Bangkok.

International Energy Agency 1988, *Coal information report*, OECD, Paris.

James, M. and McDougall, R. 1993a, *FIT: an input-output data update facility for SALTER*, SALTER Working Paper No. 17, Industry Commission, Canberra.

James, M. and McDougall, R. 1993b, *A SALTER database aggregation facility*, SALTER Working Paper No. 22, Industry Commission, Canberra.

Johansen, L. 1974, *A multi-sectoral study of economic growth*, 2nd enlarged edn, North-Holland, Amsterdam.

Jolly I., Beck T. and Savage S. 1990, *Reform of coal protection: implications for Australia and world trade*, Discussion Paper 90.1, Australian Bureau of Agricultural and Resource Economics, Canberra.

Jomini, P., Zeitsch, J.F., McDougall, R., Welsh, A., Brown, S., Hambley, J. and Kelly, J. 1991, *SALTER: A general equilibrium model of the world economy, vol. 1, model structure, database and parameters*, Industry Commission, Canberra.

Keller, W.J. 1980, *Tax incidence: a general equilibrium approach*, North-Holland, Amsterdam.

Kemp, M.C. 1962, 'Errors of measurement and bias in estimates of import demand parameters', *Economic Record*, vol. 38, no. 81, pp. 369–72.

Kenderes, M. and Strzelecki, A. 1992, *Listing of the 1986-87 ORANI database*, Research Memorandum No. OA–569, Industry Commission, Canberra.

Lienert I. 1989, 'Quantifying agricultural policies in the WALRAS model', *OECD Economic Studies*, No. 13, pp. 103–120.

Lin S. 1991, Application of cost-benefit analysis in China, unpublished PhD dissertation, Australian National University, Canberra.

Lluch, C., Powell, A. and Williams, R. 1977, *Patterns in household demand and savings*, Oxford University Press, New York.

Luskin, D. 1990, Preliminary estimates of labour supply elasticities in the SALTER model, Draft research memorandum, Industry Commission, Canberra.

Mansur, A. and Whalley, J. 1984, 'Numerical specification of applied general equilibrium models: estimation, calibration and data', in Scarf, H.E. and Shoven, J.B. (eds), *Applied general equilibrium analysis*, Cambridge University Press.

McDougall, R. 1993a, *Two small extensions to SALTER*, SALTER Working Paper No. 12, Industry Commission, Canberra.

McDougall, R. 1993b, *Incorporating international capital mobility into SALTER*, SALTER Working Paper No. 21, Industry Commission, Canberra.

Mercenier, J. and Waelbroeck, J. 1986, 'Effect of a 50% tariff cut in the Varuna model', in Srinivasan, T.N. and Whalley, J. (eds), *General equilibrium trade policy modeling*, MIT Press, Cambridge, Massachusetts.

MITI (Ministry of International Trade and Industry) 1989, *The 1985 Japan–US input output table*, Research and Statistics Department, Tokyo.

Mroz, T.A. 1987, 'The sensitivity of an empirical model of married women's hours of work to economic and statistical assumptions', *Econometrica*, vol. 55, no. 4, pp. 765–99.

National Economic and Development Authority 1988, *The 1985 interindustry (input-output) accounts of the Philippines*, National Economic and Development Authority, Philippines.

OECD 1990, *PSE/CSE calculations*, Paris (mimeograph).

Orcutt, G.H. 1950, 'Measurement of price elasticities in international trade', *Review of Economics and Statistics*, vol. 32, no. 2, pp. 117–32.

Pencavel, J. 1986, 'Labor supply of men: a survey', in Ashenfelter, O. and Layard, R. (eds), *Handbook of labor economics*, vol. 1, North-Holland, Amsterdam.

Peter, M.W. 1990, Suggestions for elasticity values for the SALTER model: supplement to the IAESR survey of multi-country models, Institute of Applied Economic and Social Research, University of Melbourne.

Phlips, L. 1974, *Applied consumption analysis*, North-Holland, Amsterdam.

Rimmer, M. 1990, *Primary factor substitution and the real wage explosion*, IMPACT Preliminary Working Paper No. O-69, University of Melbourne.

Ryan, C. 1992, *The SALTER model: construction of the European database*, SALTER Working Paper No. 10, Industry Commission, Canberra.

Saad I. forthcoming, Indonesian manufacturing exports after the petroleum boom: focusing on clothing and textiles, unpublished PhD dissertation, Australian National University, Canberra.

Salter, W.E.G. 1959, 'Internal and external balance: the role of price and expenditure effects', *Economic Record*, vol. 35, no. 71, pp. 226–38.

Salter, W.E.G. 1966, *Productivity and technical change*, 2nd edn (with an addendum by W.B. Reddaway), Cambridge University Press.

Saxon, E., Anderson, K. and Tyers R. 1986, 'Historical trends in grain, livestock products and sugar markets: the price data', in Tyers, R. and Anderson, K., *Distortions in world markets: a quantitative assessment*, background paper prepared for the World Bank's World Development Report, Washington, DC.

Selvanathan, S. 1988, A system-wide analysis of international and interregional consumption patterns, unpublished PhD dissertation, University of Western Australia, Perth.

Sicular T. 1988, 'Plan and market in China's agricultural commerce', *Journal of Political Economy*, vol. 96, no. 21, pp. 283–307.

Singh, I., Squire, L. and Strauss, J. 1986, 'The basic model: theory, empirical results, and policy conclusions', in Singh, I., Squire, L. and Strauss, J. (eds), *Agricultural household models, extensions, applications and policy*, Johns Hopkins University Press, Baltimore, Maryland.

Statistics Canada 1987, *The input-output structure of the Canadian economy 1961-1981*, Minister of Supply and Services, Canada.

Stern, R.M., Francis, J. and Schumacher, B. 1976, *Price elasticities in international trade: an annotated bibliography*, MacMillan, London.

Swan, T.W. 1963, 'Wilfred Edward Graham Salter: 1929–1963', *Economic Record*, vol. 39, no. 88, pp. 486–7.

Syntec Economic Services 1988, *Industry assistance reform in New Zealand*, Wellington (mimeograph).

Theil, H. 1987, 'Evidence from international consumption comparisons', in Theil, H. and Clements, K.H., *Applied demand analysis: results from system-wide approaches*, Ballinger Publishing Co., Cambridge, Massachusetts.

Theil, H., Chung, C.F. and Seal, J.L. Jr 1989, *International evidence on consumption patterns*, JAI Press, Greenwich, Connecticut.

Tormey, J. 1993a, *SINTIA: a guide to collecting tariff rate data for SALTER*, SALTER Working Paper No. 13, Industry Commission, Canberra.

Tormey, J. 1993b, *Creating synthetic single region input-output data for SALTER: Hong Kong and the Rest of the World*, SALTER Working Paper No. 20, Industry Commission, Canberra.

Tulpulé, A. and Powell, A.A. 1978, *Estimates of household demand elasticities for the ORANI model*, IMPACT Preliminary Working Paper No. OP-22, Industries Assistance Commission, Canberra.

United Nations 1990, *National accounts statistics: main aggregates and detailed tables, 1988*, United Nations, New York.

United Nations 1991, *National accounts statistics: analysis of main aggregates, 1988–89*, United Nations, New York.

US Department of Agriculture 1988, *Estimates of producer and consumer subsidy equivalents, government intervention in agriculture, 1982–86*, Agriculture and Trade Analysis Division, Economic Research Service, Washington, DC.

US Department of Agriculture 1990, *Estimates of producer and consumer subsidy equivalents, government intervention in agriculture, 1982–87*, Statistical Bulletin no. 803, Agriculture and Trade Analysis Division, Economic Research Service, Washington, DC.

Watts, G. forthcoming, *A SALTER database summary*, SALTER Working Paper, Industry Commission, Canberra.

Wear, S. 1990, *The elasticity of substitution between imports from different sources — estimates for New Zealand*, SALTER Working Paper No. 7, Industry Commission, Canberra.

Weiss F.D., Klepper G., Kirkpatrick G. and Juttemeier K.H. 1988, *Trade policy in West Germany*, Westview Press, Boulder, Colorado.

Weisskoff, R. 1971, 'Demand elasticities for a developing economy: an international comparison of consumption patterns', in Chenery, H.B. (ed.), *Studies in development planning*, Harvard University Press, Cambridge.

Wigle, R. and Perroni, C. 1991, *Suggested revisions to the SALTER model*, SALTER Working Paper No. 9, Industry Commission, Canberra.

Whalley, J. 1985, *Trade liberalization among major world trading areas*, MIT Press, Cambridge, Massachusetts.

Williams, R. 1978, *The use of disaggregated cross-section data in explaining shifts in Australian consumer demand patterns over time*, IMPACT Preliminary Working Paper No. SP-13, Industries Assistance Commission, Canberra.

Working, H. 1943, 'Statistical laws of family expenditure', *Journal of the American Statistical Association*, vol. 38, no. 2, pp. 257–74.

Yang Y. 1992, The impact of Multifibre Arrangement on world clothing and textile markets with special reference to China, unpublished PhD dissertation, Australian National University, Canberra.

Yotopoulos, P.A. and Nugent, J.B. 1976, *Economics of development: empirical investigations*, Harper and Row Publishers, New York.