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

April 1994

Canberra

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Industry Commission
PO Box 80 Belconnen ACT 2616
Benjamin Offices Chan Street Belconnen ACT

Telephone: Publications Officer, 06 264 3263 Facsimile: 06 253 1186

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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

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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 (**S**ectoral **A**nalysis of **L**iberalising **T**rade in the **E**ast Asian **R**egion) in his honour.

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