

# *Structural Adaptation in an Ailing Macroeconomy*

REPORT TO THE STUDY GROUP ON STRUCTURAL  
ADJUSTMENT (CRAWFORD COMMITTEE)

by

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with a contribution by  
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MELBOURNE UNIVERSITY PRESS  
1979

First published 1979  
 Printed in Australia by  
 Globe Press Pty Ltd, Fitzroy, Victoria 3065 for  
 Melbourne University Press, Carlton, Victoria 3053  
 U.S.A. and Canada: International Scholarly Book Services Inc.,  
 Box 555, Forest Grove, Oregon 97116  
 Great Britain, Europe, the Middle East, Africa and the Caribbean:  
 International Book Distributors Ltd (Prentice-Hall International)  
 66 Wood Lane End, Hemel Hempstead, Hertfordshire HP2 4RG England

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National Library of Australia Cataloguing in Publication data

Dixon, Peter B  
 Structural adaptation in an ailing macroeconomy  
 Index.  
 ISBN 0 522 84188 0

I. Australia — Industries. I. Powell, Alan Anthony Leslie, joint author. II. Australia. Study Group on Structural Adjustment. III. Title.

338.9'94

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## BACKGROUND NOTE ON THE IMPACT PROJECT

The purpose and history of the project are described in detail in Volume 1 of the *First Progress Report of the IMPACT Project* (Canberra: Australian Government Publishing Service, 1977). The present note is highly synoptic.

### AIMS OF THE PROJECT

The project was launched in 1975 by the Industries Assistance Commission in co-operation with the (then) Department of Labor and Immigration. A number of other agencies subsequently joined the project. The aim of the project is to up-grade the quality of the policy information available to the participating agencies, and to the government generally. By establishing a consistent framework within which the initiatives of individual agencies can be viewed in an economy-wide perspective, IMPACT attempts to provide a basis for better co-ordinated policy. The improved knowledge of the structure of the economy that the project brings can also enhance business decision making. To this end, a consistent policy of openly circulating all the project's working papers to all interested parties is followed.

The project maintains an arm's length stance vis-à-vis government. It does not generate advice directly nor have access to executive government; rather, its role is to improve the capacity of each of the participating agencies to make well informed, but independent, recommendations to government. It does this principally in the following three ways:

- (i) By gathering together an integrated body of factual data based on mutually compatible concepts. This body of data is sufficiently extensive to cover the areas of interest of the agencies (which include, among others, protection, industry structure, international trade, population and the workforce).
- (ii) By building a series of economy-wide analytical models which, separately or together, encompass the policy interests of the several agencies.
- (iii) By providing in-house training to members of the public service staff of the agencies, to enable them to make use of the models and to contribute to their further development.

It is thus clear that the IMPACT Project is a capital goods producing enterprise. Its final product is embodied in the form of data banks, economic models, computer systems to manipulate them both, and last (but perhaps most important of all) in human expertise.

## THE MODELS

The research strategy for the development of the IMPACT framework involves the construction of two econometric models, one for short/medium term analysis (with focus from one to about five years into the future) and one with long term focus (10 or more years into the future, say). The medium term model itself is to be made up of three separate interacting models, known as MACRO, ORANI and BACHUROO.

One field of applied economics in which there has been intensive research activity in Australia for several years is macroeconomic modelling (i.e., the study of the large aggregates in the economy, such as national income, the levels of investment, consumption, employment, money in circulation, etc.). The principal contributors to this effort have been the Reserve Bank of Australia (RBA) and the ABS-Treasury joint working group on the National Income Forecasting (NIF) model. The IMPACT agencies, whilst required to harmonize their recommendations with the general macroeconomic climate, do not have responsibility in the monetary, fiscal or demand management areas; rather their concerns are with various aspects of the *structure* of the economy, embracing such matters as its industrial and workforce compositions, and patterns of imports and exports. Macroeconomic variables could be important for the agencies, however, because of their possible interactions with the structural variables. The development by Peter Jonson and associates at RBA of a small macroeconomic model nicely coincided with our needs in this area. The MACRO model under development for IMPACT's medium term model accordingly has been heavily influenced by work done at the RBA.

The second model of the IMPACT framework, and the largest, is ORANI, which disaggregates the big economic aggregates of the economy (real consumption, real investment, real government spending) into 109 input-output categories. It also deals with relative prices of commodities, imports and exports, and occupationally disaggregated employment demand. Several papers illustrating the use of ORANI as a stand-alone model have been produced by the IMPACT team (see papers R-01 (Ch. 4), R-02 (Ch. 4), OP-19, IP-04, G-03, G-04, G-06, G-17, in the listing of IMPACT documentation given in Appendix I). The ORANI model has several novel features, perhaps the most outstanding of which is its flexibility from a policy user's viewpoint. In technical language, this flexibility is reflected in the user's ability to make almost any (logically valid) classification of the many hundreds of variables in the model into endogenous and exogenous sets. This would make it possible, for instance, for the IAC to treat some proposed set of tariffs as given (i.e., exogenous) and to project the resultant effects on the outputs of industries; some other government agency, by

contrast, might wish to treat some of these outputs as fixed (i.e., exogenous), and solve for the tariffs and/or subsidies which would be necessary to maintain these activity levels. A further example is the possibility of using ORANI in alternative time frames: as a conventional short run model with fixed industry specific capital stocks; or in long run mode, solving for the industrial structure of the aggregate capital stock subject to an exogenous pattern of relative rates of return.

Apart from the option of using ORANI in long-term mode, IMPACT has another long term model, SNAPSHOT, which has been validated over the interval 1962-63 to 1971-72. SNAPSHOT focuses on the effects on the structure of the economy of long term shifts in demography (e.g., as projected in the Borrie Report), in trading patterns (as encapsulated in projected relative prices for commodities on world markets) and in technology.

ORANI, like SNAPSHOT, can be used to project labour demands provided occupational wage relativities are taken as given. Neither model attempts to explain the labour supply, which is handled in an economic-demographic labour-force oriented model called BACHUROO. Because of staffing difficulties and severe problems in mobilizing a suitable data base—disaggregated labour force statistics of all kinds are woefully scarce in Australia—this model's development is lagging somewhat behind the other three, all of which have working prototypes and/or operational versions. Nevertheless, the demographic core of BACHUROO is well advanced—the facility to project population, family formation and female workforce participation will be documented in a forthcoming volume.

IMPACT is an ongoing project. Its modular development strategy has meant that its individual component models can be put to work progressively as they are developed. A rich variety of problems are amenable to analysis with the existing models. This book illustrates the ORANI model in action.

## FOREWORD

The content of this essay is substantially that of our report of July 1978 to Sir John Crawford's Study Group on Structural Adjustment. Conscious of the fact that the Study Group's working party on the relationship between structural adjustment and macroeconomic management had disbanded without producing a report, we did what we could in our study to fill this gap. The only significant deviation from the text of our original report occurs in Chapter 3, where we have incorporated some additional simulations which point to the robustness of our previously reported results on the comparative performance of different approaches to the restoration of macroeconomic health. Sir John has urged us, in common with the authors of other submissions to his Study Group, to publish our findings so that public debate on structural adjustment issues may be as fully informed as possible.

Our study was supported by the facilities of the Melbourne-based IMPACT team under an arrangement between the Study Group and the IMPACT participating agencies. IMPACT as such has no policy views: its function is to provide technical support for the formation of such views, independently and separately, by its participating agencies. To be of use to the Study Group, however, it was necessary for us to adopt some stance towards alternative approaches to structural adjustment. These positions are our own, and should not be seen as an official IMPACT view, nor as the view of any participating agency.

We are grateful to our colleagues at IMPACT, and in particular to John Sutton and David Vincent, who were among those more immediately involved in mounting the model simulations supporting our analysis. Brian Parmenter made an additional special contribution to the work reported in Chapter 3. Austin Mumme and Richard Snape kindly commented on drafts. Elvine Moore and Shirley Simmons respectively typed our initial report and this edited version, in both cases under taxing conditions.

April 1979

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## SUMMARY

In Chapters 1 and 2 we adopt definitions distinguishing three key ideas: structural change, structural adjustment, and structural adjustment problem. We briefly examine the sources of pressure for structural change. We conclude that these sources are very widespread and that structural change is therefore inevitable. Only if structural changes are very fast and unanticipated does structural adjustment have the potential to become a problem. A key role of governments, we believe, is to provide better economic intelligence so that structural changes are, to the greatest extent possible, foreseen. To the extent that future structural pressures cannot be foreseen, it is the function of governments to help create an environment in which the economy is able to adapt itself flexibly to changed circumstances. Consonant with both of these aims is the requirement that governments explain publicly and in detail their economic strategies and consistently apply policies once they are announced. Governments can also improve the operation of the labour market—

- (i) by upgrading the flow of information on vacancies to job seekers;
- (ii) by the timely collection and publication of structural information on the labour market;
- (iii) by abolishing all taxes which limit labour mobility (such as those on the transfer of titles and mortgages on domestic residences); and
- (iv) by providing opportunities for management and union leadership to study the implications of structural change.

In Chapter 3 we examine the interrelationships between macroeconomic management and structural adjustment. We conclude that many of the apparently structural problems of the economy would disappear with a return to macroeconomic health. We explore three approaches to the elimination of current high levels of unemployment, namely:

- (I) additional protection for the import-competing sector;
- (II) an expansion in aggregate demand via expansionary fiscal or monetary action; and
- (III) a reduction in the real costs of employing labour.

Our conclusions, based largely on computer simulations using the ORANI model, are as follows:

- (1) Increasing protectionism cannot lift the economy out of its present difficulties. The main effects of a uniform increase in protection are to redistribute unemployment among indus-

tries, occupations and regions, and to increase the rate of inflation. Increased levels of protection lead to higher wage costs which export industries are in no position to pass on to their customers; consequently, any improvement in the prospects of import-competing industries is off-set by contractions in export-related activities.

- (2) A general expansion in aggregate demand—that is, equal percentage increases in real private consumption and investment and in real government spending—would significantly increase employment *but* would have two undesirable side-effects. First, it would aggravate the inflation problem and adversely affect both import-competing and exporting industries with a consequently unbalanced pattern of stimulation across industries, occupations and regions. Second, it would lead to increasing balance of payments difficulties.
- (3) A reduction in real wage costs would significantly increase economic activity and employment, but would also be uneven in its incidence across industries, occupations and regions. This is because import-competing and exporting industries receive a larger benefit than industries in the non-traded sector from a reduction in inflation.
- (4) The fact that the differential incidence of a general expansion in aggregate demand is in the opposite direction to the differential incidence of a cut in real wage costs suggests a two-pronged approach to the macro problem. A macro-economic 'package' combining both approaches would provide balanced stimulation of industries, occupations and regions. Such a package, moreover, would reduce the rate of inflation.

In Chapters 4 and 5 we examine briefly three genuine structural pressures — that is to say, three sources of structural change which will still affect the prospects of certain industries and occupations after the restoration of macroeconomic health. The pressures examined were:

- (a) Changes in Australia's international trading relationships which seem likely in the light of prospective overseas developments in commodity prices. (Our projections of overseas prices were based largely on specially commissioned work by Professor Freebairn.)
- (b) A new mining boom.
- (c) Some possible scaling down in assistance to ten of Australia's most heavily protected manufacturing industries, namely, footwear, clothing, the textile group and automobiles.

The last of these three was treated only in synoptic detail. Our main conclusions were:

- (A) The structural pressures (a) and (b) above potentially pose problems for the exporting rather than for the import-

competing industries. Part of the explanation is that both structural pressures contribute to higher per capita incomes in Australia, which help to off-set increasing overseas competition in the case of import-competing industries, but which do not help export industries to any appreciable extent. Apart from some processed rural products, the export industries whose prospects are most adversely affected are the iron and steel and other basic metals industries.

- (B) The major exception to the conclusion reached in (A) concerns the automobile industry, whose relatively poor prospects are a consequence of our assumption that overseas prices of vehicles inflate relatively slowly. Two other import-competing industries are subjected to moderate downward pressure on profitability, namely, Cotton, Silk, Flax Yarns, etc., and Industrial Chemicals, not elsewhere classified (n.e.c.). In the latter case, even though projections in overseas prices favour the industry, this is more than off-set by the unfavourable consequences of a new mining boom.
- (C) Any attempt to insulate three of the most severely affected industries (namely, Coal and Crude Petroleum, Basic Iron and Steel, and Other Basic Metal Products) from increasing foreign competition would lead to widespread problems in the manufacturing sector. This is because these three industries loom large in the basic cost structure of manufacturing.
- (D) Viewed in an economy-wide perspective the adjustment pressures on profits and employment posed by (a), (b) and (c) are small. The amount of inter-occupational mobility involved seems feasible given historical precedents. Some re-orientation (possibly already under way) of training away from semi- and unskilled blue collar workers may be required.
- (E) At the local community level, these or other pressures could, in some instances, cause difficulties. The incidence on different states of specific pressures can be projected using the ORANI model. Projection within states at present would have to be done using less formal methods.
- (F) Unlike the balanced macroeconomic package discussed above, specific measures (e.g., tariffs, quotas) have very uneven incidence across industries, occupations and regions. If required, the IMPACT facility could be used to analyse this incidence in the case of proposals under active consideration.



## Chapter 1

# THE ORIGINS OF STRUCTURAL ADJUSTMENT PRESSURES

In this chapter we draw a distinction between the terms *structural change*, *structural adjustment* and *structural adjustment problem*. We argue that structural pressures are very pervasive and that, as a consequence, structural change is inevitable. In section 1.2 we provide a partial catalogue of such pressures. Structural adjustment problems, however, are not inevitable. We believe that in a well-managed macroeconomy, most pressures for structural change can be handled in the private sector without involving explicit government intervention: that the role of the government is to create an economic environment in which structural adjustment can take place without the emergence of structural adjustment problems. General policies towards this end are outlined in Chapter 2. Then in Chapter 3 we examine the management of the macroeconomy and report on research which leads to our basic proposition: that many apparently structural adjustment problems would disappear with a return to macroeconomic health. We also briefly discuss approaches towards achieving such an economic recovery. In Chapter 4 we examine two structural pressures in detail, namely, an expansion of mining exports and changes in Australia's international trading relations. Finally, in Chapter 5 we comment on possible future research in the structural adjustment field, briefly examining analysis of tariff reforms as an example.

### 1.1 DEFINITIONS

We commence by distinguishing structural change from structural adjustment. Structural change is continually taking place in all economies which are growing in terms of real income per head and/or population. Innovation, capital accumulation, demographic change and changing external terms of trade, all can be expected to lead to a changing occupational composition of the workforce, a changing geographic distribution of the population and a changing industrial composition of the economy. To the extent that such changes follow an evolutionary course involving a new pattern of commitment of new resources at the margin, but avoid the need to transfer already committed resources from one activity or area to another, no structural adjustment is involved. Thus we define

*structural adjustment* to mean the process of transferring already committed resources (plant, labour, working capital) from one activity and/or location to another. *Structural change* involves changing the *composition* of the economy but need not, in a growing economy, involve structural adjustment.

Depending on the degree to which factors in the economy are mobile, even the transfer of committed resources need not emerge as a social problem. Recent empirical work indicates surprisingly high mobility on the part of the Australian workforce between jobs and between occupations.<sup>1</sup> On the evidence, Australian firms are able to change their activities and to retrain and reallocate labour and other resources to a surprisingly large extent without any apparent need for public intervention.

A *structural adjustment problem* is defined to exist when the rate at which resources are required to be transferred patently exceeds the ability to cope of those who own and/or control the resources in question. As a result, resources may become idle and remain so for a longer period than makes good social sense. Structural adjustment problems, of course, are much more likely to emerge when the required rates of resource transfer are high. As a general rule, economies which are experiencing at least moderate rates of growth will cope more easily with pressures for compositional changes. Structural pressures will naturally loom larger in policy discussions during periods of macroeconomic recession. It is our view that great care is needed to distinguish between macroeconomic difficulties and genuine structural adjustment problems. These issues are taken up in Chapters 2 and 3.

With the above background and definitions, we now consider briefly some of the major pressures making for structural change in the Australian economy.

## 1.2. SOURCES OF STRUCTURAL CHANGE

### *(a) Changes in Australia's International Trading Relations*

Three developments in Australia's external trading environment over the last decade have generated pressures for structural change in the economy. The first was the entry of the United Kingdom into the EEC, the consequent loss of markets for Australian rural exports and the continuation (if not the actual escalation) of agricultural protectionism on the part of the EEC as a whole. This has led to significant adjustment problems for certain Australian industries (e.g., apple producers in Tasmania).

Second, and probably of greater long run significance to Australia, were the trade and development policies adopted by the third world countries. Many of these economies relied on exports of textiles, footwear, and other light manufacturing products as an

essential element in their development strategy. While some of the countries which were first in this field (e.g., South Korea and Taiwan) are moving progressively into somewhat heavier manufactures, the development strategies for most of the labour-abundant third world countries remain based on export of light manufactures to the developed world. These pressures impinge upon the Australian economy in the form of lower import prices for the goods in question, leading to a loss of competitiveness in the local market by Australian import-competing manufacturing industries.

The third major development was the boom in energy prices and in the prices of energy-intensive goods, visibly brought about by the OPEC cartel, but nevertheless originating in real economic pressures generated by the world's dwindling supplies of non-renewable natural resources.

What are the pressures likely to be in the future? In Chapter 4 we make a quantitative analysis of the implications of one particular scenario. At the general level, however, at least qualitative and conditional prognoses can be discerned for those domestic industries which are competitive with actual or potential exports from the third world. If the OECD countries do not solve their current macroeconomic problems, the reduced level of export demand confronting the less developed countries will scuttle existing development strategies and cause such grave economic hardship as to threaten seriously global political stability. On a more optimistic view, the developed countries will work their way out of the current recession in the foreseeable future. They can attempt to do this in one of two ways. Either they can open the doors to trade with the third world, or they can attempt to isolate their economies from it. The latter approach would not be in the self-interests even of the developed countries themselves. If they adopt it, the recovery in the west is likely to take longer, and lead to less than the full potential growth in real living standards. This is the clear lesson of the Great Depression: competitive attempts to export unemployment ultimately benefit no one.

One of the major benefits flowing from the reform of the international monetary system since Bretton Woods has been the enhanced international mobility of capital. Whilst the potential short term mobility of liquid capital owned by foreigners creates some problems for monetary management, the benefits of mobile investment capital are clearly recognized. As a consequence of increased capital mobility, however, it is no longer realistic to think about national investment markets in isolation. Much of the current uncertainty and reluctance to invest in capital markets around the world, including Australia, is undoubtedly associated with the fear that the experience of the Great Depression might be repeated. A clear commitment by the OECD nations to structural adaptation

(rather than regression to protectionism) would signal that the current recession is to be played according to a new, more rational, set of rules. Such a commitment would hence radically change the investment climate world-wide, accelerating recovery. And, as we argue below, the amount of restructuring involved would be much more manageable in macroeconomically healthy economies.

If one takes the above, globally optimistic, view of the resolution of current difficulties in western economies, then pressures arising from the less developed countries' natural comparative advantage in low technology manufactured goods are likely to persist, and perhaps to gain momentum, into the foreseeable future. Even if one is less sanguine about future prospects, we do not believe that the economies of the third world can be quarantined for long from those of the developed world (unless of course they are forced to join a communist trading block or to form one of their own). It seems, therefore, that pressures on import-competing industries generated in the sixties and early seventies by the export-oriented development strategies of poorer nations, and especially those of East and South-East Asia, must be taken as a continuing fact of economic life.

*(b) The Mining Boom*

The mining boom of the 1960s changed the composition of the Australian economy in a rather important way. In a small economy such as Australia the realization of mineral assets principally takes the form of increased export income. If such earnings are substantial (as indeed they were in the case of the mining boom), the impact on the balance of payments and subsequently upon the exchange rate and the general standard of living cannot be ignored. When consequently the Australian exchange rate was appreciated (or equivalently did not depreciate as fast as it otherwise would have done), the effect was to squeeze the domestic producers of internationally traded goods; namely, the agricultural and pastoral sectors, the import competing sector, and of course the mining industries themselves. There are good reasons for expecting Australia's long run comparative advantage in the export of minerals to lead to further expansion when the current global recession is over.

*(c) Changes in Household Demand Patterns*

The pattern of demand in the domestic economy is obviously an important source of pressures for change. Apparent changes in social attitudes and in consumer tastes lead to the redundancy of certain products and their displacement by new ones. The frequency with which Australian men now wear hats is a tiny fraction of the comparable frequency two decades ago. Baby carriages of the style

in vogue some dozen years ago are virtually unsaleable today, no doubt due partly to the fact that they will not easily fit into the back seat or boot of an automobile.

Demographic changes are another source of change in the pattern of demand for goods and services. Such changes may alter the age structure and size of households and hence influence the types of goods and services that are demanded. These compositional effects will be superimposed on the changes in demand patterns due to generally rising living standards. As per capita incomes grow, we can expect to see the substitution of what were formerly regarded as luxuries, for example, restaurant meals, for basic goods and services. Technological development will expand the range of available consumer goods and hence also lead to changing patterns of demand.

All these potential sources of change in demand patterns are due to processes which normally evolve slowly, and on the whole smoothly, through time. The displacement of old products by new ones constitutes a pressure for change but would not normally be expected to constitute the source of an adjustment problem, especially since those involved in the production of the now redundant product typically have some stake in the introduction of the new product. Certainly there is, for example, a significant overlap between the former suppliers of black and white television sets and the current suppliers of colour sets.

*(d) Changes in Government Policy*

If investment is undertaken in some particular line of activity in the expectation that the Government will pursue a set of policies that ensure the profitability of this activity within Australia, but this expectation is subsequently reversed by a change of policy, then resources may become committed to lines of activity which after the change can no longer support them profitably. This could be the source of pressures for structural adjustment. Areas in which Government policy can be important for investment decisions are protection, taxation, immigration and public expenditure. With respect to the last mentioned the composition may be as important as the total volume.

*(e) Technological Change*

Changes in technology affect the prices of both products and factors of production. Occasionally, perhaps once in a decade, a major innovation with economy-wide applications may be introduced successfully. The outstanding post-war example is in the field of electronic computation and data handling. At a less spectacular (but nevertheless for a country like Australia very significant) level,

the containerization of shipping has had a major impact on costs. Both these examples have led to some demands on the part of organized labour for structural adjustment assistance: in the case of the watersiders, accelerated retirement provisions were negotiated, whilst the prospective replacement of existing telephone exchanges by computer controlled devices has been the subject of negotiations between Telecom and the relevant union. In the retailing area, by contrast, the major labour-saving reorganization which super-markets involved has taken place without any apparent expectation on the part of the former industry that it would be assisted in the adjustment process by governments.

*(f) Institutional and Other Changes in the Labour Market*

The amount and pattern of participation in the workforce by women have changed dramatically over the last twenty years, partly as a consequence of the increasing educational levels attained by females. Coupled to this has been the equal pay decision and its progressive implementation.

Apart from changing relativities between females and males, and between skilled and unskilled labour, arbitrated decisions have resulted in a spectacular narrowing of the gap between the remuneration of juniors and experienced workforce personnel. Standard hours of work and wage settlements, as well as leave and other benefits, have been altered significantly over the last decade as a result of collective bargaining and arbitration. Whilst some of these changes may have been gradual, the real wage explosion of 1972–75 constituted a shock of major proportions. To the extent that this change in real wages is likely to persist rather than to be eroded through inflation, and to the extent that different sectors of the economy differ in their ability to absorb it, structural change is involved. A potential structural adjustment problem would arise if particular industries have plant and equipment suitable for profitable use in combination with labour at the old, but not at the new, wage rate.

## Chapter 2

### BASIC APPROACHES TO STRUCTURAL ADJUSTMENT POLICY

It seems to us that possible approaches to structural adjustment policy may be suitably classified with the aid of a medical simile. We categorize the three major types of approach, in decreasing order of desirability, as

- (i) prophylaxis
- (ii) treatment
- and
- (iii) installation of an artificial life support system.

Before briefly examining each of these, we turn our attention to an area with logical precedence—diagnosis.

#### 2.1 DIAGNOSIS—MACRO VERSUS STRUCTURAL PROBLEMS

To attempt treatment without careful prior diagnosis would reduce medicine to a random, hit-or-miss, affair. The same maxim applies to the prescription of economic policies for an ailing economy. At the risk of some oversimplification, the economic ills afflicting the economy can be classified into two broad groups: macro problems and micro problems. Examples of the former would be unsatisfactorily high levels of unemployment and inflation; examples of the latter would be chronic shortages of some types of labour in an otherwise labour-abundant economy, or bottlenecks in the supply of a particular raw material needed by a particular industry.

Among the micro problems confronting the economy, but closer to macro problems in nature than most others, is the problem of structural adjustment. According to the definitions introduced in Chapter 1, a structural adjustment problem occurs when objective circumstances require compositional changes in the economy to occur at a speed which is beyond the capacity of the natural adaptive mechanisms present in the management of enterprises, in the labour force, and in the institutions governing the functioning of the economy.

As viewed by the management or workforce of an ailing industry or enterprise, the symptoms caused by macro ills and by structural

maladjustment are remarkably similar: sluggish or declining product demand, a cost-price squeeze, and falling profits, accompanied by reductions in overtime and/or by lay-offs. Especially if these symptoms are experienced simultaneously with a loss of market share, then those afflicted are very apt to see the problem in structural, rather than in macro, terms. In the contemporary western world, neither the current generation of management nor of labour has directly experienced a macroeconomic recession comparable to the current one—they are, understandably, at a loss to know what lies on the other side of the trough for *their* firm or industry. A fairly natural desire to play it safe makes it in the interest of every industry suffering from depressed activity levels to describe their problem as 'special'—that is, as not caused by the state of the macroeconomy—and to seek 'special' terms which would guarantee viability irrespective of prospects for renewed health during macroeconomic recovery.

Obvious dangers inherent in a depressed macroeconomic climate in which every industry in difficulty seeks special terms are as follows:

- (a) By definition, most industries and enterprises experience difficulty in a severe macroeconomic slump. Not all of them can receive special terms; that is, not everyone can attain a relative advantage. Even so, governments may find it politically attractive to pretend otherwise.
- (b) The emphasis on the special circumstances of individual industries may lead to totally inappropriate, specific, instruments being used in an attempt to solve essentially sector-wide or economy-wide problems.
- (c) Those industries whose perception of their own case as special is accurate (and which by definition would still be in difficulty after the slump is over), inevitably will continue to need special assistance, and possibly at accelerating levels, during economic recovery and beyond.
- (d) Those industries whose perception of their own case as special is inaccurate (and which by definition would recover satisfactorily with the macroeconomy) would be better served by measures which restore macroeconomic health at the earliest possible moment. From the point of view of the more efficient functioning of the economy overall, the smaller the number of industries whose normal operating procedures depend on selective bureaucratic intervention, the better. From the point of view of the cost structures confronting the industries concerned (i.e., those whose health would recover with that of the macroeconomy), the lower the level of special assistance to industries described in (c) above, the better.

To summarize, intervention based on the misidentification of a macro problem as a structural adjustment problem would lead to

inappropriate, and even on their own terms inefficient, policy responses. A result of these policies would be to magnify any genuine underlying structural adjustment problem that would have to be faced after macroeconomic recovery. This would occur because industries totally lacking in long run prospects would emerge from the recession with a higher capital stock than otherwise, with established claims to subsidies (or other assistance), and would compete against naturally healthy industries for the available labour supply in a tighter labour market.

In Chapter 3 we describe what we mean by a healthy macroeconomy, and show that such a description is a feasible state for the economy — that is to say, a real possibility. We conjecture, in the light of our own and other economists' insights, about the most appropriate way of guiding the Australian economy into such a state of macro health. In Chapter 4 we make projections which identify pressures for structural adjustment whose existence is likely to continue after the recovery of macroeconomic health. For the moment, however, we continue with the medical analogy as a basis for classifying possible policy responses to properly diagnosed structural adjustment problems.

## 2.2 PROPHYLAXIS

Preventive medicine is the best medicine. This adage applies equally to industry policy. The first best approach clearly is to ensure that, to the greatest possible extent, resources do not become committed to enterprises that are profitable neither from the social nor from the private viewpoint. A role for government in the provision of economic intelligence can clearly be made. Information is a 'public good'—that is, it is difficult to establish a market where only those who pay for information are able to use it. Consequently, if left to the private sector, the provision of information is likely to be socially inadequate.

Second, besides improving the quantity and quality of information available to private investors concerning the prospective environment within which their ventures will need to be able to compete, governments can also improve the general investment climate by establishing a credible record of consistent application of well thought out, well publicized, and publicly understood principles in the area of industry development.

Third, to the extent that it is successful in eliminating business cycle troughs, fiscal and monetary management of aggregate demand can contribute greatly to the correct diagnosis and management of structural adjustment problems. A declining industry may well be able to cope with a growth rate that is lower than the economy-wide average *provided* that this average itself is a healthy positive number. Without wishing to tie conclusions on population

policy to structural adjustment as such, we note in passing that a policy which leads to a growing population will make a contribution to the avoidance of structural adjustment problems. This is because a given commitment of resources in any particular line of economic activity will, over time, become a smaller percentage of the total in a growing economy. New (socially and privately) more profitable lines of activity can develop by the absorption of new capital and labour, thus avoiding the problems involved in attempting to transfer redundant plant and labour.

If we take as given that the demographic outlook for Australia to the turn of the century is one involving at most a slowly growing population, it is clear that a mobile workforce will become a necessary ingredient in the programme of preventive medicine. Mobility for workers has two principal dimensions, occupational and locational. With respect to the former, the existing (largely apprenticeship-oriented) system of training for skilled tradesmen seems to be totally unsuitable for the type of inter-occupational mobility that will be required from the ageing workforce. This suggests a fourth type of policy initiative. Reformation of the system for training skilled labour, if successful, will go a long way towards avoiding future structural adjustment problems.<sup>2</sup> A reassuring conclusion emerging from one of our preliminary studies is that the occupational mobility needed to cope with prospective pressures on the Australian economy through the mid-eighties will be mainly mobility within rather similar occupational groupings.<sup>3</sup> The amount of retraining involved, therefore, should be well within the capability of any well designed and efficiently run scheme.

The flexibility of the workforce depends also on locational mobility. One important factor affecting locational mobility is the high transactions cost associated with buying and selling houses in Australia, caused by the rigidity and slowness of the banking system in the negotiation and renegotiation of mortgages and the existence of State imposts on the transfer of titles. This suggests a fifth prophylactic. A more flexible system for the transfer of home ownership would improve labour mobility in a way which would contribute substantially to the avoidance of structural adjustment difficulties.

### 2.3 TREATMENT

Where because insufficient prophylactic care was taken, or because of sheer bad luck, an industry finds that it has a structural adjustment problem, treatment which is partially subsidized from the public purse may be indicated. Treatment might be considered to have two aspects. The first concerns measures designed to transfer inactive or unproductive resources into a socially more productive line of activity and the second relates to income maintenance and

welfare. The latter aspect is better handled, in our opinion, as an element of the total tax/welfare/transfer system, rather than as an aspect of industrial policy. In other words, unemployed people in a depressed area or industry should attract public support because they are unemployed, not because of their industry or regional affiliation.

Many countries (including Australia) have, in the past, set up a variety of schemes to facilitate structural adjustment in various industries. Extreme forms include payment for the destruction of capital (a bounty on the destruction of fruit trees or beef cattle, for example) or rental payments on idle capital, with payment made contingent upon the capital remaining idle (post-war U.S. agricultural supply management). While these measures transfer particular capital resources *out* of producing something, they do not (at least in the short run) succeed in transferring them into producing anything else.<sup>4</sup> The subsidization of moving expenses for unemployed persons who have located a job elsewhere and who otherwise would be unable to move is a better example. It is, however, beyond the scope of this discussion to treat, or even to itemize, the extraordinary variety of structural adjustment measures which man's inventiveness in the field of social engineering has so far produced.<sup>5</sup>

### 2.4 LIFE SUPPORT SYSTEMS

We now turn to the most expensive branch of medicine and one which is used only as a last resort. An industry whose resources are completely immobile *might*, under certain stringently defined circumstances, become a candidate for an artificial life support system by way of specific subsidies. The circumstances justifying such an expensive exercise are:

- (i) that the resources with, or without public assistance, cannot be moved into a more viable line of activity;
- (ii) that the net social benefit of keeping the particular activity alive exceeds the costs of not so doing; and
- (iii) that the patient can be quarantined so that no new cases arise requiring such expensive care.

In practice item (iii) will be extremely difficult to satisfy because the supply of a specific subsidy automatically creates its own demand. If the migrant non-English speaking women textile workers in Victorian country town 'A' are eligible for a payroll subsidy, why not those in town 'B'? Why not those who will be engaged in Melbourne to operate new equipment which will only make a profit if the payroll subsidy is paid?

Given that artificial maintenance of an ailing industry's life is a very expensive business, it follows that not all ailing industries can be supported. At any given level of real cost committed to such



exercises, the decision to maintain ailing industries A and B inevitably entails deciding that other ailing industries C and D shall go to the wall. The very decision to provide any artificial life support programme at all involves a conscious decision to transfer resources from healthier parts of the economy. In such a situation not everyone can gain. We leave our medical analogy in order to emphasize the pervasiveness of this fact of economic life: by and large, not everyone can benefit from any given policy intervention.

## 2.5 THE INEVITABILITY OF TRADE-OFFS

In a recent study commissioned by the GATT secretariat,<sup>6</sup> the authors preface their work with the following early contribution to the literature on adjustment problems:

The extinction of any desire on the part of mankind, however vicious and destructive, the abolition of any established practice, however vile, will throw a certain number of men 'out of work'; . . . And, in like manner, the more abundant supply of any desired thing, however wholesome the need which it meets, and however great the gain to the well-being of society in general which it secures, may plunge some members of the social organism into penury. If all the world is well supplied with tin, it may make life easier and pleasanter to millions, but it saps the industrial position of the Cornish miner. If all the world turned sober, it would indefinitely increase its well-being, but countless publicans, brewers, distillers, and hop and vine growers would be thrown out of employment. If universal peace were secured, and armaments were reduced to the vanishing point, there would be many an Othello to mourn that his occupation was gone. If a really successful unpuncturable tyre were put on the market, there would be a great increase in collective happiness, clerical and other appointments would be kept with notably increased regularity, profanity, at least in cultivated society, would tend to be more closely restricted to its natural preserves on the golf-links, but there would be a procession of unemployed assistants of bicycle repairers, and the production of 'outfits' would be a 'ruined industry'. If the sanitary habits of the public suddenly improved, there would be a slump in the business of the undertaker, and if no one committed murder, the hangman would be out of a job.

Thus, every man who lives by supplying any want, dreads anything which tends either to dry up that want or to supply it more easily and abundantly. It is to his interest that scarcity should reign in the very thing which it is his function to make abundant, and that abundance should reign everywhere else. . . . The desire for relative scarcity in his own skill, or his own commodity, is, therefore, only too natural and intelligible in any man. It is the desire for the conditions that will secure to him what

every one desires. Only these conditions must, by their nature, tend to exclude others from the privileges they secure to him.

Philip H. Wicksteed (1910)

Wicksteed's message, which to a considerable degree is ours also, is that not everyone can benefit from resistance to structural change. Attempts to deny this fact of economic life will manifest themselves as opposition to adjustment accompanied by excessive policy intervention. But failure to adjust to emerging pressures on the part of one industry or group in the society inevitably means higher costs of adjustment for other industries or groups. Adjustment by *someone* is thus unavoidable.

There are, of course, situations in which everyone (or almost everyone) in a society can benefit as the result of well informed policy intervention. The outstanding example is successful macro-economic policy in a period which would otherwise be one of substantial underemployment of the resources of the nation (labour, capital, land). Subject to this qualification, which leads to a consideration (in quantitative terms) of the relationships between macro and structural problems in Chapter 3, our method of analysis implies that it is only in exceptional circumstances that everyone can benefit from policy intervention.<sup>7</sup> A major problem confronting the policy maker, then, is to trade off the interests of one group in the society against those of another as equitably as possible. This, for instance, is the role of the progressive income tax and of welfare policy. There are compelling arguments, however, for minimizing the scope and number of policy interventions having substantial redistributive consequences which are taken outside the usually recognized ambit of welfare policy. In recent decades much of Australian policy outside the macroeconomic and welfare areas seems to have been predicated either on the assumption that interventions are costless, or (what is worse) that they will appear to be so to the electorate. Few could disagree with the views taken of such bureaucratic or political cynicism by Blackhurst and his co-authors: 'It is not only unsafe but also morally objectionable to promote policies the acceptance and effectiveness of which must depend on most people either not noticing or misunderstanding their results.'<sup>8</sup>

Consistent with this view, in a paper published a year ago we have attempted to give a quantitative dimension to the trade-offs between industries and occupations which seem likely to confront policy-makers concerned with the structural adjustment of the Australian economy to cope with the 1980s.<sup>9</sup> We believe it would be in the interests of good policy making if these (and other) views of the likely trade-offs are debated as widely as possible before policy actions are taken.

### *Chapter 3*

## STRUCTURAL ADJUSTMENT AND THE MACROECONOMY<sup>1</sup>

The demand for structural adjustment assistance is likely to be greatest in times of depressed economic activity. As we have seen in Chapter 2, section 2.1, it is at such times that rational adjustment assistance policy is hardest to implement. The difficulty is to distinguish genuine cases of structural maladjustment from problems associated with malfunctioning of the macroeconomy. The penalty for misidentification is that costly structural adjustment schemes may be set up to cope with problems which would largely disappear with general economic recovery. We believe that major initiatives in structural adjustment assistance should not be attempted in conditions of general high unemployment and low capacity utilization—the economy overall, as well as the majority of those seeking special terms, would be better served by vigorous attempts to restore macroeconomic health.

The question, then, is what can be done to restore macroeconomic health. In this chapter we use simulations from the ORANI model<sup>2</sup> in a discussion of three broad approaches:

- (i) across-the-board increases in protection against import competition,
- (ii) Keynesian demand stimulation, and
- (iii) general reductions in real wage costs.

Our simulations provide a basis for discussing the likely effectiveness of each approach in tackling Australia's major short-run economic problem—high unemployment. They also allow us to look at the structural implications of alternative macro policies. We find that different approaches to macroeconomic policy can have quite different effects on individual industries, occupational groups and regions. Therefore, while we acknowledge that the same macroeconomic goals might be reached using different policy instruments, we wish to stress that every effort should be made to assess the structural incidence of alternative macroeconomic policies. For example, macro policies A and B may appear to be equally likely to reduce unemployment in aggregate, but A may be preferred to B on the grounds that it is likely to achieve a better balanced stimulation of activity across industries and regions.



This chapter is organized as follows. In section 3.1 we set out the assumptions underlying our simulations. Then in section 3.2 we discuss the macro results, i.e., the implications of tariff increases, demand stimulation and reductions in real wage costs for aggregate imports and exports, the price level, aggregate employment and employment by broadly defined occupational groups. On the basis of section 3.2 we conclude that reductions in real wage costs are likely to be an unavoidable element in macroeconomic recovery. Thus in section 3.3 we are led to address various issues concerning the implementation of reductions in real wage costs. In section 3.4 we turn to the industry and regional aspects of alternative macro policies. We show that a *well-balanced* stimulation of the economy would follow from an appropriate reduction in real wage costs combined with an increase in aggregate demand. Our results consequently support the view that macroeconomic recovery could be associated with significant growth in almost all industries and that many problems which may appear to be of a structural nature would be likely to disappear following recovery. Section 3.5 contains a sensitivity analysis of our results, based on running the ORANI model in *fixprice*, rather than *flexprice*, mode. Our concluding remarks are given in section 3.6.

### 3.1 ASSUMPTIONS UNDERLYING THE SIMULATIONS

It is important to understand our use of the comparative static method if confusions are to be avoided in interpreting our simulations. This is especially true in relation to our results on the effects of varying the costs of employing labour. We regard current employment demand, output levels, capacity utilization levels, etc., as being equilibrium levels at the prevailing set of real wage rates. These wages are exogenous inputs to the ORANI simulations reported here. In our view, it is reasonable to assume that the 'real wage overhang',<sup>3</sup> generated by the explosion in real wages between 1971-72 and 1974-75 has now been largely eliminated by firms shedding labour (or failing to take on additional labour where the potential for such would have existed if real wages had not risen so fast in the three years ending 1974-75). In simulating the effects of a decline in real wage costs we solve for the induced change in employment demand which would be generated after firms regain a new equilibrium reflecting the new (exogenous) real labour costs. Similarly, our simulations of the effects of changes in protection and changes in aggregate demand refer to the induced changes in *equilibrium* levels of employment demand, industry output, etc.

The more important assumptions underlying the simulations are as follows.

- (i) The labour market is slack: there are no shortages of labour at the going wage rates.

- (ii) Except in the case of our simulation of a cut in real wages, labour costs inflate at the same rate as the Consumer Price Index (100 per cent wage indexation). Occupational wage relativities do not change in any simulation.
- (iii) The balance of trade adjusts to reflect changes in the international competitiveness of import-competing and exporting industries.
- (iv) The exchange rate is fixed. Changes in the domestic price level are therefore to be interpreted as changes in domestic prices relative to world prices.<sup>4</sup>
- (v) Except in the simulation of an expansion of aggregate demand, real domestic absorption and its major components (household consumption, private investment and government spending) are stabilized at their initial values; that is, the simulated policy initiatives are taken in an environment where the simultaneous application of fiscal and monetary instruments assures that these initiatives have no net impact on aggregate demand.
- (vi) The time allowed in our projections for adjustment to the new set of circumstances is short enough to allow one to neglect changes in the amounts of plant and equipment in use but long enough for the investment plans of industries (as revised in the light of the policy changes under scrutiny) to affect the demands faced by capital goods producing industries. Such a period, termed 'the short run', would be of the order of one to two years.

Assumption (i) we believe realistically reflects current economic circumstances. It implies that employers are not limited by labour shortages in any occupational group, but can obtain as much labour as they desire at the going level of real wages. Except in our simulation of the effects of a cut in real wage costs, the latter are (according to assumption (ii)) constant, having been 100 per cent indexed to the CPI.<sup>5</sup> Assumption (iii) needs no further comment, while assumption (iv) reflects our view that exchange rate movements may have little effect on the balance of trade, their likely impact being mainly on the rate of inflation.<sup>6</sup> The assumption that real aggregate demand remains fixed when protection levels and/or real wages change—assumption (v)—leaves room in our story for the independent exercise of fiscal and monetary instruments (which are not modelled in ORANI). This assumption reflects our belief that economic instruments are available for influencing real absorption quite independently of changes in tariffs and real wages. Assumption (vi) is a conventional short run assumption in economic analysis. Whilst it is impossible to be very precise about the calendar time associated with the ORANI short run, it is our judgement that the sorts of results reported below could reasonably be expected to have worked themselves through one or two years after the initial stimulus is applied.

Besides the above, another significant set of assumptions should be mentioned. In our simulations these assumptions determine:

- (i) the extent to which unit costs of production increase in the short run as output is increased;
- (ii) the extent to which capital and labour can be substituted for each other in the short run;
- (iii) the extent to which the exports of our major exporting industries can respond in the short run to a tightening, or a relaxation, of their cost-price environment.

Except in the sensitivity analysis reported in section 3.5, our assumptions imply:

- (a) that the productivity of labour declines as output expands (for a typical industry, a one per cent expansion in output leading to a drop in average productivity of about one half of one per cent in real terms);<sup>7</sup>
- (b) that a one per cent increase in wage costs relative to the implicit rental earned on fixed assets leads to a decline of employment of one half of one per cent;<sup>8</sup>
- (c) that export volumes are somewhat responsive in the short run to changes in the ratio of product prices to domestic costs.<sup>9</sup>

Readers requiring further details on the background assumptions adopted here could refer to Dixon, Parmenter, Ryland and Sutton, *op. cit.*, section 19. Apart from the material in section 3.5, the current simulations have been run under precisely the same technical specifications as described in that source, although certain improvements have been made to our data and parameter files.<sup>10</sup>

### 3.2 THE MACRO RESULTS

Our first set of results is concerned with across-the-board increases in protection, the second and third simulate the effects of demand expansions; the fourth simulates a uniform reduction in all real wages; while in the fifth we consider a combination of demand expansion and wage reduction. By the latter we mean a reduction in the *per unit costs* of employing labour, not necessarily in labour income. Take-home pay can vary independently of real wages (in our sense) via changes in income and payroll taxes and in holiday and other fringe benefits. In this section, we analyse the macro projections, i.e., the material presented in Table 3.1. Consideration of the industry and regional projections is delayed until section 3.4.

#### (a) *The Macro Impact of a General Increase in Protection*

Protectionism has always been a tempting strategy during periods of economic recession. More than three decades ago Gottfried Haberler wrote:

The drift towards protectionism and autarchic policies of the past 60 or 70 years has been sharply accelerated by each depression. The movement away from free trade exhibits not only a secular trend, but also cyclical oscillations. Depressions and wars bring an outburst of protectionism—higher tariffs and other impediments to trade which are only incompletely removed during the following peace or prosperity period.<sup>11</sup>

In Australia depressed economic conditions have often led to policies of 'temporary assistance'. An example is the current widespread use of 'temporary' quantitative restrictions. Economic recessions have also been used as a rationale for delaying the reduction of tariffs and other protective devices.

It is our view that protection is at best an ineffective short run approach to employment creation and at the same time may impose significant long run social costs by inducing a misallocation of resources. Our concern here is with the comparatively short run question, i.e., employment creation. (On the long run question, i.e., the size of the welfare costs of protection, there are a variety of opinions.)<sup>12</sup>

According to the ORANI projections, a general increase in protection (under conditions of fixed real wages, fixed aggregate absorption and a fixed exchange rate) will, over one or two years, have a small negative effect on aggregate employment. In Table 3.1, column I,<sup>13</sup> we see that a 25 per cent increase in all tariffs induces a .001 per cent reduction in employment. ORANI suggests that gains in job opportunities for those occupations (especially Skilled Blue Collar—Metal and Electrical) employed intensively in heavily protected import-competing industries are more than off-set by falls in employment in other categories (especially Rural Workers).

It is not necessary to believe the exact figures in column I in order to believe their overall implication. We certainly would agree that changes in ORANI's parameter values, within the ranges consistent with existing statistical observations, could easily reverse the sign of the aggregate employment effect. We believe that it is realistic, however, to interpret the ORANI results as meaning that general changes in protection are likely to have only a small (either positive or negative) impact on aggregate employment. Although protection can save jobs in import-competing industries, it simultaneously destroys jobs in export industries and industries supplying export industries (see Table 3.2 and the analysis in section 3.4 below). Protection of import-competing industries imposes cost increases on the rest of the economy. Notice in Table 3.1, column I, that we estimate that a 25 per cent tariff increase adds 1.641 per cent to the consumer price index.<sup>14</sup> Under full wage indexation, this adds 1.641 per cent to the wage bills of all industries.<sup>15</sup> Compared with domestically oriented industries, export and export related industries

Table 3.1  
Results and Selected Data, The Macro Projections

Table <sup>b</sup>	Description	PROJECTIONS <sup>a</sup>				
		I	II	III	IV	V
		25% Tariff Increase	1% Increase in all Real Absorption	1% Increase in Real Government Expenditure	1% Cut in Real Wages	3.21% Increase in all Real Absorption plus 6.15% cut in Real Wages
$\mu$	Aggregate Employment	-.001	.577	.158	.514	5.00
$l_1$	Employment by occupation					
$l_2$	Professional White Collar	-.029	.863	.423	.339	4.86
$l_3$	Skilled White Collar	.073	.853	.224	.374	5.04
$l_4$	Semi & Unskilled White Collar	.021	.920	.170	.332	5.00
$l_5$	Skilled Blue Collar (Metal & Electrical)	.251	.469	.096	.666	5.60
$l_6$	Skilled Blue Collar (Building)	.107	1.070	.122	.100	4.05
$l_7$	Skilled Blue Collar (Other)	.189	.504	.044	.387	4.00
$l_8$	Semi & Unskilled Blue Collar	.101	.408	.106	.601	5.01
$l_9$	Rural Workers	-.986	-.693	.060	1.266	5.56
$e$	Armed Services	.000	.968	.968	.000	3.11
$m$	Aggregate Exports (foreign currency value)	-1.863	-1.899	-.087	1.357	2.25
$\Delta B$	Aggregate Imports (foreign currency value)	-1.899	1.815	.178	-.633	1.93
$\xi(3)$	Balance of Trade, Exports - Imports	.010	-.144	-.011	-.076	0.00
$\xi(2)$	Index of Consumer Prices	1.641	1.707	.056	-1.118	-1.40
$\xi$	Capital Goods Price Index	2.232	1.468	.065	-1.281	-3.16

<sup>a</sup>All projections are percentage changes with the exception of  $\Delta B$ .  $\Delta B$  has the units billions of 1968-69 Australian dollars.

<sup>b</sup>Notation used in Dixon, Parmenter, Ryland and Sutton, *op. cit.*

## Structural Adjustment and the Macroeconomy

relying on world markets are poorly placed to pass on cost increases. The cost squeeze effect on the export industries is reflected by our estimate that under the influence of the 25 per cent tariff increase, total exports fall by 1.863 per cent. It is interesting that this reduction in exports is sufficiently large for the simulated net effect of uniform increases in protection to push the balance of trade only slightly towards surplus.

### (b) The Macro Impact of Demand Stimulation

Until quite recently students were graduating from economics courses secure in the idea that macro policy was principally a matter of demand management. The Keynesian orthodoxy was that aggregate employment could be adjusted by changes in government expenditure, changes in taxation policy and variations in interest rates. The main limitation to employment creation via demand stimulation was seen to be the impact on inflation as the economy neared full employment. It was expected that shortages of particular types of labour and materials could lead to general price increases before full employment was reached in all occupations.

The experience of the seventies has shown that, in the contemporary economic environment, demand stimulation may not be a satisfactory approach to employment creation and that the supposed trade-off between employment and inflation may no longer apply.<sup>16</sup> One rarely sees a pronouncement by a Finance Minister or his advisers which does not stress the need for a cautious approach to demand expansion. With unemployment running at higher levels than at any time since the 1930s, to the pure Keynesian this emphasis on caution may seem to be misplaced.

Some of the difficulties with implementing a recovery policy based primarily on demand stimulation are illustrated by the two ORANI simulations in columns II and III of Table 3.1. Column II shows the effects of a balanced one per cent increase in aggregate real absorption, i.e., a one per cent increase in real private consumption and investment expenditure and a one per cent increase in all categories of government expenditure.<sup>17</sup> Column III gives results for a one per cent increase in real government expenditure alone.

In column II we see that, according to ORANI, general demand stimulations can be a very expensive method (in terms of inflation and balance of payments problems) of creating additional jobs. Under fixed real wages, a .577 per cent increase in employment is bought at the cost of an increase of 1.707 per cent in the consumer price index and an addition to the balance of trade deficit worth 3.9 per cent of total exports.<sup>18</sup> Obviously, if these calculations are anywhere near the truth, general demand stimulation cannot, by itself, provide a feasible approach for a return to full employment from a situation of (say) 5 per cent unemployment.

What aspects of the ORANI model are responsible for these rather pessimistic results? Our overall hypothesis about the behaviour of producers is that they will respond to an aggregate demand increase with an increase in output and employment only if the demand increase allows an improvement in their price/cost situation. With full wage indexation, prices and costs tend to move together in industries which are able to pass on cost increases. For the typical firm in such an industry there is no incentive for expanded operations. In fact, the typical firm may never 'notice' the increase in demand. Price increases for domestic goods will shift demand away from domestic producers towards imports. Thus, under full wage indexation, we can expect a major part of any increase in aggregate demand to be satisfied by imports.<sup>19</sup>

Moreover, we can expect general demand stimulation (under conditions of full wage indexation) to reduce job opportunities in those industries which are unable to pass on cost increases. The most obvious examples are the export industries whose selling prices are set on world markets. They are caught in a cost/price squeeze induced by higher money wages. In section 3.4 we give further consideration to the effects of domestic demand stimulation on the economy's industrial structure. For the present, we note that column II shows large reductions in aggregate exports and in the employment of rural workers.

A final comment on column II concerns exchange rate policy. Would it be possible to mitigate the adverse effects of demand stimulation on exports and on the balance of trade by simultaneously devaluing the currency? Chapter 4 of Dixon, Parmenter, Ryland and Sutton, *op. cit.*, contains a detailed description of an ORANI simulation of the effects of a devaluation. Very briefly, the conclusion was that a devaluation could only increase the level of employment if it induced a reduction in the real rate of payment to at least one of the factors of production. With fixed real wages, we could expect that a devaluation, superimposed on a general stimulation of demand, would merely increase the rate of inflation. The additional inflation would quickly eliminate any initial improvement on the balance of trade or any advantage offered to the traded-goods industries.

Unlike the results for a general demand stimulation (column II) the results in column III show highly favourable trade-offs between employment creation, inflation and the balance of trade. In column III we see that a one per cent real increase in all categories of government expenditure (with real private expenditure and real wages fixed) implies a .158 per cent increase in employment with little inflationary effect (.056 per cent) and only a minor deterioration in the balance of trade (about 0.3 per cent of exports).<sup>20,21</sup> On making the obvious multiplications, it might appear that with a

sufficient increase in government expenditure, we could eliminate 5 per cent unemployment at a cost of a 1.77 per cent increase in the consumer price index and a deterioration in the balance of trade worth approximately 9.5 per cent of exports.<sup>22</sup> What makes such an approach to employment creation impractical is the size of the required increase in government expenditure. It would need to be 5/.158, i.e. 31.65 per cent. Quite apart from questions about the feasibility of framing monetary and fiscal policies which would allow such massive changes in government expenditure while fixing real private expenditure and real wages, there is the question of long run resource allocation. A policy based on engaging people in public employment, not in response to demands for public services but merely from the point of view of creating jobs, can be enormously wasteful of human effort.

### (c) The Macro Impact of a Cut in Real Wages

A glance at Table 3.1, column IV, confirms that, according to the present ORANI simulations, real wages are the key to macro-economic recovery. A one per cent reduction in real wages leads to a .514 per cent increase in employment, an improvement in the balance of trade and a reduction in consumer prices.<sup>23</sup> If we were to eliminate 5 per cent unemployment by real wage cuts alone, then the required reduction would be 9.7 per cent, i.e., 5/.514. This, however, would induce an improvement on the balance of trade worth about 20 per cent of exports.<sup>24</sup> Such a movement towards balance of trade surplus would, undoubtedly, be considered unnecessary and undesirable. It could be eliminated by an overall increase in absorption. For example, if we increase absorption by 3.21 per cent and reduce real wages by 6.15 per cent, then the results in Table 3.1, column V, imply a 5 per cent increase in employment with no change on the balance of trade and a 1.40 per cent reduction in the consumer price index. Column V was derived from columns II and IV by computing:

$$\text{Column V} = 3.21 \times \text{Column II} + 6.15 \times \text{Column IV}.$$

The coefficients 3.21 and 6.15 were chosen from the two-instrument, two-target problem:

Find  $\alpha$ , the percentage change in real absorption, and  $\beta$ , the percentage reduction in real wages, to satisfy:

$$\begin{aligned} .577\alpha + .514\beta &= 5 \text{ (5 per cent increase in employment),} \\ -.144\alpha + .076\beta &= 0 \text{ (zero change on the balance of trade).} \end{aligned}$$

Alternatively, we could consider real wage cuts combined with increases in real government expenditure, holding private absorption fixed. Then the two-instrument, two-target problem becomes:

Find  $\gamma$ , the percentage change in real government expenditure, and  $\delta$ , the percentage reduction in real wages, to satisfy

$$.158\gamma + .514\delta = 5, \quad -.011\gamma + .076\delta = 0,$$

where the coefficients in these equations are read from columns III and IV of Table 3.1. In this problem, the answer is

$$\gamma = 21.5, \\ \delta = 3.1;$$

i.e., a 21.5 per cent increase in real government expenditure combined with a 3.1 per cent reduction in real wages will (in an environment where real wage cuts and variations in government expenditure are not allowed to affect real private absorption) increase employment by 5 per cent while having zero impact on the balance of trade. Compared with the previous package (3.21 per cent increase in aggregate real absorption and 6.15 per cent cut in real wages) this last package has the advantage of involving a smaller wage cut. On the other hand, it implies a very unbalanced stimulation of the economy with a disproportionate share of the additional employment being created in the public sector. The reader will certainly be able to think of other packages which, according to Table 3.1, imply a 5 per cent increase in employment without a balance of trade problem. Some of the more interesting may involve tariff cuts.<sup>25</sup> After a little experimentation, however, it becomes obvious that there is no plausible package which (a) generates a substantial well-balanced increase in employment, (b) involves no serious balance of trade problem and (c) does not involve a cut in real wages. The message from Table 3.1 is quite clear: cuts in real wages costs combined with a moderate expansion in aggregate demand offer Australia the best possibility for a non-inflationary return to full employment.

Our concluding point for this subsection concerns *causes* and *cures*. It has been argued by many writers<sup>26</sup> that increases in real wages have been an important *cause* of unemployment. For example, Professor Snape puts the case persuasively as follows:

To those who are accustomed, following Keynes, to play down the role of real wages, I pose a question. Suppose an economy is operating near full employment and for some reason (e.g., the conditions of 1973–74 Australia) real wages increase significantly ahead of growth of output per employee, and are retained at their new, higher level; what is likely to happen to employment? Unless there was a sizable economic 'surplus' in the profits earned prior to the real wage increase I find it difficult to conceive of circumstances in which one might argue that 'full' employment would continue.<sup>27</sup>

In the McCracken Report we have:

The route to sustained full employment lies in recognizing that governments cannot guarantee full employment regardless of developments in prices and wages. During the course of the great post-war expansion, those responsible for price-setting and wage-bargaining increasingly behaved as if there was no way in which they could price themselves out of markets or jobs. The 1974–75 recession has been a painful revelation, . . .<sup>28</sup>

However, even if Australia's unemployment has not been caused by excessive increases in real wages,<sup>29</sup> to cure the problem it may nevertheless be necessary to reduce real wages. It is easy to make a long list of reasons why the full-employment level of real wages for some (or all) groups of workers may, at times, fall. Among the reasons which might be relevant in Australia today are:

- (i) adverse movements in the terms of trade, including the adverse effects on Australian industries of protectionism overseas;
- (ii) demographic and social factors causing an acceleration in the growth of the workforce relative to the economy's capital stock;
- (iii) a slow down in the rate of investment (and growth of capital) associated with reduced confidence concerning the future political, social and economic environment;
- (iv) deterioration in industrial relations;
- (v) increased costs of hiring and firing and increased costs of worker benefits (holiday pay, worker compensation for injury, etc.).

Of course, policies aimed at increasing business confidence, at improving industrial relations and at persuading Australia's trading partners to be less protectionist could all play a useful role in improving the employment situation while limiting the required reduction in real wages. Our view, however, is that increased flexibility in the overall level of real wages and of wage relativities will be necessary for improved employment performance. In summary, we quote from Corden:

'Real wages are important for unemployment.'<sup>30</sup>

### 3.3 THE IMPLEMENTATION OF MACROECONOMIC RECOVERY

Is our emphasis on real wages misplaced? What about the often repeated argument that cuts in real wage income would have disastrous consequences on economic activity as a result of the severe contraction of demand that it is alleged would follow? It seems to us that this argument is wrong for several reasons:

- (i) It ignores the effects of reduced real wages on profits and the consequent implications for investment demand and consumption expenditure by profit earners.

- (ii) It ignores the impact on consumer demand of the earnings of those who, being initially unemployed, can find a job at a lower real wage.
- (iii) It ignores the impact of increased aggregate employment and reduced inflation on the average propensity to consume. Over the seventies, households spent a significantly reduced share of their disposable income—whereas the average savings ratio for the four years ending June 1972 was 9.1 per cent, in the four years ending June 1976 the corresponding figure was 15.3 per cent. Why, in view of the rapid depreciation in the real value of money, did households choose to save more? Detailed research at the household level has not been done in Australia on this (or virtually any other) question relating to the motivation behind consumers' actions. However, two factors likely to be important in the explanation can be identified. First, the accelerated inflation of the 1970s led to large reductions in the real value of the stock of households' savings. In an attempt to mitigate this decline households apparently chose to save a larger proportion of current income. To consider but a single category of savers, namely, those attempting to bridge the deposit gap on the purchase of a first home, accelerated saving was clearly a necessity if their goal were not to be abandoned. Second, the high inflation was accompanied by a much higher risk of unemployment. Households' savings are used partly to tide workers and their dependants over periods of lay-off. Given that this risk became higher in the mid-seventies, households had an additional reason for saving. If these arguments are accepted, then it follows that a reduction in unemployment and inflation, via a reduction in real wages, could stimulate aggregate household expenditure by reducing the average propensity to save. It also follows that the standard of living need not fall, even of those who are employed before the reduction in real wages. (It is clear that the standard of living of formerly unemployed people who find a job at the lower real wage will be raised.) An improved macroeconomic situation allows households to maintain a given level of consumption on a reduced level of real income.
- (iv) Most importantly, the argument ignores the fact that governments have freedom to manipulate aggregate demand independently of real wage rates. As Professor Gruen puts it: 'Aggregate demand is subject to control through other instruments: in particular fiscal and monetary policy. These can operate much more directly on aggregate demand than wage policy'.<sup>31</sup> The same point is made by Professor Corden: 'It must be remembered that fiscal and monetary policies can make aggregate demand whatever the government wants it to be, allowing for time lags'.<sup>32</sup>

If the time lags mentioned by Corden are a problem, then governments can adjust payroll and income taxes so that real take-

home pay is unaltered while the real costs of employing labour are reduced. That is, the government should aim to reduce the real costs of employing labour (a critical variable in determining how much labour will be employed) while simultaneously maintaining the real level of household expenditure (a critical component of aggregate demand). Of course, care must be taken not to aggravate the government's budget deficit. If it were necessary to compensate households for a sharp reduction in real wages by a large reduction in income tax, then the government could be faced with an unmanageable budget deficit. Whatever benefit might flow from the reduction in real wages could then be lost through inflationary devaluations triggered by the response of international capital flows. As seen by the authors of the McCracken Report, the problem is that:

Difficulties arise when although the deficit is not excessive in the prevailing circumstances, financial markets and public opinion in general associate a large deficit with the likelihood that inflation will re-accelerate later on. In this case, the authorities may be faced by the extremely uncomfortable dilemma that either the deficit is too small to support a sustained recovery, or it is too large to be financed in ways which will not tend to rekindle inflation once the recovery gets under way.<sup>33</sup>

This suggests that there are no soft options. The safest way to implement our package (reduced real wage costs and increased absorption) is to work on real wages first. There must be an initial small reduction in real wage costs, say 3 per cent or about half of what might be the eventually required reduction. This reduction must represent (and be seen by employers to represent) a genuine reduction in the real costs of employing labour. It must not be eroded by increased non-wage elements (workers compensation, payroll taxes, etc.).<sup>34</sup>

Our expectation is that if there were a significant reduction in the real costs of employing labour, then the second part of our package (i.e., the increase in aggregate demand) would not provide a difficult policy problem. In fact, for the reasons outlined above (i.e., the effects of cuts in real wages on profits and investment, the effects on the income of the formerly unemployed and the effects on household savings behaviour) little explicit stimulatory action may be required. However, in the last section we argued that reductions in real wages would move the balance of payments towards surplus. As the surplus appeared, a favourable situation would develop for government initiatives of the Keynesian type (e.g., cuts in income tax, increases in government expenditure, etc.) if needed.

Two final points should be emphasized. First, we would not support an immediate attempt to reduce real wages by the full 6.15 per cent indicated by our package. We would prefer a smaller

reduction, say 3 per cent. Although we have argued that cuts in real wages, even in the absence of stimulatory government action, may increase aggregate demand, there can be no certainty on this point. By starting with only a small reduction in real wages, we can limit the size of any budgetary problems which might be associated with maintaining aggregate demand. When employers have had time to take advantage of the initial wage cut, then further wage cuts could be introduced if required. With luck, however, further wage cuts would not be required. We expect that the improved economic conditions associated with an initial cut would increase business confidence and accelerate the rate of accumulation of capital. If that happened, then there would be an increase in the level of real wages which was consistent with full employment, thus limiting the required reduction in the *actual* level of real wages.

The second point concerns wage relativities. For good humanitarian reasons, policy makers, if convinced that wage cuts are required, might be tempted to introduce them at the top. For example, the policy of 'plateau indexation' seems to be motivated by 'an admirable philosophy of egalitarianism. But who benefits? The unskilled and the young people that actually keep their jobs are made more equal with the skilled and with adults. But what about the unemployed?'<sup>35</sup> The point is that by cutting real wages we are attempting to increase employment. For this purpose it does not make sense to concentrate the wage cuts on the strongest part of the labour market. Questions of income distribution and equity are best handled by tax-transfer policy, not by policies which interfere with the *relative costs* of employing different categories of labour.

#### 3.4 THE INDUSTRY AND REGIONAL IMPLICATIONS OF ALTERNATIVE MACRO POLICIES

Tables 3.2 and 3.3 extend the results from columns I, II, IV and V in Table 3.1. They show respectively the industry and regional implications of a 25 per cent increase in all tariffs, of a one per cent increase in aggregate real absorption, of a one per cent cut in real wages and of our package; i.e., a 6.15 per cent reduction in all real wages combined with a 3.21 per cent increase in real aggregate absorption.

Probably the most interesting results are those for our macro package. These can be interpreted as referring to the changes in employment and rates of return which would be associated with a macroeconomic recovery, i.e., a situation in which aggregate employment increased by 5 per cent, the balance of trade remained unaltered and the rate of inflation declined. According to Tables 3.2 and 3.3, the restoration of macroeconomic health via our package would increase rates of return on fixed capital in all but six industries, increase employment in every industry and have a uniformly

stimulatory effect across the States. Thus the results support the theme developed in Chapter 2 (especially section 2.1): that many of the problems which might appear to be specific to particular industries and regions are in reality associated with the generally unsatisfactory state of the macroeconomy and that the best form of assistance to ailing industries in Australia's present circumstances would consist of macro rather than micro policy initiatives.

Our emphasis on macro policy is further supported by the industry and regional results for a 25 per cent tariff increase. Micro policy instruments, such as tariffs, tend to relocate structural adjustment problems rather than eliminate them. According to ORANI, a 25 per cent tariff increase (under the assumptions outlined in section 3.1) would reduce rates of return in 73 out of the 109 input-output industries while employment opportunities would fall in 40 industries and in three of the States. The most adversely affected sectors would be the major export industries and export supplying industries, e.g., the agricultural industries (industries 1–6), fishing (9), the mining industries (10–12), the export-oriented food processing industries (15 and 22), the mineral processing industries (60 and 61) and the Agricultural Machinery industry (73). For each of these industries, a 25 per cent across-the-board tariff increase is projected to cause a substantial reduction in employment and to impose at least a 5 per cent reduction in the rate of return. In addition to the export-related industries, some lightly protected and non-traded industries also fare poorly under an across-the-board tariff increase. Examples are the food processing industries (16–20, 23, 24), Newspapers and Books (44), Soap and Other Detergents (50), the construction related industries (55–59, 84, 85) and the service industries (86–97, 99, 106–108).<sup>36</sup> As would be expected, the beneficiaries from the tariff increase are those import-competing industries which enjoy high levels of protection in the base period. The tariff increase improves their competitive position vis-à-vis imports and generates import replacement. The textile and footwear industries (28–36), the chemical industries (47–49, 51, 52), the Motor Vehicles and Parts industry (65), the electrical goods industries (70–72) and the miscellaneous group (74–80) are all projected to experience increases in both employment and rates of return. Each of these industries either faces relatively severe import competition as indicated by the import share in its domestic market, or has a high base year level of protection. The regional results (Table 3.3) reflect the industry results. Western Australia and Queensland, whose economies are relatively export oriented, are the major losers from a tariff increase, while Victoria, the home for much of Australia's import-competing industry, is the major winner. In short, ORANI highlights the divisiveness of tariff increases. They help one part of the community at the expense of the rest.



Table 3.2

The Effects of Alternative Macro Policies at the Industry Level\*

Industry		Industry Description	25% Tariff Increase <sup>a</sup>		1% Increase in all Real Absorption <sup>d</sup>		1% Cut in Real Wages <sup>e</sup>		Macro Package <sup>f</sup>	
ORANI No.	ABS 10 Code		Emp. <sup>b</sup>	RoR <sup>c</sup>	Emp.	RoR	Emp.	RoR	Emp.	RoR
1	01.01	Sheep	-1.7	-6.8	-1.7	-5.1	1.9	4.6	5.9	11.8
2	01.02	Cereal Grains	-2.0	-6.7	-1.9	-5.3	1.9	4.4	5.5	10.0
3	01.03	Meat Cattle	-2.6	-9.7	-2.5	-7.7	2.7	7.5	8.9	21.7
4	01.04	Milk Cattle and Pigs	-2.1	-8.9	-2.0	-6.7	2.4	6.9	8.1	20.9
5	01.05	Poultry	-1.2	-6.3	-1.0	-3.6	1.2	3.1	4.1	7.4
6	01.06	Other Farming	-1.5	-5.4	-1.7	-5.1	2.4	6.5	9.4	23.4
7	02.00	Services to Agriculture	-3	-2.2	-4	-8	5	2	1.8	-1.5
8	03.00	Forestry and Logging	-2	-2.8	-1	1.2	1.2	4.4	8.0	31.0
9	04.00	Fishing, Trapping, Hunting	-2.6	-16.7	-2.4	-13.1	2.4	11.8	7.2	30.1
10	11.01	Iron	-1.7	-6.9	-1.6	-5.0	1.7	4.4	5.4	10.9
11	11.02	Other Metallic Minerals	-2.9	-11.3	-2.9	-9.2	2.9	8.5	8.9	22.8
12	12.00	Coal and Crude Petroleum	-3.9	-15.1	-3.8	-12.3	4.1	12.2	12.9	36.0
13	14.00	Non-metallic Minerals n.e.c.	-4	-2.8	1.1	4.2	6	5	7.1	16.5
14	16.00	Services to Mining	-3	-2.9	8	3.5	3	-1.0	4.1	5.4
15	21.01	Meat Products	-1.0	-6.9	-9	-3.3	9	2.1	2.9	2.3
16	21.02	Milk Products	1	-2.0	2	1.7	0	-2.4	5	-9.1
17	21.03	Fruit and Vegetable Products	2	-1.3	6	3.8	1	-2.1	2.3	-6
18	21.04	Margarine, Oils and Fats	6	-1	2	1.9	5	0	3.9	6.2
19	21.05	Flour and Cereal Products	-1	-2.7	1	1.2	2	-1.3	1.5	-4.5
20	21.06	Bread, Cakes and Biscuits	0	-2.3	2	1.9	1	-2.1	1.0	-6.6
21	21.07	Confectionery Products	1.1	2.6	4	2.7	3	-1.0	3.1	2.8
22	21.08	Food Products n.e.c.	-3.8	-20.7	-3.1	-13.6	2.7	10.4	6.7	20.1
23	21.09	Soft Drinks, Cordials etc.	1	-1.9	8	4.8	1	-2.0	3.1	3.2
24	21.10	Beer and Malt	5	-2	1.8	6.0	-1	-1.9	4.9	7.5
25	21.11	Alcoholic Beverages n.e.c.	3.5	9.0	6	2.5	4	-1	4.8	7.2
26	22.01	Tobacco Products	2	-1.2	1.3	5.6	-2	-2.6	2.9	1.9
27	23.01	Prepared Fibres	-1	-2.7	-8	-2.9	9	2.1	3.1	3.3
28	23.02	Man-made Fibres, Yarns etc	4.1	17.4	-1.3	-5.1	1.9	6.6	7.5	24.4

29	23.03	Cotton, Silk, Flax Yarns etc.	4.5	19.4	-7	-2.7	1.4	4.5	6.4	19.2
30	23.04	Wool and Worsted Yarns etc.	8	1.9	4	2.6	3	-8	3.1	3.6
31	23.05	Textile Finishing	9	2.5	5	3.3	3	-6	3.8	7.1
32	23.06	Textile Floor Covering	8	1.4	13	5.8	6	4	7.8	21.2
33	23.07	Textile Products n.e.c.	1.3	3.1	2	1.2	1.0	1.7	6.7	14.2
34	24.01	Knitting Mills	8	1.9	3	2.2	3	-1.0	2.5	8
35	24.02	Clothing	9	2.4	2	1.3	3	-5	2.4	1.0
36	24.03	Footwear	3.0	8.9	-2	-2	7	-5	3.7	4.9
37	25.01	Sawmill Products	4	-6	5	3.0	7	8	5.8	15.0
38	25.02	Plywood, Veneers and Boards	1.2	2.2	9	3.4	5	-1	5.8	10.6
39	25.03	Joinery and Wood Products	3	-4	1.2	4.2	1	-1.0	4.7	7.4
40	25.04	Furniture, Mattresses, Brooms	4	2	2.1	6.7	1	-9	7.5	16.2
41	26.01	Pulp, Paper and Paperboard	8	1.1	-1	5	1.0	1.9	6.2	13.4
42	26.02	Fibreboard, Paper Containers	5	2	6	3.1	4	-2	4.7	8.3
43	26.03	Paper Products n.e.c.	8	1.2	1.1	4.6	5	-0	6.4	14.7
44	26.04	Newspapers and Books	-1	-1.8	8	3.7	5	2	6.0	13.2
45	26.05	Commercial and Job Printing	5	-1	8	3.7	3	-5	4.8	8.6
46	27.01	Chemical Fertilizers	-1	-3.4	-5	-1.4	6	6	2.3	-1.0
47	27.02	Industrial Chemicals n.e.c.	2.5	12.0	-8	-3.5	1.7	7.1	8.0	32.6
48	27.03	Paints, Varnishes, Lacquers	1.0	2.2	8	3.5	3	-4	4.7	9.0
49	27.04	Pharmaceutical and Chemicals	1.0	2.0	7	3.2	8	1.1	7.4	17.1
50	27.05	Soap and Other Detergents	2	-1.0	1.6	7.5	3	-1.0	6.7	18.0
51	27.06	Cosmetic, Toilet Preparations	6	5.4	1	7.2	3	-7	7.9	18.8
52	27.07	Chemical Products n.e.c.	1.3	-7	1.9	2.5	9	2.5	5.8	20.7
53	27.08	Petroleum and Coal Products	2	-1.2	2.2	13.2	5	-4	10.3	39.8
54	28.01	Glass and Glass Products	9	2.1	5	2.9	6	7	5.5	13.8
55	28.02	Clay Products	3	-8	9	3.6	4	-3	5.5	9.8
56	28.03	Cement	-3	-4.1	1.7	8.5	3	-1.0	7.4	21.1
57	28.04	Ready-mixed Concrete	0	-2.5	2.2	10.6	-2	-3.1	5.9	14.8
58	28.05	Concrete Products	-0	-2.9	1.4	7.0	-0	-2.5	4.2	7.4
59	28.06	Non-metallic Mineral Products	4	-7	1.0	5.5	4	-7	5.5	13.1
60	29.01	Basic Iron and Steel	-2.4	-15.1	-2.6	-11.7	3.0	12.6	10.2	39.5
61	29.02	Other Basic Metal Products	-3.2	-17.8	-3.3	-14.8	3.3	13.5	9.7	35.6
62	31.01	Structural Metal Products	4	-1	1.1	6.2	2	-1.6	4.5	10.3

\*Notes appear at the end of the table. All projections are percentage changes.



Table 3.2 (Continued)  
The Effects of Alternative Macro Policies at the Industry Level

Industry ORANI No.	Industry ABS 10 Code	Industry Description	25% Tariff Increase <sup>a</sup>		1% Increase in all Real Absorption <sup>d</sup>		1% Cut in Real Wages <sup>e</sup>		Macro Package <sup>f</sup>	
			Emp. <sup>b</sup>	RoR <sup>c</sup>	Emp.	RoR	Emp.	RoR	Emp.	RoR
63	31.02	Sheet Metal Products	.3	-.8	1.2	6.9	.0	-2.2	4.1	8.8
64	31.03	Metal Products n.e.c.	2.2	8.8	.5	3.1	.7	1.1	5.7	17.1
65	32.01	Motor Vehicles and Parts	4.8	20.0	-.3	-.4	1.4	4.2	7.7	24.8
66	32.02	Ship and Boat Building	.2	-.9	.7	4.6	.2	-1.4	3.3	6.1
67	32.03	Locomotives, Rolling Stock	-.3	-3.4	.3	2.4	.3	-.8	2.7	2.7
68	32.04	Aircraft Building	.4	-.4	.5	3.2	.6	1.2	5.5	17.5
69	33.01	Scientific Equipment etc.	.4	-.0	1.0	4.3	.3	-.5	5.1	11.0
70	33.02	Electronic Equipment	3.4	11.9	.7	3.8	.8	1.4	7.5	21.1
71	33.03	Household Appliances n.e.c.	.8	1.6	1.7	7.6	.1	-1.6	6.0	14.8
72	33.04	Electronic Machinery n.e.c.	1.2	3.0	.7	3.6	.5	-.0	5.2	11.6
73	33.05	Agricultural Machinery	-.8	-5.2	-.9	-3.2	1.1	2.6	3.6	5.5
74	33.06	Construction etc., Equipment	-.2	-1.1	.3	2.1	.7	.8	5.1	11.9
75	33.07	Other Machinery, Equipment	.7	1.0	.3	2.3	.6	.5	4.8	10.6
76	34.01	Leather Products	2.2	7.1	.0	.5	.6	.7	3.8	6.1
77	34.02	Rubber Products	1.1	3.5	.6	4.9	.6	.4	5.6	18.4
78	34.03	Plastic and Related Products	1.3	3.1	.6	3.3	.7	.6	5.9	13.9
79	34.04	Signs, Writing Equipment etc.	1.1	2.2	.6	3.0	.5	.1	5.3	10.5
80	34.05	Other Manufacturing	.8	1.4	1.3	5.2	.3	-.5	6.1	13.8
81	36.01	Electricity	.0	-1.8	1.2	7.9	.8	2.1	8.9	38.2
82	36.02	Gas	-.2	-.6	1.5	9.7	.4	-.5	7.2	28.1
83	37.01	Water, Sewerage and Drainage	-.0	-2.2	.7	5.1	.3	-1.2	3.8	8.8
84	41.01	Residential Buildings	.0	-1.8	1.2	4.4	-.0	-1.7	3.8	4.0
85	41.02	Building, n.e.c., Construction	.1	-1.7	1.2	4.6	-.1	-2.1	3.0	1.7
86	46.01	Wholesale Trade	-.2	-1.3	.8	2.9	.3	-.3	4.5	7.4
87	48.01	Retail Trade	-.1	-1.2	1.5	5.0	-.1	-1.4	4.5	7.4
88	48.02	Motor Vehicle Repairs	-.4	-2.1	1.4	4.9	.3	-.4	6.4	13.3
89	48.03	Other Repairs	-.2	-1.4	1.2	3.9	.3	-.4	5.4	9.9
90	51.01	Road Transport	-.5	-2.8	.1	.9	.6	-.1	4.3	6.6
91	52.01	Railway and Other Transport	-.6	-3.1	-.1	.7	.7	.7	3.5	3.9
92	53.01	Water Transport	-.4	-2.4	-.1	.2	.5	.1	2.7	1.4
93	54.01	Air Transport	-.2	-1.9	1.2	4.3	.5	.2	6.9	14.8
94	55.01	Communication	-.3	-2.5	1.1	4.0	.5	.2	6.5	14.1
95	61.01	Banking	.1	-.2	1.0	3.1	.3	-.1	5.2	9.4
96	61.02	Finance and Life Insurance	.0	-.4	1.5	4.5	.3	-.1	6.8	14.2
97	61.03	Other Insurance	.0	-.4	1.1	3.5	.3	-.1	5.7	10.9
98	61.04	Investment, Real Estate etc.	.1	-.1	1.2	3.3	.4	.3	6.4	12.6
99	61.05	Other Business Services	-.0	-.9	.9	3.0	.3	-.2	4.9	8.3
100	61.06	Ownership of Dwellings	.1	-.0	1.6	4.7	.5	.6	8.3	18.7
101	71.01	Public Administration	.0	-.9	1.0	3.7	.0	-1.3	3.3	3.8
102	72.01	Defence	.0	-.2	1.0	3.3	.0	-1.0	3.1	4.1
103	81.01	Health	.0	-.2	1.4	4.6	.3	-.1	6.1	14.0
104	82.01	Education, Libraries, etc.	.0	-.2	1.1	3.9	.1	-.8	4.2	7.7
105	83.01	Welfare Services	.0	-.8	1.1	4.1	.2	-.7	4.7	8.8
106	91.01	Entertainment	-.3	-1.6	1.4	4.5	.4	-.1	6.8	13.8
107	92.01	Restaurants, Hotels, Clubs	.0	-.7	1.4	6.5	.2	-.8	5.7	15.8
108	93.01	Personal Services	-.0	-.9	1.5	4.8	.4	-.2	7.2	14.4
109	99.01	Business Expenses	.1	.2	.6	1.7	.2	-.1	3.4	5.0

<sup>a</sup>These computations give the industry results for experiment I, Table 3.1; i.e., the 25 per cent tariff increase is imposed in an environment of fixed capital stocks, fixed exchange rate, fixed real wages and fixed aggregate absorption.

<sup>b</sup>Emp. is employment calculated in weighted labour hours. In calculating the percentage change in employment in industry j, we weight the percentage changes in employment in each occupation in industry j by their shares in j's total wage bill.

<sup>c</sup>RoR is rate of return on fixed capital, i.e. profits (after depreciation and allowance for costs of holding working capital) as a percentage of the replacement value of fixed capital.

<sup>d</sup>These computations give the industry results for experiment II, Table 3.1; i.e., the 1 per cent increase in absorption is imposed in an environment of fixed capital stocks, fixed exchange rate and fixed real wages.

<sup>e</sup>These computations give the industry results for experiment IV, Table 3.1; i.e., the 1 per cent real wage cut is imposed in an environment of fixed capital stocks, fixed exchange rate and fixed aggregate absorption.

<sup>f</sup>These computations give the industry results for experiment V, Table 3.1; i.e., the 3.21 per cent expansion in absorption combined with the 6.15 per cent reduction in real wages takes place in an environment of fixed capital stocks and fixed exchange rate.

Table 3.3

Employment Results at the State Level of  
Alternative Macro Policies<sup>a</sup>

Region	25% Tariff Increase <sup>b</sup>	1% Increase in all Real Absorption <sup>b</sup>	1% Cut in Real Wages <sup>b</sup>	Macro Package <sup>b</sup>
NSW (incl. ACT)	.06	.75	.43	5.06
Vic.	.53	.78	.38	4.82
Qld	-.70	.25	.76	5.48
SA (incl. NT)	.25	.75	.40	4.87
WA	-.60	.42	.56	4.79
Tas.	-.22	.53	.53	4.92
Australia <sup>c</sup>	.05	.66	.47	4.97

<sup>a</sup>All projections are in percentage changes. The State results were derived from the national results by applying the method described in Peter B. Dixon, B. R. Parmenter and John Sutton, 'Spatial Disaggregation of ORANI Results: A Regional Balance Method', *IMPACT Preliminary Working Paper* No. OP-19, Industries Assistance Commission, Melbourne, February 1978 (forthcoming in *Economic Analysis and Policy*). In terms of that paper, the computations reported here were made with  $\gamma = 1$ , i.e., the computations take into account both variations across the States in the industrial composition of their economic activity and the multiplier effects arising from the relationship between State incomes and the level of State consumption.

<sup>b</sup>As in Table 3.2, these computations extend the results for experiments I, II, IV and V of Table 3.1 (see notes <sup>a</sup>, <sup>d</sup>, <sup>e</sup> and <sup>f</sup> at the end of Table 3.2).

<sup>c</sup>There are minor differences between the results in the last line of this table and those for experiments I, II, IV and V in the first line of Table 3.1. Different weighting schemes were used in the two tables to compute the percentage change in aggregate employment from the percentage changes in occupational employment.

In one respect the industry and regional results for a one per cent increase in real aggregate absorption are similar to those for the tariff simulation. The export-related industries (1-6, 9-12, 15, 22, 27, 60, 61, 73) are all losers. To the export industries, the domestic demand situation is relatively unimportant. For them, the aspect of the domestic economy which really matters is the cost situation. Under both the 25 per cent tariff increase and the one per cent expansion in aggregate demand the projected increase in domestic costs is about the same (1.641 per cent and 1.707 per cent—see Table 3.1). Consequently, according to ORANI, the implications for the export industries of a 25 per cent tariff increase and of a one per cent increase in aggregate demand are almost identical. On the other hand, the implications for some of the import-competing industries are quite different. Whereas the textile and footwear industries (28,

29, 36), Industrial Chemicals n.e.c. (47) and the Motor Vehicles and Parts industry (65) were among the winners under a tariff increase, they join the losers under an increase in aggregate demand. For these industries the benefits of a general demand increase are more than off-set by the deterioration (because of domestic cost increases) in their competitive position vis-a-vis imports. The main winners from an increase in aggregate demand are the service industries and other industries facing little import competition (e.g., Beer and Malt (24) and the construction-related industries (55-59)). A second group of industries which does well consists of those supplying commodities for which household expenditure elasticities are high (for example, household durables such as Textile Floor Coverings (32), Furniture, etc. (40) and Household Appliances, n.e.c. (71)).<sup>37</sup> Turning to the regional results we see that ORANI implies that Keynesian demand stimulation generates employment in all states. However, the export-oriented states, Western Australia and Queensland, benefit the least.

In comparison with the effects of demand stimulation and increases in protection, ORANI projects that very few industries would reduce their workforces under a general cut in real wage costs. Small reductions are shown for Milk Products (16), Beer and Malt (24), Tobacco Products (26), Ready-mixed Concrete (57), Concrete Products (58), the construction industries (84, 85) and Retail Trade (87). The unfavourable result for Milk Products reflects the industry's reliance on inputs from the agricultural sector. Under a real wage cut, the prices of all commodities tend to be less than they otherwise would have been. However, for export industries (including agriculture) the price reductions are minimal. Thus, non-export industries with heavy inputs from export industries are comparatively poorly placed. (The maintenance of export prices, combined with reductions in domestic costs, also explains the strong performance of the export industries, particularly industries 1-6, 9-12, 22, 60, 61). For Beer and Malt (24) and Tobacco Products (26) the explanation for the small reductions in employment is found in ORANI's treatment of commodity taxes. Both industries are subject to high sales taxes. In the current specification of the model these taxes are treated as specific (rather than *ad valorem*). Therefore, according to ORANI, there is an increase in the real burden of sales taxes under any stimulus which generates an overall reduction in prices. For the construction-related industries (57, 58, 84, 85), the slight employment losses reflect the fixity of real aggregate investment. (It will be recalled that our simulation of the effects of real wage cuts was conducted with fixed real aggregate investment and consumption.) Because the wage cut favours the export industries, it induces a reallocation of the investment budget towards agriculture. Agricultural investment is slightly less

construction-intensive than investment in general. Thus, the construction industries are left with slightly reduced demand. For retail trade, the reduction in employment arises from the assumption of fixed real consumption. The changes in relative prices induced by the wage cut happen to cause a reallocation of the consumer budget away from retail-intensive commodities.

Apart from the export-related industries, the other main winners from a real wage cut are the import competitors. Reductions in domestic costs are particularly valuable for these industries<sup>38</sup> because they generate import replacement demand. However, a glance at the regional results confirms that the effects on the export industries are dominant. The exporting States, Queensland and Western Australia, receive the biggest percentage boosts in employment, whereas the smallest gain is for Victoria, the least export-oriented State.

Before leaving the real wage simulation, it is worth commenting on the rate of return results. Perhaps surprisingly, ORANI indicates reductions in the rates of return for more than half the industries (57 out of 109). In every case, however, the reduction is small, the maximum being 3.1 per cent for Ready-mixed Concrete (57). The preponderance of small negatives in the projected changes in rates of return highlights the idea that owners of capital do not necessarily benefit from a reduction in real wages. In those industries which have little connection with international trade, cost reductions under conditions of fixed aggregate demand generate matching price reductions. To the extent that the non-trading industries use traded inputs, there can be a squeeze on their profits and a reduction in their rates of return. As was emphasized above, ORANI projects a large impact on the balance of trade from a reduction in real wages. The reason is now clear: the industries with the most to gain from real wage cuts are the traded goods industries. Their selling prices are largely independent of their buying prices for labour and intermediate inputs.

To conclude this section, we return briefly to the results for the macro package. We remarked at the beginning of our description of the industry and regional results that the macro package produces a well-balanced stimulation of the entire economy. In achieving this balance, both real wage cuts and demand stimulation play a role. Real wage cuts alone would generate a lop-sided stimulation concentrated in the traded-goods industries. Demand stimulation alone would have the opposite effect, stimulating the non-traded sector at the expense of import-competing and export industries.

### 3.5 ORANI IN CONSTANT COST MODE<sup>39</sup>

The inevitable question at the end of a study of the type reported in this chapter is how much reliance can be placed on the results.

Economic science is, unfortunately, many years away from a time when statistically derived confidence intervals can be associated with projections based on a model such as ORANI. All we can rely upon is our assessment of the plausibility of the mechanisms by which the model results are generated. As in our earlier IMPACT applications papers,<sup>40</sup> we have attempted to give readers ample opportunity to trace out what it is about the ORANI model which is primarily responsible for our conclusions. In this section we extend our description of the ORANI mechanisms with some sensitivity analysis.

A principal difficulty with sensitivity analysis is to keep it manageable. In a large model there are literally millions of seemingly sensible sensitivity questions which could be asked. Here we have chosen three very basic ones: to what extent do our conclusions depend on our assumptions

- (a) that unit costs of production increase with output in the short run due to a falling marginal productivity of labour;
- (b) that the elasticity of substitution between capital and labour is 0.5 (implying that a given capital stock can be used with varying amounts of labour depending on relative factor prices); and
- (c) that exports are somewhat elastic to changes in their cost-price environment.<sup>41</sup>

In Table 3.4 we provide some ORANI results<sup>42</sup> from the model set up so that

- (i) constant costs and zero capital-labour substitution elasticities prevail in all but the agricultural industries (for agriculture the original ORANI specification is retained), and
- (ii) export quantities and foreign currency earnings are totally insensitive to cost conditions inside Australia.

The technical specification for the simulations is given in Appendix II and could be read in conjunction with Dixon, Parmenter, Ryland and Sutton, *op. cit.*, especially section 19. Intuitively, what we have done on the production and pricing side is to modify the model so that prices for manufactured goods and services equal variable costs (materials and labour) plus a constant percentage mark-up on labour costs to cover overheads and profits.<sup>43</sup> At the same time, the quantity of labour used per unit of output has been made independent of the level of output. All output expansions are accommodated by balanced<sup>44</sup> increases in the use of labour and previously idle capital. Thus price changes for manufactured goods and services are associated only with changes in variable input prices and not with changes in output levels. On the export side, we have assumed that Australia satisfies fixed foreign demands at fixed foreign currency prices. In the background of this very rigid export

story is the assumption that the government adjusts domestic institutional arrangements (including subsidies) so that even in the face of changes in the domestic cost situation, our major export industries are willing to satisfy the given export demand at the given foreign currency price.

Table 3.4  
Macro Projections under Constant Costs,  
Zero Capital-Labour Substitution Elasticities and Fixed Exports

Variable <sup>b</sup>	Description	PROJECTIONS <sup>a</sup>		
		I	II	III
		1% Increase in all Real Absorption	1% Cut in Real Wages	4.80% Increase in all Real Absorption plus 4.17% Cut in Real Wages
$\mu$	Aggregate Employment	.806	.271	5.00
$e$	Aggregate Exports (foreign currency value)	.000	.000	0.00
$m$	Aggregate Imports (foreign currency value)	1.237	-1.423	0.00
$\Delta B$	Balance of Trade, Exports - Imports	-0.051	0.058	0.00
$\xi(3)$	Index of Consumer Prices	.504	-1.919	-5.59
$\xi(2)$	Capital Goods Price Index	.404	-2.013	-6.46

<sup>a</sup>All projections are percentage changes with the exception of  $\Delta B$ .  $\Delta B$  has the units billions of 1968-69 Australian dollars.

<sup>b</sup>Notation used in Dixon, Parmenter, Ryland and Sutton, *op. cit.*

The striking feature of Table 3.4 is that despite these radical departures from the conditions underlying our earlier simulations, the general macro policy implications remain intact. On combining the results in column I (the impact of a one per cent increase in aggregate absorption assuming fixed real wages)<sup>45</sup> with those in column II (the impact of a one per cent reduction in real wages assuming fixed aggregate absorption), we find that a 4.80 per cent expansion in aggregate absorption together with a 4.17 per cent reduction in real costs per unit of labour would generate a non-inflationary 5 per cent increase in aggregate employment with no deterioration in the balance of trade. This compares quite closely with our earlier package of a 3.21 per cent increase in aggregate absorption combined with a 6.15 per cent reduction in real costs per unit of labour.

Not surprisingly, column I of Table 3.4 is a more favourable picture of the effects of demand expansion than the corresponding column (II) in Table 3.1. Also, not surprisingly, Table 3.4, column

II, gives a less favourable picture of the effects of real wage cuts than does column IV of Table 3.1. Under the assumptions of constant costs in the non-agricultural industries and fixed exports, a one per cent increase in aggregate absorption generates more employment, less inflation and less deterioration on the balance of trade than was the case in our earlier simulation. Some inflation and deterioration on the balance of trade remains. Because of diminishing returns, agricultural output expansions lead to price increases which become generalized throughout the economy via their impact on money wages. Thus we have substitution in favour of imports. In addition, import demand is stimulated because of domestic output expansion. When we turn to the real wage cut simulation we find that a one per cent reduction in all real wages generates less employment and leads to a smaller improvement in the balance of trade than was the case in column IV of Table 3.1. In Table 3.4, substitution of labour for capital is limited to the agricultural industries and no increase in exports is allowed. This leaves import replacement as the main mechanism by which wage cuts increase employment. According to Table 3.4, a one per cent reduction in real wages gives domestic import-competing industries sufficient competitive edge to cause a fall in imports of 1.423 per cent.

In summary, the comparative insensitivity of our macro package (i.e., the demand expansion and wage reduction required to generate a 5 per cent increase in aggregate labour demand without a deterioration in the balance of trade) with respect to the three major changes in the simulation specification is explained as follows. Compared with the original specification, under the specification used in this section demand expansion is projected to be less harmful to the balance of trade. On the other hand, in view of the fixity of exports, wage cuts are projected to be less effective in improving the balance of trade. Thus, while any given demand increase produces less deterioration on the balance of trade, any given deterioration on the balance of trade requires a greater wage cut for its elimination.

In conclusion, it appears that a favourable set of conditions for a predominantly demand-stimulatory approach to macroeconomic recovery would occur if

- industries typically exhibited constant costs (or horizontal supply curves) even in the short run, and
- export volumes and earnings were sensitive to the domestic cost situation.

Of course, at least a minimal element of cost reduction remains a prerequisite to macroeconomic recovery with balanced trade. However, circumstances (a) and (b) would allow demand and employment expansions with only minor inflationary effects. Flexibility in exports would limit the real cost reductions required on

account of the balance of trade. By contrast, if either exports are insensitive to domestic costs or if domestic producers typically have upward sloping supply curves, then real cost reductions are likely to be at the heart of macroeconomic recovery.

### 3.6 CONCLUDING REMARKS

In this chapter we have used the ORANI model to assist in a discussion of the industry and regional implications of a macroeconomic recovery. We have found that if macroeconomic recovery were secured via reductions in real wage costs combined with a moderate expansion in aggregate demand, then we could expect a substantial increase in employment in all industries and all states. This led us to conclude that many of the problems which appear to be special to particular industries are in fact related to the unsatisfactory functioning of the macroeconomy.

We have tried not to underestimate the difficulties involved in implementing macroeconomic recovery. In section 3.3 we emphasized that the hard part, the reduction in real wage costs, must come first. As real wage costs are reduced, we would expect the balance of payments to improve. This would allow the government freedom to pursue expansionary monetary and fiscal policy as required. In summary, our views are both optimistic and pessimistic. We are optimistic in that we completely reject the often expressed view that high unemployment is necessarily with us to stay. We believe that macroeconomic recovery could be achieved in a comparatively short time. On the other hand, we are pessimistic in that we can see no easy options. In particular, we believe that protectionism will offer no relief from Australia's current economic ills—it will do little except redistribute unemployment and intensify the rate of inflation. Similarly, general expansions in aggregate demand, in the absence of reductions in real costs, are likely to be merely inflationary. Without reductions in real wage costs, macroeconomic recovery will be left to chance. It will depend on a significant improvement in Australia's terms of trade, a dramatic autonomous improvement in investor confidence or some other lucky event which raises the anticipated value of employing additional labour. If we are to ensure continuous prosperity for the entire community, we must allow flexibility in real wage costs. This means flexibility in both directions in the overall wage level, flexibility in relativities between occupations and flexibility in the relativities between regions.

## Chapter 4

### LIKELY INCIDENCE OF SOME PRESSURES FOR STRUCTURAL CHANGE

Our focus in this chapter is on prospective developments in the Australian economy through to the mid- and late 1980s. In this context we examine two genuine structural pressures, that is, two forces for change in the composition of the economy which will continue to operate after the restoration of macroeconomic health. The particular structural pressures examined were chosen from the list given in Chapter 1 because both were judged to have potentially large effects over the next decade, and because sufficient quantitative information exists about them to allow projections to be made. The forces in question are changes in international demands for and supplies of commodities of importance to Australia as a trading nation, and a further expansion of Australian mining activity—another 'mining boom' for short.<sup>1</sup>

#### 4.1 ASSUMPTIONS ABOUT INTERNATIONAL TRENDS IN COMMODITY PRICES

Since Australia is a nation rather heavily involved in international trade, with exports amounting typically to about 16 per cent of gross domestic product (GDP) in recent years, overseas economic pressures are quantitatively important for the management of the Australian economy. The IMPACT models, however, make no claim to coverage of the world economy. For projection purposes, therefore, we need independent assessments of likely overseas developments which affect demands, supplies, and prices of internationally tradeable commodities. In the case of the projections reported in this chapter, we have relied heavily on a specially commissioned study by Professor J. W. Freebairn.<sup>2</sup> Professor Freebairn, in turn, has made good use of work undertaken overseas, including a recent study for the U.N. by Professor Leontief and others.<sup>3</sup> Neither Professor Freebairn nor the present authors, however, would want to claim too much for the projections. The state of the art does not yet allow (perhaps will never allow) accurate forecasting of the net effects of the multitude of economic forces operating in the global economy. Even where the direction and general orders of magnitude of prospective changes can be foreseen, their timing will be problematical.

The price of oil is a good example of the difficulties faced by those devising projections. In an earlier set of projections,<sup>4</sup> we extrapolated in a straightforward manner from the experience in energy prices over the period 1968–74. This included the major rise in the price of oil following the formation of OPEC. As a result of accepting a continuation of the strong upward trend in oil prices, in that earlier study it was assumed that the price of oil would treble during the decade to 1985–86, whereas commodity prices in general were assumed only to double.<sup>5</sup> For the purposes of the current projections, however, we have accepted the view that OPEC cannot hope for further sustained rises in the relative price of oil. The basic argument is that the more influential members of the oil cartel, and in particular Saudi Arabia, are inclined to the view that in the long run, further rises in the real price of oil would not be in the interests of the oil-producing nations. Already some technological accommodation towards substitute fuels has taken place, and major research on new energy sources is under way. Our projections are based on the assumption that further rises in the price of oil are only at the same rate as the general level of commodity prices. Given the inevitably tenuous nature of the economic and political considerations underlying this projection, it would be important for policy makers to examine several alternative projections based on different oil price scenarios, and to update these projections frequently. Similar considerations would apply to many other potential changes originating overseas. Subject to the availability of staff, such projections can be produced routinely by IMPACT, but for reasons of space further projections are not presented here.

The price scenarios upon which the projections are based are shown in Table 4.1. The small country assumption is adopted with respect to imports—i.e., world prices are not affected by the Australian level of demand. In the case of Australia's traditional exports, however, Australian output is allowed to affect world prices. Australia's major export industries are listed in Table 4.3. In the case of these commodities, the price projections given in Table 4.1 reflect what would happen to world prices in the absence of an expansion or contraction in Australian exports. Our assumptions concerning the export demand elasticities which determine the response of world prices to Australian exports are listed in Table 4.3.

As in our earlier set of projections,<sup>6</sup> the prices assumed to rise most slowly are those of machinery, equipment and appliances. This group includes automobiles. Our assumptions reflect the long-term history of these prices which have fallen relative to most commodities due, in part, to the scope for technological innovation and capital-intensive production techniques. The next slowest-to-rise prices under our assumptions are those of products exported by less developed countries (LDCs). Our list of such products has been

Table 4.1

Assumptions concerning Rates of Growth in World Commodity Prices, 1977-78 to 1984-85

Description of Commodities/Industry	Price Group Number	Projected Additional Inflation in Commodity Price relative to slowest Growing Group (Grp 11) (per cent per annum)
<i>Mainly Agricultural Exports</i>		
21.01 Meat Products	1	5.2
34.01 Leather Products	2	5.0
01.01 Sheep (wool)	3	4.8
04.00 Fishing, Trapping, Hunting		
<i>Mainly Advanced Country Exports other than Machinery, etc.<sup>a</sup></i>	4	4.3
<i>Milk Products</i>		
21.02 Milk Products	5	4.0
<i>Certain Foods, Drink &amp; Tobacco</i>		
21.04 Margarine, Oils & Fats	6	3.8
21.06 Bread, Cakes & Biscuits		
21.11 Alcoholic Beverages, n.e.c.		
22.01 Tobacco Products		
<i>Non-Energy Minerals</i>		
11.01 Iron	7	3.4
11.02 Other Metallic Minerals		
14.00 Non-Metallic Minerals, n.e.c.		
<i>Miscellaneous Group<sup>a,b</sup></i>	8	2.8
<i>Sugar and Related Products</i>		
21.07 Confectionery	9	2.7
21.08 Food Products, n.e.c.		
<i>Mainly LDC Exports and Prospective Exports<sup>a</sup></i>	10	2.6
<i>Machinery, Equipment &amp; Appliances<sup>a</sup></i>	11	0

Sources:

J. W. Freebairn, *op. cit.* and Dixon, Harrower and Powell, *op. cit.*

<sup>a</sup>For key to composition of these groups, see Table 4.2.

<sup>b</sup>The overall world commodity price level is assumed to inflate at the same rate as this group.

expanded to include steel (29.01 Basic Iron and Steel) and most metal products which are not highly fabricated. This treatment of these products is somewhat speculative, but reflects developments expected over the next decade. The LDC group prices are assumed to rise 2.6 per cent per annum faster than the machinery group.



Table 4.2

Key to Commodity Groups used for Price Projections

Price Group		Input-Output Commodity Groups Included <sup>a</sup>	
No.	Description		
4	Mainly Advanced	23.01 Prepared Fibres	23.02 Man-made Fibres, Yarns, etc.
	Country Exports	26.01 Pulp, Paper & Paperboard	26.02 Fibreboard, Paper Containers
	other than	26.04 Newspapers & Books	26.05 Commercial & Job Printing
	Machinery, etc.	27.02 Industrial Chemicals, n.e.c.	27.03 Paints, Varnishes, Lacquers
		27.05 Soap & Other Detergents	27.06 Cosmetic, Toilet Preparations
		34.04 Signs, Writing Equipment etc.	
8	Miscellaneous	01.02 Cereal Grains	01.04 Milk Cattle and Pigs
	Group	01.06 Other Farming	03.00 Forestry and Logging
		21.03 Fruit & Vegetable Products	21.05 Flour & Cereal Products
		21.10 Beer & Malt	27.08 Petroleum & Coal Products
10	Mainly LDC	23.03 Cotton, Silk, Flax Yarns, etc	23.05 Textile Finishing
	Exports &	23.07 Textile Products, n.e.c.	24.01 Knitting Mills
	Prospective	24.03 Footwear	25.01 Sawmill Products
	Exports	25.03 Joinery & Wood Products	25.04 Furniture, Mattresses, Brooms
		28.02 Clay Products	28.03 Cement
		29.01 Basic Iron & Steel	29.02 Other Basic Metal Products
		31.02 Sheet Metal Products	31.03 Metal Products, n.e.c.
		34.03 Plastic & Related Products	34.05 Other Manufacturing
11	Machinery,	32.01 Motor Vehicles & Parts	32.02 Ship & Boat Building
	Equipment &	32.04 Aircraft Building	33.01 Scientific Equipment etc.
	Appliances	33.03 Household Appliances, n.e.c.	33.04 Electrical Machinery, n.e.c.
		33.06 Construction, etc., Equipment	Other Machinery, Equipment

balance of trade deficit which is financed by a 'free' gift of foreign exchange representing the export receipts from the new mineral exports. By contrast with Gregory's analysis, our simulations allow an increase in domestic absorption (i.e., consumption plus investment plus government expenditure) to be generated by the mining boom. That is, we make allowance for the income effects of the newly exploited mineral wealth as well as for the relative price effects stressed by Gregory. The new export income induces increases in domestic absorption combined with domestic inflation and/or exchange rate appreciations which are sufficient to ensure that the additional foreign currency is absorbed by reductions in traditional exports and by increases in imports. It is important to note that traditional mining exports, as well as other exports, will be curtailed by these processes. Our simulations show only these 'adjustment' effects on the mining industries. As indicated above, the direct effects on the mining industries of increased export potential are not explicitly modelled.

We have previously concluded that the mining boom of the late 1960s and early 1970s was worth about 15 per cent of total export earnings or about \$A0.5 billion in 1968/69 prices.<sup>10</sup> Our projections assume a new mining boom of similar proportions. Explicitly, we assume that additional mineral exports develop over a period of five years, yielding at the end of that time a further annual addition to foreign exchange receipts of \$A0.5 billion (1968/69 prices).

#### 4.3 PROJECTION METHOD

In earlier work<sup>11</sup> we reported projections of long term changes in industry outputs. For technical reasons associated with the structure of the 1977 version of the ORANI model<sup>12</sup> it was not possible to use it to project in detail the long run industrial composition of exports. Our preferred methodology would be to simulate the long run effects on industries of our exogenous shocks. That is, we would attempt to give a picture of how the economy which had been exposed to the terms of trade and mining boom changes would differ in a typical year, say ten years hence, compared to its state at a similar time in the absence of shocks. For example, if such a simulation were to give a projected output increase of 20 per cent in a particular industry, the appropriate interpretation would be that the output of that industry would (at the end of the projection period) be 20 per cent greater if the shocks had occurred than it would otherwise have been. In this context the appropriate shocks would be an annual 'free' balance of trade deficit of \$A0.5 billion and world price changes cumulated over ten years at the annual rates indicated in Table 4.1.

Major respecification of the ORANI model to facilitate its use in this mode is at an advanced stage.<sup>13</sup> In the meantime we report projected changes in rates of return on fixed capital obtained from a

revised version of the ORANI model in short run (i.e., annual) mode. There are good reasons for expecting changes in industry-specific short run rates of return on capital to be highly correlated with the changes induced in industry outputs over a longer adjustment period. The mechanism behind this result is straightforward. In the short run (i.e., in an annual ORANI solution) the stock of physical capital in each industry remains fixed. Projected movements in prices and costs in the solution period (i.e., year) affect the prospective profitability of new investment. The various industries compete for the available economy-wide investment budget according to their prospective rates of return on capital. Industries whose rates of return are increasing relatively fast win out in the investment stakes. Over a period of years, higher than average rates of net investment in the industries consistently showing higher than average rates of return lead to the growth of these industries and the decline, relatively speaking, of others. When the industrial composition of the economy has fully adjusted to the pressures causing differential movements in profitability, of course, the differentials no longer persist, and a new equilibrium composition has been attained.

The projections reported in Table 4.4 are the short run effects on industry rates of return of one year's changes in world prices at the rates indicated in Table 4.1 and of an annual addition to foreign exchange receipts equivalent to \$A0.1 billion at 1968/69 prices. These projections are designed to capture the structural impact of the two long term exogenous developments under study in a typical year of the projection period; i.e., they refer to the additional pressures exerted in year  $t$  (as a result of the two exogenous developments) over those existing in year  $(t-1)$  where years  $t$  and  $(t-1)$  are typical years in our 5-year horizon.

#### 4.4 ASSUMPTIONS ABOUT THE MACROECONOMIC ENVIRONMENT

Simulations with the ORANI model can be produced under a wide variety of assumptions about the macroeconomic environment. We have argued above that questions of structural change should be assessed in isolation from short run, business cycle phenomena. Accordingly the macroeconomic environment assumed for the generation of the projections in Table 4.4 is one of macroeconomic health. In particular we assume that the economy is initially in a state of full employment and is so maintained. Occupational wage relativities are fixed but the overall level of real wages is allowed to adjust to maintain full employment.

Given our assumptions, the mining boom leads (according to the ORANI model) to an increase of 0.43 per cent in real absorption, while the assumptions made in Table 4.1 lead to a further increase of 0.19 per cent. We assume that the resultant total increase in real absorption, 0.62 per cent, is allocated among its major components



in proportion to their initial shares. Thus each of real personal consumption, real private fixed capital formation, and real government expenditure grows by 0.62 per cent in our simulations as a result of the two pressures under examination.

Since the projections are made under assumptions of overall labour scarcity and fixed short term capacity, the increased real income of the economy leads to gains in real wages and in the overall real rate of return on investment. As far as labour goes, we have assumed that wage relativities are fixed—the projected gain in real wages (namely, 0.6 per cent) is therefore uniform across all occupations. In the case of capital, different industries fare differently (Table 4.4). The net effect of the mining boom and changing international prospects for commodity prices is to raise the economy-wide average rate of return on investment by about 1.45 per cent. In this context, care is needed to distinguish between per cent, and percentage points. If the initial economy-wide rate of return were (say) 12 per cent, then the new rate of return would be  $(1.0145 \times 12)$  per cent, viz., 12.174 per cent. In this particular example in percentage points the rise is thus 0.174.

Underlying our projections is the assumption that levels of tariffs, and the tariff equivalents of other protective devices, remain unaltered. Consistent with our projection horizon, we assume maintenance of equilibrium in external payments (in the long run, payments must be balanced). Thus neither the mining boom nor the prospective changes in international commodity prices are permitted to affect the balance of trade in our projections.

This medium/long term perspective is also relevant to the interpretation of the timing of projected changes. The evolution of structural pressures for change is seldom smooth. Even if our projected rates of growth in world relative prices, as shown in Table 4.1, turned out over the long haul to be very accurate—and this is far from likely—actual year-to-year movements would show a great deal of irregularity. There is no prospect of being able to forecast such irregular movements over more than a very short interval of time: the best that we can hope for is to project behaviour in a 'typical' year. The percentage changes in rates of return attributed in Table 4.4 to the effects of changing international prices and to the mining boom respectively are to be interpreted as those which would occur in a typical year of the projection period. The changes in industries' rates of return serve as indicators of the long term pressures for change—industries showing high positive changes in their rates of return would be expected to expand progressively as they cumulatively absorb a higher share of the economy's total investment budget; industries showing large negative changes in their rates of return would be expected to contract (at least in a relative sense) over the long term.

Table 4.4

*Projected Effects on Industry Profitability of Changes in International Commodity Prices and a Further Expansion in Mining Exports*

Industry and Prospect	Deviation of Annual Percentage Change in Industry's Rate of Return about Economy-wide Average of such Changes due to:			
	International Commodity Price Changes		Mining Boom (per cent)	Total (per cent)
	Own Price (per cent)	Other Prices (per cent)		
	A	B	C	D
<i>Moderate Upward Pressure on Profits</i>				
01.05 Poultry	0.0	14.1	-3.4	10.7
21.01 Meat Products	16.7	-3.1	-2.8	10.9
22.01 Tobacco Products	-0.1	1.8	3.4	5.1
27.05 Soap & Other Detergents	0.3	1.5	3.4	5.2
27.08 Petroleum & Coal Products	0.0	3.3	5.7	9.0
28.03 Cement	0.0	2.8	3.9	6.7
28.04 Ready-mixed Concrete	0.0	3.5	5.8	9.3
28.05 Concrete Products	0.0	2.7	4.0	6.6
31.02 Sheet Metal Products	0.0	2.1	3.7	5.8
36.02 Gas	0.0	1.9	4.1	6.0
<i>Mild Upward Pressure on Profits</i>				
01.01 Sheep	4.8	0.2	-4.8	0.2
01.03 Meat Cattle	0.0	12.4	-7.4	5.0
02.00 Services to Agriculture	0.0	1.4	-0.8	0.6
14.00 Non-metallic Minerals, n.e.c.	0.4	0.1	1.2	1.8
16.00 Services to Mining	0.0	1.4	1.7	3.1
21.02 Milk Products	0.2	0.9	1.6	2.7
21.03 Fruit & Vegetable Products	0.0	1.3	2.4	3.7
21.04 Margarine, Oils, Fats	1.4	-0.7	0.5	1.2
21.05 Flour & Cereal Products	0.0	1.1	0.8	2.0
21.06 Bread, Cakes & Biscuits	0.1	1.1	1.5	2.8
21.07 Confectionery Products	-0.1	0.7	1.3	1.9
21.09 Soft Drinks, Cordials, etc	0.0	1.7	2.8	4.4
21.10 Beer & Malt	0.0	1.6	3.2	4.8
21.11 Alcoholic Beverages, n.e.c.	1.3	-0.3	0.8	1.9
23.04 Wool & Worsted Yarns, etc.	0.2	0.2	1.2	1.7
23.05 Textile Finishing	-0.1	0.1	1.4	1.4
23.06 Textile Floor Covering	-0.3	-0.6	2.0	1.1
24.01 Knitting Mills	-0.1	0.3	1.1	1.4
24.02 Clothing	-0.1	-0.4	0.5	0.0
25.01 Sawmill Products	-0.3	0.2	0.6	0.5
25.02 Plywood, Veneers & Boards	-0.1	0.1	1.2	1.2

# Structural Adaptation in an Ailing Macroeconomy

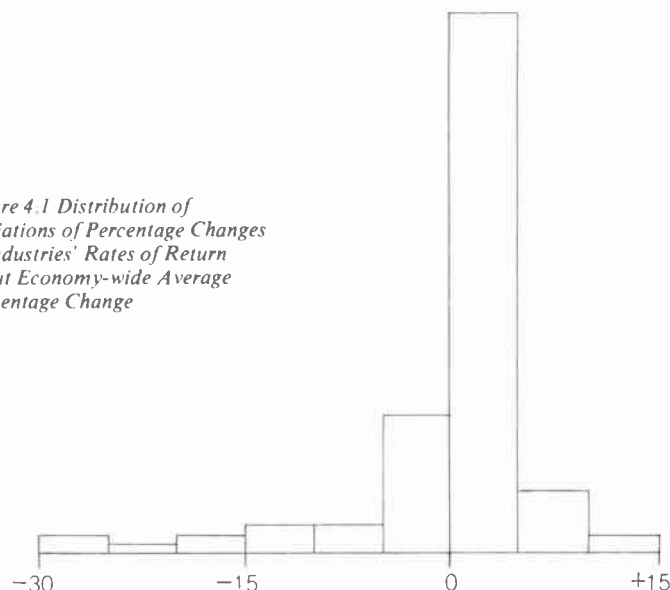
25.03	Joinery & Wood Products	0.0	0.6	2.0	2.6
25.04	Furniture, Mattresses, Brooms	0.0	0.6	3.1	3.6
26.01	Pulp, Paper & Paperboard	2.4	-0.4	-1.0	1.0
26.02	Fibreboard, Paper Containers	0.3	0.1	1.1	1.6
26.03	Paper Products, n.e.c.	0.6	0.6	1.7	2.9
26.04	Newspapers & Books	0.9	0.2	1.2	2.2
26.05	Commercial & Job Printing	0.3	0.6	1.5	2.5
27.01	Chemical Fertilizers	2.0	0.8	-1.2	1.5
27.06	Cosmetic, Toilet Preparations	0.5	1.2	3.2	4.8
27.03	Paints, Varnishes, Lacquers	0.4	-0.8	1.4	1.1
27.04	Pharmaceutical & Chemicals	1.5	0.3	0.5	2.3
27.07	Chemical Products, n.e.c.	3.9	-0.8	-0.8	2.3
28.01	Glass & Glass Products	-0.3	-0.3	0.6	0.0
28.02	Clay Products	-0.1	0.4	1.4	1.7
28.06	Non-metallic Mineral Products	-0.1	1.4	2.4	3.7
31.01	Structural Metal Products	-0.1	1.5	3.1	4.6
32.02	Ship & Boat Building	-0.6	0.9	2.4	2.6
32.03	Locomotives, Rolling Stock	-0.2	-0.2	1.2	0.8
33.01	Scientific Equipment, etc	-1.1	0.5	1.8	1.2
33.03	Household Appliances, n.e.c.	-1.4	1.8	3.7	4.1
33.05	Agricultural Machinery	-0.9	4.1	-3.0	0.2
34.02	Rubber Products	-0.2	-0.7	1.6	0.7
34.03	Plastic & Related Products	-0.2	-0.3	0.8	0.3
34.04	Signs, Writing, Equipment, etc.	1.2	0.1	0.9	2.2
34.05	Other Manufacturing	-0.1	0.6	2.2	2.7
36.01	Electricity	0.0	0.8	2.1	2.9
37.01	Water, Sewerage & Drainage	0.0	1.8	2.5	4.3
41.01	Residential Building	0.0	1.3	2.4	3.7
41.02	Building, n.e.c., Construction	0.0	1.6	2.7	4.3
46.01	Wholesale Trade	0.0	0.2	1.1	1.3
48.01	Retail Trade	0.0	0.7	2.6	3.3
48.02	Motor Vehicle Repairs	0.0	1.3	2.0	3.3
48.03	Other Repairs	0.0	0.5	1.6	2.0
54.01	Air Transport	0.0	0.8	1.5	2.3
55.01	Communication	0.0	0.9	1.3	2.3
61.01	Banking	0.0	-0.3	1.1	0.8
61.02	Finance & Life Insurance	0.0	0.0	1.7	1.7
61.03	Other Insurance	0.0	-0.2	1.2	1.0
61.04	Investment, Real Estate, etc.	0.0	-0.7	1.0	0.3
61.05	Other Business Services	0.0	-0.1	1.1	1.0
61.06	Ownership of Dwellings	0.0	-0.4	1.4	1.0
71.01	Public Administration	0.0	0.5	1.9	2.4
72.01	Defence	0.0	-0.1	1.6	1.5
81.01	Health	0.0	-0.1	1.8	1.6
82.01	Education, Libraries, etc.	0.0	-0.1	1.7	1.7
83.01	Welfare Services	0.0	0.4	1.8	2.2

# Some Pressures for Structural Change

91.01	Entertainment	0.3	0.4	1.7	2.4
92.01	Restaurants, Hotels, Clubs	0.0	1.0	2.9	3.9
93.01	Personal Services	0.0	0.3	1.9	2.2
<i>Mild Downward Pressure on Profits</i>					
01.04	Milk Cattle & Pigs	0.0	6.5	-6.6	-0.2
03.00	Forestry & Logging	0.0	-1.2	-2.0	-3.2
04.00	Fishing, Trapping, Hunting	17.2	-6.2	-11.8	-0.8
23.01	Prepared Fibres	12.1	-10.9	-2.6	-1.4
23.02	Man-made Fibres, Yarns, etc.	7.4	-4.6	-5.7	-3.0
23.07	Textile Products, n.e.c.	-0.3	-1.2	-0.6	-2.1
24.03	Footwear	-0.3	-1.0	-0.8	-2.1
31.03	Metal Products, n.e.c.	-0.3	-1.0	0.5	-0.8
32.04	Aircraft Building	-3.9	0.0	0.5	-3.3
33.02	Electronic Equipment	-5.8	0.2	0.6	-5.0
33.04	Electrical Machinery, n.e.c.	-2.9	0.1	1.2	-1.5
33.06	Construction, etc., Equipment	-1.4	-0.3	0.2	-1.5
33.07	Other Machinery, Equipment	-1.0	-0.9	0.4	-1.5
34.01	Leather Products	1.8	-1.4	-0.4	0.0
51.01	Road Transport	0.0	0.1	-0.2	-0.1
52.01	Railway & Other Transport	0.0	-1.1	-0.7	-1.8
53.01	Water Transport	0.0	-0.5	-0.3	-0.8
99.01	Business Expenses	0.0	-0.9	0.5	-0.4
<i>Moderate Downward Pressure on Profits</i>					
01.02	Cereal Grains	0.0	-6.8	-4.8	-11.6
01.06	Other Farming	0.0	-2.7	-5.7	-8.4
11.01	Iron	1.9	-2.8	-4.7	-5.5
11.02	Other Metallic Minerals	2.9	-4.7	-8.5	-10.3
23.03	Cotton, Silk, Flax Yarns, etc.	-0.9	-4.1	-3.7	-8.7
27.02	Industrial Chemicals, n.e.c.	6.3	-2.9	-15.3	-11.9
<i>Substantial Downward Pressure on Profits</i>					
12.00	Coal & Crude Petroleum	0.0	-6.1	-11.7	-17.8
21.08	Food Products, n.e.c.	-1.9	-14.1	-11.3	-27.3
29.01	Basic Iron & Steel	-1.7	-7.1	-11.5	-20.4
29.02	Other Basic Metal Products	-2.8	-11.0	-13.4	-27.2
32.01	Motor Vehicles & Parts	-12.2	-1.2	-2.6	-16.0
Economy-wide average		*	*	0.3	1.4

\*In columns A and B percentage changes in industry rates of return are deviated from economy-wide average effects specific to rows. For example, in the case of the entry for 21.01 Meat Products the figure in column A indicates that the effect on the rate of return in the Meat Products industry of changing the world price of the products of that industry by the percentage shown in Table 4.1 (5.2 per cent) is 16.7 greater than the effect of this single price change on the average rate of return in the economy overall.

Figure 4.1 Distribution of Deviations of Percentage Changes in Industries' Rates of Return about Economy-wide Average Percentage Change



#### 4.5 THE INDUSTRY PROJECTIONS

Projected changes in industry rates of return are shown in Table 4.4. As explained in section 4.1, it is *relative* profitability that determines the shares of the economy's investment budget going to different industries. Our results are therefore reported as deviations from the economy-wide average changes in rates of return on capital induced by the two structural pressures under consideration. In the case of prospective changes in international commodity prices, the results have been partitioned into two separate price responses: that involving the international price of the commodity produced by the industry in question (column A) and the net effect of price movements for other internationally traded commodities (column B). To take an example from the first block of industries in Table 4.4, the relative rate of return on capital in 27.05 Soap & Other Detergents is projected to rise by a total of 5.2 per cent. Of this, 3.4 per cent is due to the mining boom, and 1.8 per cent is due to changing international commodity prices. From Tables 4.1 and 4.2 we note that 27.05 Soap, etc. is included in a group whose prices are assumed to rise relatively fast. The effect of the projected rise in the relative price of the products produced by industry 27.05 alone is to raise the rate of return in this industry by 0.3 per cent (0.3 in column A). The net effect of other exogenous price movements (+1.5 in column B), however, is also favourable to 27.05, and indeed exceeds the own-price effect. In the case of commodities and services which are not internationally traded, changes in overseas prices do not directly affect prospects in the domestic economy (e.g., 36.02 Gas).

The distribution of changes in rates of return is shown in Figure 4.1. Ten industries experience 'moderate' upward pressure on profitability (increases in rates of return between 5.1 and 15.0 per cent above the economy-wide average);<sup>14</sup> more than half (viz., 70) of the 109 input-output industries experience 'mild' upward pressure on profits (increases between zero and 5.0 per cent above the economy-wide average); 18 industries experience mild downward pressure on profits (defined symmetrically with the last group); 6 industries experience moderate downward pressure on profits (rates of return deviating between 5.1 and 15.0 per cent below the economy-wide average); and finally, 5 industries experience 'substantial' downward pressure on profitability (rates of return deviating 15 per cent or more below the economy-wide average).

#### (a) The Most Severely Affected Industries

Four of the five severely affected industries belong to the export group. Each of these industries is adversely affected by both the mining boom and the net effect of the change in the terms of trade. The fact that one of the industries involved is itself in the mining sector (12.00 Coal and Crude Petroleum) reflects the absence from our simulations of the direct effect of the mining boom. It needs to be stressed that the results reported refer to rates of return in pre-mining-boom mining activity as characterized by the 1968–69 production technology (the latest for which input-output data are available). To the extent that single enterprises encompass both traditional and new mining activity, the reported effects do not accurately reflect what is likely to happen to the profitability of mining enterprises. This remark applies with equal force to 11.01 Iron and 11.02 Other Metallic Minerals. Although (because of the lack of the necessary technological data) the direct input-output linkages of the new mining activity have not been modelled, it does not follow that associated aggregate employment demand has been left out of account. This is because our projections are based on a fully employed economy. The net effect of this treatment would be a small compositional error—jobs and profit opportunities created by the new mining activity in reality have a specific occupational and industrial profile, whereas in our projections their implicit profiles are economy-wide averages.

The strong influence of the mining boom on the prospects of exporters in the most severely affected group is brought about by the additional foreign exchange earned by mineral exports. With balanced trade this leads to exchange rate appreciations (or equivalently, smaller devaluations than would otherwise have occurred), forcing down the domestic price of the products concerned. Export industries facing relatively low international demand elasticities (01.01 Sheep and 23.01 Prepared Fibres—see Table 4.3)

will, other things being equal, do better than those facing high demand elasticities. This is because as the former industries contract output, the international prices of their commodities may increase by appreciable amounts. Again, other things being equal, highly capital-intensive industries will suffer smaller losses in short run profitability than less capital-intensive industries faced with a comparable cost/price squeeze. (For present purposes, a 'Cost-price squeeze' is defined to take place whenever wage costs inflate faster than an industry's product price.) 11.01 Iron, for example, which is more capital-intensive than 11.02 Other Metallic Minerals, has a drop in relative profitability of 5.5 per cent, compared with a drop of 10.3 per cent for the latter industry.

The poor performance of the export industry 21.08 Food Products, n.e.c., is only due partially to its heavy sugar content. Sugar is an internationally traded commodity nominally subject to many restraints on trade (e.g., the International Sugar Agreement, among others). The 16 per cent downward pressure on profitability (Columns A + B) is the largest effect recorded for international commodity price changes in Table 4.4. The figure in column A (-1.9 per cent) reflects the low rate of inflation assumed in Table 4.1 to apply to the prices of sugar-intensive products, which in turn reflects our views that the basic market pressures are towards lower world sugar prices, and that these pressures in the future (as in the past) will cause price-fixing agreements to fail. But by far the larger component is due to the indirect effects of other price changes (column B, -14.1 per cent). Relative to other major export industries, 21.08 Food Products, n.e.c., is a labour intensive industry (with labour's share in value added around 67 per cent). The industry also faces a highly elastic export demand curve (Table 4.3). These two factors combine to make the industry particularly vulnerable to increases in domestic costs and/or an exchange rate appreciation. Since the *overall* set of foreign price projections is favourable to Australia—its export prices on average inflating faster than its import prices—a potentially favourable trade balance effect feeds back to squeeze the export industries (among which 21.08 is especially vulnerable). As may be verified from column B of Table 4.4, other exporters squeezed in this way include 04.00 Fishing, Trapping, Hunting, 23.01 Prepared Fibres, 01.02 Cereal Grains, 11.01 Iron, and 11.02 Other Metallic Minerals. The mining boom effects on 21.08 Food Products, n.e.c., are of comparable severity to the other export industries in the most severely affected group.

The substantial effect of the mining boom on four of the five industries listed last in Table 4.4 relates to their export status. This leads one to ask why the agricultural export industries seem to fare somewhat better. In the case of 01.01 Sheep and 01.03 Meat Cattle the deleterious effects of the mining boom are off-set or more than

off-set by the bright commodity price prospects for wool and for 21.01 Meat Products (to whom the Meat Cattle Industry sells most of its output). The effect of the mining boom on the *total* prospects of agricultural export industries, however, is understated in Table 4.4 because owner-operator's labour is not rewarded separately from his fixed capital in the model. In agricultural industries, one also needs to take into account the return to land (which is treated separately from other fixed capital). In the version of ORANI used to produce these projections, only one kind of agricultural land is distinguished. The effect of the mining boom is to lower the real return on agricultural land by almost 10 per cent. Since we have gone into the effects of the mining boom on agricultural incomes elsewhere,<sup>15</sup> we will not dwell on the point here: suffice it to note that these considerations imply that much of agriculture would appear in the most severely affected group if other criteria of classification were used.<sup>16</sup>

The exceptional case among the most severely affected industries is 32.01 Motor Vehicles and Parts. Due to the increase in consumption brought about by the mining boom, this industry only suffers slightly in the face of the increased import competition which the boom entails. (We elaborate on this point in more detail in the next section.) The major reason for the motor vehicle industry's poor prospects in our projections is the underlying set of price assumptions (Table 4.1). If these assumptions are not accepted, a brighter outlook for the industry may be warranted.

#### (b) Industries with Better Prospects

In general we might expect the mining boom to harm the prospects of internationally traded goods. This is because the exchange rate effects of additional mineral exports subject domestic industries to stronger import competition. There are countervailing forces in play as well, however.

Of the five industries projected to experience substantial downward pressure of profitability, three (11.01 Other Metallic Minerals, 29.01 Basic Iron and Steel and 29.02 Other Basic Metal Products) are early inputs in the chain of metal manufacturing. In these export industries the domestic price is effectively set by the foreign price and by the exchange rate. Strong downward pressure on product prices in these industries is thus induced by the exchange rate appreciation effect of the mining boom. This leads to a lower industrial cost structure which *in part* explains why many of the manufacturing industries later in the chain (e.g., 33.04 Electrical Machinery, 32.04 Aircraft Building, 33.05 Agricultural Machinery, 33.07 Other Machinery, Equipment) suffer, at worst, only mild downward pressures on profits. Further, because elasticities of

import substitution demand in capital goods industries typically are relatively low,<sup>17</sup> some measure of shelter from mining-induced import competition is automatically available for the four industries cited as examples. An additional factor working in favour of all the import-competing industries is the expansion in domestic absorption. The only metal-based manufacturing industry to face moderate or severe downward pressure on its profits is 32.01 Motor Vehicles and Parts. By comparison with capital goods industries (e.g., 33.06 Construction, etc., Equipment) and industries producing intermediate inputs (e.g., 31.01 Structural Metal Products and 31.02 Sheet Metal Products), motor vehicles are extremely vulnerable to import competition. (The vulnerability of a domestic industry to import competition is an increasing function of base period import penetration and the elasticity of import substitution.)<sup>18</sup> In comparing 33.06 Construction, etc., Equipment with 32.01 Motor Vehicles and Parts, the relative vulnerability of the latter is due mainly to the difference in their import substitution demand elasticities (0.5 for 33.06, and 5.0 for 32.01). On the other hand, motor vehicles' greater relative vulnerability to import competition by comparison with structural and sheet metal reflects not only the lower import substitution elasticities for the latter (1.5), but also the base period market shares of imports (less than 6 per cent for both 31.01 Structural Metal Products and 31.02 Sheet Metal Products, but of the order of 30 per cent for 32.01 Motor Vehicles and Parts).

There are ten industries where increases in rates of return are projected to deviate more than 5 per cent above the economy-wide average. These may be further subdivided into the following groups:

- (a) *Exports and export-linked products*
  - 01.05 Poultry
  - 21.01 Meat Products
- (b) *Energy-intensive products*
  - 27.08 Petroleum and Coal Products
  - 36.02 Gas
- (c) *Consumer goods, n.e.c.*
  - 22.01 Tobacco Products
  - 27.05 Soap and Other Detergents
- (d) *Construction inputs*
  - 28.03 Cement
  - 28.04 Ready-mixed Concrete
  - 28.05 Concrete Products
  - 31.02 Sheet Metal Products

The major reason for the success of group (a) is that the price assumptions for meat exports are so favourable as to outweigh the unfavourable effects of the mining boom comfortably. Although little or no Australian poultry is exported, it is a quirk of the input-output conventions that 01.05 Poultry, sells most of its meat output

to 21.01 Meat Products. Because Poultry meat is, from the viewpoint of the Meat Products industry, an intermediate input, the Leontief assumptions of the ORANI model with respect to such inputs apply. The net effect in the projections is that for each ton of beef processed by the Meat Products industry, some small quantity of Poultry must also be processed. For this reason we have reservations about the projections for Poultry. On the other hand, the error is small enough from the viewpoint of 21.01 Meat Products and 01.03 Meat Cattle to justify confidence in the projections for these industries. Energy-intensive products (b) are similar to metal manufactures in that they also face lower input costs. In 1968-69, 27.08 Petroleum and Coal Products bought 73 per cent of its usage of intermediate inputs from 12.00 Coal and Crude Petroleum. The service industry 36.02 Gas bought 20 per cent of its intermediate usage from 12.00 Coal and Crude Petroleum, and an additional 7

Table 4.5

*Expenditure Elasticities assumed for Fifteen Major Consumer Goods and Services*

Consumer Commodity Group	Elasticity with respect to Total Consumption Spending
Food Group (total)	(0.335)
Components:	
1. Bread and Cereals	0.131
2. Meat and Fish	0.520
3. Dairy and Eggs	0.017
4. Sugar, Preserves, Confectionery	0.429
5. Fruit and Vegetables	0.474
6. Other	0.458
7. Drink and Tobacco	0.565
8. Clothing and Footwear	0.291
9. Housing	1.888
10. Household Durables	1.576
11. Private Transport	1.193
Public Transport Group (total)	(0.857)
Components:	
12. Rail, Tram and Bus Fares	0.100
13. Air Fares	2.500
14. Other	0.300
15. Other Goods and Services	1.195
Total Expenditure Elasticity of the Marginal Utility of Money (Frisch Parameter, $\omega$ )	-1.82

Source: Ashok Tulpulé and Alan Powell, 'Estimates of Household Demand Elasticities for the ORANI Model', *IMPACT Preliminary Working Paper No. OP-22*, Industries Assistance Commission, Melbourne, June 1978.

per cent from 36.01 Electricity, itself a big customer of 12.00. Increased absorption also helps explain the success of group (b), but is much more significant in the case of group (c), consumer goods. Neither of the industries in the latter group faces substantial import competition.

Other things being equal, the influence of a given increase in aggregate demand (absorption) on the prospects of any particular industry depends on the responsiveness of the demand for that industry's product to increased spending. The largest of the three components of absorption is personal consumption. Our assumptions concerning the expenditure elasticities relevant to different consumer goods are shown in Table 4.5.

The reason for the relative success of group (d), construction inputs, relates to both the increase in aggregate investment (which is good for industries supplying inputs to capital formation generally), and to the change in the investment profile generated by the mining boom. For reasons already discussed, many import-competing manufacturing industries fare better in the projections than exporters of basic materials and several rural industries. These import competitors, as well as industries whose output is not internationally traded, have investment demand which on average is more intensive in construction than that of either the exporters of basic materials or the rural industries. This compositional change in investment demand favours inputs to 41.01 Residential Building and 41.02 Building, n.e.c. Each of these industries itself experiences healthy upward pressure on profitability (3.7 and 4.3 per cent respectively). Since these two industries are major customers of the industries in the (d) group, the compositional change in investment demand helps to explain the group's relatively good prospects.

### (c) Reconciliation with Earlier Projections

In an earlier paper we used the ORANI model in long run mode to prepare projections of the prospects of Australia's industries through the mid-1980s.<sup>19</sup> An important feature of that paper was an analysis of the trade-offs between the prospects of different industries within the import-competing sector. As already explained, however, for technical reasons the outputs of the major exporting industries (those listed in Table 4.3) had to be projected exogenously in the earlier projections. Other differences in the basis of projection may be found listed in Table 4.6. Each of these differences accounts, in some part, for the somewhat different results obtained. From the policy viewpoint, however, it is important to establish which results are robust in the sense that they do not depend critically on particular maintained assumptions and/or techniques of projection.

In the context of structural adjustment, it is natural to focus our attention on those industries whose projected prospects are poorest.

Table 4.6

Sources of Differences between Projections of Table 4.4 and those of Dixon, Harrower and Powell<sup>a</sup>

Item	Model underlying Table 4.4	Model used by Dixon, Harrower and Powell
mode of use of the ORANI model	short-run solution for a 'typical' year in prospect through mid-1980s	long-run solution for 1985-86
international commodity price projections	based on a variety of methods (see Freebairn, <i>op. cit.</i> )	based on trends in U.S. Wholesale Price Index 1968-74
principle variable projected	changes in short-run return on capital in different industries	rates of growth of industry outputs
industries projected exogenously	none	the 11 major export industries of Table 4.3
changes to data base	some industries' capital intensity (shares of capital in value added) revised	
changes to parameter file	expenditure elasticity estimates updated from time series evidence ending in 1975-76 using TELES <sup>b</sup> - new estimates shown in Table 4.5	expenditure elasticity estimates based on time series data ending in 1966-67 using the Linear Expenditure System
changes to treatment of agricultural industries	owner-operator's labour treated as fixed in the short run and not rewarded separately from fixed capital and land	owner-operator's labour treated as a variable factor of production (viz., aggregated with hired labour)

<sup>a</sup>Comparison is made with the 'flexecon' projections of Dixon, Harrower and Powell, *op. cit.*

<sup>b</sup>The Twice-Extended Linear Expenditure System - see Tulpule and Powell, *op. cit.*

In the earlier study the industries projected to face growth rates less than about half the economy-wide average were those listed in Table 4.7. All fifteen are in the import-competing sector, whereas in the current projections (Table 4.4) the fifteen industries facing the largest relative declines in rates of return include only five import-competing industries. This striking difference between the two sets

Table 4.7

*Industries Projected in Earlier Study to face Poor Growth Prospects through the mid-1980s*

Dixon-Harrower-Powell Study <sup>a</sup>	Indicator of Prospects from Present Study <sup>b</sup>
Input-output industries projected to decline, or to grow at less than 0.45 times the average growth rate:	(per cent) <sup>c</sup>
23.02 Man-made Fibres, Yarns, etc.	-3.0
23.03 Cotton, Silk, Flax Yarns, etc.	-8.7
23.06 Textile Floor Covering	1.1
23.07 Textile Products, n.e.c.	-2.1
24.03 Footwear	-2.1
25.01 Sawmill Products	0.5
27.02 Industrial Chemicals, n.e.c.	-11.9
32.01 Motor Vehicles and Parts	-16.0
32.04 Aircraft Building	-3.3
33.01 Scientific Equipment etc.	1.2
33.02 Electronic Equipment	-5.0
33.04 Electrical Machinery, n.e.c.	-1.5
33.07 Other Machinery, Equipment	-1.5
34.02 Rubber Products	0.7
34.03 Plastic and Related Products	0.3

Sources:

<sup>a</sup>Dixon, Harrower and Powell, *op. cit.*

<sup>b</sup>Table 4.4 above, column D.

<sup>c</sup>Projected deviation in industry's rate of return about economy-wide average of such changes.

of projections hinges on our earlier treatment of the export industries as exogenous. This had the effect in the earlier projections of isolating these industries from pressures induced via the exchange rate consequences of the mining boom. Our earlier set of projections was, for this reason, unduly optimistic about the prospects of export industries.

Table 4.7 also gives details of the prospects projected in the present study for each of the fifteen industries with the slowest growth prospects in the earlier study. Ten of the fifteen appear with below average prospects in the current projections, and three appear in the bottom fifteen on both lists; namely:

- 23.03 Cotton, Silk, Flax Yarns, etc.
- 27.02 Industrial Chemicals, n.e.c.
- 32.01 Motor Vehicles and Parts

The single most important factor in resolving the differences between the two sets of projections is the prices of basic manufacturing inputs: 12.00 Coal and Crude Petroleum, 29.01 Basic Iron

and Steel and 29.02 Other Basic Metal Products. In the earlier set of projections the domestic prices of these goods were set equal to their local costs of production and their exogenous levels of output were achieved within the general equilibrium framework of the ORANI model via the payment of an endogenous export subsidy. In the current projections, however, the domestic price of these basic inputs is determined principally by world prices and the exchange rate. Via the latter the mining boom thus exerts a major downward influence on the basic industrial cost structure in the present set of projections, but not in the earlier one.<sup>20</sup> For this reason the current set is to be preferred. On the other hand, we doubt that the trade-offs *within* the import-competing sector outlined in our earlier work<sup>21</sup> would change radically as a result of this improvement.

#### (d) Labour Demand Patterns

Projections of short run percentage changes in the occupational distribution of employment are presented in Table 4.8. Recall that these projections are made on the assumption that occupational wage relativities remain fixed. Changes in the occupational structure of the workforce are therefore generated entirely by changes in the industrial composition of the economy. In this section we attempt to address the question of whether the amount of inter-occupational labour mobility implied by Table 4.8 seems feasible in the light of our knowledge about labour mobility in the Australian economy. Data on occupational mobility are very scarce in Australia—the data to which we had access consist of two supplementary Labour Force Surveys covering respectively the twelve-month periods preceding November 1972 and December 1975. A comparison of the net inter-occupational mobility revealed in special tabulations from these two surveys with that required to accommodate the two structural pressures under examination is given in Table 4.9. To facilitate comparison, the actual mobility figures for 1972 and 1975 have been scaled to reflect workforce growth to 1981-82, which is the year for which our projections have been translated into numbers of jobs.

Three groups are projected to lose employment demand as a result of the structural pressures induced by the mining boom and changing international commodity prices. They are metal and electrical tradesmen (occupation 4), semi- and unskilled blue collar workers (occupation 7) and rural workers (occupation 8). Employment losses in these occupations reflect the adverse effects of the structural pressures on the export industries, in particular the rural industries, and on some major import-competing industries, especially the motor vehicles industry. During both 1972 and 1975 two of these groups (metal and electrical tradesmen and rural labour) experienced net losses through inter-occupational transfers.



Table 4.8

Projected Annual Changes in Labour Demand Patterns due to Increased Mineral Exports and  
Changing World Commodity Prices

IMPACT Occupational Group <sup>a</sup>	Changes in Employment Demand due to					
	Changes in World Commodity Prices		the Mining Boom		Total	
	per cent	jobs <sup>b</sup>	per cent	jobs <sup>b</sup>	per cent	jobs <sup>b</sup>
	(1)	(2)	(3)	(4)	(5)	(6)
1. Professional White Collar	0.04	90	0.21	477	0.25	567
2. Skilled White Collar	0.01	90	0.19	1,690	0.20	1,780
3. Semi- and Unskilled White Collar	0.06	1,060	0.24	4,523	0.30	5,583
4. Skilled Blue Collar (Metal & Electrical)	-0.37	-2,650	-0.12	-863	-0.49	-3,513
5. Skilled Blue Collar (Building)	0.13	390	0.42	1,227	0.55	1,617
6. Skilled Blue Collar (Other)	0.45	850	0.03	56	0.48	906
7. Semi- and Unskilled Blue Collar	-0.18	-3,670	-0.12	-2,403	-0.30	-6,073
8. Rural Workers	0.64	3,620	-0.92	-5,200	-0.28	-1,580
9. Armed Services	0.19	220	0.42	493	0.61	713
Sum		0		0		0

a) or a description of the IMPACT occupational grouping, see 'The Occupational Grouping for IMPACT' by M. K. McIntosh, Appendix I in J. A. Naphtali, M. K. McIntosh and Lynne S. Williams, 'A Cross-Sectional Analysis of Inter-Occupational Mobility in Australia', *IMPACT Working Paper No. B-06*, Industries Assistance Commission, Melbourne, February 1978.

b) Figures notionally refer to 1981-82 for which year total employment is assumed to be 6.96 million.

Table 4.9

Comparison of Actual Annual Occupational Mobility 1972 and 1975 with Annual Mobility  
needed to accommodate Structural Pressures<sup>a</sup>

Occupation	Net Mobility into (+) or out of (-) Occupation				
	Actual <sup>b</sup>		Scaled to 1981-82 <sup>c</sup>		Necessary to accommodate struc- tural pressures <sup>d</sup>
	1972	1975	1972	1975	
	(1)	(2)	(3)	(4)	(5)
1. Professional White Collar	+2,984	+4,750	+3,733	+5,802	+567
2. Skilled White Collar	+4,791	+5,581	+5,994	+6,817	+1,780
3. Semi- and Unskilled White Collar	-29e	-149e	-36	-182	+5,583
4. Skilled Blue Collar (Metal & Electrical)	-5,932	-3,211	-7,420	-3,922	-3,513
5. Skilled Blue Collar (Building)	-250e	-1,331	-312	-1,626	+1,617
6. Skilled Blue Collar (Other)	+343e	-237e	+429	-289	+906
7. Semi- and Unskilled Blue Collar	+3,792	+1,214	+4,743	+1,483	-6,073
8. Rural Workers	-2,675	-4,422	-3,346	-5,401	-1,580
9. Armed Services	n.a.	n.a.	n.a.	n.a.	+713
Not elsewhere classified or no previous occupation	-3,024	-2,195	-3,785	-2,682	
Sum	0	0	0	0	0

a) Structural pressures are a mining boom generating approximately 15% additional export revenue after five years, and the changes in international commodity prices shown in Table 4.1.

Sources:

b) J. A. Naphtali, M. K. McIntosh and Lynne S. Williams, *op. cit.* (see footnote to Table 4.8). (Lecturers and Teachers have been allocated to Occupations 1 & 2 in equal proportions.)

c) Workforce assumed to total 6.96 million in 1981-82.

d) Column (6), Table 4.8.

e) Estimates may be unreliable due to possibly large sampling error.

These transfers were probably at least partly a response to the mining boom of the 1960s. In each case the mobility required to accommodate the structural pressures is less than historically observed levels of inter-occupational mobility. Although there were net movements into the third group (namely, semi- and unskilled blue collar), there was considerable volatility in the size of the flows between the two years for which data are available.

The overwhelming impression which one gains from Table 4.9 is that the extent of required occupational mobility arising via the ORANI projections from prospective changes in Australia's international trading pattern and from additional mineral exports is well within the range of historical precedent. Moreover, this conclusion is reinforced by the fact that the historical data presented exclude flexibility due to net entrants to or exits from the workforce, which is a major component of total flexibility.

The current set of employment projections have not been disaggregated on a regional basis, but a facility to do so exists if this additional information is required and the necessary resources are allocated.

#### 4.6 RELEVANCE OF THE PROJECTIONS FOR POLICY

The projections in this chapter have been made in order to assess the likely incidence of two pressures for structural change, namely, prospective movements in world commodity prices and a further expansion in mineral exports adding 15 per cent to annual export revenue after five years. The projections were made in the context of an economy to which macroeconomic health had been restored. This was done in order to allow the distinction between macroeconomic management and structural adaptation to be made. As we have seen in Chapter 2, section 2.1, and in Chapter 3, such a distinction is critical if errors involving futile mis-matching of policy goals and instruments are to be avoided. If industries delay adaptation to structural pressures, however, the pressures will accumulate and possibly lead to disrupting large changes, and perhaps to structural adjustment problems, at a later date.

The overwhelming impression gained from the projections is that the incidence of the structural pressures we have identified is modest. In a typical year of the projection period changes in rates of return in only 10 out of 109 industries deviated 10 per cent<sup>22</sup> or more from the economy-wide average of such changes (+1.4 per cent).

The incidence of the structural pressures under discussion is not principally on import-competing industries, but rather on export industries. The exception is Motor Vehicles, where our world price outlook for product prices, if accepted, is sufficiently unfavourable to the domestic industry to cause its rate of return in a typical year to decline to be 14 per cent less than it would otherwise have been.

Some export-oriented agricultural industries, especially Cereal Grains and Other Farming, appear in the list of 11 industries least favoured by the structural pressures. As mentioned above, there are other grounds for believing that the adjustment required in agricultural industries in response to a further mining boom will be quantitatively larger than in other sectors of the economy. In the case of two agricultural industries with (according to our assumptions) particularly bright price prospects, the two sources of structural pressure work in opposite directions, having a net beneficial effect. The industries in question are Sheep and Meat Cattle.

Industries in the mining sector also appear in the bottom eleven. For reasons explained above, the results refer to the 'old', rather than to the 'new' parts of these industries. Since the prospects of the new mining activities are by definition good, net pressures on mining industries would not be large *provided* they participate in the further expansion of mining. Some re-organization and modernization within the industries will, of course, be needed.

Industries not so well placed to cope with the projected substantial downward pressures on profitability are Basic Iron & Steel, Other Basic Metal Products, and Food Products, n.e.c. It is the fact that the basic metal industries in our projections have to adjust to world prices which ensures that adjustment pressures on most import-competing industries are slight. Any attempt to insulate basic metals from world price competition via tariffs or quotas would, as a consequence, lead to the appearance of difficulties elsewhere. This is part of the inevitable trade-off of interests discussed in Chapter 2.

Viewed nationally, pressures on the composition of labour demand induced by the structural changes under discussion seem manageable, especially if they are foreseen by educational institutions, the public, trade unions, and employers. In some states and, more particularly, in certain regions of some states, the loss of job opportunities may create short run problems. The important point is that, in a healthy macroeconomy, other jobs will be created elsewhere. Whilst the 'names and addresses' of those threatened by dismissal will be easily established and perceived facts in local communities, the names of the employers offering substitute jobs may not be so readily apparent. Better provision of information in the labour market, and possibly also the provision of some specific measures aimed to improve the mobility of labour, are called for.

The above remarks should not be interpreted to mean that large numbers of workers would necessarily have to change jobs to accommodate structural change. It is likely that most of the industries subjected to structural pressure would continue to grow, but at a slower rate than the economy-wide average. Much of the labour adjustment would then take place via naturally occurring retirements and new entries to the labour force. All these ideas are

amenable to quantitative analysis, and the IMPACT framework would allow many of the specifics to be addressed.

## *Chapter 5*

### SCOPE FOR FURTHER WORK

In the previous chapters we have made some general observations about sources of structural change, general policy approaches to dealing with them, and their relationship to macroeconomic management. Using IMPACT's ORANI model we have made a detailed analysis of the relative effectiveness of macro versus industry-specific instruments in dealing with an economy beset by high unemployment, high inflation, and a relatively low level of investment activity. Finally we have examined in detail two structural pressures, namely changes in Australia's international trading relations and a mining boom, using the same model. In this final short chapter we indicate some additional areas of potential interest, and suggest how further research might proceed.

#### 5.1 OTHER STRUCTURAL PRESSURES: TARIFF REFORM

There is the question of additional pressures not examined in detail in this report. These include foreseeable technological developments and government induced pressures for change brought about, say, by a commitment to trade liberalization in either bilateral or multilateral trade negotiations. Work on the long term impact of technology is in hand using IMPACT's SNAPSHOT model, whilst the details of how to accommodate foreseeable technological change into the ORANI model have also been worked out.<sup>1</sup> In the case of structural pressures brought about consciously by government protection policy, the flavour of the kind of results obtainable with the ORANI model is given in Table 5.1. In the table we address the following questions: suppose that tariffs in ten of Australia's highly protected manufacturing industries are cut by 25 per cent in an environment in which good macroeconomic management ensures that full employment is maintained after the cut.

- (i) How much does employment fall in these now less protected manufacturing industries?
- (ii) Does employment fall elsewhere, and if so, by how much?
- (iii) Where do the new employment opportunities arise?

For reasons of space we restrict our discussion of these results to the main points. The reader should also note that our data on initial levels of protection have become somewhat dated because of events over the last few years, especially the widespread use of quotas.

Table 5.1  
Redistribution of Employment Projected to Result from a 25 per cent Cut in Protection of Textiles,  
Footwear, Clothing and Motor Vehicles

Principal Losses in Employment Demand: Falls of 0.4 per cent or more		Principal Gains in Employment Demand: Rises of 0.4 per cent or more	
Industry	Fall (per cent of industry's workforce)	Industry	Rise (per cent of industry's workforce)
23.01 Prepared Fibres	0.4	01.01 Sheep	0.9
23.02 Man-made Fibres, Yarns, etc. <sup>a</sup>	5.2	01.02 Cereal Grains	1.1
23.03 Cotton, Silk, Flax Yarns, etc. <sup>a</sup>	5.1	01.03 Meat Cattle	1.5
23.04 Wool and Worsted Yarns, etc. <sup>a</sup>	0.9	01.04 Milk Cattle	1.3
23.05 Textile Finishing <sup>a</sup>	0.8	01.05 Poultry	0.7
23.06 Textile Floor Covering <sup>a</sup>	0.8	01.06 Other Farming	1.2
23.07 Textile Products, n.e.c. <sup>a</sup>	1.6	03.00 Forestry & Logging	0.6
24.01 Knitting Mills <sup>a</sup>	0.9	04.00 Fishing, Trapping, Hunting	1.4
24.02 Clothing <sup>a</sup>	0.9	11.01 Iron	0.9
24.03 Footwear <sup>a</sup>	3.5	11.02 Other Metallic Minerals	1.6
27.03 Paints, Varnishes, Lacquers	0.5	12.00 Coal & Crude Petroleum	2.3
32.01 Motor Vehicles & Parts <sup>a</sup>	5.5	21.01 Meat Products	0.5
34.01 Leather Products	1.3 <sup>b</sup>	21.08 Food Products, n.e.c.	1.6
34.02 Rubber Products	0.4	26.01 Pulp, Paper & Paperboard	1.4
		29.01 Basic Iron & Steel	0.4
		29.02 Other Basic Metal Products	1.8
		33.05 Agricultural Machinery	0.6
		48.02 Motor Vehicle Repairs	0.4
Loss in above industries as per cent of national workforce 0.17		Gain in above industries as per cent of national workforce 0.11	

<sup>a</sup>Industry whose protection level has been assumed cut by an amount equivalent to a 25 per cent cut in the nominal *ad valorem* tariff rate.

<sup>b</sup>Probably seriously overstated due to change in mix of materials inputs used by the footwear industry since the 1968-69 input-output accounts were compiled (i.e., footwear is now a much less important customer of the leather industry).

The industries where nominal tariff levels are cut by a quarter are indicated in Table 5.1. They are the textile group, Footwear, Clothing and Motor Vehicles. In no case does the projected fall in an industry's employment demand due to the tariff cut exceed 5½ per cent of its workforce. As pointed out in Chapter 4, in a healthy macroeconomy which is growing, adjustments of the size shown in Table 5.1 do not necessarily involve any retrenchments at all. Those displaced from the industries whose tariffs have been cut and from associated industries hurt by this change account for 0.17 of one per cent of the national workforce.

Also shown in Table 5.1 are industries whose prospects brighten as a result of a tariff cut. Almost without exception they are export industries or other industries (e.g., Agricultural Machinery) whose prospects are closely tied to those of export industries. Of the 0.17 per cent of the national workforce displaced in the more severely affected industries, 0.11 per cent reappears in new jobs in the industries listed on the right in Table 5.1, whilst the remaining 0.06 per cent in new employment demand is rather evenly spread over the remainder of the economy. Finally, the occupational composition of the displaced labour is shown in Table 5.2. The total number of

Table 5.2

Occupational Distribution of Changes in National Labour Demand resulting  
from a 25 per cent Cut in Protection of Certain Industries<sup>a</sup>

Occupational Group	Reallocation of Labour demand due to changed levels of protection on		
	Motor Vehicles	Footwear, Clothing, Textiles	Total
(per cent changes in employment demand)			
1. Professional	+0.005	+0.032	+0.036
2. Skilled White Collar	-0.028	+0.003	-0.025
3. Semi- & Unskilled White Collar	-0.021	+0.013	-0.009
4. Skilled Blue Collar (Metal & Electrical)	-0.212	+0.080	-0.132
5. Skilled Blue Collar (Building)	-0.059	+0.018	-0.041
6. Skilled Blue Collar (Other)	+0.074	-0.345	-0.270
7. Semi- & Unskilled Blue Collar	-0.015	-0.067	-0.082
8. Rural Workers	+0.445	+0.187	+0.632
9. Armed Forces	-0.030	+0.011	-0.020
Weighted Sum of Changes <sup>b</sup>	0	0	0

<sup>a</sup>The industries whose protection has been reduced are those shown as<sup>a</sup> in Table 5.1 (textiles, clothing, footwear and vehicles).

<sup>b</sup>Weights set at base period shares of national workforce, namely, .0328, .1290, .2726, .1019, .0423, .0269, .2963, .0813 and .0169.

inter-occupational transfers implied by the last column of Table 5.2 amounts to 1.25 per cent of the national workforce. Actual inter-occupational transfers in 1972 and 1975 amounted to 5.3 and 4.3 per cent of the workforce respectively.<sup>2</sup> The tariff reform examined would not seem, therefore, to subject the workforce to major pressures. Since presumably any cut in tariffs would be phased in gradually over a period of years, the required rate of occupational transfer would clearly be very modest indeed. Retraining within major occupational groups (for instance, within the metal trades) may nevertheless be needed in some cases.

A facility to extend these projections to include disaggregation by State, and further industry detail, exists within the IMPACT project, subject to the allocation of the necessary resources.

## 5.2 OTHER ISSUES

Policy makers will be concerned, and justifiably so, about the sensitivity to the underlying assumptions of particular conclusions reached in the course of analysis. To some extent in this report we have been able to indicate the sensitivity of our projections to assumptions. For example, in Chapter 4 we have indicated separately the net impacts on the prospects of a domestic industry of:

- (i) prospective overseas changes in the price of its product;
- (ii) prospective overseas changes in the prices of other products;
- (iii) a new mining boom.

The contribution to the total result of each of these factors can be readily identified. Disagreement about the plausibility of, say, the assumed rate of inflation in overseas vehicle prices would not lead to a total loss of information if the plausibility of the assumptions underlying factors (ii) and (iii) above were accepted. But more systematic and detailed sensitivity analysis could, and should, be undertaken before final policy conclusions are reached.

At several points in the report we have referred to the trade-offs between the interests of different industries, occupational groups, and States. In Chapter 3 we have seen that appropriate mixes of macro instruments have rather uniform incidence across the economy and hence do not involve taking major decisions in favour of one group at the expense of others. Where the use of specific instruments such as tariffs or quotas is involved, however, either implicitly or explicitly the interests of different groups must be traded off against each other. An example of this is the redistribution of employment demand and industrial output following a change in the tariff structure. Specific proposals can be, and should be, analysed in these terms. We have not devoted major space in this report to trade-off analysis, however, for two reasons:

- (a) There is an unlimited range of specific policy changes that might be contemplated. The existing IMPACT facility should be used to analyse *particular* policy actions contemplated by policy makers rather than in an inevitably futile attempt to compile an exhaustive compendium.
- (b) Our facility to carry out such analyses has been established in several earlier papers detailing illustrative applications of the ORANI model.<sup>3</sup>

Finally, we would be less than frank if we did not record our embarrassment at having to support our analysis with a data base which in the case of input-output statistics is no more recent than 1968–69, and which in the case of labour force data is based on a sample survey of very limited size and scope. Unless the priorities attached to these areas are upgraded, the quantity and quality of the information available to service policy analysis of the structure of the Australian economy will continue in its current inadequate state.

## Appendix I List of Publicly Available IMPACT Papers

PAPER NO. I	TITLE, AUTHOR	DATE
<b>REPORTS</b>		
R -01	THE IMPACT PROJECT : AN OVERVIEW, MARCH 1977. FIRST PROGRESS REPORT OF THE IMPACT PROJECT, VOLUME ONE (ALAN A. POMELL). (CANBERRA: AUSTRALIAN GOVERNMENT PUBLISHING SERVICE, 1977), PP. XIX+182.	MARCH 1977
R -02	ONE (ALAN A. POMELL). A GENERAL EQUILIBRIUM MODEL OF THE AUSTRALIAN ECONOMY : CURRENT SPECIFICATION AND ILLUSTRATIONS OF USE FOR POLICY ANALYSIS. FIRST PROGRESS REPORT OF THE IMPACT PROJECT, VOLUME TWO (PETER B. DIXON, B. R. PARMENTER, G. J. RYLAND AND JOHN SUTTON). (CANBERRA: AUSTRALIAN GOVERNMENT PUBLISHING SERVICE, 1977), PP. XI+297.	JULY 1977
<b>MACRO MODULE</b>		
MP-01	A MACRO MODULE FOR THE IMPACT MODEL (B. R. BACON AND H. M. JOHNSTON), PP. 61.	DEC. 1976
MP-02	ESTIMATION OF THE CONSUMPTION FUNCTION : A SYSTEMS APPROACH TO EMPLOYMENT EFFECTS ON THE PURCHASE OF DURABLES (CHRIS ALAUZE), (PETER B. DIXON, B. R. BACON AND R. J. WALTERS), PP. 38.	FEB. 1979
MP-03	THE MACRO MODULE DATA BASE (B. R. BACON AND R. J. WALTERS), PP. 38.	MAY 1978
<b>BACHUROO MODULE</b>		
B -02	BACHUROO - AN ECONOMIC-DEMOGRAPHIC MODULE FOR AUSTRALIA (ASHOK H. TULPUL AND MALCOLM MCINTOSH), PP. 68.	MAY 1976
BP-03	REGIONAL VARIATIONS IN LABOUR FORCE PARTICIPATION RATES - AUSTRALIA, 1971 (VINCE MANION), PP. 67.	JULY 1976
BP-04	AN ANALYSIS OF LABOUR FORCE PARTICIPATION RATES IN AUSTRALIA (JOHN LEAPER AND RON SILBERBERG), PP. 59.	SEPT. 1976
BP-05	ESTIMATION AND MAPPING OF THE DISTRIBUTION OF INCOME IN AUSTRALIA FOR THE IMPACT MODEL (ALAN A. POMELL), PP. 63.	NOV. 1976
B -06	A CROSS-SECTIONAL ANALYSIS OF INTER-OCCUPATIONAL MOBILITY IN AUSTRALIA (J. A. MAPHALLI, M. K. MCINTOSH AND LYNNE S. WILLIAMS), PP. 86.	FEB. 1978
B -07	DETERMINANTS OF AUSTRALIAN MIGRATION (VERNA CADDY, BRENDA JACKSON AND ALAN A. POMELL), PP. 94.	JUNE 1978
BP-08	FERTILITY, FAMILY FORMATION AND FEMALE WORK-FORCE PARTICIPATION IN AUSTRALIA, 1922-1974 (R. FILMER AND R. SILBERBERG), PP. 86.	DEC. 1977
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Simulations reported in Tables 3.1–3.3		Simulations reported in Table 3.4		Simulations reported in Chapters 4 and 5	
Exogenous Variable <sup>1</sup>	Description	Exogenous Variable	Description	Exogenous Variable	Description
$\left. \begin{matrix} m \\ p_{j2} \\ m \\ p_{g+1} \end{matrix} \right\}$	C.i.f. foreign currency import prices	$\left. \begin{matrix} m \\ p_{j2} \\ m \\ p_{g+2} \end{matrix} \right\}$		$\left. \begin{matrix} m \\ p_{j2} \\ m \\ p_{g+1} \end{matrix} \right\}$	
$t_j$	One plus the <i>ad valorem</i> tariffs	$t_j$		$t_j$	
$\phi$	The exchange rate, \$A per \$US	$\phi$		$\phi$	
$s_j, j \in G2$	One plus the <i>ad valorem</i> export subsidies			$s_j, j \in G2$	
$x_j^{(4)}, j \notin G$	Export demands	$x_j^{(4)}$	Export demands (all export demands are exogenous)	$x_j^{(4)}, j \notin G$	
$k_j(0)$	Current capital stocks in use	$r_j$	$j$ = non-agricultural industry. Real rentals per unit of capital		
$c_R$	Real aggregate household expenditure	$k_j(0)$	$j$ = agricultural industry Current capital stocks in use	$k_j(0)$	Balance of trade
$i_R$	Real aggregate investment	$c_R$		$\Delta B$	
		$i_R$		$f_R$	The ratio of real aggregate household expenditure to real aggregate investment
$\eta$	Supply of agricultural land	$\eta$		$\mu$	Aggregate employment <sup>3</sup>

Wage shift variables		Parameter Values	
$\left. \begin{matrix} f_{(g+2)1m} \\ f_{is}^{(5)} \end{matrix} \right\}$	Other demand shift terms	$\left. \begin{matrix} f_{(g+2)1m} \\ f_{is}^{(5)} \end{matrix} \right\}$	
$\left. \begin{matrix} f_{g+1}^{(5)} \end{matrix} \right\}$		$\left. \begin{matrix} f_{g+1}^{(5)} \end{matrix} \right\}$	
$f_j^{(2)}, j \notin J4$	Exogenous investment	$f_j^{(2)}, j \notin J4$	
$f_j^e$	Shifts in foreign export demands	$f_j^e$	
$f_{(g+3)j}$	Shifts in the real price of 'other' cost tickets	$f_{(g+3)j}$	
$q$	Number of households	$q$	
Parameter Values		Parameter Values	
With the exception of the improvements noted in section 3.1 of the text, all parameters were set as for the tariff change simulations in Dixon, Parmenter, Ryland and Sutton, <i>op. cit.</i> , Ch. 4. In particular, the elasticity of substitution between capital and labour was set at 0.5 for all industries.		As for Tables 3.1–3.3.	

<sup>1</sup>Notation and further details are explained in Dixon, Parmenter, Ryland and Sutton, *op. cit.*

<sup>2</sup>G is the set of 'export' industries, i.e., exports are endogenous for  $j \in G$ . In our first set of simulations,  $G = \{1, 2, 9, 10, 11, 12, 15, 22, 27, 60, 61\}$ . In the Table 3.4 simulations, G is empty.

<sup>3</sup>Note that equation [13.5] of the ORANI structural form was modified (for the purposes of the experiments reported in chapters 4 and 5) to read:

$$P(g+2)(1m) = \xi^{(3)} + f_{(g+2)11} \quad (m = 1, \dots, M), \quad (13.5')$$

in which the last mentioned variable ( $f_{(g+2)11}$ ) is endogenous and interpreted as the rise in the real wage rate. Since the RHS of (13.5') is the same for each occupation  $m$ , earnings relativities are constant.

## NOTES

## CHAPTER 1 THE ORIGINS OF STRUCTURAL ADJUSTMENT PRESSURES

<sup>1</sup> Industries Assistance Commission, *Structural Change in Australia* (Canberra: Australian Government Publishing Service, June 1977), Ch. 5.

## CHAPTER 2 BASIC APPROACHES TO STRUCTURAL ADJUSTMENT POLICY

<sup>1</sup> In particular fields, e.g., agriculture, this has been well recognized for decades. To continue with the rural example, the Bureau of Agricultural Economics regularly publishes 'Outlook' and 'Situation' reports on a variety of commodities.

<sup>2</sup> In the branch of economic theory dealing with human capital it is well recognized that on-the-job training will not voluntarily be paid for by a firm if the skills learned can easily be used by an employee transferring to another potential employer. The reluctance of employers to take on apprentices at current award pay-scales seems to be connected with the risk of a firm losing its investment in training to another firm shortly after an apprentice qualifies as a tradesman. The firm 'pirating' the skilled worker can, in view of the fact that it has avoided training costs, afford to pay at least a small wage premium to attract the employee.

In the development of future retraining schemes designed to help prevent structural maladjustment in the labour market it will be important to learn from this experience. Roughly the rule should be that firms are only asked to pay for on-the-job training which produces skills which are specific to the firm.

<sup>3</sup> Peter B. Dixon, John D. Harrower and Alan A. Powell, 'Long Term Structural Pressures on Industries and the Labour Market', *Australian Bulletin of Labour*, Vol. 3, No. 3 (June 1977), pp. 5-44.

<sup>4</sup> In the case of extremely specific capital, of course, there may be no other suitable activity for its employment.

<sup>5</sup> A brief list is given by the IAC in its discussion paper, *Some Issues In Structural Adjustment* (Canberra: Australian Government Publishing Service, September 1977), pp. 46-55.

<sup>6</sup> Richard Blackhurst, Nicolas Marian and Jan Tumliar, *Trade Liberalization Protectionism and Interdependence*, GATT Studies in International Trade No. 5 (Geneva: General Agreement on Tariffs and Trade, November 1977), pp. viii+79.

<sup>7</sup> The other case in which trade-offs might sometimes be avoidable involves policy interventions designed to correct market failures associated with, for example, externalities. Even here, however, the unexploited opportunities for pure Pareto gains must be quite limited.

<sup>8</sup> Blackhurst *et al.*, *op. cit.*, p. 53.

<sup>9</sup> Dixon, Harrower and Powell (*op. cit.*) consider the trade-offs among those industries which are not major exporters.

## CHAPTER 3 STRUCTURAL ADJUSTMENT AND THE MACROECONOMY

<sup>1</sup> Brian R. Parmenter made a major contribution to the empirical work and writing of this chapter.

<sup>2</sup> For a comprehensive technical description of the ORANI model, see P. B. Dixon, B. R. Parmenter, G. J. Ryland and J. M. Sutton, *ORANI, A General Equilibrium Model of the Australian Economy: Current Specification and Illustrations of Use for Policy Analysis* — First Progress Report of the IMPACT Project, Vol. 2 (Canberra: Australian Government Publishing Service, August 1977). For a non-technical treatment, see Alan A. Powell, *The IMPACT Project: An Overview, March 1977* — First Progress Report of the IMPACT Project, Vol. 1 (Canberra: Australian Government Publishing Service, 1977), pp. 53-91.

<sup>3</sup> By the real wage overhang, we refer to the gap, at current levels of employment, between the costs to the employer of a unit of labour and the marginal value product of that unit. (An alternative definition of the real wage overhang is the gap that would exist at full employment between the cost of a unit of labour and the marginal value product of this unit if rewarded at currently prevailing wage rates. We will avoid this definition.)

<sup>4</sup> We do not claim to be able to distinguish between changes in the relative prices of traded and non-traded goods brought about on the one hand by a change in the exchange rate or on the other by a change in the domestic price level.

<sup>5</sup> It is important to distinguish the concept of wage indexation used in this book from its popular usage. In the language used here we would say that wages were  $x$  per cent indexed in 1978-79 if costs per unit of labour input *actually* rose by  $xy/100$  per cent in that year, where  $y$  is the percentage increase in the consumer price index in 1978-79.

<sup>6</sup> See Dixon, Parmenter, Ryland and Sutton, *op. cit.*, Ch. 4; and W. Kasper, 'The Emergence of an Active Exchange Rate Policy—Some Quantitative Lessons', in W. Kasper (ed.), *International Money — Experiments and Experience* (Canberra: Australian National University Press, 1976).

<sup>7</sup> In the ORANI model, if capital is held fixed, then a one per cent expansion in the output of an industry leads to a decline of  $(S_K/S_L)$  per cent in average labour productivity, where  $S_K$  and  $S_L$  respectively are the shares of capital and labour in value added. In the ORANI data base, a typical value for  $S_K$  would be 0.33, and for  $S_L$  0.67.

<sup>8</sup> With fixed capital stocks, the percentage change in employment demand in ORANI is  $\sigma(\pi - w)$ , where  $\sigma$  is the elasticity of substitution between labour and capital and  $\pi$  and  $w$  are, respectively, the percentage changes in the implicit rental price of capital and in the money wage rate.  $\sigma$  is assumed to be 0.5 in these simulations.

<sup>9</sup> With ORANI in short run mode, the elasticity of output with respect to real value added price is  $\sigma S_L/(1 - S_L)$  where the symbols are as defined in the previous notes. With owner-operators' labour treated as a fixed cost,  $S_L$  becomes the share of hired labour in primary factor costs. In the ORANI data base  $S_L$  ranged from 5 per cent to 18 per cent for major agricultural export-oriented industries. The typical value of  $S_L$  for these industries is about 0.14, implying that their short run supply elasticity is approximately 0.08. The export demand schedules faced by these industries have elasticities ranging from 1.3 to 20.0.

<sup>10</sup> The principal modifications made consist of reallocation of base year gross operating surplus (GOS) between fixed capital and other claimants, and the use of new econometric estimates of the 'Frisch parameter' and of household expenditure elasticities of demand. The latter are reported in Ashok Tulpulé and Alan Powell, 'Estimates of Household Demand Elasticities for the ORANI Model', *IMPACT Preliminary Working Paper* No. OP-22, Industries Assistance Commission, Melbourne, September 1978. The principal effect of reallocating GOS was to make industries overall somewhat more capital intensive. In the case of agricultural industries, the return to owner-operators' labour was aggregated with the return to fixed capital; i.e., owner-operators' labour becomes fixed in the short run.

<sup>11</sup> Gottfried Haberler, 'Some Factors Affecting the Future of International Trade and International Economic Policy', in Seymour E. Harris (ed.) *Economic Reconstruction* (New York: McGraw Hill, 1945), p. 320.

<sup>12</sup> For a recent survey see P. B. Dixon, 'Economies of Scale, Commodity Disaggregation and the Costs of Protection', *Australian Economic Papers*, Vol. 17, No. 30 (June 1978), pp. 63-80.

<sup>13</sup> This particular simulation of the effects of a tariff increase is described in greater detail than is possible here in Dixon, Parmenter, Ryland and Sutton, *op. cit.*, Ch. 4.

<sup>14</sup> The increase in the capital goods price index is even higher. The capital goods price index includes a comparatively heavy weighting on protected imports.

- <sup>15</sup> As well as increased wage costs, protection imposes increased materials costs. This idea is emphasized in the 'effective protection' literature and also plays a significant role in the ORANI computations.
- <sup>16</sup> Some economists still cling to the notion of a Phillips curve: they just argue that it is subject to large shifts and occasionally slopes the wrong way.
- <sup>17</sup> In terms of the ORANI notation, the computations were run with  $c_R = i_R = 1$ . In view of the model equations (7.1) and (7.2), the *f*151s were set at zero, as were all the other exogenous variables. The exogenous/endogenous split is given in Appendix II or in Table 3 of Dixon, Parmenter, Ryland and Sutton, *op. cit.*
- <sup>18</sup> \$0.144 billion is about 3.9 per cent of exports in the model's base year.
- <sup>19</sup> Notice in column II that imports are shown as increasing by 1.815 per cent.
- <sup>20</sup> \$0.011 billion is about 0.3 per cent of exports in the model's base year.
- <sup>21</sup> In these simulations, short run expansions of public services increase unit costs, just as short run expansions in private production activities increase unit costs. However, unit costs (or 'prices') of public services (defence, public administration, etc.) do not enter the ORANI consumer goods price index and do not flow on to wages.
- <sup>22</sup> Note that  $5.0/.158 = 31.65$  and  $31.65 \times .056 = 1.77$  and  $31.65 \times 0.3 = 9.5$ .
- <sup>23</sup> Column IV does not imply a negative rate of inflation. It means that if real wages are decreased by one per cent (without the decrease being allowed to affect real absorption or the exchange rate) then after about one or two years the price level will be 1.118 per cent less than it otherwise would have been.
- <sup>24</sup> \$0.076 billion  $\times 9.7 = \$7.39$  billion. This represents about 20 per cent of exports in the model's base year.
- <sup>25</sup> Tariff cuts might play a particularly important role in a package designed to control inflation.
- <sup>26</sup> See, among others, R. H. Snape, 'Comment', *Economic Papers* No. 56, October 1977; W. M. Corden, 'Macro-Economic Policy Options for Australia', *Economic Papers* No. 56, October 1977; F. H. Gruen, 'Some Thoughts on Real Wages and Unemployment', in M. R. Fisher *et al.*, *Real Wages and Unemployment*, CAER Paper No. 4, March 1978; P. D. Jonson, J. C. Taylor, M. W. Butlin, J. I. Eberhardt and R. W. Rankin, 'Development and Use of RBA 76', in *Reserve Bank of Australia Conference in Applied Economic Research*, December 1977 (Sydney), pp. 37-114, esp. pp. 63-4; D. W. Stammer, 'Real Wages and Unemployment', in M. R. Fisher *et al.*, *op. cit.*; and P. B. Dixon, B. R. Parmenter and J. M. Sutton, 'Some Causes of Structural Maladjustment in the Australian Economy', *Economic Papers* No. 57, January 1978.
- <sup>27</sup> Snape, *op. cit.*, p. 38.
- <sup>28</sup> See McCracken *et al.*, *Towards Full Employment and Price Stability*, OECD, 1977, p. 18.
- <sup>29</sup> Dr Sheehan (see P. Sheehan, 'Real Wages and Unemployment: An Alternative View', in M. R. Fisher *et al.*, *op. cit.*), for example, denies the existence of wage overhang, i.e., he argues that increases in real wages have not been excessive in relation to productivity growth. While we do not take a position on the validity of Sheehan's statistics, we do question their relevance. During a period in which excessive real wage growth was causing unemployment, average productivity could be either increasing or decreasing relative to real wages. 'This historical real overhang approach is unsatisfactory because it concerns itself with averages, whereas the relevant magnitudes are, of course, marginal costs and productivities.' — Gruen, *op. cit.*, p. 70.
- <sup>30</sup> Corden, *op. cit.*, p. 30.
- <sup>31</sup> F. H. Gruen, *op. cit.*, p. 80.
- <sup>32</sup> W. M. Corden, *op. cit.*, p. 27.
- <sup>33</sup> P. McCracken *et al.* (The McCracken Report), *op. cit.*, p. 197.
- <sup>34</sup> Evidence that the real cost of securing a man-hour of labour services has continued to rise despite partial wage indexation may be found in Australian Treasury,

*Round-up of Economic Statistics*, September 1978, p. 25.

- <sup>35</sup> Corden, *op. cit.*, p. 32.
- <sup>36</sup> Readers may feel that computations of rates of return in such industries as Defence (102), Education (104), etc. are rather artificial. However, changes in rates of return in these industries can be interpreted as indicating changes in their intensity of capital utilization compared (in the appropriate way) with changes in the costs of creating additional capital.
- <sup>37</sup> The household expenditure elasticities used in ORANI are reported in Tulpulé and Powell, *op. cit.*, and are reproduced in Chapter 4, Table 4.5.
- <sup>38</sup> e.g., certain members of the textile group, namely, 29, 30, 33; the Pulp, Paper and Paperboard industry, 41; Industrial Chemicals, n.e.c., 47; and the Motor Vehicles and Parts industry, 65.
- <sup>39</sup> The analysis of this section was inspired by W. M. Corden's recent paper 'Wages and Unemployment in Australia', presented at the 7th Conference of Economists, Macquarie University, August 1978. In particular, we seek to illustrate his proposition (stated on p. 26) that 'Once the balance of payments effects of demand expansion are introduced and the exchange rate is allowed to depreciate, a "diminishing returns" model is the correct one even where there are constant returns domestically. If demand expansion is to be successful in increasing employment the real wage must fall. This conclusion could only be avoided if the country were willing to borrow abroad to avoid a depreciation or if there were increasing returns domestically...'
- <sup>40</sup> A complete list of publicly available IMPACT papers is given in Appendix I.
- <sup>41</sup> In section 3.1 it was noted that elasticities of supply for major exports in the simulations reported in sections 3.2 and 3.4 were typically quite low and that elasticities of foreign demand for Australian exports were typically high. The elasticity of export volumes is a composite of these demand and supply elasticities.
- <sup>42</sup> Table 3.4 contains only selected macro projections. Space limitations prohibit the presentation and analysis of the underlying occupational, industry and regional employment results. Readers requiring these results can obtain them from the authors.
- <sup>43</sup> Alternatively, the mark-up could have been calculated on total variable costs. Such a change would not, we suspect, affect any of the conclusions of this section.
- <sup>44</sup> Labour and capital are used in fixed proportions. (The elasticity of substitution between labour and capital is set at zero.)
- <sup>45</sup> In terms of Appendix II, the results in column I of Table 3.4 were generated with  $c_R = i_R = 1$  and all other exogenous variables set at zero. The results in column II were obtained with the exogenous variables set so that  $f_{(g+2)/m} = -1$  for all  $m$ . Again, all other exogenous variables were at zero.

#### CHAPTER 4 LIKELY INCIDENCE OF SOME PRESSURES FOR STRUCTURAL CHANGE

<sup>1</sup> Other forces for which, in principle, projections could be made with the ORANI model include demographic and technological change. Recent work by Professor Williams (Ross A. Williams, '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, Melbourne, February 1978 (mimeo)) establishes that demographic changes are not likely to lead to major changes in demand patterns over a period as short as a decade — at least not at any level of aggregation for which data are available. We don't believe that demographic changes currently in process will lead to major changes in the patterns of demand at the input-output level of disaggregation, except perhaps in the fields of health, education, welfare and public administration. Recent work by the Bureau of Industry Economics (D. Chapman and A. J. Wood, 'Technological Update of Input-Output Industries to 1990/91', 'Technology in 1990/91: an Analysis of Selected Industries', and 'Less Detailed Technological

Updates of Input-Output Industries to 1990/91', Bureau of Industry Economics, February 1978) has made a useful start on characterizing likely technological changes in prospect. Unfortunately, this work, whilst suitable for immediate use in the SNAPSHOT model (which is not yet in use on a routine basis), will require a major input of professional time to make it suitable for use in the ORANI model. This was beyond IMPACT's resources given the time-frame for the Study Group's report.

<sup>2</sup> J. W. Freebairn, 'Projections of Australia's World Trade Opportunities: Mid and Late 1980's, IMPACT Working Paper No. 1-07, Industries Assistance Commission, Melbourne, December 1978.

<sup>3</sup> W. Leontief *et al.*, *The Future of the World Economy* (New York: Oxford University Press, 1977).

<sup>4</sup> Peter B. Dixon, John D. Harrower and Alan A. Powell, 'Long Term Structural Pressures on Industries and the Labour Market', *Australian Bulletin of Labour*, Vol. 3 (June 1977), pp. 5-44.

<sup>5</sup> *Ibid.*, Table 2.

<sup>6</sup> Dixon, Harrower and Powell, *op. cit.*

<sup>7</sup> For a more detailed discussion of our treatment of the mining boom, see Dixon, Harrower and Powell, *op. cit.*

<sup>8</sup> R. G. Gregory, 'Some Implications of Growth in the Mining Sector', *Australian Journal of Agricultural Economics*, Vol. 20, No. 2 (August 1976).

<sup>9</sup> The direct input-output linkages to new mining activity are becoming more important through time as an increasingly larger percentage of the industry is accounted for by 'new' developments (*viz.*, post 1968-69). The timely provision of input-output statistics would allow these direct effects to be modelled.

<sup>10</sup> P. B. Dixon, B. R. Parmenter and John Sutton, 'Some Causes of Structural Maladjustment in the Australian Economy', *Economic Papers* No. 57 (January 1978), pp. 10-25.

<sup>11</sup> Dixon, Harrower and Powell, *op. cit.*

<sup>12</sup> Dixon, Parmenter, Ryland and Sutton, *op. cit.*

<sup>13</sup> For a full discussion of approaches to use of the ORANI model for long term projections, see Peter B. Dixon, B. R. Parmenter and John M. Sutton, 'Notes on the Theory of Long-run Simulations with the ORANI Model', IMPACT Preliminary Working Paper No. OP-20, Industries Assistance Commission, Melbourne, July 1978.

<sup>14</sup> The change in the average economy-wide rate of return is 1.4% (not percentage points — see p. 48). There are 10 industries for which the change in the industry specific rates of return are projected to be between 6.5 and 16.4% above their original values.

<sup>15</sup> Alan A. Powell and Brian R. Parmenter, 'The IMPACT Project as a Tool for Policy Analysis: Brief Overview', *Australian Quarterly*, Vol. 51, No. 1 (March 1979), pp. 62-74.

<sup>16</sup> We are aware of the artificiality of the input-output conventions in Australian agriculture — since single enterprises involved in both wheat and sheep are a dominant farm type, the separate results for 01.01 Sheep and 01.02 Cereal Grains should not be interpreted independently of each other.

<sup>17</sup> See Chris M. Alaouze, J. S. Marsden and John Zeitsch, 'Estimates of the Elasticity of Substitution Between Imported and Domestically Produced Goods at the Four-Digit ASIC Level', IMPACT Preliminary Working Paper No. OP-11, Industries Assistance Commission, Melbourne, July 1977.

<sup>18</sup> See Dixon, Parmenter, Ryland and Sutton, *op. cit.*, Ch. 4, section 21.

<sup>19</sup> Dixon, Harrower and Powell, *op. cit.*

<sup>20</sup> We do not claim to be able to distinguish between changes in the relative prices of traded and non-traded goods brought about on the one hand by a change in the exchange rate or on the other by a change in the domestic price level. The important point is that the mining boom causes the prices of important raw materials to be

lower (relative to a general index of domestic prices) than they would otherwise have been.

<sup>21</sup> Dixon, Harrower and Powell, *op. cit.*

<sup>22</sup> That is the change in the average economy-wide rate of return is 1.4 per cent (not percentage points — see p. 48). For only 10 industries is the change in the industry specific rate of return projected to be outside the range -8.6% to +11.4% of its original value.

#### CHAPTER 5 SCOPE FOR FURTHER WORK

<sup>1</sup> For a synoptic outline, see David P. Vincent, 'Technology Scenarios: Their Role in the IMPACT Project', Paper presented to the Workshop on Technology Assessment and Future Studies in National and Corporate Planning, Department of Science, Canberra, July 1978.

<sup>2</sup> J. A. Naphtali, M. K. McIntosh and Lynne S. Williams, 'A Cross-sectional Analysis of Inter-occupational Mobility in Australia', IMPACT Working Paper No. B-06, Industries Assistance Commission, Melbourne, February 1978.

<sup>3</sup> See papers nos R-01 (Ch. 4), R-02 (Ch. 4), G-03, G-04, G-06, OP-19, IP-04 and G-17 listed in Appendix I.

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This study provides an entirely new perspective on current economic debates in Australia by emphasizing the relationship between questions of structural adjustment and macroeconomic strategies. As such it is essential reading for all professional economists and students of economic policy, as well as for policy advisers in the business community and in government. The book is based on a report prepared for Sir John Crawford's Study Group on Structural Adjustment by Professors Dixon and Powell, directors of the inter-agency IMPACT research project.

The analysis is based mainly upon simulations carried out with ORANI, a multi-sectoral model of the Australian economy. Detailed projections reveal that alternative approaches to macroeconomic recovery have vastly different implications for different industries, occupations, and States. The authors conclude that a combination of a modest squeeze on real wage costs combined with some stimulus to aggregate demand could significantly reduce the aggregate level of unemployment and at the same time generate a balanced expansion in all occupations and States, and in most industries.

An implication of the analysis is that many apparently structural difficulties would disappear following an appropriately managed return to macroeconomic health. To supplement this conclusion the authors also make projections of the incidence of three genuinely structural (as distinct from macroeconomic) pressures: namely, likely developments in competition in world trade; a new 'mining boom'; and the possibility of tariff reductions in some of Australia's most highly protected industries. None of these is projected to involve unmanageable rates of structural change for either industries or the workforce, given a return to macroeconomic health.



# STRUCTURAL ADAPTATION

IN AN AILING MACROECONOMY



Dixon, Powell, Parmenter,