METAL TRADES UNIONS

POLICY FOR INDUSTRY DEVELOPMENT AND MORE JOBS

The Metal Trades Unions have taken the Industry Development Policies in the ACTU / ALP Accord and applied them to the manufacturing industry.

This Report shows how the Accord policies can help create new jobs and revitalize Australia's Economy.

August 1984

FORWARD

On June 5, 1984 the Metal Industry Award Negotiation Committee, representing the 13 unions in the Metal Trades Federation of Unions, held a special meeting to review the progress in implementing the industry policy provisions of the Prices and Incomes Accord. At that meeting the following resolution was carried unanimously.

"The Metal Unions Negotiation and Campaign Committee expresses its concern at the continued rejection by Government of providing an adequate basis for the Metal Manufacturing Industries to contribute to the economy to the extent that it can.

We assert that a clear combination of import replacement as well as export expansion is essential if industry modernisation is to be effected, if employment growth is to be promoted in real and significant terms and if the benefits of expansionary economic strategies are to be maximised and fully realised.

We reject outright as ineffective and destructive those industry strategies which predominantly rely on indirect mechanisms and the so called strictures of the market. They will not provide sufficient jobs. They will increase the drain of resources and they will continue to destroy the base of skill and technological development.

We call on the Federal Government to change the direction of its industry policies in the form of an unequivocal commitment to the manufacturing industry whilst there is still time to do so.

We call on the Federal Government to provide real tripartite management of industrial development with proper and responsible regard to the principal partners in industry. The Employers and the Unions resent the purely ideological influences exerted on Government from academics and bureaucrats who hold the principal parties in industry at arms length in favour of theorising to make us fit into an unreal world.

In the meantime even in expanding economic circumstances major vital metal industry companies are closing at the rate of one per week.

A continuing level of more than 9% unemployment cannot be accepted in a Country as well as endowed as in Australia. It spells disaster at the onset of any further recession.

The Metal Unions adopt the interim report and the proposals based in the example of four industry sectors in the Metal Industry and determines to present them to Government.

We express strong criticism of the delay in getting the full tripartite industry development apparatus into operation and at the inadequacy of information relating to industry policy decisions before they are finally determined.

We determine to seek a full discussion on all the related matters with the Prime Minister.

We call for the AMC to coordinate a Government funded public awareness campaign to promote the need for a substdantial manufacturing industry to re-establish full employment.

We also determine: To discuss the matter with employers organisation

: Inform the ACTU and State Trade and Labor Councils

: Meetings of all Metal Union Officials in each State

: A fully representative meeting of officials at national level

: Shop Steward Meetings in all Metropolitan and Regional centres

: Launch a Nationwide petition to support our approach

: That we lead from the Shop Stewards to mass stop work rallies of the membership

: Request the ACTU for a seminar of all those appointed to Industry Councils as soon as possible

: An early meeting of metal trades union representatives and machinery and metal Engineering, Basic Metals,

Electrical and Electronic, Metal Fabricated Products Industry Councils.

: Job and industry meetings and deputations to members of the Federal Caucus.

: To meet again in six weeks to further plan the campaign."

As the resolution indicates, the Metal Unions attach the highest priority to the speediest possible return to full employment. We note that on present economic and industrial policies forecast, unemployment will remain at a serious level for the foreseeable future. We believe that the employment objective should be achieved through a combination of policies including -

* expnsionary macroeconomic strategies

* redistribution, tax and wealth programmes

* effective industry development strategies involving -

  i) across-the-board manufacturing industry; modernisation programmes;
  ii) specific industrial expansion programmes for the key metals and engineering technology industries, based on a combination of import replacement and export expansion;

  iii) an effective and well resourced consultative decision making framework involving government, employers and trade unions.

To this end a study has been commissioned into the issues of full employment and industrial development. The results show that considerable advances can be made towards the achievement of our objectives over a comparatively short period of time.

On behalf of the Metal Unions I would like to thank the authors of this Report for the work they have done. It provides an example of the approach to industry development policy that the Metal Unions will continue to pursue. I would only hope that the consensus objective underlying this report proves to be achievable. It will certainly be at the forefront of Metal Union and employer endeavours to convince Govenment to implement an appropriate industry development policy before it is too late, with all that would imply for the future of industry, the economy and the Prices and Incomes Accord

Laurie Carmichael Secretary Metal Industry Award Negotiation Committee
August 1984 .

ACKNOWLEDGEMENTS

A report of this nature is not possible without a number of contributors. The AMFSU would like to thank all those who made the report possible.

First and foremost Dr. Peter Brain and the National Institute of Economic and Industry Research. The Institute provided the macro economic forecasts and the metals and engineering demand expansion simulations. They also facilitated the coming together of Government, Union and Employer representatives for discussion and debate on industry development policy from which this report benefited considerably. In selecting the Institute to run the forecasts, simulations and co-ordinate the production of this report the union paid particular attention to the forecasting model used - the Imp Multi Purpose model. Galley proofs outlining all dimensions of how the model functions were readily available upon request to ourselves and to others, and allowed us the opportunity to carefully assess its capability.

The Business Union Liaison Unit in the Department of Trade and no fewer than six other Commonwealth and State Government Departments were particularly helpful in facilitating discussions on the problems and issues relevant to industry, employment and economic development policy. Likewise individual employers, employer organisations and employer representatives on industry councils facilitated discussions on the problems and issues relevant to industry development policy.

A number of individuals and organisations made contributions to the content and organisation of the report. They include John Freeland, Dr. Carol O'Donnell, Kim Windsor and Shane Tregilis of the Labour Resources Centre. Our thanks are also especially extended to Greg Richardson of the National Institute.

For several years now Colin Edwards, former metal worker and AMFSU branch secretary, and now Principal Ministerial Advisor to the Minister for Employment and Training, Mr. Jim Simmonds, has provided the trade union movement with invaluable expertise in the area of employment and industry policy analysis. In a real sense this report reflects Mr. Edwards work with employers unions and government over the past few years, . particularly in terms of policy development, institutional design and quantitatives analysis. The AMFSU and other metal unions are particularly grateful to Mr Edwards for his role in this project.

A number of other people contributed to the report, but have asked to remain anonoymous. Workers, stewards, organisers and State and National union officials all gave freely of their time and provided much of the information gathered together in this report. Nixon Apple and Steve Cooper from AMFSU National Research Office helped organise and co-ordinate the research effort as well as contributing to the content of the report.

The support team, including AMFSU and National Institute secretarial staff, and National Institute's design and layout team were particularly helpful. Rank Xerox was of considerable assistance in providing advice on their computer based laser type setting equipment. Mr Michael Millane and the Pink Panther Instant Printing team at 450 Little Collins Street in Melbourne worked round the clock to ensure the report was ready for its official launch on Monday 27th August, 1984.

To all these people and organisations a special thanks for their co-operation and contribution.

INTRODUCTION

When the Labor Government came to office in March 1983 it was confronted with the most serious economic crisis the nation had faced in fifty years. Unemployment and inflation had been rising simultaneously for most of the past decade and were both in excess of 10% at the time of the March elections.

While recent developments such as the drought, international recessionary trends and the sheer magnitude of the 1982-83 recession in Australia (which brought with it a fall in the level of employment of nearly 3 per cent in the year to March 1983,and raised the numbers of unemployed to over 700,000) were of immediate concern to Labor, it was recognised that the problems facing the nation were deeply rooted in the often erratic and contractionary domestic economic policies that had been pursued.

The deficiencies in domestic economic policy and the need to adopt a radical alternative approach had been the subject of extensive discussions between the ALP and the ACTU since the late 1970's. The Prices and Incomes Accord which arose from these discussions recognised that:

"....with inflation being high when unemployment is high, sustained economic recovery sufficient to restore and maintain a situation even remotely resembling full employment is not possible whilst reliance is placed solely on conventional economic weapons of fiscal, monetary and exchange rate policy, however varied and applied. This is because economic recovery will soon lead to increased inflation, thus forcing Government to adopt contractionary anti-inflation policies which will truncate the recovery and prevent any restoration of full or even near-full employment."

The Accord's analysis of fighting unemployment and inflation simultaneously correctly emphasised that the pursuit of more expansionary macro policies than could otherwise occur required agreed upon mechanisms for managing and resolving competing income claims. Such mechanisms were required so that the benefits of additional expansion were seen in the growth of output and employment rather than simply another inflationary wage - price spiral. Within such an environment the Accord's redistribution objectives could be pursued with greater consistency, effectiveness and broad community support.

The benefits from the Accord's approach of combining more expansionary macro policies than could otherwise be pursued, with mechanisms for revolving competing income claims have already been recognised as substantial and more far reaching than many thought was possible just over 12 months ago. These benefits stemming directly and indirectly from the implementation of the Accord have included:

1. An expansionary monetary/fiscal policy:

The increase in the Commonwealth Budget deficit from 2.8% of GDP (1982-83) to an estimated 4.5% (1983-84) along with supportive State Government policies have contributed significantly to

. Growth of non farm GDP at an annual rate of more than 10% since the June Quarter 1983.

. Creation of 233700 new jobs (April 1983-May 1984) and a reduction in the unemployment rate (seasonally adjusted) from 10.4% (September 1983) to 8.9% (May 1984).

. Reduction in inflation (as measured by the CPI) to 3.9% over the year to the June Quarter 1984.

In addition, the Accord's macro policy prescriptions and mechanisms for managing competing income claims have contributed to establishing a much more favourable environment for private investment through:

. Reducing interest rates

. Reducing real unit labour costs. In the March quarter 1984 the Treasury index of real unit labour costs had fallen to 98.3 (average 1966-67 to 1972-73 = 100) so that the so called "real wage overhang" of the mid 1970's has been more than eliminated.

. Increases in profitability. In the 6 months to March 1984 the gross operating surplus of trading enterprise companies was 16.2% compared to 12.1% over the 6 months to December 1982.

. Achievement of the Government's monetary and budget deficit targets for 1983-84.

. Reducing industrial disputation to its lowest level in 16 years.

2. Distributional Objectives and Management of Competing Income Claims.

While more could have been achieved in fulfilling the Accord's distributional objectives, it is important to emphasise:

. The 1984-85 budget has provided significant tax cuts for low and middle income earners, and significant benefits for pensioners and low income single parent families.

. The first home owners scheme introduced by Labor and the expansion of public housing has been significant for many low and middle income earners, during 1983-84.

. The changes to social security arrangements and the introduction of Medicare have made a contribution to redistributing to those most in need.

. The 80% increase in 1983-84 in expenditures on employment and training schemes has been of particular benefit to thelong term unemployed who would not otherwise benefit from employment growth during recovery.

. The bringing into the Conciliation and Arbitration Commissin of a number of professional groups for review of their fee setting practices and establishment of a tripartite task force on executive and managerial salaries has somewhat enhanced the even handed approach to managing competing income claims.

These and other measures (including the establishment of Accord Consultation structures such as ACPI and EPAC, industrial relations reform, occupational health and safety, etc) have begun the task of tackling the uneven and inequitable distribution of wealth, income, and influence, as well as providing the environment for a more expansionary policy than would otherwise be possible.

However, it has been of some considerable concern to the ACTU and to the Metal Trades Federation of Unions in particular that little has been done to integrate the Accord's industry development policy with macro economic policy and the management of competing income claims. The unions have noted their disappointment with Government over a number of issues including:

. The Government rejecting virtually all of the ACTU's submission to the Uhrig review of the IAC.

. Failure to establish the planning structures for industry during Labor's first year in office. The Secretariat for the Australian Manufacturing Council has still not been established.

. Failure to consult fully with the unions over the Car Industry Plan after the Car Industry Council handed in its report to Government in December 1983.

These and other issues have left workers and their unions with little confidence that the de-industrialisation of Australia is a central concern of Government. This in turn has led the union movement to question the commitment of Government to the Accord's industry policy prescriptions. Without such a commitment union acceptance and support for other areas of the Accord could be diminished at a critical stage in the economic upturn.

Recent developments suggest some acceptance by Government of the need to change direction in its industry policy. This is demonstrated in both the recently adopted ALP policy platform on industry policy and the unanimous endorsement of ALP conference resolutions on industry policy and the Accord, emergency measures for heavy engineering and the metals sector as well as shipbuilding and offset arrangements. It remains to be seen how these measure will be put into practice. In the interim there is a real need for the union movement to continue to explain why it is so necessary to integrate with macro economic policies an industry policy based on import replacement, export expansion and modernisation programs. Such an approach is needed so that the constraints on economic growth can be overcome and the full employment objective achieved more rapidly than would otherwise occur.

Macro Economic Industry Policies - THE LINK

The March 19th, 1983 meeting of the ACTU Executive agreed on a two year action plan. The published document, "ACTU: The Way Forward - A Positive Plan for 1984 & 85" re-emphasises the Prices and Incomes Accord approach of integrating expansionary monetary, fiscal policies with industry policies in an environment of price and wage stability.

In essence it is a re-assertion of the Accord statement that "the paramount objective of economic policy is the attainment of full employment. Industry Development policy should be integrated with macro-economic policy to achieve this goal".

The concern of the ACTU Executive and of the affiliated unions (including the metal unions) was that although the Government had made substantial progress in fulfilling the objectives and prescriptions of the Accord in most areas there had been little effective integration of an overall industry policy approach with macro-economic policy and that the approach to industry policy lacked the essential reference to the Accord.

It must be emphasised that it was not simply that industry policy as one of the essential items of the Accord, was not being conducted in line with the Accord. The legitimate concern was that without the full inegration of industry policy the full potential for economic expansion, growth, employment creation, price and wage stability and redistribution could not be achieved.

In order to focus on the constraints to full potential in these areas the metal unions commissioned a study by the Melbnourne Institute of Applied Economic and Social Research in October 1983. Subsequently further work was commissioned from the new National Institute of Economic and Industry Research under the direction of Dr. Peter Brain. The national research office of the AMFSU, working in conjunction with the new National Institute gathered together a team of experienced research personnel and invited contributions from policy makers, Government advisors and various Union officials and employers. This team was able to add significantly to the main economic projections of the Institute by developing a detailed analysis of, main economic projections and policy proposals for, an industry development plan for the metals and engineering industry. This report provides an example of how industry policy and macro economic policy need to be integrated if unemployment in Australia is not to remain at its projected level of more than 10% by the end of 1980's.

NIXON APPLE National Research Office Amalgamated Metals Foundry and Shipwrights' Union

PREAMBLE

At the very least this report deserves to make a worthwhile contribution to the debate over industry assistance policies in the Australian context.

Past debates over industry assistance policies hence tended to become sterile, with the focus of attention being concentrated on one of the two opposite positions - free trade or protection (tariffs and/or quotas). The facts are that the protection instruments are but one of a wide range of policy instruments available to assist industry; that billions of dollars each year are allocated to industry assistance in Australia, either via the public exchequer or as a implicit consumption tax; and that industry assistance policies are being vigourously pursued by our major trading competitors, to the detriment of Australian producers. A wide range of assistance measures are used in Australia. For example, there are price support schemes for agricultural products, town and transport infrastructure contruction for mining enterprises, subsidies for aluminium producers, high tariff and quota protection for clothing and footwear manufacturers, and broad based taxation concessions. To continue to prolong the debate in terms of the simplistic dichotomy between free trade versus protection is to trivalize the fundamental issues and objectives associated with Government policy generally and thereby to do a grave disservice to the people of Australia and especially to those who are unemployed.

This study indicates the following factors around which debates should focus:

A rationale for industry assistance or development policies, both in terms of the natural mechanisms of economic growth and the likely medium-term environment of the Australian economy.

A description of the critera of unconstrained free market allocation decisions in selected industries, which do not always correspond to the textbook model.

Principles of policy design and a framework of machinery of government which, if applied, could result in a more rational allocation of industry assistance resources.

The inference that a reallocation of industry assistance resources to targetted industries in the metals and engineering sector may result in a higher rate of return per assistance dollar.

As the subject matter of this report should be in the public domain the National Institute of Economic and Industry Research is pleased to have had an opportunity to contribute to the report; to assist in the editorial process so that the views of other contributors could be embodied in a consistent framework; and to prepare the document for publication. Needlessly to say, given the many contributors to the document, the views expressed herein are not necessarily those of the National Institute.

Peter J. Brain National Institute of Economic and Industry Research

A Statement from a contributor

The following Report constitutes, I believe, a profound contribution to the debate on employment, technological change and the future direction of the Australian and Victorian economies. However, the Report could not have been written without the co-operation and assistance of both government and industry. In particular the Victorian Minister of Employment and Training, Mr Jim Simmonds, has been especially helpful, as have the officials of his Department. Nevertheless, the views expressed in this Report remain those of the contributors, and are not necessarily shared by either the Minister or the Ministry of Employment and Training.

Colin Edwards Consultant and Contributor

METAL TRADES UNIONS POLICIES FOR INDUSTRY DEVELOPMENT

SUMMARY AND OVERVIEW

Industry development policies may be defined as policies aimed directly at influencing any or all of output, employment or international competitiveness in tradeable goods industries. Part 1 of this paper provides a broad review of the case for development policies. It begins with the case against their use as developed from the neoclassical model of economic behaviour. The argument is examined but is rejected for two reasons: firstly, it is considered that the assumptions of the model are irrelevant to the structure of modern industrial economies and, secondly, its power to describe and explain the dynamics of the growth process are limited. In general, it is argued that a realistic model of modern economies would show that development policies can be an effective means of improving economic efficiency and living standards and that this has been demonstrated by the more successful East Asian economies.

At the same time, it is pointed out that their effectiveness is not global but depends on the economic environment during the time that the policies are expected to operate. A projection of the environment that can be expected in the medium-term future in Australia is therefore included in Part 1. From this it is argued that, without large-scale policy initiatives, growth is unlikely to exceed an annual average rate of 3 per cent in the medium-term future (up to 1989). Hence, it is unlikely that recorded unemployment can be much lower than average yearly level of 700,000 (which is associated with a similar level of unrecorded, or hidden, unemployment).

The issue of timing the introduction of development policies is important, because economic activity is prescribed by constraints, or barriers, to growth and the force of these constraints can differ in different economic environments. They are considered in more detail in the body of this paper, but the general view taken here is that the use of conventional monetary or fiscal policies as a means of attempting to expand domestic demand in the medium-term future beyond what is given in the projection would be self-defeating. Neither growth nor unemployment would be improved, while interest rates and inflation would rise and there would be an increase in the instability in foreign exchange markets. On the other hand, the potential force of the constraints could be lessened by the application of appropriate industry development policies, which could then be complemented by the introduction of the conventional fiscal or monetary measures to expand demand upp to the higher ceilings.

Having examined in general terms the case for industry development policies, the paper then examines what guidelines, or objectives, are required to develop efficient, effective policies. It is argued that development policies are not cost free. They require either the direct input of resources, such as bounties on production, or indirect measures, such as compensation for export industries when tariffs are introduced. Since tradeable goods industries differ in their ability to benefit from assistance measures, economic rationality demands that resources be allocated where the greatest gain from the assistance dollar is to be made. In orther words, assistance resources should be allocated to specific industries and not be spread evenly but thinly over the tradeable goods sector as a whole. It is recognized here that generalized assistance policies will not be equally effective in all industries. In the past, some industry development policies have failed because this has not been adequately taken into account. Specifically, successful policies will need to incorporate the following design characteristics. They should:

- encourage export-orientation
- aim to promote international standards of efficiency in Australian industry
- reduce competitive forces in the economy only if there are offsetting benefits
- fix the term over which assistance will be granted.

While the need for achieving intenational standards of competitiveness and stimulating exports is stressed here, it is also noted that in many cases the prior need is to expand the domestic market for an industry's product. Empirical evidence is given to support this view. Firstly, there is evidence that suggests that productivity growth, and hence an improved degree of competitiveness, is simultaneously linked to an expansion in output; in general, it does not precede output growth. Secondly, the Japanese experience is cited, which suggests that the growth in Japanese exports was preceded or occurred simultaneously with growth in the domestic market. The evidence is consistent with the view that realized or potential demand is the key direct factor in the decision to expand output and hence to employ labour or to invest in capital equipment. This is so because new technology is primarily embodied in capital equipment, so that improvements in an economy's competitiveness will generally follow improvements in demand. Hence, not only can competitive constraints be removed directly, by such means as changing workforce skills in the industry, industry organization or the technological support available to the industry, but it is possible to make such policies much more effective by applying policies designed to increase demand directly. The stimulus to domestic demand also provides a stable domestic market with certain cash flows, which allows the rational producer to approach the more uncertain international markets with more confidence.

It is suggested in this paper that the development program for a particular industry should be divided into three phases, where the program as a whole is designed to last over a specified time period. In the first phase, domestic demand should be increased (principally by way of reducing import penetration and competitive constraints). This would generate a cumulative growth process, in which an expansion in domestic demand for the industry's output would be followed by improvements in efficiency and by further increases in demand and output. By this means, the degree of international competitiveness should have significantly improved and the second phase of the industry development policy could be introduced. In the second phase, the focus of policy should be to promote export growth. When substantial export markets have been secured and the industry is operating at world standards of efficiency the second phase is completed. The third phase is essentially one of withdrawal, in which the resources devoted to the particular industry are withdrawn from that industry and reallocated to the next set of industries selected for development.

Which industries, or group of industries, should receive assistance implies that selection criteria need to be established. This aspect of policy development is considered in Part 1 of this paper. In summary, it is concluded that the following features of industry structure are relevant.

(i) Growth potential - the selected industries should be substantial growth potential. More particularly, they should be industries whose product has a high world income elasticity. Similarly, for the first phase of a development policy to be effective, the propensity to import should also be high.

(ii) Increasing technological advantage - the ability to improve and maintain competitive advantage depends on the ability to adopt and diffuse new technologies. Since new technology is generally concentrated in a subset of manufacturing industry as a whole, this subset should have a high priority for assistance resources.Developing these prticular industries will strengthen the technological base of the economy and its flexibility to adapt to new technologies. Hence the overall degree of competitiveness will be improved. In Part 2 of the paper, the metals and engineering sector of the Australian economy is examined in terms of its suitabilty for development, given the criteria for selection discussed in Part 1.It is concluded that there is a prima facie case for developing the industries in this sector.

Part 2 of the Report presents our analysis of the metals and engineering industries which highlights their importance to the economy overall. The industries collectively are responsible for the production of a wide range of fabricated products with a high metal content. The degree of fabrication runs across the spectrum from light to heavy. The industries account for 40 per cent of total plant and equipment capital stock, half of total manufactured imports and 44 per cent of total manufacturing exports. The Industries collectively supply about half of their output to other industries as inputs in the latter's current production. About 25 per cent of the Industries output is supplied to other industries as capital equipment. This makes the metals and engineering industries, collectively, the most important manufacturers of capital goods in the Australian economy.

Corresponding to their role as producers of production technologies for other industries, the metals and engineering sectors employ a very skill intensive workforce. In Victoria, for example, whilst the industries account for roughly 8 per cent of total employment, they account for more than 34 per cent of professional mechanical engineers, 50 per cent of engineering technicians, and between 50 and 75 per cent of all craft-skilled employment.

A combination of structural and cyclical factors, however, have had a very severe impact upon employment in the industries over the last decade. For example, in the nine years from August 1974 to August 1983 three was a net loss of 152,000 jobs in the metals and engineering industries.

Finally Part 2 examines the size distribution, by employment, of enterprises in the metals and engineering industries compared with manufacturing generally. The principal findings are that metals and engineering firms are, on average, some 22 per cent larger than their counterparts in the remainder of manufacturing. However, large firms in metals and engineering are some 65 per cent larger. These latter 'large' enteprises account for roughly 2 per cent of total metals and engineering enterprises but for roughly 60 per cent of total metals and engineering employment.

Part 3 examines the growth potential which exists for the metals and engineering industries in terms of existing market opportunities both within the domestic economy (import replacement) and overseas (export expansion). Section 1 of Part 3 examines the potential for import replacement.

The evidence suggests that Australia's propensity to import products characteristic of the metals and engineering industries is very high compared with its import propensities for other products, and with the import propensities of comparable countries. Between 80 and 90 per cent of Australia's total merchandise imports are comprised of manufactured goods. About half of manufactured imports are made up of metals asnd engineering goods. Between 1966 and 1981, moreover, the share of imports in the total supply of manufactured goods increased by 32 per cent. The metals and engineering import share increased by 41 per cent, whilst for non-metals the increase was roughly 23 per cent. This suggests that the potential for increasing domestic growth through import reduction is quite high.

Not only are Australia's imports heavily biased towards particular commodities, but they are also biased towards particular sources within the world economy, especially the EEC, USA, Japan and the ASEAN group of countries. Between them these four locations account for roughly 70 per cent of total imports. Whilst the level of import competition from the EEC and the USA is still very high, with correspondingly high Australian deficits, the bulk of the growth in import competition appears to be coming from the local East Asian regions and especially Japan.

In strategic terms Australia would find it politically and economically difficult to reduce its deficits with the West through an expansion of exports of either primary or manufactured products. Similarly Australia would find it difficult to reduce its surpluses with the East through an increase in its imports from that region (a difficult option whilst Australia's unemployment remains high.)

It is recommended therefore that an import replacement strategy be adopted which is targeted on metals and engineering products sourced from the West (through the encouragement of importers to produce locally) which allows expansion of the domestic economy, followed by an export expansion strategy targetted on achieving higher export penetration for the metals and engineering industries in the East Asian region. However, such a strategy will necessarily involve competing with the Japanese and other South East Asian producers for market share both in Australia and in the Western pacific economies.

There are of course, a number of obstacles that would confront an import replacement strategy. These are dealt with in Section 3.1.2. These obstacles relate to both the intensity of import competition and new forms of import competition that began to develop in the late 1970's during the construction phase of the "resources boom". The level of intensity of import competition in Australia's metal engineering industry is analysed using MTIA survey data. This data suggests a discernible shift in import competition away from the EEC and USA/Canada to Japan, Taiwan, Korea and to a much lesser extent the ASEAN countries.

To test this hypothesis an examination of changing import shares by country of origin is undertaken. This examination shows that Japan's share of imports into Australia's metal engineering industry as a whole increased by 71 per cent, from a share of 15.9 per cent in 1978-79 to 28.3 per cent in 1983-84. It is also shown that this increase is broadly based across most sub sectors of metals engineering. Similarly the examination shows a high growth rate in import share for Korea and Taiwan, but not ASEAN. Equally significant is the decline in the share of imports from the U.S.A., U.K. and Germany, which ranged from 25 per cent (USA) to 38 per cent (UK).

To examine the new forms of import competition in Australia's metals engineering industry the paper provides an overview of Japanese investment in Australian manufacturing, the decline in tooling and design capacity in the motor vehicle industry and the phenomena of modular importing into Australia's heavy metal engineering industry. Case studies of modular, turn-key whole plant importing into Australia are provided in the case of Victoria's brown coal liquefaction plant, W.A.'s aluminium smelter and Queensland power stations. These case studies are supported by documentation on the extent of whole plant exporting by Japan into Western Pacific economies. The conclusion is reached that these new forms of import competition, supported by export financing and a number of other measures by overseas governments and producers constitute a serious obstacle to a strategy of import replacement. Section 3.1.3. Focuses on the policies required to deal with these new forms of import competition and the measures required to promote import replacement. It is demonstrated that what is required is a combination of demand stimulus and targeted industrial development strategies. Accordingly it is recommended that a short and medium term strategy is required.

The final section of Part 3 deals with the macro and micro economic implications of industry assistance programs for metals and engineering sector industries. The industries are the appliances and electronic equipment, electrical machinery and equipment, agricultural machinery and other industrial machinery industries. It is assumed that the industry development programs are successful to the extent of increasing domestic production for those industries equal to five per cent of total supply (domestic production plus imports). This increase in domestic production can come from either export expansion, import replacement or a combination of both. It is found that there is a 34,900 direct increase in total employment at the end of five years. However, if the room created in terms of easing the balance of payments and public sector borrowing requirement constraints to growth is utilized by complementry fiscal expansion then the total increase in employment is between 80,000 and 97,500 depending on the fiscal instruments used. Indeed if the impact of the industry development program is to have any major effect on the economy there must be complementry fiscal expansion otherwise the exchange rate will appreciate from levels it otherwise would have taken thereby reducing the competitiveness of industries which are not recipients of new assistance initatives. The effects of a sustained program over three years equal to the initial program will be approximately three times the initial program. That is the increase in employment will be between 238,000 and 293,000. This would occur over a five to seven year period.

Section 3.2 deals with the growth potential for Australian metals and engineering producers which exists in export markets. The evidence suggests that this potential is very high, especially in the newly industrialising economies of the South East Asian region.

An examination of world production and trade trends over the last two decades shows that the world economy has become significantly more trade oriented, especially in the manufactures sector. Moreover in volume terms, manufactures registered the strongest export peformance over the review period (1960-1981). Furthermore, within manufacturing exports the capital equipment industries exhibit world income elasticities nearly double the elasticity for food, and more than double that of raw materials.

Between 1970 and 1979 OECD exports of capital goods increased in real terms at an annual average rate of 12.1 per cent, compared with manufactures growth of 9.3 per cent. Japan has been particularly successful in this area. For example, in the nine years to 1980 Japan's ratio of technology exports to imports experienced a three-fold increase. Most of these exports moreover were targeted on the OPEC countries and the newly industrialising economies of the Western Pacific Region.

Australia's post war export experience has been characterized by dramatic changes in the composition of exports. Exports of agricultural commodities, for example, accounted for 70 per cent of export earnings in the 1950's but by 1982-3 rural exports accounted for roughly 40 per cent of export earnings. This decline, however, has been matched by strong growth in exports of minerals and fuels which now account for roughly 40 per cent of export earnings.

Whilst the share of manufacturing commodities in exports has remained roughly constant over the two decades to the early 1980's, the proportion of export earnings accounted for by manufactures has displayed some short term cyclical fluctuations around this level. The low proportion of manufactured products in Australia's exports is unique among developed economies. Manufacturing exports account for about 60 per cent of world trade, and about 75 per cent of the exports of developed economies. Policies designed to rectify this imbalance must be trageted upon lifting a number of internal and external constraints upon manufacturing, and particularly metals and engineering, export expansion.

The first obstacle is that of securing a higher share of the domestic market for local producers in order to achieve a basic integration and development of the industry. It is essential for example that trade practices legislation, which places the principal emphasis upon 'allocative' efficiency to the exclusion of 'technical' efficiency (especially the technical efficiencies associated with increasing returns), be consistent with the objective of industry integration aimed at removing the problem of excessive fragmentation. as well achieving international standarads of size and efficiency

The second major obstacle is that of export franchise restrictions - i.e. arrangements whereby a parent, technology licensor or product licensor prohibits its subsidiary or licensee from exporting certain products or permits exports to designated markets only. The Trade Development Council have identified 900 Australian located firms which were subject to export franchise restrictions involving 5,400 exportable products. Subsequent research by the Department of Trade has shown that of 7,000 exportable items with 'promising' markets roughly 1,000 are subject to export franchise restrictions of one form or another.

In part 4 it is argued that evidence form Crawford through to Cashman suggests that the 'malaise' of Australian manufacturing has not lessened over the last decade, and that in fact it might actually be becoming more severe. Some have suggested that, compared with our major competitors, Australia is less technologically developed now than it was in the period before the Second World War.

This stems in part from the approach to industrial development pursued over the last two decades which has asserted the primacy of improvements in efficiency as preconditions for industrial growth. The evidence worldwide, however, suggests that efficiency follows growth it does not precceed it. If we are to successfully modernise Australia's manufacturing, therefore, we must pursue policies which accelerate the rate of industrial growth. These policies must also be backed up by of course policies aimed at improving efficiency.

Growth, however cannot be accelerated in the short term because of the constraints outlined earlier. Furthermore, we cannot achieve faster growth in the medium term because Australia's sluggish export performance, combined with its high propensity to import manufactures and especially capital goods means that higher investment will add to domestic production capacity faster than it will add to domestic demand. The result will be expanding public sector and balance of payments deficits which will undermine the growth process and will lead to medium term stagnation. Australia must, therefore, expand the share of metals and engineering production in gross demestic product in the short run through policies designed to absorb their current spare capacity, and in the medium term their share of GDP must be expanded through net expansions in their capacity.

This will also lead to expansions in the technological capabilities of the Australian economy since these depend upon the level of development of the metal and engineering industries. This is because the metals and engineering industries employ a very skill intensive workforce to produce products which become the production technologies of the remainder of the economy. The metals and engineering industries thus play an active role in the identification, transfer, adaptation and diffusion of technological opportunities for the whole economy. Failure to develop and expand the metals and engineering industries, therefore, will not only lead to medium term economic stagnation, but will also lead to increasing loss of technological flexibility and adaptability within the local economy.

The final section of Part 4 deals with the issues of adaptabiliy, flexibility and the automony of the local economy, especially as these issues relate to the importance of small business. We show that the evidence suggests that most small businesses are heavily dependent upon a small number of larger private sector enterprises and public sector organisations which appears to strictly limit the flexibility and autonomy of small firms. Furthermore, a re-working of the U.S. evidence suggests that small firms generate new jobs roughly in proportion to their share of overall employment, a finding which, coupled with the dependency of most small firms, appears to limit the importance of small firm sas such in the processes of job generation, technological change and industrial development.

Part 5 of the paper outlines examples of policy design, and implementation and a proposed machinery of government structure for manufacturing industry assistance policies in general and for the metals and engineering sector in particular

The major principles are:

(i) Accountability. Industry assistance as embodied in industry development programs should not be open-ended, a feature which has unfortunately characterized much of Australian industry assistance measures adopted in the past. Strict performance criteria should be laid down for all parties benefiting from assistance. Assistance should only be maintained if the pre set performance criteria is satisfied. Sunset provisions should be included where appropriate.

(ii) Compensation: Industry and development programs which reduce the competitiveness of export industries should be linked with adequate compensation measures.

(iii) Information: All relevant information should be brought to bear in the selection of industries for assistance, and the change of policy.

(iv) Representation: All parties affected by industry development programs should be consulted in the design and implementation stages of policy. Only if sound based support is achieved will assistance recipients feel confident to use the resources to their fullest potential.

(v) Flexibility: All necessary assistance instruments should be used to manage the efficiency and effectiveness of industry development programs.

(vi) Co-ordination: Co-ordination between the different levels of policy development and implementation is required to avoid misallocation and wastage of resources; to harmonize industry development programs with the current and future competitive advantages of the economy; and to ensure objectives are consistent The machinery of government structure outlined in Part 5 is basically built around existing institutions and functions. Very little, if any, additional bureaucratic resources will be needed. A key requirement is that the focus of institutions and functions be directed to the informational requirements, involved in the design and support of industry development inititives. Secondly the expertize of private sector research and informational bodies should be fully utilized.

The remaining sections of Part 5 introduce the concept of an Industrial Development Agreement which from the trade union viewpoint, rests on the recognition that in many instances successful industry development programs will require changes in the functions, locations, skills and in some instances, the levels of employees. To eliminate misunderstandings, to facilitate change, and to clearly pinoint the responsibilities of both employers and employees in industry development programs, as well as the benefits that may accrue from the success of such programs a more formal framework is required than that presently available. Hence it is argued he concept of an Industrial Development Agreement, provides auseful instrument for accelerating industrial change and development.

Detailed policy recommendations are given in the appropriate section of the text. Policy recommendations on Import Replacement are given in Section 3.1.3 . Policy recommendations with respect to Export Expansion are listed in Section 3.2.3. Machinery of government recommendations are contained in Part 5.

CONTENTS

PART I A GENERAL ANALYSIS OF INDUSTRY DEVELOPMENT POLICIES

Industry development policies may be defined as policies aimed at directly increasing the demand or the output of the domestic tradeable goods sectors, or at improving their competitiveness (for example, by improving their efficiency), or at having both these effects. The policy instruments available include tariffs, quotas, production subsidies, export subsidies, government purchasing guidelines, tax concessions, bilateral trade agreements, scientific and administrative supports and regulations and the development of standards policies.

In the first two sections of Part I of this paper, two of the arguments against the use of industry development or assistance policies are reviewed. These are, respectively, the arguments derived from the neoclassical model of economic behaviour and those derived from a model of competitive market forces acting over time. In the third section, it is argued that a critical determinant of the success of development policy is the economic environment, or the level of prevailing and foreseeable economic activity. In the fourth section, the macroeconomic environment that could prevail in the medium-term future without the introduction of any new industry development policies is considered. In the fifth section it is pointed out that industry assistance policies are not costless and that efficiency in resource allocation demands that industry policies be concentrated on those industries that will yield the most return per assistance dollar. The design of an effective policy for industry development is then discussed, with particular reference to the Japanese model of development. In the sixth and last section, the criteria by which industries should be selected as suitable for industry development policies are discussed.

1.1 THE FIRST MODEL: THE NEOCLASSICAL MODEL

Arguments against industry assistance policies that rely on the implications of the perfectly competitive neoclassical model of economic behaviour suggest that industry development policies distort price and cost relativities, and result in a sub-optimal distribution of resources (capital, labour and land). The result obtained from this model is that a greater proportion of resources are allocated to industries yielding a lower output per unit of resources input than would be the case in the absence of industry policies. Consequently, there is lower overall real income per capita.

It is argued that a reduction in industry assistance would release resources which would be absorbed, in general, by the export-oriented industries, or by industries which have a high degree of comparative or competitive advantage. Comparative advantage is assumed to depend directly on relative factor prices, which, in turn, are determined by the structure of the supply of factors of production. It is generally assumed that export-oriented industries will be freely able to gain access to world markets with relatively minor price penalties, and that the major constraint limiting their size is the level of domestic costs and prices, relative to those prevailing internationally. A reduction in protection, by reducing domestic costs will therefore enable these industries to expand. This conclusion is reached because it is assumed that adjustments in factor prices will ensure the full utilization of at least one, and in some cases all, factors of production. Proponents of this view point to Australia's relatively high tariff level compared with the average of advanced industrial countries, the decline in Australia's relative living standards (GDP per capita) over the last two decades, and her relatively low export propensity (exports as a percentage of GDP) as the principal empirical evidence supporting their position.

The underlying model, although expressed in various degrees of complexity, actually rests on three basic assumptions which together combine to provide an integrated and well-defined analytical framework. These three assumptions are given as follows.

– *Resource allocation*. The proper allocation of scarce resources (land, labour and capital) across a virtually infinite number of uses is seen as the principal 'problem' of economics.

– *Diminishing returns*. The technology and consumer preferences of the system each display long-run constant returns to scale, so that equal proportionate increases in all inputs taken together yield equal proportion increases in output, either as production or as consumer satisfaction. However, disproportionate increases in any one particular factor will lead to disproportionately smaller increases in outputs.

– *Substitutability*. This principle requires that all factors (products) be substitutes in production (consumption).

In the context of competitive markets for both factors and products, these three assumptions, together with the assumption that the decision criterion of producers and consumers is the maximization of short-run profits or satisfaction, will, under certain conditions, lead to maximum economic efficiency. That is, subsequent rearrangements of either factors in production or products in consumption will not yield higher levels of output or consumers' satisfaction.

The rejection of the neoclassical model as an evaluative tool of industry development policies rests largely on its irrelevance to the technological, behavioural and institutional structure of a modern industrial economy. For example, in most industries, demand, not the price-cost margin, is the most important direct influence on the production and employment decisions of the producer. Nor is there any automatic mechanism for ensuring that the economy will fully employ at least one factor of production (generally, capital). Again, international trade is becoming less free and fair: the factors underlying international trade in many commodities are not confined purely to the neoclassical attributes of price, cost and quality; they also include political, strategic and defence considerations, the sources of supply, and institutional relationships within and between countries and international companies.

To ensure that these non-neoclassical considerations are taken into account, market access and the prices governing an increasing proportion of commodities need to be set in the context of bilateral and multilateral negotiations, with governments or their agencies exerting various degrees of influence. The importance of non-neoclassical considerations in determining Australian access to the Japanese market for many of its principal export commodities has been well documented. Further, it is pointed out that international trade is dominated by hundreds of different kinds of non-tariff barriers, while Australia's past reliance on measurable tariff and quota instruments gives a distorted picture of her use of industry development policies, relative to other economies.

In this environment, industry development policies that either cause the employment of resources that would not otherwise have been employed, or offset imperfections in international markets and so give Australian producers greater access to them, can permanently improve real income per capita and hence economic welfare.

More pertinent to the analysis in this paper, however, is the fact that economists concerned with the process of growth and industry development have found that the three principles of the neoclassical model are not particularly useful in explaining the actual processes of the economy. Indeed, an inversion of these arguments can produce a much more fruitful explanation. The principles would then be as follows.

—*Resource creation.* The growth process in practice leads to a progressively finer pattern of industry specialization, through the virtually continuous process of industrial differentiation. The issue here is that the problem of the allocation of finite resources across industries must be modified by the recognition that the productivity, and hence the cost relativities of available productive resources, depends critically on the manner in which they are organized and, in particular, on the prevailing degree of specialization. The pattern of resource allocation at any given time should properly be seen as nothing more than one point in an extended sequence of industrial growth and development, a sequence in which changes in productivity, technological change and consumer tastes, etc., are, in sharp contrast to the neoclassical theory, all determined endogenously by the development process itself.

—*Increasing returns.* It is well understood that, where basic materials are processed or transformed, increasing returns predominate. Generally speaking, increasing returns arise from three sources. Firstly, the relation between area and volume. For example, the metal required for the manufacture of an oil tanker increases with the square of the increase in size, while the capacity or volume of the tanker increases with the cube of the increase in size, where size is a linear dimension. Secondly, the break-up of complex processes into simple processes, in which the latter lend themselves to more efficient methods of production. In its modern form, this is characterized by the process of industry differentiation referred to above. Thirdly, learning by doing. For example, the optimum designs for machines etc. can only be achieved after many years or decades of experience.

—*Complementarity.* In practice, sustained economic growth is characterized by the simultaneous evolution of a wide range of industries, bound together by a network of complementary purchases and sales. The performance of any one particular industry within the group thus critically depends on the performance of the whole group. In fact, interindustry differentiation and specialization based on technical production complementarities are one of the principal sources of increasing returns and increases in technical efficiency.

Given that these three principles apply to the process of economic growth, then the emptiness of the neoclassical model as a policy tool is apparent, a conclusion that is neatly summarized by Kaldor, in 'The Irrelevance of Equilibrium Economics', *Economic Journal,* December 1972, as follows:

> The whole issue..... is whether an 'equilibrium of costs an advantages' is a meaningful notion in the presence of increasing returns. When every

> change in the use of resources – every organisation of productive activities – creates the opportunity for a further change which would not have occurred otherwise, the notion of an 'optimum' allocation of resources – when every particular resource makes as great or greater contribution to output in its actual use as in any alternative use – becomes a meaningless and contradictory notion: the pattern of the use of resources at any one time can be no more than a link in the chain of an unending sequence and the very distinction, vital to equilibrium economics, between resource-creation and resource- allocation loses its validity. The whole view of the economic process as a medium for the 'allocation of scarce means between alternative uses' falls apart – except perhaps for the consideration of short run problems, where the framework of social organisation and the distribution of the major part of available 'resources', such as durable equipment and trained or educated labour, can be treated as given as a heritage of the past, and the effects of current decisions on future development are ignored. (p. 1245)

The process implies that there should be a strong, empirical relationship between economic growth and productivity growth, with the causality running from growth to increases in the rate of growth of productivity, and with a somewhat weaker feedback subsequently from productivity growth to overall economic growth. That this is indeed the case is borne out by Australian research by Metcalfe and Hall who concluded that 'industries with above-average rates of output growth also experience above-average rates of productivity growth (the Verdoorn Relationship)'.

The same authors also attempted to assess the direction of causation involved. Specifically, they tested what has become known as the 'Salter Mechanism' – that the uneven incidence of exogenous technical developments explains the distribution of productivity, and that differences in labour productivity growth are reflected in differences in the movement of relative prices, with consequent changes in the pattern of output. In other words, they tested to see whether the line of causation ran from exogenous technological change to output growth (a fair summary of the neoclassical notion of technological change). The authors conclude that 'relative price changes can at best only account for a small part of observed pattern of output change in Australian manufacturing. This clearly weakens the force of any Salter-based argument which suggests that it is exogenous changes in production technology which are the prime generator (sic) of structural change' (Metcalfe and Hall, 'The Verdoon Law and the Salter Mechanism', AEP December 1983, p. 371).

The observed weakness of the Salter effect is, however, entirely consistent with the point made earlier, that one would expect some, relatively smaller, feedback from productivity growth to output growth through the price mechanism.

On this view of the development process, industry development policies can play a key role in increasing total output, employment and productivity growth by building on the key elements of the growth process – resource creation, increasing returns and production complementarities. Section 4 deals at length with the way in which these factors combine to provide a considerably more fruitful account of ther process of industrial growth and development.

To conclude, to reject the neoclassical model as a tool for evaluating industry development policies is not to reject the traditional concept of comparative advantage. Hence, it is not to reject the contribution to exports made by rural and mineral products. However, the neoclassical model treats comparative advantage as a static concept that depends only on relative factor prices. Yet the theoretical considerations referred to above, and the experience of the more successful of the modern industrial economies, suggest that competitive advantage can be created by industry development policies which lead to the development of sophisticated and highly differentiated production activities, perfectly consistent with the economy's underlying structure. As will be discussed below, policies of this kind can lead eventually to sustained export growth in selected industries.

1.2 THE SECOND MODEL: COMPETITIVE MARKET FORCES

A second set of arguments is sometimes used against industry development policies. These arguments are couched in the language of dynamic, intertemporal competition. Their thrust is that market forces are the key factor in determining an industry's efficiency and ability to adapt to change. A state of vigourous dynamic competition is believed to determine the extent to which firms in a given industry will adopt the least-cost production and distribution technologies; achieve reasonable profit margins, and establish the most efficient industry organization, in terms of the relationship between the relative size of firms and the extent of vertical and horizontal integration. The strength of market forces is also assumed to determine the size and focus of research and development programs and the speed of adoption of new technologies.

It is argued that the weaker are market forces in an industry, then the higher are profit margins, the greater is the gap between the production technology employed and the 'best practice' technology, and the less is the interest in developing and adopting new products and processes. Since industry development policies in general, and protection devices in particular, tend to weaken the influence of market forces by sheltering domestic firms from international competition, there is said to be a prima facie case that the domestic industries so protected are making sub-optimal use of the resources employed. Reductions in industry assistance, by increasing competition, will ensure that the industry becomes more efficient by bringing its structure and technological base into line with international standards of 'best practice'.

The problem with this approach is that, without assistance, many industries in the small-scale Australian economy would not exist at all or, more importantly, may never reach international standards of competitiveness. The market force argument is important, however, in drawing attention to the fact that industry development policies may differ in their implications for industrial efficiency. If industry policies are to be put into effect, it is important that the selected policies encourage competitive forces, or at least do not significantly lead to their reduction.

1.3 THE ECONOMIC ENVIRONMENT

It is one thing to argue that industry development policies can be an effective means of increasing economic efficiency and real incomes as well as of improving Australia's competitive advantage. It is quite another to argue that this is always so. In general, the case for industry development policies is critically dependent on the prevailing economic environment.

If there is a full-employment environment and a strong balance of payments, then maintaining industry assistance, for example, at prevailing levels will result in a greater appreciation of the exchange rate than it would have been had the level of assistance to import-competing industries been reduced. In this environment, reductions in protection would not only improve the growth potential of the more efficient export industries (by limiting the exchange rate appreciation) but, if complemented by appropriate adjustment policies, they would release the capital and labour resources to enable these industries to realise that potential.

Arguments of this kind could justifiably have been used to advocate the withdrawal of industry assistance in the economic climate prevailing from the mid-1960s to the early 1970s, when the basic economic problem was one of constraining aggregate demand to the supply potential of the economy, and of forestalling the implications of a strong balance of payments position. As will be discussed in the following section, this case against industry assistance policies does not apply in the current or prospective future environment.

The case for the present value of industry assistance is based on the four constraints to growth existing in the present economic environment. These constraints are summarised below in general terms and, following this, in more detail. Compared with the 1950s and 1960s, there are significant constraints on the ability of governments to take the lead in generating high rates of economic growth, and so to lower the unemployment rate, by means of conventional monetary and fiscal policy instruments. Indeed, the current economic climate is one where expansion in the tradeable goods sector is a necessary prerequisite for reducing the constraints on demand management policies.

The first constraint is the stock and the quality of installed capacity. The capacity of the economy to produce goods and services and to employ the available workforce at any point in time is limited by the quantity and quality capital stock in place. This, in turn, is determined by past growth rates and by producers' expectations of future growth rates. Low economic growth since the mid 1970s has adversely affected producer expectations of future growth rates. As a result, it will be argued in the following section that the characteristics of Australian productive capacity will place severe limitations on the ability of government to significantly reduce unemployment rates by conventional demand expansion policies. If demand was expanded beyond this limit, either inflationary pressures would develop or the additional demand would be met from foreign sources. This, and the other constraints on growth, are further discussed in the following section of this paper.

Secondly, although Australia's growth performance over the early 1980s was higher than the OECD average, it was bought at the cost of substantial increases in the ratios of foreign debt to GDP and of debt-servicing costs B[Bexport receipts These ratios are approaching the limits where, if exceeded, Australia's long-term financial stability would be questioned, which would put the exchange rate and the prospects for domestic growth at risk. As a corollary, Australia's future growth prospects are limited to that sustainable by her international trade performance and, in the absence of any other significant improvement, they will thus be limited to future growth in the OECD area. Any attempt to improve economic activity beyond this limit can only be transitory and, in the longer term, the level of unemployment can only be expected to increase.

Thirdly, it is recognised that the ability of domestic financial institutions to absorb government debt without substantial increases in interest rates is limited. Any attempts by governments to expand demand that also result in a significant increase in the ratio of government debt to GDP will lead to an offsetting contraction in private sector activity, stemming from the resultant increases in interest rates.

Fourthly, producers will only secure markets, invest and employ labour if they expect a stable economic environment and, in particular, a stable inflationary environment to be maintained.

These four constraints can be categorised as follows:

(i) Capital Capacity Constraint

In the 1950s and 1960s, gross non-farm product was expanding at a rate of between 4 and 7 percent per annum. This required producers to maintain a considerable degree of excess capacity, given the long time lags - of between 1 and 6 years or more - involved in approving, designing, constructing and installing new capacity. This meant that, given the generally low unemployment rates of the period, there was generally adequate physical capital in place to provide employment to the available workforce, irrespective of the level of cyclical activity.

Over the 1970s, growth in actual, and hence expected, demand was considerably lower than in the 1950s and 1960s. This has resulted in a winding-down in the desired excess capacity levels, which corresponded to the increases in the unemployment levels and as a result it is unlikely that there will be adequate capacity in place to absorb into employment the numbers required to reduce the rate of unemployment to 1973-74 levels. The difference between the number unemployed that would result if the capital in place were fully utilised, and the minimum achievable unemployment level, is the level of unemployment due to the capital capacity constraint.

Attempts by policy authorities to increase demand and hence to reduce unemployment levels below capital capacity constrained levels through expanding domestic demand, whether using instruments drawn from the fiscal, financial or trade categories, will be unsuccessful. Either the additional demand created will be channelled directly overseas for purchases of foreign sourced goods and services, or domestic costs and prices will continue to rise (or, in an inflationary world, their rate of growth will accelerate) until the excess of domestic demand over supply is eliminated.

Policies to reduce unemployment due to capital capacity constraints must centre on policies which induce an expansion of capacity in place. These will necessarily be biased towards policies which restructure demand away from private and public consumption and towards private and public investment expenditure. Furthermore, producers must have their expectations of the underlying long-term growth rate of the economy altered. This, in turn, requires the establishment of a stable economic environment and, in particular, expectations of a lower future inflation rate.

(ii) Balance of payments constraint

In the long run, an economy must maintain solvency by achieving an average equilibrium in its balance of payments. This requires that its imports of goods and services be ultimately offset by exports of goods and services. Given a stable relationship between imports and domestic economic activity, in the long run the export performance of an economy will determine its sustainable domestic level of economic activity and hence its employment levels. As the export performance of an economy is, inter alia, determined by the level of economic activity in its major trading partners, the balance of payments constraint requires that an economy's growth profile resemble that of its major trading partners.

The balance of payments constraint becomes operative when the foreign investment required to support a given level of domestic economic activity can only be achieved by significant increases in domestic inflation and/or depreciation of the currency. In the short term, policymakers can offset the effects of the constraint by the use of reserves to support the currency and final demand structures. However, if this policy is pursued the ratio of overseas borrowing to GDP will steadily rise with corresponding rises in the debt services payment to export receipts ratio. Eventually these ratios will reach a point where the long-run stablity of the economy will be questioned and foreign borrowing will be secured only by a substantial risk premium being included in returns on investment in the economy. Further, such a situation is generally complemented by accelerating rates of inflation if real incomes have not fallen to offset the impact of devaluation on the domestic cost structure.

In this situation, confidence can only be restored by a sharp contraction in economic activity, in order to reduce imports with the resources released by the improvement in the current account balance can then be used to restore the foreign borrowings to GDP ratio and the debt revenue to export receipts ratio to acceptable levels. The net outcome for economies which initially ignore the balance of payments constraint is often one where the levels of economic activity and hence unemployment are respectively below and above the levels that would have prevailed if fiscal and monetary policies had maintained a level of economic activity compatible with the balance of payments constraint, although this latter course may have entailed higher unemployment in the short run. The recent experience of the Latin American economies indicates that the balance of payments constraint can only be ignored for a relatively short period before the consequences have to be faced.

The traditional policy prescriptions for an economy subject to the balance of payments constraint are to increase protection; to introduce export support programs, and/or to devalue. These would have the effect of either increasing export performance and/or reducing import intensity. However, it is now recognised that in the current world environment these policies are likely to be ineffective. This is because most advanced industrial economies are similarly subject to the balance of payments constraint, with the result that sustained policy initiatives by any one economy to achieve a balance of payments advantage are likely to be met by retaliatory policy action, which will either neutralise or more than offset the initial advantage. Secondly, the effectiveness of traditional trade instruments in alleviating the balance of payments constraint is undermined by political and institutional objectives which support real wage and other income maintenance objectives. The essence of the effectiveness of trade policies to achieve an advantage for an economy in world markets comes from a reduction in real incomes. If this does not occur, then tariff or exchange rate changes to improve competitiveness will be offset by cost and price adjustments.

To reduce unemployment caused by the balance of payments constraint, policies are needed in the international arena which remove the constraints on world economic growth, for example, by increasing the supply of natural resources or breaking up cartels which control individual commodities, and by making institutional arrangements which harmonise the growth objectives of the major world economies. Individual economies can mitigate the balance of payments constraint by exploiting any resource (agricultural endownments, minerals, energy, skilled labour, capital and technology) which gives the economy a comparative advantage in the production of goods and services, and whose international competitiveness cannot be easily undermined by the protective measures of other economies.

A debt service to export of goods and services receipts ratio of 20 per cent is the rule of thumb trigger point commonly adopted to indicate the need for demand management policies. These policies should complement interest and exchange rate movements aimed at producing a level of economic activity that is compatible with the international economic environment. The Australian economy is currently approaching this trigger point.

(iii) Public sector borrowing requirement constraint

The public sector borrowing requirement constraint exists when further increases in government borrowings can only be achieved by significant increases in domestic interest rates. This occurs when the public can only be induced to increase the holdings of government securities in their portfolios by significant increases in the government bond rates. If the government attempts to ignore the borrowing constraint, interest rates will rise and the consequent fall in private sector activity will offset (and may completely offset) the rise in activity induced by the increase in the public deficit. The contraction can be ameliorted by expansion in the money supply, which by expanding private sector portfolios increases their capacity to absorb government and private debt. Unfortunately, in an inflationary environment, the money supply is used as an indicator of future inflation rates. Thus, if the inflationary constraint is operative, tight monetary policies rather than easy monetary policies, are required. This in turn strengthens the public sector borrowing constraint.

(iv) Inflationary expectations constraint

The inflation and inflationary expectations constraint operates when the use of traditional demand expansion instruments to increase employment and reduce unemployment so raises inflationary expectations that private sector activity falls, and to the extent that this neutralises the intended impact of the policy change on the labour market. A precondition for the operation of this constraint is the existence of an unsatisfactory rate of inflation, which private sector decision makers interpret as indicating that the actual rate of growth of real wages is above the warranted growth rate. The latter variable is the rate of growth of real wages compatible with the return to and maintenance of a satisfactory inflation rate. In relation to our international competitiveness, decision makers will also use, as a rule of thumb, a Phillips relationship linking reductions in rates of unemployment to the rate of growth of real wages. In this environment, if the government attempts to reduce unemployment, decision makers will conclude that the gap between the actual and warranted real wage growth rate will worsen and inflation will accelerate.

This increase in inflationary expectations can be transformed into a reduction in aggregate demand in several ways. One route would be where decision makers expect a reversal of policy to correct the expected worsening of inflation, with the result that the initial policy stimulus is ignored and plans are put into effect to allow for future contractionary policies. Increases in inflationary expectations will lead to increases in actual long-run interest rates and other interest rates, with the result that aggregate demand components sensitve to interest rates will contract.

The only relatively painless solution to unemployment in the environment of the inflationary expectations constraint is agreement by all sections of the community on a durable, equitable income distribution mechanism to reduce ex-ante claims on total income to the level which the economy can provide in real terms.

Given Australia's recent high inflation rates relative to the OECD in general, and the prices of internationally traded goods in particular, any medium-term projection must focus on likely trends in domestic income formation and wage costs.

1.4 THE MEDIUM-TERM OUTLOOK : NO NEW INDUSTRY DEVELOPMENT POLICY INITIATIVES

The point made in the previous section was that the relevance of industry development policies depends on the medium-term economic environment of the economy and on the strength of the constraints to economic growth. This section will summarise the projections prepared by the National Institute of Economic and Industry Research in August 1984 for the period 1983-84 to 1988-89. The projection assumes no additional industry development initiatives other than those presently in place or which have been announced. For example, the Motor Vehicle Industry Plan is incorporated in the projection. Firstly, the projection will be interpreted in terms of the four constraints listed in the previous section, with a view of assessing the role, if any, that new industry development policy initiatives may play over the remainder of the 1980 decade.

The International Outlook

Critical to the balance of payments constraint to growth is the rate of world growth. The international projections embodied herein are a combination of the OECD 1984 and 1985 short-term outlook, published in July 1984, and the post-conference LINK projections to 1988, published in May 1984. The 1989 growth rates in the world economies are assumed to be slightly below the projected 1988 growth rates.

The projected outcome for the world economic aggregate are given in Table 1.1. The economic growth rate of the OECD is projected at 2.4 per cent per annum on the 1984-89 period. Underlying the projection is a projected growth rate of just under 6 per cent for the United States for 1984, falling to 2.5 per cent in 1985 and 1.2 per cent in 1986. The United States growth rate recovers to between 2 and 3 per cent for the remainder of the period. With the exception of Japan, the growth rates of the other OECD economies are fairly stable, at between 2 and 3 per cent per annum. The average Japanese growth rate over the period is 3.2 per cent. One reason for the different growth profiles in the United States vis-a-vis the other major OECD economies is the expanding fiscal policies undertaken in the former economy and the contracting fiscal policies generally adopted by the latter group. This is illustrated in Table 1.1.

The growth in general economic activity in most economies is only sufficient to maintain employment rates in the 1980s at the levels prevailing over the trough of the recession, that is, at the levels prevailing in 1982. This is shown in Table 1.3. The major exception is the United States, where recovery has been and will be the strongest. The projected current account/trade balances by country and region consistent with the GDP growth profiles are given in Table 1.4. The most notable features are the very large United States deficits by the mid 1980s, the large Japanese surplus and the deterioration of the non-oil developing economies' trade balances over the projection period.

TABLE 1.1 WORLD ECONOMIC AGGREGATES

	GDP - CONSTANT 1970 PRICES OECD GDP	DEVELOPING COUNTRIES	COMMUNIST BLOCK	TOTAL WORLD GDP	WORLD QUANTUM TRADE -INDEX	WORLD MANUFAC-TURING INDEX INDEX	WORLD TRADE PRICE (US.$)
Unit	US$b			US$b		NUMBER	
1980	2828.00	698.00	1179.00	4705.00	133.00	127.00	3.09
1981	2879.91	707.15	1222.00	4809.06	133.00	129.00	2.97
1982	2862.48	731.64	1261.00	4855.12	129.00	128.00	2.84
1983	2925.53	737.34	1294.00	4956.88	133.42	130.69	2.78
1984	3047.47	761.63	1340.00	5149.10	145.10	140.22	2.72
1989	3429.99	907.74	1573.00	5910.73	194.19	175.63	3.65
Percentage changes							
1980	1.29	4.65	3.88	2.42	1.53	0.79	10.36
1981	1.84	1.31	3.65	2.21	0.00	1.57	-4.01
1982	-0.61	3.46	3.19	0.96	-3.01	-0.78	-4.18
1983	2.20	0.78	2.62	2.10	3.42	2.10	-2.30
1984	4.17	3.29	3.55	3.88	8.76	7.29	-1.86
Compound growth rate(percent) -							
1975-1980	3.25	5.31	3.92	3.71	5.87	4.90	9.87
1980-1984	1.89	2.20	3.25	2.28	2.20	2.51	-3.09
1975-1989	2.55	3.79	3.49	2.97	4.85	4.10	4.66
1984-1989	2.39	3.57	3.26	2.80	6.00	4.61	6.02

Table 1.2 Fiscal policy indicators, Major OECD economies

	Deficit as per cent of GDP(a) 1981 %	1982 %	1983 %	1984 %	1985 %	Deficit to gross private savings 1981 %	1983 %	Government debt to GDP 1983 %
United States	-0.9	1.3	0.5	0.2	1.3	5.3	22.9	45.7
Japan	-0.6	-0.7	-0.7	-0.8	-0.6	14.2	12.2	66.5
Germany	-0.1	-1.4	-1.5	-1.1	-0.6	19.3	12.9	41.0
France	1.0	0.4	0.0	-0.6	-0.4	10.0	18.6	32.4
United Kingdom	-2.9	-1.5	1.7	-0.4	-0.2	15.6	21.7	55.0
Italy	3.5	0.0	-2.3	-0.3	-0.4	45.4	42.1	79.7
Canada	-1.2	0.7	0.7	0.2	0.3	5.3	26.4	54.9

Note: (A) positive sign indicates a move towards expansionary policy
Source: OECD, Economic Outlook, July 1984

Table 1.3 Unemployment Rates: Selected OECD Economies

		OECD	LINK
	1982	1985	1988
	%	%	%
United States	9.7	7.25	7.4
Canada	11.2	11.0	8.4
Japan	2.5	2.5	2.4
United Kingdom	11.7	11.25	10.5
Germany	7.9	7.75	8.3
France	8.0	10.5	10.1
Italy	9.5	10.25	10.2
Belgium	12.8	15.0	14.4
Austria	3.7	5.0	5.0
Norway	3.2	3.25	3.3
Sweden	3.3	3.0	4.6
Spain	16.8	20.0	19.6

Source: OECD, Economic Outlook, July 1984, and World Outlook, LINK Project, May 1984

Table 1.4: Trade and Current Account Balances

	Current Account Balances, OECD - July 1984				Trade Balance, LINK		
	1982	1983	1984	1985	1983	1985	1988
United States	-11.2	-40.8	-86.25	-105	-49	-96	-73
Canada	2.4	1.3	2.5	2.25			
Japan	6.9	20.8	30.5	36			
France	-12.1	-4.0	-2	0.5			
Germany	3.6	3.9	5.05	10			
Italy	-5.5	0.5	-.75	.25			
United Kingdom	9.7	3.1	2.5	2			
Other OECD	-23.1	-9.6	-4	1.75			
Total OECD	-29.3	-24.7	-51.75	-52.5	-19	-36	5.1
Developing countries - oil					41.3	38.2	49.7
Developing countries - non-oil					-14.3	-16.8	-24.8
Centrally planned economies					9.5	10.1	7.0

Both the OECD and LINK assume that the inflation rate (as measured by the private consumption deflator) in the OECD area will remain near its 1983 rate. That is, between 1984 and 1989, the OECD inflation rate will remain at between 5 and 6 per cent. This assessment is based on the assumptions that the recovery in real output will be mild; there will be no unpredicted supply shocks (and hence no major shock to commodity prices), and that unemployment rates will remain relatively high, so that rates of wage growth will be contained. From Table 1.1, world trade prices are projected to grow by 6 per cent per annum between 1984 and 1989.

As indicated above, the United States has been and will be faced with rising fiscal and current account deficits. The United States' dollar has been rising over the recent past. Between 1980 and 1983, the effective rate appreciated by 36 per cent, although the current account deficit deteriorated considerably. This occurred because capital inflows have exceeded the current account deficit. Further, the capital inflows, by providing finance (directly or indirectly) for the budget deficit, have reduced the pressure on domestic interest rates caused by the increase in the fiscal budget deficit over the period. It is doubtful whether this situation can continue indefinitely. The rise in the United States' exchange rate has reduced competitiveness in the United States, which is the main factor behind the projected current account deficit. In 1984, the growth in United States' imports is projected to be near 20 per cent, compared with 4 per cent for exports. As the current account deficit increases, there will be a continuing build-up of dollar-dominated assets in the hands of foreign portfolio holders. As the proportion of these assets increases, so will the risks attached to holding them, which will render such investments less attractive. A point must be reached when the capital inflow will be less than the current account deficit, triggering a decline in the dollar against other currencies. Table 1.5 shows the decline in the US dollar over the projection period. The greatest adjustment occurs in the yen which should follow from the respective current account projections of Japan and the United States.

When the dollar decline occurs, the pressure in domestic capital markets to finance the United States' fiscal deficit will increase, which will exert substantial upward pressure on United States' interest rates. It is assumed here that the real rate of interest in the 1984 to 1986 period will be higher than it was in 1983. This factor more than offsets the strong 1985 fiscal stimulus, shown in Table 1.2, and is a major factor behind the growth profile described above. The long-term bond rate in the United States, shown in Chart 9, is much more stable than the short-term rate, shown in Table 1.2, and its high level is a major source of the slow-down in United States' growth over the next two years. Real interest rates should remain high and stable for

TABLE 1.5 EXCHANGE RATE PER U.S. DOLLAR FOR MAJOR OECD ECONOMIES

	JAPAN	FRANCE	GERMANY	ITALY	UNITED KINGDOM	CANADA
Unit	YEN	FRANC	MARK	LIRE	POUND	DOLLAR
1980	219.00	4.31	1.86	881.00	0.45	1.20
1981	221.00	5.43	2.26	1137.00	0.50	1.19
1982	249.00	6.57	2.43	1353.00	0.57	1.23
1983	237.00	7.62	2.55	1519.00	0.66	1.23
1984	228.50	7.92	2.49	1647.00	0.65	1.27
1989	180.00	7.80	2.15	1870.00	0.68	1.25
Percentage changes						
1980	-0.09	1.17	1.64	6.02	-4.26	2.31
1981	0.91	25.99	21.51	29.06	11.11	-0.75
1982	12.67	20.99	7.52	19.00	14.00	3.63
1983	-4.82	15.98	4.94	12.27	15.79	0.24
1984	-3.59	3.94	-2.35	8.43	-1.52	3.25
Compound growth rate(percent) -						
1975-1980	-5.90	0.09	-5.44	6.17	0.00	0.00
1980-1984	1.07	16.43	7.57	16.93	9.63	1.57
1975-1989	-3.51	4.36	-0.96	7.80	2.99	0.00
1984-1989	-4.66	-0.30	-2.89	2.57	0.91	-0.36

Calendar years

the rest of the projection period. The 1989 projected rate for United States medium-term government debt is 12 per cent.

In summary, the difficulties facing the world economy over the projection period will be because demand expansion in the United States is undertaken without reference to the constraints outlined above, in particular, without reference the balance of payments and public sector borrowing constraints. The policy was successful in the first half of the 1980 decade because of the central role of the United States' economy in the world economy. However, over the second half of the 1980 decade, the structural imbalances created by these policies will lock the world into a lower growth profile than would have occurred if the United States' policies were co-ordinated and consistent with those of other major OECD economies.

This factor is particularly relevant to the non-OECD economies. The negative influence of the high external debt/GDP ratios in developing economies, and in particular the South American economies, on their recent and immediate growth prospects has been well documented. A fall in the United States dollar would give these economies an unambiguous improvement in their total external debt position. However, the gain could be offset or even reversed, by a rise in United States' interest rates and any subsequent increase in OECD interest rates. Thus, the behaviour of United States interest rates and exchange rates over the past five years; the attempt of non-oil developing economies to sustain higher growth rates in 1980 and 1981 than were justified, and the likely future movement in the United States exchange and interest rates, have together reduced the growth prospects of these economies relative to the OECD. As it is, the modest growth rate of the developing economies incorporated in these projections, and shown in Table 1.1, still results in a doubling of their trade balance deficit between 1983 and 1988.

<u>The Mining Sector</u>

Production of the principal mining and processed metals in 1988-89 is given in Table 1.6. Projected black coal production is based on the assumptions that, between 1983-84 and 1989-90, exports of steaming coal will grow on average by 14.2 per cent per annum while exports of coking coal will grow by 4.3 per cent per annum. Steaming coal exports to Japan and other Asian countries will grow very strongly, as will coking coal to other Asian countries. Exports to European countries and coking coal exports to Japan are likely to be relatively weak. Crude oil production in 1988-89 is based on a production profile in which crude oil production peaks at 25250 megalitres in 1984-85 and crude oil and condensate exports reach 25.5 million barrels in the same year, due to high production from the Fortescue field, Bass Strait. Crude oil and condensate

Table 1.6: Production: Principal Mining Commodities and Processed Metals

Commodity	Unit	1982-83	1988-89
Iron Ore	million tonnes	75.3	109.6
Coal	million tonnes	92.9	139.9
Crude Oil (inc. condensate)	megalitres	20188	18770
Natural Gas	gigajoules	5531	6831
Copper	1000 tonnes	235.0	260.0
Lead	"	460.0	440.0
Zinc	"	642.6	650.0
Alumuna	"	6701	10030
Aluminium	"	404	1400
Uranium	"	4.9	4.5

Table 1.7: Mining Investment ($million, 1979-80 prices, years ended June)

	'82	'83	'84	'85	'86	'87	'88	'89	'90	'91	'92
Oil and gas,	684	1022	698	612	759	958	1063	745	926		
of which, replacement			24	21	25	28	33	35	106		
Black coal,	1045	1219	712	373	428	760	876	851	928		
of which, replacement			153	157	182	199	232	255	335		
Diamonds			7	100	200	20					
Other non-metallic minerals	27	30	45	45	45	45	45	45	45		
construction materials	34	17	30	30	30	30	30	30	30		
Iron ore (all replacement)	66	46	55	59	56	96	133	129	74		
Uranium	46						50	100	150	75	25
Other metallic	351	264	320	320	340	340	340	340	340		
Total mining,	2253	2605	1960	1639	1678	2229	2537	2240	2493		
of which, replacement			627	632	678	738	813	834	928		

Table 1.8: Alumina and aluminium investment ($M,1979-80 prices, years ended June)

	Actual				Forecast				
	'82	'83	'84	'85	'86	'87	'88	'89	'90
Alumina									
Pinjarra	5								
Gladstone	107	133	70	20					
Wagerup	85	5	95	190	30		95	190	30
Worsley	279	239	130	60		90	180	120	180
Gove	10	10							
Total new			295	270	30	90	275	310	210
Replacement			70	72	68	73	72	95	155
GFCE	486	387	365	342	98	163	347	405	365
of which, WA	369	244	260	286	64	127	311	358	288
Qld	107	133	95	45	25	25	26	32	52
NT	10	10	10	10	10	10	10	10	10
Aluminium									
Bell Bay	5	5							
Kurri Kurri	61	48	15	5					
Boyne Is.	175	105	50	30		110	170	110	170
Portland	164	20		270	215	35		110	220
Tomago	123	292	200	40					
Bunbury				110	215	145	260	20	
Total new			265	455	430	290	430	240	390
Replacement			19	19	18	19	17	25	88
GFCE	528	470	284	474	448	309	447	265	478
of which WA				110	215	45	260	20	
Qld	175	105	50	30		110	170	110	170
NSW	184	340	220	50	4	5	4	6	22
Vic	164	20	9	279	223	43	8	121	260
Tas	5	5	5	5	5	5	5	8	26
Alumina and aluminium GFCE	1014	857	649	816	546	472	794	670	843

exports are assumed to be eliminated by 1986-87. Exports of LNG are now expected to occur in late 1988 or early 1989 and to slowly build up to a plateau of 6 million tonnes a year. The 1988-89 exports are assumed to be 0.7 million tonnes. In 1983-84 iron ore production increases sharply from the level given in Table 1.6 for 1982-83, largely due to short-term factors, such as a strong export growth due to a strike in India. Between 1983-84 and 1988-89 exports will grow at around 3 per cent per annum.

Underlying projected aluminium production in 1988-89 is the assumption that the Portland aluminium smelter production reaches 264,000 tonnes in 1986-87, while the proposed Bunbury smelter in Western Australia reaches a similar level in 1987-88. The remaining growth in aluminium production is due to the completion of capacity expansion plans presently underway. The capacity of the Wagerup refinery in 1985-86 doubles and the capacity of the Worsley refinery increases from 500,000 tonnes in 1983-84 to 1.5 million tonnes in 1988-89. No new uranium mines are assumed to be commissioned over the projection period.

No net addition to copper, lead, tin or zinc capacity has been assumed over the projection period. it is assumed therefore that Roxby Downs and Macarthur mines do not commence production until the early 1990s.

The profile of mining investment by commodity is shown in Table 1.7. The high levels of black coal investment in the post 1985-86 period is due to the present excess capacity levels being worked off by this time. Oil and gas investment includes outlays for the export phase of the North-West Shelf project which is assumed to reach a peak of $590 million in (1979-80 prices) in 1987-88. Investment on oil and gas projects in the Bass Strait is assumed to fall away after 1985-86 in the absence of new discoveries. However, the development of new discoveries in other areas is assumed to require sustained expenditure of $350 million in (1979-80 prices) per annum by 1986-87. Present iron ore production capacity (after allowing for planned mine closures over the projection horizon) will now be adequate to supply demand requirements. The assumed alumina and aluminium investment profiles are given in Table 1.8. Overall, the profiles for mining and aluminium/alumina investment result in investment levels approaching the peak levels of the 1982-83 period.

Agriculture

The projections for production by agricultural commodity are given in Table 1.9. Underlying the wheat output projection is the assumption that, despite the downward trend in real world wheat prices, increased plantings and high crop yields will allow wheat exports to reach just under 16 million tonnes in 1988-89, which is just below the

TABLE1.9 REAL FARM OUTPUT (1980 M)

	LIVESTOCK PRODUCTS				CROPS			GROSS VALUE OF FARM PRODUCTION
	WOOL	CATTLE	SHEEP	OTHER LIVESTOCK	WHEAT	OTHER GRAINS	SUGAR CANE	
Unit	1980 $M	1980 $M	1980 $M	1980 $M	1980 $M	1980 $M	1980 $M	1980 $M
1980	1650.99	2385.99	654.00	1531.00	2478.00	766.98	548.98	11768.00
1981	1634.02	2238.07	691.37	1526.00	1661.52	667.44	611.04	10738.64
1982	1671.02	2400.17	605.88	1488.00	2504.49	840.63	639.95	12016.00
1983	1635.00	2354.00	618.00	1576.00	1362.00	485.00	635.00	10290.00
1984	1663.00	1999.00	522.00	1630.00	3353.00	1196.00	898.00	11076.00
1989	1828.00	2401.00	731.00	1632.00	2893.00	902.00	764.00	13081.00
Percentage changes								
1980	0.99	-22.55	21.33	3.24	-11.49	-12.30	-3.35	-10.62
1981	-1.03	-6.20	5.71	-0.33	-32.95	-12.98	11.30	-8.75
1982	2.26	7.24	-12.37	-2.49	50.74	25.95	4.73	11.89
1983	-2.16	-1.92	2.00	5.91	-45.62	-42.31	-0.77	-14.36
1984	1.71	-15.08	-15.53	3.43	146.18	146.60	41.42	7.64
Compound growth rate(percent) -								
1975-1980	-2.13	0.21	5.35	2.07	7.35	6.95	0.31	3.01
1980-1984	0.18	-4.33	-5.48	1.58	7.85	11.75	13.09	-1.50
1975-1989	-0.04	0.12	2.69	1.20	3.70	3.62	2.50	1.83
1984-1989	1.91	3.73	6.97	0.02	-2.91	-5.49	-3.18	3.38

Calendar years

TABLE1.10 FARM COSTS AND FARM INCOME

	GROSS VALUE OF FARM PRODUCTION	LESS FARM MARKETING AND	GROSS PRODUCT AT FACTOR COST	LESS DEPRECIATION WAGES AND INTEREST	FARM INCOME	REAL FARM INCOME	FARM PRODUCT AT
Unit			$ M			! 79.80 PR	
1980	11764.00	4572.00	7026.00	2186.00	4840.00	4840.00	7449.00
1981	11584.00	4944.00	6649.00	2579.00	4070.00	3720.29	6633.00
1982	12709.00	5798.00	6845.00	3140.00	3705.00	3067.05	7657.00
1983	11702.00	6426.00	5192.00	3378.00	1814.00	1346.70	6287.00
1984	15009.00	6700.00	8222.48	3910.00	4312.48	2990.62	8250.00
1989	19971.30	11025.62	8845.38	5375.71	3469.68	1686.74	8218.38
Percentage changes							
1980	15.05	18.54	13.21	13.44	13.11	2.64	-11.25
1981	-1.53	8.14	-5.37	17.98	-15.91	-23.13	-10.95
1982	9.71	17.27	2.95	21.75	-8.97	-17.56	15.44
1983	-7.92	10.83	-24.15	7.58	-51.04	-56.09	-17.89
1984	28.26	4.26	58.37	15.75	137.73	122.07	31.22
Compound growth rate(percent) -							
1975-1980	14.89	12.72	15.40	9.20	19.04	7.33	2.84
1980-1984	6.28	10.03	4.01	15.65	-2.84	-11.34	2.59
1975-1989	9.13	11.14	6.99	10.04	3.92	-4.88	1.72
1984-1989	5.88	10.48	1.47	6.57	-4.26	-10.82	-0.08

Fiscal years ending 30 June

1986-88 record. The production of other grains is expected to remain at around 8 million tonnes for the next few years. Expected low returns to major producers should keep sugar production below the 1983-84 level over the projection horizon, while the heterogeneous other crop category is expected to grow slowly over the period. The medium-term outlook for beef and sheep products is reasonably favourable. The Australia cattle herd is expected to build up from 22.5 million in March 1980 to over 30 million by March 1989. There will also be a steady expansion in the national sheep flock. Accordingly, as indicated in Table 1.9, the supply of wool and sheep and beef products will increase steadily over the projection horizon. The formation of farm income is given in Table 1.10.

Wage Rates and Earnings

The importance of the behaviour of earnings as a determinant of economic growth has been stressed repeatedly. Earnings are, however, among the most unpredictable, uncertain and volatile of all economic statistics. To gain some further understanding of the determinants of the behaviour of earnings, a study has been included as an appendix to this report. The equations developed in this Appendix have not been used directly, but they have an indirect influence in relation to the following issues.

The projection assumes that wage determination over the projection period follows the principles laid down in the current ALP/ACTU accord. That is, it is assumed that national wage decisions are based strictly on the full indexation of wages to prices. The Accord also allows for productivity cases commencing in 1985. It is assumed that there will be an increase in national wages in July 1985, representing the increase in productivity during 1983-84. Wage drift is captured by allowing average weekly earnings to respond to National Wage Case decisions. (It is assumed that there is only a slight drift between average award wages and National Wage Case Decisions). The determinents of the drift are:

(i) capacity utilisation;

(ii) the velocity of money with respect to its trend value;

(iii) productivity with respect to its trend value

The empirical elasticities of wage drift with respect to its determinants are available on request. Further, an allowance for increased superannuation benefits has been built into the projection by setting the drift between average earnings and wage, salary and supplements earnings for non farm employees at 1 per cent per annum for the next three years. The wage rate projections are given in Table 1.11.

TABLE 1.11 PROJECTED GROWTH IN NOMINAL AND REAL WAGE RATES

	NOMINAL WEEKLY WAGE PER MALE UNIT	REAL WEEKLY WAGE RATE	NOMINAL WEEKLY MALE AWARD WAGES
Unit	$	1980 $	$
1980	242.20	242.20	203.40
1981	275.10	251.46	227.20
1982	305.50	252.90	255.10
1983	337.90	250.85	282.20
1984	359.70	249.45	306.60
1989	550.33	267.53	469.24
Percentage changes			
1980	9.84	-0.33	0.00
1981	13.58	3.83	11.70
1982	11.05	0.57	12.28
1983	10.61	-0.81	10.62
1984	6.45	-0.56	8.65
Compound growth rate(percent) -			
1975-1980	10.82	-0.08	0.00
1980-1984	10.39	0.74	10.80
1975-1989	10.00	0.68	0.00
1984-1989	8.88	1.41	8.88

Fiscal years ending 30 June

Macroeconomic Aggregates

Projected selected economic aggregates and the formation of gross domestic production are given in Tables 1.12 and 1.13 respectively. By 1988-89, the average employment rate is a percentage point above the average rate in 1983-84. The average inflation rate between 1983-84 and 1988-89,as represented by the consumer price index, is a percentage point above world trade price growth. The public sector borrowing requirement as a percentage of GDP is between the 1982-83 and 1983-84 average levels, while the real rate of interest in 1988-89 is the same as in 1983-84. From Table 1.13 the average absolute GDP growth rate over the 1983-84 to 1988-89 period is just above the 1974-75 to 1979-80 rate. From Table 1.1 the projected average growth in GDP is slightly above the average OECD growth rate. In general, the relative pattern of average growth rates across the demand components of GDP resembles the 1974-75 to 1979-80 profile. The major exceptions are the significantly high growth rates in total public investment and in imports of goods and services. It is important to note that the projected macro aggregates, shown in Tables 1.12 and 1.13 are dependent on the policy stance built into these projections, a policy stance that is, in turn, dependant on the growth constraints referred to earlier in this report. The impact of projected activity on the constraining factors is discussed in further detail in the next section of the report.

Population and the Labour Market

Projected demographic agregates are given in Table 1.14. Given the projected total fertility rate and age specific death rates, the natural annual increase stabilizes at around 140,000 over the second half of the 1980 decade. The net gain in population from overseas sources is assumed to return gradually to an upper limit of 85,000 by 1985-86. From the Table, the population by the end of June 1989 will be 16.7 million given the average total population growth rate from 1983-84 to 1988-89 of 1.4 per cent per annum. From Table 1.15 the average growth rate in the civilian population 15 and over is 1.9 per cent per annum over the 1983-84 to 1988-89 period. This is 0.15 percentage points above the average annual growth in the recorded workforce, which, in turn, is 0.25 percentage points above the average rate of growth in total employment. As a result, the recorded unemployment rate increases by 1.1 percentage points between 1983-84 and 1988-89. The level of recorded unemployment in 1988-89 is estimated at 829,000.

After including defence employees, the total recorded participation rate falls from 60.8 percent in 1983-84 to 60.4 percent in 1988-89. The aggregate participation rate is affected by labour market conditions to the degree that, in the long run, the

TABLE 1.12 SELECTED ECONOMIC INDICATORS

	CONSUMER PRICE INDEX	PSBR AS PERCENT OF GDP	2 YEAR BOND RATE	ACTUAL UNEMPLOY. RATE (% WORK-FORCE)	CURRENT ACCOUNT BALANCE (% EXPORT)	NET APPARENT CAPITAL INFLOW (% GDP)	CAPACITY UTILISATION	NON-FARM PRODUCT
Unit	NO. I			PERCENT				
1980	1.00	3.19	0.11	6.09	-8.43	2.18	0.98	108218.00
1981	1.09	3.52	0.13	5.79	-20.96	5.07	1.01	113307.00
1982	1.21	3.24	0.15	6.08	-39.02	6.82	1.00	115846.00
1983	1.35	6.33	0.14	8.86	-25.79	5.50	0.94	115454.00
1984	1.44	7.74	0.12	9.53	-23.73	4.74	0.95	119945.00
1989	2.06	6.55	0.13	10.64	-34.73	5.26	1.00	138880.44
Percentage changes								
1980	10.20	-43.33	17.54	-2.42	-64.86	-26.73	-1.21	2.62
1981	9.40	10.48	18.04	-4.99	148.60	133.27	2.75	4.70
1982	10.42	-7.88	19.20	5.14	86.14	34.38	-0.45	2.24
1983	11.51	95.03	-4.70	45.67	-33.90	-19.32	-6.20	-0.34
1984	7.05	22.31	-12.54	7.56	-8.00	-13.89	1.64	3.89
Compound growth rate(percent) -								
1975-1980	10.91	-5.08	2.85	8.75	17.39	9.04	0.12	2.55
1980-1984	9.58	24.82	4.07	11.85	-29.52	21.48	-0.63	2.61
1975-1989	9.25	3.34	2.75	7.23	-3.34	9.85	0.16	2.72
1984-1989	7.36	-3.28	1.61	2.22	-7.92	2.11	0.84	2.97

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TABLE 1.13 MACRO AGGREGATES

	TOTAL PTE CONSUMPTION EXPENDITURE	TOTAL GOVT. CURRENT EXPENDITURE	PRIVATE HOUSING EXPENDITURE	TOTAL PRIVATE INVESTMENT	TOTAL PUBLIC INVESTMENT	NON FARM STOCKS	IMPORTS, GOODS & SERVICES	EXPORTS, GOODS & SERVICES	GROSS DOMESTIC PRODUCT
Unit	1980 $M	1980 $M	1980 $M		1979.80 MILLION OF $			1980 $M	1980 $M
1980	70108.00	18708.00	4862.00	11415.00	8963.00	975.00	20918.00	21617.00	115667.00
1981	72513.00	19727.00	5434.00	13876.00	9205.00	637.00	22761.00	20399.00	119940.00
1982	75334.00	19955.00	5296.00	16607.00	8802.00	635.00	25311.00	20588.00	123503.00
1983	76333.00	20630.00	3909.00	14057.00	9387.00	-1603.00	22859.00	20713.00	121741.00
1984	77891.00	21863.00	4477.00	12153.00	9336.00	-201.00	23536.00	22140.00	128193.00
1989	89984.35	25416.10	5563.98	13968.19	11524.46	1445.88	31092.40	28062.52	147098.83
Percentage changes									
1980	2.36	2.21	11.82	-6.72	-2.93	400.00	0.12	7.82	1.60
1981	3.43	5.45	11.76	21.56	2.70	-34.67	8.81	-5.63	3.69
1982	3.89	1.16	-2.54	19.68	-4.38	-0.31	11.20	0.93	2.97
1983	1.33	3.38	-26.19	-15.35	6.65	-352.44	-9.69	0.61	-1.43
1984	2.04	5.98	14.53	-13.54	-0.54	-87.46	2.96	6.89	5.30
Compound growth rate(percent) -									
1975-1980	2.51	4.59	5.42	1.14	-1.06	0.00	1.47	5.55	2.57
1980-1984	2.67	3.97	-2.04	1.58	1.02	-32.62	2.99	0.60	2.60
1975-1989	2.70	3.87	2.89	1.86	1.42	0.00	3.41	3.87	2.66
1984-1989	2.93	3.06	4.44	2.82	4.30	48.38	5.73	4.86	2.79

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Table 1.14: Demographic Aggregates (thousands)

Year ended June	Natural Increase	Net Overseas Migration	Net Increase in Population	Population end of Period	Mean Population	Annual Percentage Rate of Change in Mean Population
1977	115.5	57.9	159.2	14192.2	14008.0	1.3
1978	118.3	62.7	167.0	14359.3	14183.4	1.3
1979	115.1	55.1	156.5	14515.7	14354.8	1.2
1980	117.0	75.9	179.6	14695.4	14541.1	1.3
1981	121.5	119.2	227.9	14923.3	14836.5	2.0
1982	126.1	129.1	255.1	15178.4	15083.1	1.7
1983	128.7	62.1	190.8	15369.2	15304.2	1.5
1984	138.6	75.0	213.6	15582.8	15484.9	1.2
1985	140.0	80.0	220.0	15802.8	15702.7	1.4
1986	141.1	85.0	226.1	16028.9	15927.4	1.4
1987	142.3	85.0	227.3	16256.2	16154.1	1.4
1988	141.2	85.0	226.2	16482.4	16378.5	1.4
1989	143.6	85.0	228.6	16711.0	16606.1	1.4

TABLE 1.15POPULATION, PARTICIPATION RATES AND THE WORKFORCE

	CIVILIAN POPULATION 15 AND OVER	POTENTIAL WORKFORCE	TOTAL LABOUR FORCE	PERSONS NOT IN WORKFORCE	TOTAL EMPLOY-MENT (INC. DEFENCE)	NUMBER UNEMPLOYED (LABOUR FORCE SURVEY)	UNEMPLOY-MENT RATE (PER CENT OF LABOUR FORCE)
Unit	'00	'00	'00	'00	'00	'00	%
1980	107463.00	69760.00	66310.00	41973.00	62271.00	4039.00	6.09
1981	110240.00	71530.00	67911.00	43050.00	63981.00	3930.00	5.79
1982	112550.00	72839.00	68966.00	44313.00	64770.00	4196.00	6.08
1983	114730.00	74441.46	70069.00	45392.00	63859.00	6210.00	8.86
1984	116774.00	76004.73	71416.00	46088.00	64608.00	6808.00	9.53
1989	128322.33	83627.78	77879.64	51193.59	69594.03	8285.61	10.64
Percentage changes							
1980	1.77	2.38	2.10	1.18	2.26	-0.37	-2.42
1981	2.58	2.54	2.41	2.57	2.75	-2.70	-4.99
1982	2.10	1.83	1.55	2.93	1.23	6.77	5.14
1983	1.94	2.20	1.60	2.43	-1.41	48.00	45.67
1984	1.78	2.10	1.92	1.53	1.17	9.63	7.56
Compound growth rate(percent) -							
1975-1980	1.79	2.36	1.45	2.36	1.00	10.33	8.75
1980-1984	2.10	2.17	1.87	2.37	0.93	13.94	11.85
1975-1989	1.92	2.15	1.68	2.28	1.16	9.03	7.23
1984-1989	1.90	1.93	1.75	2.12	1.50	4.01	2.22

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coefficient of the participation rate function indicates that a 1 percentage point increase in the recorded rate of unemployment will result in a 0.8 percentage point decrease in the recorded aggregate participation rate. This function can also be used to estimate the potential workforce, or the recorded workforce when the recorded unemployment rate was at its "full employment" value. Estimates of the potential workforce, made on the assumption that a 'full-employment' unemployment rate would be the same as the recorded rate in 1973-74, 2 per cent, are given in Table 1.15. These estimates were then used to generate the estimates of the level and rate of hidden unemployment shown in Table 1.16. Thus Table 1.16 shows the number of people who would have been in the workforce if the rate of recorded unemployment had remained at 2 per cent.

The share of full-time employment in total employment depends on labour market conditions. The total unemployment level given in Table 1.16 is the sum of recorded unemployment, hidden unemployment and, in addition, the additional numbers unemployed if the full-time share took the levels prevailing in 1973-74 rather than those actually used in the projection. In 1973-74, full-time employment as a percentage of total employment was 87.8 per cent. Between 1983-84 and 1988-89 it is projected to fall from 83 per cent to 80 per cent. Thus, the difference between total unemployment and recorded plus hidden unemployment in 1988-89, represents the additional unemployment that would have arisen if the full-time employment share had been 87.8 instead of the projected 80 per cent.

Employment by major industrial sector is given in Table 1.17. Low levels of real farm income, which are shown in Table 1.10, underlie the 41,000 fall in farm employment between 1983-84 and 1988-89. Manufacturing and transpot employment fall marginally, while construction and commerce employment rise by 93,000 and 97,000 respectively. Finance and community service employment increase by 88,000 and 176,000 respectively. The total change in employment between 1983-84 and 1988-89 is just under 500,000. Employment growth in the finance and community service sectors explain over 50 per cent of the total change, which is below that of the recent historical experience. Between 1974-75 and 1983-84, the changes in finance and community service sector employment were 157,000 and 316,000 respectively, while the change in total employment was 537,000. Hence the total contribution from these two sectors was 88 per cent. The decline in the contribution from the two sectors during the projection period is mainly because the projected growth rate of current government expenditure is relatively low.

Table 1.18 indicates projected employment by major manufacturing industries. Employment between 1983-84 and 1988-89 falls in the food, textile clothing and

Table 1.16: Recorded and hidden unemployment (fiscal year averages)

	Recorded unemployment	Hidden unemployment	Total unemployment	Recorded unemployment rate	Hidden unemployment rate (a)	Total unemployment rate (a)
	'000	'000	'000	%	%	%
1974-75	247	38	321	4.0	0.6	5.2
1979-80	404	345	890	6.1	4.9	12.6
1983-84	681	458	1350	9.5	6.0	17.8
1988-89	829	575	1725	10.6	6.9	20.6

Notes: (a) As a per cent of potential workforce

TABLE 1.17 EMPLOYMENT BY SECTOR ('00)

	PRIMARY	MANUFAC-TURING	CONSTRUC-TION	TRANSPORT	FINANCE	COMMERCE	COMMUNITY AND BUSINESS SERVICES	ENTER-TAINMENT
Unit	'00	'00	'00	'00	'00	'00	'00	'00
1980	4052.36	12344.91	4785.61	3378.00	4954.01	12552.19	9580.05	3819.64
1981	4137.00	12408.00	4879.00	3477.00	5377.00	12690.00	10044.00	3883.00
1982	4079.00	12445.00	4740.00	3563.00	5626.00	12738.00	10194.00	3969.00
1983	4151.00	11633.00	4364.00	3658.00	5697.00	12535.00	10362.00	4012.00
1984	4086.00	11437.00	4084.00	3628.00	5887.00	12538.00	10906.00	4110.00
1989	3679.68	11255.09	5014.02	3610.58	6762.88	13506.23	12670.98	4399.89
Percentage changes								
1980	3.88	3.19	-1.93	1.20	2.91	2.16	4.02	3.67
1981	2.09	0.51	1.95	2.93	8.54	1.10	4.84	1.66
1982	-1.40	0.30	-2.85	2.47	4.63	0.38	1.49	2.21
1983	1.77	-6.52	-7.93	2.67	1.26	-1.59	1.65	1.08
1984	-1.57	-1.68	-6.42	-0.82	3.34	0.02	5.25	2.44
Compound growth rate(percent) -								
1975-1980	0.84	-1.30	0.10	1.22	2.79	2.05	4.33	1.89
1980-1984	0.21	-1.89	-3.89	1.80	4.41	-0.03	3.29	1.85
1975-1989	-0.39	-1.12	0.37	0.91	3.26	1.25	3.57	1.69
1984-1989	-2.07	-0.32	4.19	-0.10	2.81	1.50	3.05	1.37

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TABLE 1.18 EMPLOYMENT IN MANUFACTURING INDUSTRIES

	FOOD, BEVERAGES AND TOBACCO PRODUCTS	TEXTILE, CLOTHING AND FOOTWEAR PRODUCTS	SAWMILL AND WOOD PRODUCTS	PAPER PRODUCTS AND PRINTED MATTER	TOTAL CHEMICALS	NON-METALLIC MINERAL PRODUCTS	METAL PRODUCTS	TRANS-PORT EQUIP-MENT	MACHINERY AND HOUSEHOLD APPLIANCES
Unit	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
1980	186353.00	117513.00	77213.00	101579.00	60294.00	45777.00	203092.00	136884.00	159428.00
1981	183617.00	115503.00	78862.00	102410.00	59926.00	45862.00	209339.00	128437.00	161753.00
1982	178699.00	113338.00	80205.00	103043.00	60237.00	45997.00	212349.00	131551.00	162977.00
1983	176316.28	105535.68	76388.10	101177.65	60043.52	44771.64	195552.47	125525.51	153671.84
1984	167734.64	112199.64	78128.93	103331.63	60070.78	45611.07	179729.40	126385.41	149608.91
1989	137677.27	105999.56	82025.55	111541.23	59504.86	49885.26	181783.65	121814.39	139031.97
Percentage changes									
1980	-1.75	0.10	3.77	3.69	-2.41	1.76	3.78	0.10	-0.57
1981	-1.47	-1.71	2.14	0.82	-0.61	0.19	3.08	-6.17	1.46
1982	-2.68	-1.87	1.70	0.62	0.52	0.29	1.44	2.42	0.76
1983	-1.33	-6.88	-4.76	-1.81	-0.32	-2.66	-7.91	-4.58	-5.71
1984	-4.87	6.31	2.28	2.13	0.05	1.87	-8.09	0.69	-2.64
Compound growth rate(percent) -									
1975-1980	-1.09	-2.52	-0.23	-0.29	-1.17	-2.13	-0.52	-1.47	-3.86
1980-1984	-2.60	-1.15	0.30	0.43	-0.09	-0.09	-3.01	-1.98	-1.58
1975-1989	-2.52	-1.64	0.35	0.57	-0.51	-0.15	-0.97	-1.35	-2.36
1984-1989	-3.87	-1.13	0.98	1.54	-0.19	1.81	0.23	-0.73	-1.46

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footwear, chemists, transport equipment and machinery and household appliance industries, but increases in the wood and paper products, non-metallic minerals and metal product industries.

The Balance of Payments

Summary aggregates from the balance of payments' current and capital accounts and the formation of income payable on foreign investment are given in Tables 1.19 and 1.20 respectively. The terms of trade between 1983-84 and 1988-89 are projected to fall by 5 per cent. In part, this is because annual growth in the export prices (in U.S. dollars) of cereals, wool, meat, iron ore, copper, zinc and lead products is below the annual growth in world trade prices. Given the projected growth rates in real exports and imports of goods and services and the movement in the terms of trade, the discrepancy between the nominal value of exports of goods and services and the corresponding value of imports, shown in Table 1.19 increases from -\$2.2 billion to -\$8.7 billion in 1988-89. Given the increase in property income to overseas, the deficit in the balance on current account more than doubles between 1983-84 and 1988-89. The recent historical experience, in which borrowings form the major component of capital inflow will continue over the projection period.

The weighted average exchange rate is projected to fall from its average 1983-84 value of 0.82 to 0.78 in 1988-89. This is due to the deterioration in the current account balance and to the projected inflation profile in Australia vis-a-vis Australian trading partners.

Constraints to Growth

The rationale for the projection outlined alone can only be properly understood in relation to the four constraints to growth.

The Balance of Payments Constraint

Table 1.21 provides three measures of balance of payments disequilibrium. Between 1974-75 and 1979-80, income payable on foreign investment (excluding undistributed income) as a per cent of export of goods and services was stable and less than 6 per cent. However, in the next four years the ratio increased to 16 per cent and is projected to increase by an additional 2.3 percentage points between 1983-84 and 1988-89.

The ratio of private and public liabilities owed to foreigners to GDP is projected to increase by almost threefold between 1974-75 and 1988-89. This result is due to the

TABLE 1.19 THE BALANCE OF PAYMENTS, CURRENT AND CAPITAL ACCOUNT ITEMS ($M)

	TOTAL NOMINAL EXPORTS, GOODS & SERVICES	TOTAL NOMINAL IMPORTS, GOODS & SERVICES	PROPERTY INCOME TO O/S (EXC. NEW ENERGY INCOME PAYABLE)	BALANCE ON CURRENT ACCOUNT	FOREIGN INVEST-MENT IN GOVT. SECURI-TIES	NET PRIVATE FOREIGN INVEST-MENT	NET APPARENT CAPITAL INFLOW EXC.ENERGY	NET OFFICIAL MONETARY MOVEMENTS	RATIO OF WORLD TO AUST'N INTEREST RATES
Unit	$M	$M	$M	$M	$M	$M	$M	$M	%
1980	21586.00	20918.00	2129.00	-1820.00	207.00	3023.00	2516.00	-301.00	101.61
1981	22003.00	24749.00	3076.00	-4612.00	426.00	5983.00	6691.00	1149.00	104.00
1982	22662.00	28562.00	3168.00	-8842.00	505.00	9471.00	10204.00	1354.00	79.19
1983	24498.00	27988.00	3263.00	-6318.00	691.00	8295.00	9013.91	2436.00	77.46
1984	27703.00	29936.00	4833.00	-6573.00	127.00	8100.00	8855.29	1856.00	91.14
1989	45142.69	53897.95	6868.18	-15676.79	1105.43	13531.88	15676.79	0.00	82.72
Percentage changes									
1980	30.81	17.62	27.10	-54.03	-84.71	46.82	-17.37	142.74	14.29
1981	1.93	18.31	44.48	153.41	105.80	97.92	165.94	-481.73	2.36
1982	3.00	15.41	2.99	91.72	18.54	58.30	52.50	17.84	-23.85
1983	8.10	-2.01	3.00	-28.55	36.83	-12.42	-11.66	79.91	-2.18
1984	13.08	6.96	48.12	4.04	-81.62	-2.35	-1.76	-23.81	17.65
Compound growth rate(percent) -									
1975-1980	16.82	15.39	17.17	3.49	58.03	25.97	23.61	8.29	0.56
1980-1984	6.44	9.38	22.75	-37.86	-11.50	27.94	36.97	57.58	-2.68
1975-1989	11.43	12.61	15.06	-15.16	32.72	20.87	22.92	0.00	-1.26
1984-1989	10.26	12.48	7.28	-18.99	54.15	10.81	12.10	0.00	-1.92

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TABLE 1.20 FORMATION OF INCOME PAYABLE ON FOREIGN INVESTMENT

	DIVIDENDS PAYABLE OVERSEAS	INTEREST PAYMENTS ON BORROW-INGS	INTEREST PAYABLE ON GOVT. SECUR-ITIES	TOTAL INCOME PAYABLE ON FOREIGN INVESTMENT	RETURN ON OVERSEAS BORROW-INGS
Unit	$M	$M	$M	$M	NUMBER
1980	876.00	567.00	386.00	2129.00	0.05
1981	992.00	691.00	372.00	3076.00	0.05
1982	1054.00	1273.00	435.00	3168.00	0.05
1983	1057.00	1992.00	589.00	3263.00	0.06
1984	1311.00	2451.00	596.00	4833.00	0.06
1989	1688.92	5848.71	717.48	6868.18	0.06
Percentage changes					
1980	43.14	29.16	25.73	27.10	12.89
1981	13.24	21.87	-3.63	44.48	-4.63
1982	6.25	84.23	16.94	2.99	15.36
1983	0.28	56.48	35.40	3.00	10.75
1984	24.03	23.04	1.02	48.12	-2.04
Compound growth rate(percent) -					
1975-1980	15.51	16.00	38.41	17.17	3.26
1980-1984	10.60	44.19	11.42	22.75	4.52
1975-1989	10.34	24.57	17.39	15.06	2.95
1984-1989	5.20	19.00	3.81	7.28	1.41

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1983-84 position in relation to international debt and debt servicing costs, and to a projected domestic level of economic activity in relation to foreign economic activity which generates a deficit on current account as a per cent of exports of goods and services, of between 20 and 30 per cent for the years 1984-85 to 1987-88.

The balance of payments constraint becomes operative when the indicators of balance of payments disequilibrium include a degree of uncertainty in the minds of foreign lenders as to the credit standing of an economy. Lomax sums it up in the following manner:

> The reason for making these calculations [of balance of payments disequilibrium] is the enormous importance of maintaining market confidence, for the efficient financing of countries, once they become consistent users of the commercial markets. It is by now axiomatic that the best indicator of likely market problems in the near future is the liquidity of countries, so monitoring liquidity is an important feature of market behaviour. Looking at this from the other side, a country which maintains a good liquidity situation, and is forecast to maintain a good liquidity situation in the future, should have much less difficulty with its market relationships. The first measure of liquidity used is the level of a country's reserves in relation to its borrowing needs in the market place.

The second measure is the debt service ratio, which is calculated as the interest paid and amortisation of medium and long-term debt, as a percentage of export and service receipts.

> ...The international financial market needs firm criteria of credit worthiness .... The criteria which we believe would be suitable, and on the evidence seem to be taken into account in the market place, are that a country should have enough reserves to cover six months' market borrowing, and that its debt service ratio on this measure should be no more than 20 - 25 per cent. (D.F. Lomax, National Westminster Bank *International Review*, June 25, 1984).

Calculated values of the two criteria suggested by Lomax are shown in Table 1.22 for the years 1983-84 and 1988-89. On both criteria, the Australian growth profie from 1983-84 to 1988-89 results in the balance of payments constraint to growth being operative in 1988-89. Any growth rate of domestic activity higher than has been projected here is likely to lead to substantial instability in Australian international capital flows and, as a by-product, in the exchange rate.

In this context, it is perhaps interesting to note that countries in which the two criteria are in the vicinty of the projected Australian values for 1988-89 are Eqypt, Nigeria and New Zealand. In addition economies which presently have a debt service ratio at 20 per cent or more are Algeria, Israel, Ivory Coast, Kenya, Malawi, Morocco,

Table 1.21: Measures of Balance of Payment Disequilibrium

	Income Payable on Foreign Investment (excluding Undistributed Income) as a per cent of Exports of Goods and Services	Balance on Current Account as a per cent of Exports of Goods and services	Private and Public Stock of Liabilities owed to foreigners as a per cent of GDP
1974-75	5.4	-21.9	12.3
1979-80	4.9	- 8.4	14.6
1983-84	16.3	-23.7	25.6
1988-89	18.6	-34.7	34.5

TABLE 1.22: INDICATORS: AUSTRALIAN INTERNATIONAL CREDITWORTHINESS

($ billion)

	Private and Public Stock of Liabilities Owed to Foreigners	Stock of Private and Public Medium and Long Term Debt	Amortisation of Private and Public Medium and Long Term Debt	Internal Payments on Private and Public Medium and Long Term Debt	Export of goods and Services $	Debt Service Ratio Percent	Number of Months Market Cash covered by Official Reserves
1983/84	43.5 (a)	31.5 (a)(b)	2.7 (b)(c)	2.7 (d)	27.7	18.7 (g)	18.9 (b)(c)
1988/89	95.2 (a)	68.9 (a)(f)	5.4	5.3 (e)	45.1	23.7 (g)	6.7 (h)

NOTES:

(a) Mid year fiscal year estimate

(b) National Westminster Bank "International Review" June 25th, 1984
The estimates in this publication have been converted to Australian dollars

(c) Estimate for 1984

(d) Estimated by multiplying total government and private sector interest payment from Table 20 by the ratio of the estimates of private and public medium and long term debt to total debt given in National Westminster Bank "International Review".

(e) Indexed by the change in total private and public interest payments from Table 20, gives the 1983.84 estimates.

(f) Indexed to the private and public stock of liabilities owed to foreigners gives 1983.84 debt estimates.

(g) Amortisation of private and public sector debt (adjusted to fixed year bases) plus interest on public and private medium and long term debt divided by export receipts of goods and services.

(h) 12 times official reserves (held constant at 1984 levels except for exchange rate adjustment) divided by current account deficit plus debit amortisation plus short term debit less non-market capital and credit inflows.

Tunisia, Turkey, Indonesia, Phillipines, Portugal and all the major East European and Latin American countries.

<u>The Capacity Stock Constraint</u>

Table 1.12 indicated that the projected capacity utilization ratio is 100 per cent in 1988-89. This means that in 1988-89 the projected GDP level equals the GDP that would be produced if the capital stock in place was operating at "normal" utilization rates. This is identical to the situation that prevailed in 1981-82. In contrast, the utilization rate in 1982-83 was 94 per cent; that is, the level of GDP was 6 per cent below the level that would have been produced if the capital stock in place had operated at "normal" utilization rates.

The measure of capacity utilization was constructed in the following manner. Extending the Australian bureau of statistics estimates of private and public enterprise capital stock in place to the limited available data, the ratio of GDP to capital stock is calculated. The resulting data were regressed against time. Next, a benchmark year was selected (1968-69) where the evidence suggests that the economy was operating at full potential. The ratio of GDP to capital stock in place for the benchmark year was then applied to the trend regression function to derive the "normal" or "potential" GDP/capital stock ratio for each year of the historical period. Finally, the "normal" ratio was applied to the capital stock in place series to obtain "normal" GDP. The capacity utilization series in Table 1.12 is thus the ratio of actual GDP to the estimate of "normal" GDP that could be produced from the capital stock in place. Over the projection horizon, the capital stock in place at the end of a year is given by the capital stock in place at the end of the previous year plus private and public enterprise investment less depreciation. The trends in the ratio of GDP to capital stock in place was estimated by aggregating the capital/output ratio across industries. The estimate of depreciation of the capital stock in place (based on ABS estimates) not only reflects retirement of capacity but also the decline in the relative quality of capital in place. That is, it is probably more accurate to interpret the capital stock in place estimate in any given year as that part of the total stock of installed capacity which can be economically operated.

It follows that in 1988-89 economic activity is at the level which can be (economically) obtained from the capital stock in place. Hence GDP is constrained to the level of the capital stock.

The relationship between the capital stock constrained GDP and "full- employment" constrained GDP is of interest. Table 1.23 shows estimates of full-employment GDP.

They are derived by assuming that productivity in any given year (GDP per employed person) is the same regardless of the level of GPD in that year, and estimating the GDP required to restore 1973-74 labour market conditions, in terms of the recorded unemployment rate and the proportions of full-time and part time work of that year. That is, it is an estimate of the GDP required to obtain a total unemployment rate of 2 percent. Capital stock constrained GDP is also given in the Table. A comparison of the two measures indicates that, in 1979-80, "full employment" GDP was 11 per cent greater than the GDP that could be obtained from the capital stock in place. This discrepancy had grown to 14 per cent in 1983-84. In 1988-89, the discrepancy is projected to be 23 per cent. Table 1.4 translates the information in Table 1.23 into the investment required to eliminate the discrepancy between capital stock constrained GDP and "full employment" GDP. That is, it gives estimates of the "capital gap". From Table 1.24, the projected growth in private and public enterprise investment over the 1983-84 to 1988-89 period will result in the the estimated capital stock in place increasing by 12 per cent between the benchmark years. However, the table shows that to attain the 'full-employment' GDP, the capital stock in place must be $243 billion in 1979-80 prices. In other words, the capital gap is more than a quarter of GDP in 1988-89 and 2.4 times the projected level of private and public enterprise investment in that year. The magnitude of the capital gap, however measured, highlights the critical role of investment expenditure in creating the preconditions for a sustained reduction in unemployment levels.

The above quantitative analysis can be used to calculate the cost of unemployment, or more accurately, the cost of departing from the labour market conditions of 1973-74. The first column in Table 1.25 shows the difference between full-employment GDP and the actual GDP level in the selected years. In 1988-89, the departure from the 1973-74 labour market conditions results in a loss of GDP per capita of $2120 in 1979-80 prices. As projected per capita GDP in 1988-89 is $8861 in 1979-80 prices the cost of GDP being lower than its full-employment level, in the terms of this projection, is that real per capita income in 1988-89 is 19 per cent lower than it could have been had full-employment been achieved. Of course, this single figure disguises the fact that most of the burden of this cost will be borne by the unemployed.

The Public Sector Borrowing Constraint

The public sector borrowing constraint becomes operative when marginal increments in sales of government securities to domestic bondholders engenders significant upward pressure on interest rates. There are no precise measures of the presence of

Table 1.23: Capital Stock Constraint and Full-Employment GDP ($1979-80 billion)

	Actual GDP	Capital Stock Constrained GDP	GDP required to Restore 1973-74 labour market conditions: full-employment GDP	Ratio of Full-Employment GDP to Capital Stock Constrainted GDP
1974-75	101.9	104.6	105.3	1.01
1979-80	115.7	117.0	130.2	1.11
1983-84	128.2	134.3	153.2	1.14
1988-89	147.1	147.8	182.3	1.23

Table 1.24: Full-Employment Capital Requirements ($1979-80 billion)

A[A	Actual Capital Stock in place	Capital Stock Required to Restore 1973-74 Labour Market Conditions	Capital Gap	Capital Gap as Percent of Actual GDP	Ratio of Capital Gap to Actual Investment
1974-75	134.5	131.5	- 3.0	- 3.0	- 0.21
1979-80	153.7	166.9	13.2	11.4	1.0
1983-84	179.8	200.0	20.2	15.8	1.3
1988-89	201.2	242.6	41.4	28.1	2.4

Table 1.25: The Economic Cost of Unemployment

	GDP foregone due to divergence from 1973-74 Labour Market Conditions ($1979-80 b)	GDP foregone per capita ($1979-80)
1974-75	3.4	259
1979-80	14.5	997
1983-84	25.0	1615
1988-89	35.2	2120

this constraint, as there are of the previous two constraints. Nevertheless, an attempt will be made to develop some quantitative guidelines.

Table 1.26 indicates that the ratio of total non-primary financial assets (the financial assets of all financial institutions less the assets of the Reserve Bank, to GDP increased by 16 per cent between 1974-75 and 1983-84. It is projected to increase by a further 4 per cent between 1983-84 and 1988-89.

From the beginning of the 1970 decade until 1983-84, the ratio of the total domestic holdings of government (commonwealth, state, public authority and public enterprise) securities to total non-primary financial assets remained fairly constant at between 0.23 and 0.25. Over the projection Period, the domestic public sector borrowing requirement will cause this ratio to increase to 0.29. If it can be assumed that the (more recent) historical ceiling of 0.25 represents a boundary or threshhold guideline, beyond which financial market and interest rate instability would significantly intensify, then the maximum domestic public sector borrowings of governments and their agencies from domestic sources may be defined as 25 per cent of the change in total financial assets.

Table 1.27 contrasts the actual and projected total, domestic and maximum domestic public sector borrowing requirements. The difference between the total and domestic borrowing requirement represents the volume of funds raised by governments and their agencies from foreign sources. The Table indicates that the more recent and the 1988-89 projected domestic public sector borrowing requirements are above the "maximum" level.

However, this calculation of the maximum public sector borrowing requirement is in terms only of the change in the stock of domestically held public debt. No account is taken of the average ratio of domestically held public debt to total non-primary financial assets. Given the projected total stock of non-primary financial assets (Table 1.28) in 1988-89 and a 25 per cent threshhold value of the government borrowing ratio, then the domestically held public debt stock would have to be $104 billion. The time profile of projected domestically held public sector borrowing requirements over the 1984-84 to 1988-89 period results in the projected net stock being $118.5 billion. The discrepancy now amounts to $14.5 billion, which is considerably greater than the "marginal" discrepancy of $4.9 billion shown in Table 1.27.

The public sector borrowing requirement constraint, in terms of the statistical analysis presented here, could be ameliorated altering the characteristics of

Table 1.26: Financial Asset Ratios

	Ratio of Total non-primary Financial Assets to GDP	Ratio of Domestic Holdings of Government Securities to Total Financial assets
1974-75	1.16	0.23
1979-80	1.21	0.25
1983-84	1.34	0.25
1988-89	1.39	0.29

Table 1.27: Public Sector Borrowing Requirements ($b)

	Total Public Sector Borrowing Requirement	Domestic Public Sector Borrowing Requirement	Maximum Domestic Public Sector Borrowing Requirement
1981-82	4.9	3.2	7.1
1982-83	10.4	8.3	6.8
1983-84	14.5	12.8	8.9
1988-89	19.5	16.4	11.5

government securities to correspond, from the point of view of the investor, to the characteristics of private sector debt. Investors might then be willing to absorb greater proportions of public debt into their portfolios without significant increases in interest rates.

Secondly, the domestic public sector borrowing requirement can be reduced by issuing a greater proportion of the total requirement to foreign investors. Table 1.27 indicates that the proportion issued to foreign investors in 1988-89 follows recent historical trends.

Whether or not both these courses of action are possible is beyond the scope of this study. Nevertheless, a reasonable conclusion from the analysis of this section is that the growth projections outlined above carry the economy to the point where the public sector borrowing requirement in 1988-89 could possibly be a fundamental constraint to accelerating the rate of economic growth.

It may be noted here that the relatively high ratio of public sector debt to total non-primary financial assets, and the high nominal interest rates in the United States are principal factors explaining the projected interest rates shown in Table 1.28.

The Inflationary Expectations Constraint

The criteria which can be used to assess the strength of the inflationary expectations constraint are the absolute inflation rate, the inflation rate relative to recent experience, and the inflation rate relative to the economy's major trading partners. Although the annual average inflation rate projected over the 1983-84 to 1988-89 period is significantly below the rate of recent Australian experience, it is above that of her major trading partners. The inflationary expectations constraint could become operative over the projection horizon if any cost shocks, even if relatively minor, were superimposed on the projections given here.

TABLE 1.28 MAJOR MONETARY AGGREGATES ($M)

	RESERVE BANK HOLDINGS OF GOVT. DEBT	MONEY SUPPLY (M2)	TOTAL FINANCIAL ASSETS	2 YEAR GOVT. BOND RATE	VELOCITY OF MONEY (M2)
Unit	$M	$M	$M	%	RATIO
1980	5198.00	29011.00	139718.00	10.59	3.99
1981	4728.00	32976.00	162700.00	12.50	4.00
1982	5036.00	35083.00	190500.00	14.90	4.27
1983	2701.89	38583.00	216089.00	14.20	4.25
1984	2022.31	41508.00	250151.00	12.42	4.50
1989	8271.64	64966.16	414856.26	13.45	4.59
Percentage changes					
1980	0.48	11.40	15.02	17.54	1.23
1981	-9.04	13.67	16.45	18.04	0.30
1982	6.51	6.39	17.09	19.20	6.67
1983	-46.35	9.98	13.43	-4.70	-0.44
1984	-25.15	7.58	15.76	-12.54	6.05
Compound growth rate(percent) -					
1975-1980	33.45	10.94	14.37	2.85	2.18
1980-1984	-21.02	9.37	15.67	4.07	3.09
1975-1989	14.60	9.93	13.39	2.75	1.79
1984-1989	32.54	9.37	10.65	1.61	0.37

Fiscal years ending 30 June

Government Policy

From the above discussion of the four fundamental constraints to growth, it is considered that the projected growth profile allows the economy to operate on, or just within, each of these constraints. In other words, in terms of the assumptions of the projection, the growth profile is the maximum that can be achieved. However, this is not a coincidence, since Government Policy was set endogenously so as to ensure that the constraints were not significantly exceeded. At the beginning of each year of the projection horizon, the desired annual rate of growth of real government current expenditure and public authority investment were set at 3.5 and 4.5 percent respectively, and all tax rates were left unchanged at the previous year's level. The advised growth in the money supply was set at 1 percentage point less than the growth in the previous year's nominal gross domestic product. If the above policy settings generated growth which led to one or more of the constraints being significantly exceeded, they were made more contractionary, until growth was reduced by enough to satisfy the constraints . For every required percentage point reduction in a general 'policy indicator variable' the following adjustments were made to the individual policy instruments;

1) The rate of growth of real current government expenditure was reduced by 1 percentage point.

2) The income tax rate was increased by half of a percentage point.

3) The money supply growth rate was reduced by 2 percentage points.

4) The rate of growth of new finance available for new dwelling construction was reduced by 3 percentage points.

5) The growth rate of public authority capital expenditure was reduced by 2.5 percentage points.

6) The tax rate for consumption-based indirect taxes, in aggregate, was increased by 1 percentage point.

It can be seen from Table 1.13 that the rate of growth of current government expenditure over the projection period is below its desired growth rate. Table 1.29 shows that the household income tax rate increases by 3 percentage points between 1983.84 and 1988.89. The indirect tax share in GDP increases by 1 percentage point. Thus contractionary policies were necessary over the projection period, in order to

TABLE 1.29 PROJECTED TAX RATES

	HOUSEHOLD INCOME TAX	COMPANY TAX	PAYROLL TAX	ENTER-TAINMENT TAX	TURNOVER TAX	INDIRECT TAX SHARE OF GDP
Unit	RATE	RATE	RATE	RATE	RATE	
1980	0.16	0.46	0.03	0.10	0.00	0.12
1981	0.17	0.46	0.03	0.10	0.00	0.12
1982	0.18	0.46	0.03	0.10	0.00	0.12
1983	0.17	0.46	0.03	0.10	0.00	0.13
1984	0.18	0.46	0.03	0.11	0.00	0.12
1989	0.21	0.46	0.03	0.11	-0.01	0.13
Percentage changes						
1980	6.61	0.00	-0.12	3.97	0.00	3.77
1981	2.56	0.00	-2.12	0.61	0.00	-2.06
1982	5.25	0.00	0.00	7.36	0.00	1.23
1983	-1.62	0.00	0.00	0.41	0.00	3.93
1984	1.79	0.00	0.00	6.15	0.00	-0.93
Compound growth rate(percent) -						
1975-1980	2.20	1.60	-0.37	3.85	0.00	2.39
1980-1984	1.96	0.00	-0.53	3.58	0.00	0.52
1975-1989	2.50	0.57	-0.29	2.51	0.00	1.48
1984-1989	3.24	0.00	0.00	0.35	0.00	1.36

Fiscal years ending 30 June

maintain consistency between the general level of economic activity and the four constraints to growth.

The level of excess capacity in 1983-84, the world recovery, the fall in the inflation rate (down to 5 per cent) in 1984-85, and the natural forces of growth (stock building etc.) allow for a vigorous growth rate (around 3.5 percent per annum) over the 1983-84 to 1985-86 period.

However, because world growth falls in 1986 and, more importantly, because of the lagged response of capacity augmenting investment expenditure to general economic recovery contractionary policies have to be introduced in 1986. Indeed, the projected excess of the Australian inflation rate over that of Australia's major competitors is largely attributable to the increase in indirect taxes necessary to reduce domestic growth.

Given the assumptions of the projection, the constraints to growth, and the role of conventional policy instruments in maintaining overall balance, it follows that the projection defines the limits to the use of these conventional policies as a means of creating employment and reducing unemployment over the projection period. If unemployment is to be significantly reduced below the projected level of 0.82 million by 1988-89, it follows that alternative policies must be introduced. These could include the following possibilities:

– policies designed to reduce the constraints - including industrial policies to strengthen the industrial base of the economy; trade initiatives to increase domestic production by increasing exports or reducing import penetration; incentives to increase the capital infrastructure of the economy, and measures to improve the general competitiveness of the economy, such as industrial relations policies to stabilise and harmonize income claims;

– policies to increase employment per unit of output - as could be achieved by reordering public sector programs in favour of more labour-intensive employment, or by encouraging job-sharing or permanent part-time work, etc.

– programs designed to reduce the burden of unemployment by reducing the average duration of unemployment, and policies to reduce the supply of labour or to limit labour force participation - such as encouraging full-time participation in education, early retirement, and so on.

In short, what is required is a level of activity in the private tradeable goods sector (primary and manufacturing) which is above that of the projection but, at the same time, which does not require domestic demand to be greater than is shown in the projection.

Industry development policies can be designed to achieve this objective. However, it must be recognised that producers will only invest, employ labour and expand production if they can expect a stable and non-inflationary environment. They must be able, for example, to expect that the incomes accord will hold and will be effective in at least stabilizing and, if possible, reducing the inflation rate, and that any industry development policies are clearly defined, are consistent with the market mechanisims and will be adhered to. Only after domestic producers have expanded the level of production, that is, after the industry development policies have taken effect, will the tax base expand, the balance of payments improve or the capacity of the economy to absorb government debt increase. It then becomes possible for governments to introduce further fiscal expansionary measures so as to increase Australia's rate of growth to well above what it has been over the last decade. Effective industry development policies, therefore, are a vital generator of the growth process in the current economic environment but, to be successful, they require a favourable environment in terms of general macroeconomic expectations.

1.5 GUIDELINES FOR THE DEVELOPMENT OF POLICY STRATEGIES

It has been argued that, in general terms, industry development policies can be an effective means of improving growth rates, overall efficiency and the degree of competitiveness of the domestic economy. If this argument is accepted, it can then be argued that industry development policies should be a necessary component of any general strategy designed to make a substantial improvement to Australia's current and projected rates of unemployment. In this section, there is an attempt to develop a set of general guidelines for designing effective and efficient policies of this kind.

Industry development policies are not costless. Policy instruments, such as production subsidies, investment allowances and technological or administrative support mechanisms, are a direct charge on the exchequer. If the prevailing economic environment requires fiscal restraint, the introduction of such policies may therefore require, at least in the first instance, a reallocation of expenditure from actual or potential alternative uses or an increase in taxation, or both. Similarly, the introduction of such policies as tariffs, quotas, or other mechanisms that maintain the production of high-cost or technologically inferior products, relative to foreign-sourced supplies, will, other things being equal, impose a cost on the general economy. Export-competing industries using such protected domestic products will be at a particular cost or quality disadvantage, as will import-competing industries, whose degree of competitiveness will be impaired. To avoid these costs, the first requirement is that the development policy must incorporate factors that will ensure that 'best practice' technology is adopted; the second requirement is that it must include devices to compensate export-oriented and import-competing industries for the costs of the policy, even though this second requirement is itself a direct charge on the exchequer. This charge is simply an example of the general economic problem of allocation, in that assistance policies involve the use of scarce resources; economic rationality demands that these resources be used in the most efficient way possible.

To require that development policies be efficient leads to the question of whether an ideal policy would apply to the economy generally, or whether it should be specific to one industry or group of industries. For example, should export subsidies be available for a defined group of commodities, or should they apply to all exports? Before answering this question, it needs to be recognized that, at any given point in time, industries differ in the extent of their ability to use the resources embodied in a given industry development strategy. This is so because the products of different industries have different degrees of competitive advantage, and the determinants of competitive advantage are largely industry specific.

The competitive advantage of a particular product is, in broad terms, the ratio of the weighted average of the characteristics of the domestically produced product (its price, functional range, ease of use, durability, material composition, etc.) to the weighted average of the characteristics of the competitive, internationally traded product from foreign sources. The competitive advantage of the product will therefore depend on:

- the comparative advantages of the components used in its production
- the production technology, relative to best-practice technology as used by foreign suppliers. (Since production technology is, in general, embodied in capital goods, this will, in part, be a function of the average age of the industry's capital stock)
- the skills of the labour employed domestically, again, relative to best-practice skills of foreign labour.
- the average capacity of domestic production units, if returns to scale are relevant, related to foreign best-practice plant capacity
- the technology of product design, function, etc., relative to foreign best practice and the relative cost structure of the economy.

It was argued previously that the principles of the process of growth – resource creation, increasing returns and complementarity – provided scope for industry development policies to improve the competitive advantage of domestic output. Since industries differ in their ability to benefit from such policies, the most efficient use of the resources allocated to such policies is to allocate them where there will be the greatest improvement possible in competitive advantage per dollar of expenditure. Hence, industry development strategies should be industry, or product, specific.

Having selected the industries most suitable for policy support, it is then necessary to ensure that the policy is directed to the particular factor, or factors, that will yield the greatest increase in competitive advantage. In some industries, the constraint to competitiveness may be removed simply by introducing policies that will reduce the average age of the capital stock. In others, it may be necessary to change the skills of the workforce, to assist in upgrading the technology embodied in the final product or in the components supplied by other industries. On the other hand, it may be necessary to reorganize the industry so that the average size of production units is increased or, alternatively, a broad approach may be required, in which a range of factors, or constraints on competitiveness, are corrected.

It has been assumed in the above discussion that, by removing certain, specific 'competitive' constraints, domestic expansion will be assured. However, it will be argued here that demand, or more accurately realized demand, is the key decision variable influencing production, investment and employment decisions, and hence the growth of productivity. Effective industry development policies, aimed at lifting competitive constraints, may therefore need to be complemented with policies designed to expand industry demand. On this argument, the decision to invest, or to augment skills, in specific areas will not be taken unless additional markets for both output and labour have been identified.

The argument that complementary policies may be required is supported by the empirical evidence given in the previous section, which suggested that output growth precedes productivity growth and hence improved competitive advantage.

In the absence of an adequate macroeconomic stimulus to growth- and the view taken in this paper is that the multiple constraints referred to in the previous section will be an inhibition to growth — it follows that efficient policies for industry development may need to include a direct stimulus to growth in the selected industries. Thus as the firms in the industry expand their output, the level of excess capacity falls. With fixed costs spread over a greater volume of output, unit costs also fall and the level of profitability rises. At high capacity utilization and with improved profitability, investment intentions tend to be revised upwards, with the result that the average age of capital stock tends to fall, so technical efficiency is greatly improved. In addition, there is an incentive to pursue expanded training and re-training programs in order to meet the needs of the increase in technical efficiency. Equally research and development expenditure plans will tend to be revised upwards, which should result in an acceleration in the rate of innovation both in products and processes. In turn, this should lead to the more efficient operation of the firm and to an increase in its market share. As capital expansion raises the firm's level of capacity, there will be increasing returns through the 'scale economies' factor in the medium term, while the complementary nature of much industrial activity will lead to increasing returns through reductions in unit costs in supply industries, both through an acceleration in inter-industry specialization and the growth in the scale of their operations.

Thus, when policies designed to increase output directly have been introduced, policies designed to remove competitive constraints become much more effective, since they will be reinforcing and complementing what the firms are already doing.

There are two key features of this process. Firstly, growth will tend to be cumulative because of the circularities referred to above; after a time, it tends to propel both itself and each of the previously mentioned efficiency factors. Beyond a certain point, therefore, the degree of international competitiveness of domestic industry can be expected to improve significantly. Secondly, once this point has been reached, the general focus of industry policies should shift to the international arena in order to improve the export penetration of domestic industry. After this point, the rationale for industry development policies diminishes greatly, and often very quickly. Policy resources can then be released and, if necessary, applied to other industrial sectors. Of course, the whole process will only occur within the context where the policies have identified both the appropriate industries and the policy instruments for use in those industries.

In broad terms, the guidelines for industry development policies outlined above correspond to the development strategies in postwar Japan and, latterly, in other major East Asian economies. In terms of economic growth, export performance and employment growth, these economies have been very successful over the last two decades. They have also placed industry development policies at the centre of their general economic policies. Generally their basic strategy has been to strengthen the technological base of the tradeable goods sector gradually, by way of policies of assistance that encouraged a gradual movement of the industrial base through increasing the levels of scientific application and sophistication in fabrication. That assistance has, however, been conditional upon a proven level of efficiency in the industries assisted, where the domestic level of efficiency was measured against the world standards.

To varying degrees, the policies were also directed to specific industries. Thus the scarce resources available for industry assistance at any one time were concentrated on specific industries, and not thinly spread over a wide range of activities, as has been the practice in Australia. They were also integrated policies: the forward and backward linkages required to support the efficient operation of the selected industries were developed simultaneously; they were also integrated in the sense that a wide range of industry assistance instruments (financial incentives for exports and capital accumulation, subsidies, tariffs, quotas, government purchasing, technological support, marketing suport, industry information and educational programs) were applied in a co-ordinated fashion to support policy objectives for the particular industry.

Moreover the policies were rational. Although protective barriers were used in the early development of policy, the *quid pro quo* was that a best-practice technology, a high degree of capacity utilization, economies of scale and adaptability to change were all expected, as was the efficient organization of industry. Once this was achieved, further gains of lower production costs were obtained by switching the objectives of assistance, where possible, towards export-oriented growth. Assistance was sustained until the industry reached a scale of operation and product quality and range sufficient to compete unaided (other than by political protection) on world markets. Domestically oriented industries were and still are equally valued, being subject to sustained assistance if they were important in the backward and forward linkages for the support of export-oriented industries, or, again, if they were considered to be an important element in achieving macroeconomic objectives.

If there is one lesson to be learnt from the success of these East Asian economies, it is that comparative advantage is not solely a function of physical endowments, but can be created by means of the efficient application of the appropriate industry assistance policies.

Furthermore, there is also some empirical evidence from the Japanese experience that the causal link between growth in domestic output and export growth is important and runs from the former to the latter. During the period of the greatest export growth in Japan, from 1946 to 1965, the propensity to export was not particularly high, and the evidence suggests that 'only in a minority of cases is there spillover from foreign markets to the home market' (Cornwall 1977, p.192). Further evidence for this is given in Table 21, which suggests that high growth in Japanese domestic output led to productivity increases and then to improved competitive advantage and export growth.

Table 21 Domestic markets and export performance, Japan, 1955 to 1964

Growth in domestic demand		Growth in exports		Growth in demand plus exports		Share of goods
More than % %	Less than %	More than %	Less than %	More than %	Less than %	
				15		40
	10	15				1
15			10			44
					10	15

Source: H. Kanamari, 'Ecomonic Growth and Exports' (in Cornwall, 1977)

Further, the table shows that, of the fifty-five Japanese industries studied, some 40 per cent experienced growth in both domestic demand and exports of over 15 per cent; 44 per cent experienced growth in domestic demand of over 15 per cent and in exports of less than 10 per cent, while 15 per cent experienced growth rates in both factors of less than 10 per cent. Significantly, only in one industry was export growth higher than the growth in domestic sales. What the study suggests, according to Cornwall, is that export growth rarely exceeds growth in the home market, even in a country considered to be the most oriented towards realizing and exploiting the foreign markets of the future.

The evidence presented earlier suggests that there were strong links between output growth and productivity in the Australian manufacturing sector during most of the postwar period. Why, then, was there a comparative failure to achieve the spillover into exports, so characteristic of Japan and other successful East Asian economies? The evidence would suggest that it was largely because of inherent weaknesses in the industry development policies pursued at the time.

Firstly, it was never a primary policy objective to orient manufacturing industry towards exports. Rather, the objective was to establish production for domestic markets only. Secondly, firms and industries receiving industry assistance were never required to achieve international standards of production efficiency, and much of the capital expansion undertaken implicitly assumed that industry assistance would be permanent. Thirdly, throughout much of the period, the size of the domestic market inhibited the formation of production units of sufficient scale to be internationally competitive. This factor, which became less significant as the size of domestic markets grew, was and still is exacerbated by the tension between the need for technical productive efficiency and the need for competitive allocative efficiency (ie. the prevention of the formation of inefficient monopoly control).

The failure to achieve greater export orientation, then, was largely, but not exclusively, a failure of policy design. As such, criticisms of previous approaches to industry assistance are not therefore criticisms of assistance *per se*. Future policy design should properly include specific objectives with respect to standards of production efficiency and to export orientation. In addition, firms or industries receiving such assistance should be accountable to government for their performance, in terms of these criteria. This can best be achieved by specifically incorporating 'sunset' provisions into the selected industry assistance policies.

Finally, whatever strategies are adopted, they must have bi-partisan support. Producers will not locate new markets, invest, hire or train staff, or undertake the necessary research and development essential for long-term success, if the assistance policy is regarded as temporary or likely to be changed at short notice. There must be long-run stability in the application of industry development policies.

1.6 CRITERIA FOR INDUSTRY SELECTION

In general, industries qualifying for industry development assistance should have certain, specific characteristics if the resources allocated to industry development are to be efficiently spent. Some comments on the two most important of these characteristics are given below.

Growth Potential

Ideally, industries selected for development assistance should have a significant potential for growth, both in domestic and in world markets. A useful index of this potential is the income elasticity of demand for the products of the industry, that is, the relation between the percentage increase in world and domestic incomes and the subsequent percentage increase in world and domestic sales of the particular good or service. A summary of these elasticities in a broad range of industrial sectors is given in the next part of this paper.

Within the set of industries qualifying in terms of their growth potential, however, only those for which policies would be successful within the production and trade context of the existing domestic economy should be selected. Growth in aggregate export markets, for instance, is a weighted average of the growth in various national markets and, in some cases, markets with the highest growth may be ruled out on locational grounds. Equally, some industries and products may be ruled out on the grounds that the optimum scale of operations, or some other technical requirement, may be currently beyond the scope, at feasible assistance levels, of the domestic economy.

Equally, the demand prospects for a particular commodity, and hence its suitability for selection are not independent of the particular policy stance adopted at any given time, or of anticipated changes in the policy stance. The growth prospects of particular industries must therefore be evaluated against the general policy backdrop expected to prevail over the assistance period. For example, in a period of rapid, across-the-board industry modernization, the demand for particular products such as capital equipment will be significantly increased, perhaps over an extended period. The policy stance therefore has significant implications for the type of industries selected for expansion.

Thus, industries qualifying for selection must have readily identifiable, preferably large and certainly rapidly growing markets within locational and technical reach of domestic production capabilities. Apart from tapping into existing and potential demand within the domestic and world economies, however, qualifying industries should ideally be capable of making significant contributions to the development of the domestic economy from the supply side. Of particular importance in a period of rapid technological change is the ability of the selected industries to contribute to the increase in the technological advantage of the domestic economy.

Increasing Technological Advantage

The importance of technological change, either in the form of reductions in factor input per unit of output and/or of improvements in technical characteristics of products, is central to overall industrial performance, and hence to export growth, general economic activity and employment levels. Conventional textbook treatment of technological change, however, leaves the esential elements of the process unexplained. It is assumed that technological change is introduced into industries as if it were 'manna from heaven'. This is neither a useful nor an accurate explanation of the development and diffusion of technological change.

A useful starting point in the search for a more realistic explanation of the diffusion of technological change is to broadly classify industries according to their product categories or formation. There are five of these catagories:

- industries producing primary products or highly fabricated products which are used by industries producing goods for final demand
- industries producing components or medium to highly fabricated products which are used by industries producing goods for final demand
- industries producing consumer products
- industries producing capital goods (including some durable consumer goods)
- service industries.

In general, technological change is introduced into the economy by changes in material composition, product specification or functions of the products, in either the components or the capital goods industries. The technological base of the overall economy is changed by the use of components in the production of consumer and capital goods and by the use of capital goods in the production of goods and services generally. The diffusion of technological change is facilitated by complementary changes in the skills of labour, which enable the changed components and capital equipment to be used efficiently. It is this process which has underwritten much of the very rapid progress in production efficiency in the 19th and 20th centuries. Therefore, the relative efficiency of the overall economy is ultimately dependent upon the degree of specialization achieved in the component and capital equipment industries, hereinafter referred to as the 'technology' industries.

Technological change can, of course, be introduced by innovations in either the imported or the domestically produced product. However, the overall relative technological strength of an economy is not independent of the source of supply of the products of the technology industries, with the relative technological strength of an economy, up to a limit, being directly proportional to the structure and size of the domestic technological sector. This stems from several factors. Firstly, economies at any given point of time differ in their ability to exploit technological knowledge as well as in differences in the quality and quantity of their physical endowments. Thus, achieving the greatest possible technical efficiency depends on the ability of an economy to adapt and adopt the technology embodied in components and capital equipment so as to maximize its competitive advantage, subject to the constraints of its state of development and physical endowments. Secondly, in a world where the composition of production and consumption are shifting continuously, the ability of the economic system to respond flexibly and effectively to the ever-changing need of producers and consumers depends continually on its ability to diffuse the required changes in product specification and function through changes in component and capital equipment, design and performance. This, in part, depends on the existence of a vigorous, technologically efficient and adaptable domestic technological sector.

The features that bear on the ability of an economy to grasp the opportunities of technology and technological advance in terms of improvements and overall competitive advantages are (a) a generalized familiarity with components and capital equipment (b) the ability to adapt components and capital equipment to the requirements of the domestic economy (c) the ability to engage directly in the process of technological innovation and (d) the ability to adapt the scientific and research capabilities of the economy to the question of what is an appropriate technological advance. These capabilities are dependent on the existence of a well-developed, efficient and adaptable technological sector.

If the East Asian model of industry assistance policies tells us anything, it is that competitive advantage can be created and manipulated independently of factor endowments and relative prices. The ability to do so, however, is a function of the diversity, specialization and sophistication of the domestic technological sectors.

It follows that the selection of industries for assistance must take into account whether or not the development of an industry or class of industries will strengthen the overall technological base of the economy and, if so, to what extent.

PART 2 THE METALS AND ENGINEERING SECTOR

This part of the study presents an analysis of the metals and Engineering Sector with particular emphasis on the centrality of the sector to the economy. Initially the composition of the sector in terms of industries and products is considered. Secondly, the composition and trends of employment in the sector are discussed. The final part of the section looks at the enterprise structure of the sector and in particular the distribution of firm size.

2.1 The Industry Composition Of The Metals And Engineering Sector

The metals and engineering sector is defined here as the eleven industries in the Australian Manufacturing Census with ASIC numbers 294 to 336 inclusive. Table 2.1.1 shows this breakdown, the ASIC industry numbers, and a list of the principal products produced by each industry. An inspection of the commodities produced indicates that the basic metal industries produce lightly fabricated products; the fabricated structural metal products, sheet metal products, and other fabricated metal products industries produce medium fabricated products, while the remaining industries produce highly fabricated (or sophisticated) products.

At the end of the 1970s, the metals and engineering sector accounted for 40 per cent of total plant and equipment capital stock, half of total manufacturing imports and 44 per cent of total manufacturing exports. However, in 1979-80 the manufacturing sector's shares in total Australian merchandise exports and imports were 53 and 89 per cent respectively. It follows that the metals and engineering sector accounted 23 and 45 per cent of total Australian exports and imports respectively. However, the contribution of the metals and engineering sector, other than the basic metals industries, to total Australian exports was 6 per cent.

Selected economic indicators of activity in the metal and engineering industries in 1979-80 are given in Table 2.1.2. Basic iron and steel was the largest industry in the sector in terms of gross output, and agricultural machinery the smallest. With the exception of the basic metal industries and other transport equipment (mainly repair activities), the export shares in total sector sales are about 10 per cent or less. The import propensities of the metals and engineering industries producing highly fabricated products are high, being about 20 per cent or more. Indeed, these industries account for 87 per cent of metals and engineering imports and two-fifths of total Australian merchandise exports.

Table 2.1.1 ASIC and product definition: metals and engineering industries

ASIC definition to 1976-77	ASIC definition after 1976-77	Industry name and products included
291	294	BASIC IRON AND STEEL:Iron ore pelletising and metallising; melting furnaces and converters installed in iron and steel works, processed iron ore; basic iron; view castings; steel ingots; rolling and forging of iron and steel; steel structural sections; metallurgical coke and by-products; wire and wire products; steel pipes and tubes.
292,293	295,296	NON-FERROUS METAL BASIC PRODUCTS Smelting and refining of copper, silver, lead and zinc; alumina; smelting of aluminium; netting, drawing and extending of aluminium; non-ferrous metal castings; secondary recovery and alloying of non-ferrous metals.
311	314	FABRICATED STRUCTURAL METAL PRODUCTS Constructional steel; fabricated steel garages, carports, sheds; architectural aluminium products; steam boilers and generators.
312	315	SHEET METAL PRODUCTS Metal cans, canisters and containers; sheet metal furniture and storage equipment; metal ceiling materials; kitchenware; refrigeration and air conditioning; plumbing fixtures and fittings.
313	316	OTHER FABRICATED METAL PRODUCTS Cutlery, industrial knives and hand tools; springs and wire products; nuts, bolts, screws and rivets; metal coating and finishing; steam, gas and water fittings; blinds and awnings; metal furniture fittings; sheet metal goods and kitchenware.
321	323	MOTOR VEHICLES AND PARTS Finished motor vehicles; partly finished motor vehicles for sale or transfer out as such; truck and but bodies, trailers and caravans; motor vehicle instruments, testers and electrical equipment; other motor vehicle components and parts.
322	324	OTHER TRANSPORT EQUIPMENT Ship building and repair; railway locomotives and rolling stock manufacture and repair; aircraft building and repair; motor cycles; perambulators, trolleys, strollers
331,3321-	334,3351-	APPLIANCES AND ELECTRONIC EQUIPMENT
3323	3354	Photographic equipment and supplies, optical instruments and film processing; measuring apparatus;p surgical and scientific equipment; aeration and household appliances; water heating systems.
3324-26	3355-57	ELECTRICAL MACHINERY AND EQUIPMENT Electric and telephone cable, wire and strip; batteries; generators; electrical motors, made or assembled; welding and cutting plant and equipment; lighting.
3331	3361	AGRICULTURAL MACHINERY AND EQUIPMENT Agricultural implements and machines made as assembled.
3332-39	3362-69	OTHER MACHINERY AND EQUIPMENT Construction and earthmoving machinery and equipment; materials handling equipment; woodmaking and metalmaking machinery and equipment; pumps, pumping equipment and air and gas compressors; commercial and industrial spaceheating and air conditioning equipment; dies, saw blades and machine tool accessories; food processing machinery.

Table 2.1.2 Metals and engineering industries, selected statistics, 1979-80

	Share in manufacturing output	Exports: share in total manufacturing exports	Export propensity	Imports: share in manufacturing imports	Import propensity
	(a)	(b)	(c)	(d)	(e)
	%	%	%	%	%
Basic iron and steel	6.5	6.3	13.5	2.4	7.0
Non-ferrous basic metal products	6.3	26.0	57.2	0.8	2.4
Fabricated structural metal prods.	2.3	0.2	1.3	0.1	0.6
Sheet metal products	2.3	0.1	0.6	0.1	0.7
Other fabricated metal prods.	2.6	1.1	5.6	3.5	21.3
Motor vehicles and parts	7.2	1.8	3.5	11.7	24.5
Other transport equipment	2.0	2.5	16.9	2.4	19.4
Appliances and electric equipment	3.4	2.9	12.0	14.2	45.7
Electrical machinery & equipment	2.2	0.8	5.3	3.6	25.4
Agricultural machinery & equipment	0.7	0.6	11.6	1.9	36.9
Other industrial machin. and equipment	3.5	2.5	9.9	10.5	38.0

Notes: (a) Industry gross output (that is including material input) divided by total manufacturing gross output.

(b) Exports of industry divided by total manufacturing exports.

(c) Exports of industry divided by industry gross output.

(d) Imports of industry divided by total manufacturing imports.

(e) Imports of industry divided by industry supply where supply equals gross industry output plus imports.

In summary, the metals and engineering sector is a significant sector of the Australian manufacturing industry. However the industries producing highly fabricated products in this sector made a small contribution to Australian exports and account for a significant share of total imports.

2.1.1 The Metals and Engineering Sectors as Manufacturers of Producer Goods

In very broad terms, the goods and services produced by industry in any given time period can be classified into two major divisions, namely: producer goods and consumer goods.

A large proportion of the goods and services produced in any period leave the sphere of production to be absorbed into the consumption of households and government. Some 'consumer' goods, especially consumer durables (motor vehicles, televisions, etc.) are produced for export and subsequent consumption overseas. The distinguishing characteristic of consumer goods, therefore, is that they are goods which leave the sphere of production to be consumed both at home and overseas.

Producer goods by contrast are absorbed within the sphere of production and range from unprocessed raw materials through to semi-finished 'components' destined to be used as inputs into production itself. In addition to being inputs into current production, some producer goods are used as inputs into both the replacement and expansion of production technologies themselves. These latter forms of producer goods are often referred to as capital goods, and the distinction between inputs into current production processes and inputs into the replacement and expansion of production technologies corresponds to the distinction between circulating and fixed capital.

The producer goods sectors supply fixed and circulating capital inputs both into their own production processes and into the production processes of the consumer goods producing sectors. Both sectors contribute in varying proportions to the national economy's foreign trade balance through exports and imports. Government at various levels enters the picture both as a producer and consumer. Households and government purchase the bulk of the output of the consumer goods sector with incomes accruing from taxes and the general production of goods and services. Industry, by contrast, purchases the bulk of the output of the producer goods sectors with revenues obtained from both consumer and capital spending.

Table 2.1.3 lists the fifteen industries which are collectively classified as the metals and engineering sector, and shows on the basis of 1978 input-output data, the values and proportions of the output of the individual metal and engineering industries, as well as the collective total, which are supplied as inputs on capital and current account to other industries.

Table 2.1.3 The metals and engineering industries as suppliers of intermediate and fixed capital inputs, 1977-78 (a)

Input output number	(1) Inter-mediate sales $m	(2) Fixed capital sales $m	(3) Total supply $m	(4) (1)/(3) %	(5) (1+2)/(3) %
29.02	1168	101	2668	44	48
31.01	909	132	1097	83	95
31.02	806	243	1110	73	95
31.03	1353	196	1726	78	90
32.01	2198	1356	5238	42	68
32.02	210	245	529	40	86
32.03	253	142	400	63	99
32.04	379	183	602	63	93
33.01	275	118	698	39	56
33.02	771	190	1435	50	63
33.03	346	147	1131	31	44
33.04	959	370	1491	64	89
33.05	185	359	573	32	95
33.06	174	483	682	26	96
33.07	838	1453	2465	34	93
A Total: Metals and engineering sector					
	20764	5718	21845	49	76
Other major producer goods sectors					
29.01	2715	125	3258	83	87
34.03	1315	33	1534	86	88
27.02	1717	30	1847	93	95
41.02	661	8509	9184	7	100
(b)	6248	79	9447	66	67
(c)	7523	892	13593	55	62
(d)	10333	605	13002	80	84
B. Total: other producer goods sectors					
	30512	10273	53864	57	76
C. Total: Economy					
	72621	20733	173989	42	54
D. Total: C less A					
	65857	15015	152144	43	53
E. Total: C less (A plus B)					
	35345	4742	98279	36	41

Source: Catalogue Number 5209.0 (1983), Table 8.

Industry key:

29.02 non-ferrous metals	32.04 aircraft	33.07 other mc
31.01 struct'l metal prds	33.01 scientific equip	29.01 basic iron and steel
31.02 sheet metal prds	33.02 electronic equip	34.03 plastic, etc prds
31.03 other metal prds	33.03 household applics	27.02 other basic chems
32.01 motor vehicles	33.04 oth electr equip	41.02 other constr
33.02 ships and boats	33.05 agric'l mc	
32.03 railway rolling stock	33.06 constr mc	

Notes:

(a) Table 8 in the input-output tables shows competitive imports indirectly allocated, that is, the purchases of inputs by a particular industry sector include imported inputs. Table 8 therefore more accurately reflects the 'technological' characteristics of production as distinct from the share of inputs sourced from domestic producers, that is, the 'economic' characteristics of production.

(b) The energy sector is made up of input-output industries 12.00 Coal, oil, gas 27.08 Petroleum, coal products 36.01 Electricity

(c) The distribution sector is made up of input-output industries 47.01 Wholesale 51.01 Road transport

(d) The financial and other services sector is made up of: 56.01 Communication 61.02 Banking 61.02 Non-bank finance 61.05 Other business services

Table 2.1.3 shows that about half the output of the metals and engineering sector enters the current production of industry generally (including the metals and engineering industries themselves), whilst about three-quarters of the output of the sector enters either current production or capital expansion. These figures should be interpreted carefully. For example, the table shows that the non-ferrous metals industry sells less than half its output to other industries, which would seem to suggest that its role as a supplier of producer goods is quite limited. In fact in 1977-78 this sector exported approximately 52 per cent of its total supply, thus of the remainder available to the domestic economy 100 per cent was supplied to other industries. Household appliances also shown in the table should not be classified as a producer good industry.

Modifying the table to correct for the non-ferrous and household appliance industries gives a proportion for the remainder of 51 per cent of sales into current production and 82 per cent of sales into current production plus capital expansion.

The metals and engineering industries are not, by any means, the only producer goods industries. Table 2.1.3 also lists a number of other major producer goods producers which collectively sell more than half their annual production to other industry groups (including themselves and the metals and engineering group) and which sell more than three quarters of their total supply into either current production or capital expansion. With the exception of the other construction sector, this latter group of producer goods industries are considerably more oriented towards the supply of inputs into current production. For example, excluding other construction, the ratio of intermediate sales to fixed capital sales for this latter group is almost 17 to 1, whilst the corresponding ratio for the metals and engineering group is much smaller, at less than 2 to 1. This suggests that the metals and engineering group supplies a much higher proportion of its annual production into capital expansion programmes as distinct from current production. The role of the metals and engineering industries as capital goods suppliers is considered in detail in the following section.

None of this should be taken to mean that the metals and engineering group represents a homogeneous set of easily classifiable activities. On the contrary (and we have already referred to the fact that household appliances are, by definition, not producer goods) the group embraces a very diverse and heterogeneous set of activities, involving very different levels of capital and skill intensities as well as very different patterns of industrial concentration, and of vertical and horizontal linkages, and an equally diverse pattern of input origins and output destinations.

Table 2.1.3 gives a list of the 15 industry groups, which for the purpose of this discussion, are defined as the metals and engineering group of industries. Each member of the group is engaged in activities which, in varying degrees, involve the transformation of basic material inputs with above-average metal content into more or less elaborately transformed manufactures. There is therefore no single yardstick against which it is possible to measure the degree of transformation.

At the 'highly transformed' end of the spectrum the metals and engineering group includes, for example, the electronic equipment industry, which consists of establishments mainly engaged in manufacturing communications, broadcasting or other electronic equipment or parts.

Two other key industries are included. The first is the electrical machinery and equipment industry, which manufactures electric motors, generators, electricity transmission or distribution equipment, switchgear, transformers, and other electrical machinery and equipment. The second is the industrial machinery and equipment industry, which manufactures agricultural, construction, materials handling, and wood and metal working machinery and equipment; dies, saw blades and machine tool accessories; food processing machinery and the very large and heterogeneous category, industrial machinery and equipment - not elsewhere classified. This latter class of activities involves the manufacturing of office, business and other industrial machinery and equipment, and for which the Standard Industrial Classification lists no fewer than 152 primary activities.

2.1.2 The Metals and Engineering Industries as Suppliers of Capital Goods

Neither the National Accounts nor the current input-output tables provide details of the investment activity of industries at a sufficiently disaggregated level to be useful in the present context. Table 2.1.4, however, shows the sales of the three main groups of suppliers of investment goods and services broken down into their respective public and private sector purchasing categories. The public sector is further subdivided into its 'public enterprise' and 'general government' components.

Table 2.1.4 below, as with input-output accounting generally, reflects the fact that each item is simultaneously a purchase and a sale. And whilst the purchase and sale of an item is obviously the same thing viewed simply from a different perspective, the significance of the item will in general be different from the buyer and seller viewpoint. A useful starting point, therefore, is to examine the table from both the supplier and buyer perspectives. Not too much emphasis should be placed upon the specific 1977-78 values in the table since clearly these are well out of date.

Table 2.1.4 The Distribution of Output of Investment Goods

	Gross fixed capital expenditure, 1977-78				
		Public sector			
	Private sector	Public enterprise	General govt.	Total govt.	Total
Metals and engineering	4524 (80) (34)	889 (16) (21)	226 (4) (6)	1115 (20) (14)	5639 (100) (27)
Residential building	3937 (92) (30)	323 (8) (8)	32 (-) (-)	355 (8) (5)	4292 (100) (20)
Other construction	2510 (30) (19)	2807 (33) (68)	3193 (37) (88)	6000 (70) (77)	8510 (100) (41)
Sub total	10971(59) (83)	4019(22) (97)	3451(19) (94)	7470 (41) (96)	18441 (100) (88)
Total	13212(63) (100)	4146(20) (100)	3631(17) (100)	7777(37) (100)	20989(100) (100)

Source: Australian National Accounts, ABS, 5304.0; Input-Output Tables 1977-78, ABS, 5209.0. (1983 Table 8).

Notes: Bracketed numbers to the right of each figure in the table show the figure as a percentage of the total capital sales of the industry listed at the left of the table. The bracketed numbers below each figure show the figure as a percentage of the total capital purchases of the sectors listed across the top of the table.

The Capital Goods Selling Industries

Almost 90 per cent of all investment goods purchased in Australia are sold by just three industry groups:

Metals and engineering: this group of industries sells roughly 80 per cent of its investment goods and services to the private sector, with the balance sold to the public sector - mainly to public enterprises. Investment goods represent slightly more than 25 per cent of the metals and engineering group's total sales. Private sector investment spending would therefore appear to be critically important from the engineering industry's viewpoint.

Residential building: this group of industries sells approximately 92 per cent of its investment goods and services to the private sector, with the balance going to the public sector - almost all of the latter to public enterprises. Residential building investment goods sales represent more than 80 per cent of the industry's total sales. The residential building industry is thus even more dependent on private sector investment spending than the metals and engineering group.

Other construction: unlike the other two groups of industries, other construction supplies 30 per cent of its investment goods to the private sector, with the balance roughly divided equally between public enterprises (33) and general government (37 per cent). Investment goods sales to the private sector represent 27 per cent of the other construction sector's total supply. The similarity between the proportions of total investment goods and of total supply sold to the private sector reflects the fact that 93 per cent of the other construction industry's total supply consists of investment goods sales. Again, unlike the other two sectors, the other construction sector is critically dependent upon the public sector's level of investment spending.

Moreover, whilst the metals and engineering group sells roughly 25 per cent of its output directly into investment activity, residential construction and other construction sell respectively 80 per cent and 93 per cent. Such proportions can be very misleading, however, since they ignore the metals and engineering group's importance as a supplier of inputs into those sectors which, in turn, directly supply investment goods. As will be shown below, the other construction industry is heavily dependent upon the metals and engineering group as a major source of inputs.

The Purchasers of Capital Goods

This section examines the composition of the investment spending of the public and private sectors, and the ways in which such spending is distributed across the three major groups of supplying industries.

Private sector: of the $13,200 million of private sector investment spending in 1977-78, roughly 83 per cent was allocated to the three major groups of investment goods suppliers. Of this 83 per cent, more than 40 per cent was sourced from the metals and engineering group. Thus, while the metals and engineering group supplies roughly 20 per cent of its total supply to private sector investment spending, of this latter sector's investment spending, roughly 34 per cent is directed to the metals and engineering group. This represents a significant asymmetry in the relations between the industry group and the investment sector, with the private sector disproportionately dependent upon the industry group for its investment goods.

Public sector: of the $7,800 million allocated by the public sector in 1977-78 to investment spending, roughly 96 per cent was allocated across the three major groups of investment goods suppliers. Some 14 per cent of total public sector investment spending was allocated directly to the metals and engineering group, whilst 77 per cent was allocated directly to the other construction sector. The pattern of investment spending is roughly similar for both public enterprises and general government, with 21 per cent and 6 per cent respectively being allocated directly to the metals and engineering group, and 68 per cent and 88 per cent being allocated directly to the other construction group. In each case, both components of the public sector allocate the bulk of their investment spending directly to the other construction group.

In summary, it appears that the private sector allocates a relatively high proportion of its investment spending towards the metals and engineering group, and that consequently a correspondingly smaller proportion of its investment spending is allocated directly to the other construction group. Conversely, for the public sector the proportions are reversed. This is misleading however because it tends to underestimate the public sector's indirect dependency upon the metals and engineering group.

Overall, the private sector allocates more than half of its investment spending to the metals and engineering and other construction groups of industries. For the public sector, this proportion is much higher, at more than two-thirds. However, for every dollar's worth of goods and services purchased by the other construction group and transformed by this latter group into the investment goods ultimately destined for both public and private sector investment projects, more than 40 cents is spent directly on purchases from the metals and engineering group. For the residential building group, this proportion is much lower, but it is nevertheless still significant, at 17 cents in the dollar.

The metals and engineering intensity of the 'other construction' group's purchasing stems from the nature of this type of construction activity itself. The Standard Industrial Classification, for example, defines 'other construction' activity as involving:

* *Non-residential building construction:* the construction of offices factories, hospitals, hotels, motels, schools, theatres and warehouse, etc.

* *Non-building construction:* the construction and/or repair of roads, bridges, runways etc. In addition this activity involves the construction of railway permanent ways, dams, irrigation systems, water or gas supply systems, harbour works, and the non-building component of oil refineries, pipelines and other construction projects.

* *Special trade construction:* structural steel erection, plumbing, electrical installations, heating and air conditioning, earthmoving and dredging, metal wall cladding, fencing and screening, metal roofing and scaffolding.

These simple descriptions of the 'other construction' group, particularly 'special trade construction', are almost sufficient in themselves to show the importance of the metals and engineering group of industries as a supplier of inputs.

Once the indirect linkages between the metals and engineering group and the other construction group are examined, even at a very general level, a much clearer picture of the role of the metals and engineering group as the principal suppliers of capital goods to the Australian industrial systems emerges. Even where the system does not appear to be directly dependent, it is nevertheless heavily dependent indirectly; and, moreover, such indirect dependency is only at one stage removed.

To summarise this section has classified the annual flow of goods and services within the national economy into the two broad categories of consumer and producer goods. Producer goods and services represent a large proportion of the total output of the economic system, and are characterized by the fact that they either enter current production as 'intermediate' inputs or as 'capital' goods destined for the replacement and expansion of the production technologies of the industrial system, as 'capital' inputs.

Secondly, on the basis of the most recent National Accounting data, it was established that the metals and engineering group of industries supply the bulk of their total production to other industries as either 'intermediate' or 'capital' inputs. They thus represent a key set of producer goods industries. Other producer goods industries, such as energy and distribution etc., were also identified, and it was shown that within the set of producer goods industries some groups tend to be more 'intermediate' input-oriented whilst other groups tend to be more 'capital'-oriented. On the basis of intermediate to capital sales ratios, the metals and engineering industries were shown to lean much more towards the capital input end of the spectrum.

Finally, the role of the metals and engineering group as capital goods suppliers was examined in detail. It was shown that three major groups of industries supply the bulk of all capital goods and services purchased in Australia, and that the metals and engineering group supplies roughly one-third of all capital goods directly. Additionally, the importance of the 'other construction' group of industries as capital goods suppliers was identified. Finally, the dependence of 'other construction' upon the metals and engineering group was established. The conclusion reached was that, once such direct and indirect industrial linkages are shown, the importance of the metals and engineering group as the principal supplier of capital goods is established beyond question.

The later sections dealing with industry modernisation and development deal at length with the role of the metals and engineering industries in the processes of technological change, economic growth and industrial efficiency. Anticipating this later discussion somewhat, this section has shown that generally the metals and engineering industries are effectively engaged in a continuous process of inter, and intra, industry technology transfer. Technology, however, is rarely adopted without passing through a complex adaptation and modification process, and this in turn requires a metals and engineering industry with appropriate craft, technical and professional skills. The next section, therefore, examines in detail the comparative skill intensity of the metals and engineering workforce.

2.2 The skill intensity of the metals and engineering industries

The metals and engineering industries utilise of a wide range of skill-intensive activities. In occupational terms three levels of expertise are required: (i) professional (ii) technical and (iii) skilled or craft. Brief descriptions are given below of the principal characteristics of each of these skills levels, together with data on the relative proportions of each level present in the metals and engineering group. Whilst this section is based on Victorian data from the 1976 census, we have no reason to suppose that - except for changes of composition - the picture would be significantly different in terms of relative skill proportions in other states and, hence, in the national economy.

(i) Professional occupations

The Victorian metals and engineering industries, whilst accounting for approximately 8 per cent of total Victorian employment, account for more than 34 per cent of the total statewide employment of professional mechanical engineers. Professional mechanical engineers as a group are concerned with the application of scientific and engineering principles to the development, design, construction, operation, maintenance, and repair of machinery and equipment which produces, transmits or consumes energy. They are also concerned with the tools with which such equipment is made, as well as with the evaluation of installed plant related to such machinery and equipment.

Entry into the profession requires a degree in mechanical or a related branch of engineering, and occupations involving research may require a higher degree. The principal activities of the professional mechanical engineer include research, design, evaluation, supervision and organization associated with development, installation and maintenance of machinery, plant and equipment.

Closely related to the professional mechanical engineer in the metals and engineering sectors are professional electrical, materials and metallurgical engineers. Electrical engineers are concerned with research, design, manufacture and construction and with the operation and maintenance of electrical and electronic equipment, machines, systems and components. Materials and metallurgical engineers are, by contrast, concerned with determining and evaluating technical and econ-omic factors relating to the development, production and use of materials in engineering applications.

(ii) Technical occupations

At the technician level, the Victorian metals and engineering industries collectively account for 23 per cent of statewide employment of draftsmen and tracers, and almost 50 per cent of mechanical engineering technicians. As a group, draftsmen are concerned with preparing engineering design drawings for such purposes as the manufacture and installation of machines and equipment, or the construction of structures and other projections.

In addition, they are responsible for the preparation of technical assembly, installation, operation and maintenance manuals. Engineering technicians on the other hand are responsible for carrying out technical functions in support of engineering research, design, manufacture, construction and maintenance. Other responsibilities include testing of construction, installation and manufacturing processes; diagnosing malfunctions and taking corrective action; compiling and assisting in evaluation and interpretation of technical data and preparing material lists and cost estimates. Engineering technicians can be divided into their electrical, electronic, mechanical and process control categories.

In summary, the metals and engineering sector accounts for 34 per cent, 23 per cent and 48 per cent of statewide employment of professional mechanical engineers, draftsmen and mechanical engineering technicians respectively. When this is set against the fact that the metals and engineering group accounts for only 4 per cent of all professional, technical and related occupations - the intensity of the professional engineering and engineering/technical occupations within the group becomes readily apparent.

(iii) Skilled Occupations

Tradesmen, production-process workers and labourers account for 72 per cent of all employment within the metals and engineering group. The largest sub-groups are fitters and turners (7.22 per cent), labourers (7.3 per cent) and assembler-process workers (8 per cent). The craft skills intensity of the industries is clearly demonstrated by Table 2.2.1.

Additionally, between them the industries employ, 14 per cent of the state's electricians and 33 per cent of the state's electrical fitters.

Around the professional, technical and craft skills core of the industries are a range of occupations which generally embody above-average skills. This group of occupations would include tradesmens assistants, inspectors, checkers, viewers and examiners.

Craft occupations in the metals and engineering sectors can be conveniently but not exhaustively, separated into their metal cutting, forming and fabrication/assembly sub-divisions. In the metal cutting area, for example, toolmakers are concerned with the design and fabrication of cutting, shaping and forming tools and other precision equipment for use in, and in conjunction with, machine tools. Metal cutting requires a trade qualification in toolmaking, or in fitting and turning, specializing in toolmaking. In some cases a post-trade qualification, possibly at certificate level, in related areas such as drafting technology or detail/design drafting and between two to four years experience is required.

Machine tool setters, by contrast, are concerned with setting up and operating a large range of machine tools using precision adjustable, measuring instruments, blueprints and other detailed drawings and specifications. Fitters and turners are concerned with fitting and assembling of parts, the fabrication of these parts into products, and maintaining and repairing these products. A fitter is typically required to study job requirements, fit and assemble parts and sub-assemblies using hand tools and measuring instruments, test and operate assembled items, dismantle items, repair and/or replace worn and defective parts, and reassemble items. For both of the above occupations, a trade qualification and, perhaps, other qualifications plus considerable experience are required.

The same is true of the occupations falling principally within the metal forming and assembly range of activities. The sheet metal worker, for example, is concerned with laying out and fabricating patterns around which metal and other materials are shaped and cut out. The boilermaker, similarly, is involved in activities which include working from drawings to layout and mark metal; setting up and operating machines and equipment to cut, bend, roll, or otherwise shape and form structural metal, welding, bolting or otherwise joining the metal component; and erecting or repairing metal structures on site.

The welder's activities include studying blueprints and other specifications and carrying out welding in conformity with standards required; flame and arc-cutting, gouging, assembling, fabricating and repairing of pressure vessels, pipes and all other metal products including all welding processes on all metals.

As with the occupations above, the forming and assembly craft occupations are surrounded by a wide range of supervisory and managerial occupations requiring the same skills and expertise of the craft, and indeed with personnel often drawn from the pool of craft workers, as well as an equally wide range of semi and unskilled occupations.

Table 2.2.1 The intensity of craft skills in metals and engineering industries

	% of statewide employment by occupation employed by metals and engineering industries
Fitters and turners	46
Machine-tool and die makers	73
Machine tool setters and operators	75
Sheet metal workers	56
Welders and cutters	56
Boilermakers	50
Non-professional engineers	32

Source: 1976 Census, Victoria

Summary

The purpose of this section has been to show that the metals and engineering industries collectively have by far the largest concentration of occupations essential to the technological development of a modern industrial economy. Victorian evidence has been used to show that the concentration of occupations exists along a spectrum ranging from the university-trained, tertiary-qualified professional engineer, through a wide range of technical occupations to unquestionably the largest single concentration of craft skills of any industial sector. In other words, the highly skilled occupations essential to modern industry are not uniformly distributed across the economy, but are strongly concentrated in the numerically small metals and engineering sectors.

2.3 Employment Patterns 1974-1984

In the nine years from August 1974 to August 1983 there was a net loss of 152,000 jobs in the Metals and Engineering Industry: 15,000 in the Basic Metals Industry, 25,100 in the Fabricated Metals Industry: 46,900 in the Transport and Equipment Industry; and 65,000 in the Other Machinery and Equipment Industry (Appendix Q contains detailed statistical tables from which these observations are drawn; references in the text refer to Appendix Q).

1974 saw an employment high point in the industry before the 1975-78 recession. This was followed by a temporary resource led recovery to 1981 and a subsequent recession to 1983. Thus the nine year period saw two high points in employment and two low points.

If these changes in employment were of a purely short term cyclical nature, employment at the 1981 peak would have equalled that of the previous high point in 1974. This was not the case. In August 1981 there were 57,500 fewer people employed in the industry than in August 1974: a fall from 605,700 in 1974 to 548,200 (see Table 1).

In other words, the years spanning the most recent trade cycle, from peak to peak, saw a 9.5 per cent decline of employment in the industry as a whole.

From this lower high point in 1981 employment fell by another 94,500 in the two years to August 1983: from 548,200 to 453,700. This represented a 17 per cent fall in employment from 1981 and a 25 per cent fall from 1974.

The 1981 low point in the cycle was significantly lower than that in 1978: from 497,200 in 1978 to 453,700 in 1983.

There is clearly a structural component in these employment changes but the question raised is whether or not these structural elements have caused a permanent loss of employment opportunities in the Metals and Engineering Industry.

In answering this question a significant fact is that the late 1970s early 1980s resources boom did not return employment in the industry to 1974 levels. Thus the structural changes in the industry which occurred between 1974 and 1981 contributed significantly to a net employment loss between those years. The resources boom years betweem 1979 and 1981 created 51,000 jobs but this upswing in the trade cycle was insufficient to counter the job displacement of 108,500 caused by cyclical and structural factors between 1974 and 1978.

The combined impact of cyclical and structural factors has had a differential impact on the four industries (see Tables 2, 7, 11, 15 nd 19 and figure 1).

The Basic Metals Products Industry proved to be the most resilient through the first full cycle with total employment in August 1981 being higher than in August 1974: 107,600 as apposed to 106,600 in 1974. It can therefore be assumed that cyclical factors were more significant than structural factors in basic metal products employment patterns from 1974 to 1981. Moreover throughout that period the share of employment on a state by state basis remained relatively stable (see Table 9).

The 1982-83 recession changed this pattern. The economic downturn severely cut demand for basic metal products and BHP embarked on a major rationalisation program and, subsequently, a major recapitalisation of the steel industry. Thus the job loss of 18,700 in the basic metal products industry from February 1981 to February 1984 will probably not be reversed in the current upturn in the trade cycle.

These structural changes in the basic metal products industry have significantly modified the state by state share of employment in the industry. From February 1981 to February 1984 the NSW share of employment in the industry fell from 61 per cent to 51 per cent. Conversely, the Victorian share rose from 9.8 per cent to 17 per cent.

Thus structural factors have tended to overshadow cyclical factors in their impact on employment in the Basic Metal Products Industry in the post 1981 period. Despite this the proportionate employment loss in this industry has been less than the other three industries.

The Fabricated Metal Products Industry has been more volatile than the Basic Metal Products Industry,whilst employment in fabricated metal products held up for a longer period after 1979 than in the other three industries it had nevertheless fallen more rapidly and more significantly than the others in the 1977-78 period (see Figure 1). The loss of 27,000 jobs between 1974 and 1978 was uneffected by the recovery until 1980-81. From August 1978 to August 1980 employment rose slowly from 106,600 to 108,000. At that point with resource boom orders coming through, 16,100 jobs were created in the year to August 1981. This, however, was not sufficient to make up the loss of 27,000 jobs between 1974 and 1978 and the index of employment (1974 = 100) rose only to 93.3. Since then the index has fallen back to 81.1 (August 1983) with total employment in the industry at 107,900. Analysis of the data indicates that in the period to 1983 cyclical factors outweighed structural factors in influencing employment trends in the Fabicated Metal Products Industry. Such structural factors as did exist tended to have a greater effect on the location of employment than in aggregate trends, with employment tending to move to the resource rich states.

There are, however, very strong indications that new forms of import competition, including the trend toward off-shore sourcing of modular constructed resource related capital equipment, are having a profound and adverse effect on domestic orders for fabricated metal products. The implication is that if this major structural trend is not reversed employment in the Fabricated Metal Products Industry will not recover in line with the overall pattern of economic growth. There is every danger that structural factors will from now on overshadow cyclical factors in determining the employment outlook in the industry.

From August 1974 to August 1983, 30 per cent of jobs in the Transport Industry have been lost, with employment falling from 156,000 to 109,100. From 1974 to 1978 the labour market in the industry was highly erratic with, for example, a fall of 21,900 in employment on the twelve months to August 1975, in the following 12 months an increase of 23,200. The major cause of this volatility was undoubtedly cyclical. However, from then on structural factors have come to overshadow the cyclical factors. There can be no doubt that on present policies the jobs which have thus been lost to the industry will never be recovered. Moreover, the continued restructuring of the car industry under the auspices of the new industry plan will mean the permanent loss of between 10,000 to 30,000 additional jobs.

The Other Machinery and Equipment Industry has been the most severely hit by both cyclical and structural factors. The industry's employment index fell from 100 to 1974 to 80 in 1978, only partially recovered to 86 in 1981, and again fell sharply in the year to August 1983 to 69.

The total employment loss over the nine years was 65,000, from 210,100 in August 1974 to 145,100 in August 1973. It would appear that the industry is in a state of long term structural decline in NSW and Victoria, a decline which is being partly moderated by a significant growth trend in WA and Queensland. However, the base upon which this growth is occurring is small, with the two states contributing only 14.7 per cent of total employment in the industry in February 1984 (see Table 21). It is apparent that structural factors have been more significant than cyclical factors on the decline in employment of this industry.

The changes in employment in each of the four industries has effected changes in the proportion of total Metals and Engineering Industry Employment. Transport and Other machinery and Equipment have experienced relative declines from 25.8 per cent to 24.1 per cent and from 34.7 to 32 per cent respectively. Conversely, the Basic Metal Products Industry has increased its share of total employment from 17.6 to 20.2 per cent. (see Table 23)

Only two States have experienced employment gains in the period from February 1979 to February 1984. In Queensland 4,397 additional jobs have been generated and in WA there was an addition of 1,207. Thus in these States the growth in employment in the upturn from February 1979 to February 1981 was larger than the employment loss in the subsequent recession. In NSW and Victoria the employment loss from February 1981 to February 1984 was significantly larger than the earlier employment expansion. It can therefore be concluded that structural factors have combined with cyclical forces to effect a relative strengthening of the Metals and Engineering Industry in the resource-rich States of Queensland and WA (see Table 4).

Female employees have been more adversely affected than males by aggregate declines in employment. (Tables 1, 3, 7, 11, 15 and 19). In each of the four industries female employment has fluctuated more widely than the male pattern.

In aggregate women made up 19.2 per cent of employment in the industry in 1974, by 1983 this had fallen to 16.1 per cent. Women made up 28.7 per cent of the total job loss over the 9 years. In the transport equipment industry they made up 13.5 per cent of employment in 1974 but experienced 16 per cent of total employment loss. In the Other Machinery and Equipment Industry they made up 28.5 per cent of employment in 1974 and accounted for some 26.5% of total employment loss.

This section thus far has examined in detail the nature of the metals and engineering industries as skill intensive manufacturers of production technologies and 'components'. We have seen also that employment in the industries is experiencing a number of adverse trends. In the final part of this section, laying the empirical groundwork for later sections, we examine the size distribution, by employment, of enterprises within the metals and engineering industries compared with their counterparts more generally within the remainder of manufacturing.

2.4 Size Distribution of Firms in the Metals and Engineering Industries

Enterprises in the metals and engineering sector account for roughly 37 percent of total manufacturing enterprises, whilst the metals and engineering workforce accounts for almost 42 percent of manufacturing employment. Metals and engineering enterprises employ on average approximately 61 persons, whilst the average for manufacturing as a whole is roughly 54 persons, and the average for manufacturing net of metals and engineering is roughly 50 persons per firm. Thus on average metals and engineering firms are some 22 percent larger in terms of persons per enterprise than firms in the rest of manufacturing.

As with manufacturing generally, however, the crude average masks the distribution of firms around the average. In like manner the presentation of aggregate data masks a number of significant differences within the metals and engineering sector. Table 2.4.1 below gives the relative size distribution of enterprises, by persons employed, in the manufacturing, metals and engineering and manufacturing net of metals sectors, respectively.

Table 2.4.1 Enterprise size by employment in manufacturing and the metals and engineering industries 1978-79

	Metals		Manufacturing		Manufacturing less metals	
Persons	(a)	(b)	(a)	(b)	(a)	(b)
0.9	3,837	23,350	9,995	59,984	6,158	36,634
10-19	1,916	25,913	5,268	71,033	3,352	45,120
20-49	1,365	40,984	3,735	111,907	2,370	70,923
50-99	434	29,832	1,234	85,628	800	55,796
100-499	373	80,272	1,177	249,870	804	169,598
500+	132	289,594	363	596,101	231	306,507
Total	8.057	489,945	21,772	1,174,523	13,715	684,578

Notes: (a) *Enterprises*: defined as the unit comprising all operations (at year end) of a single operating legal entity.
(b) *Persons employed*: including working proprietors, as at June 1979.

Source: ABS, *Enterprise Statistics*, Catalogue No. 8103, 1982.

At the smaller firm end of the spectrum the distribution of enterprises in manufacturing net of metals and the metals sector are roughly similar. For example, enterprises in manufacturing net of metals employing less than 50 persons account for almost 87 percent of total enterprises and slightly more than 22 percent of the workforce. The corresponding proportion for the metals and engineering sector are 88 percent of enterprises employing 18 percent of the workforce.

This similarity is carried through to the very small firm end of the spectrum. In manufacturing net of metals, enterprises employing less than 10 persons account for 45 percent of enterprises and 5.4 percent of employment. In metals and engineering, similarly, the proportions are 48 percent of enterprises employing 4.8 percent of the workforce.

At the large firm end of the spectrum, by contrast, the distribution of firms begins to differ markedly with the metals and engineering industries exhibiting significantly larger firm sizes. For example, in metals and engineering there are 132 enterprises each employing more than 500 persons. Such enterprises account for 1.6 percent of the metals and engineering enterprise total and 60 percent of the metals and engineering workforce. On average each large enterprise employs 2,194 persons.

In the rest of manufacturing there are 231 enterprises each employing more than 500 persons, and such enterprises account for 1.7 percent of the total number of enterprises in the rest of manufacturing and less than 45 percent of the workforce. On average each large enterprise in the rest of manufacturing employs roughly 1,327 persons. Thus when taking all enterprises together the average metals and engineering firm is 22 percent larger than the average firm in the rest of manufacturing, but the average 'large' metals and enginering firm is some 65 percent larger than its counterpart in the rest of manufacturing.

Table 2.4.2, which gives a four sector breakdown of the metals and engineering sector, however, shows that there are some significant differences in the distribution of firm sizes wthin the metals and engineering sector itself.

Table 2.4.2	Employment size distribution of enterprises in the metals and engineering industries 1978-79							
	(29) Basic metals prds.		(31) Fabricated metals prds.		(32) Transport equipment		(33) Other machinery and equipment	
Persons	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
less than 10	121	774	1,780	10,885	507	2,982	1,429	8,70
10-19	78	1,080	831	11,163	250	3,292	757	10,378
20-49	71	2,182	586	17,368	151	4,519	657	16,915
50-99	30	2,061	159	10,930	64	4,488	181	12,353
100-499	29	6,853	101	20,605	64	13,989	179	38,825
500 plus		2587,94325		30,689	27	89,491	55	81,471
Total	354	100,893	3,482	101,640	1,063	118,761	3,158	168,65

Notes: (a) *Enterprises*: defined as the unit comprising all operations in Australia (at end of year) of a single operating legal entity.
(b) *Persons employed*: including working proprietors, as at June 1979.

Source: ABS, *Enterprise Statistics*, Catalogue No. 8103, 1982.

The Table reveals that whilst the Other Machinery and Equipment sector accounts for roughly 34 percent of the metals and engineering workforce it also accounts for almost 42 percent of the enterprises within metals and engineering which employ more than 500 persons. With average workforces of 1,481 persons, however, these firms are not the largest within the metals and engineering sector. They are overshadowed, for example, by large firms in the Basic Metals Products and Transport Equipment sectors which have 'large firm' average workforces of 3,518 and 3,315 persons respectively. These latter sub-sectors are, of course, dominated by the steelmaking and motor vehicle manufacturing giants. The smallest 'large' firms occur in the Fabricated Metal Products sector which have average workforces of 1,228 persons. Thus taking the 52 largest enterprises in the Basic Metals and Transport Equipment sectors we find that less than one percent (0.65 percent) of metals and engineering enterprises account for more than 36 percent of the metals and engineering workforce.

In absolute terms the very small firms (employing less than 10 persons) in the metals and engineering industries are heavily concentrated in the Fabricated Metals and Machinery sub-sectors. There are more than 3,200 such enterprises in these sub-sectors and whilst they collectively account for 40 percent of total metals and engineering enterprises they account for only 14 percent of the metals and engineering workforce. Conversely, the very small firms in Basic Metals and

Transport Equipment account for 8 percent of the metals and engineering total and only 1 percent of the metals and engineering workforce. Of these latter industries there are considerably more 'small' firms in the Transport Equipment sector.

Within manufacturing therefore the 'average' metals and engineering enterprise is 22 percent larger, in terms of persons employed, than the 'average' enterprise within the remainder of manufacturing. Moreover, the average 'large' firm in the metals and engineering industry is 65 percent larger than its average 'large' firm counterpart in the remainder of manufacturing. Very large enterprises in the metals and engineering industries account for less than 2 percent of total sectoral enterprises but approximately 60 percent of total sectoral employment,

The largest enterprises in the metals and engineering sector are concentrated in the Basic Metals and Transport Equipment industries which when aggregated account for less than one percent of total metals and engineering enterprises but more than 36 percet of metals and engineering employment. The smallest enterprises, by contrast, are concentrated in the Fabricated Metals and Equipment sectors. These latter sectors, nevertheless, have their share of 'large' firms and whilst the largest firms in these sectors account for one percent of total metals and engineering enterprises they also account for almost 23 percent of total metals and engineering employment.

APPENDIX Q: Employment Statistics in the Metals and Engineering Industries.

TABLE 1

TOTAL METALS AND ENGINEERING INDUSTRY

Persons Employed by Sex August 1972 to August 1983, and Indexes of Persons Employed by Sex August 1972 to August 1983 (1974 = 100)

AUG	NUMBER ('000)			INDEXES (1974 = 100)		
	M	F	PERSONS	M	F	PERSONS
1972	480.9	86.2	567.0	98.3	74.0	93.6
1973	484.4	102.6	587.2	99.1	88.1	97.0
1974	489.0	116.5	605.7	100.	100.	100.
1975	452.7	93.2	545.7	92.6	80.0	90.1
1976	461.4	98.2	559.6	94.4	84.3	92.4
1977	454.0	93.2	547.2	92.8	80.0	90.3
1978	406.8	90.6	497.2	83.2	77.8	82.1
1979	432.4	86.8	519.2	88.4	74.5	85.7
1980	454.9	77.6	532.5	93.0	66.6	87.9
1981	466.8	81.3	548.2	95.5	69.8	90.5
1982	437.8	84.9	522.8	89.5	72.9	86.3
1983	380.8	72.9	453.7	77.9	62.6	74.9

TABLE 2

METALS AND ENGINEERING INDUSTRY

Changes in Employment by Industry; August 1974 to August 1978; August 1978 to August 1981; August 1981 to August 1983; and August 1974 to August 1983 ('000).

Industry	Change Aug 1976- Aug 1978 ('000)	Change Aug 1978- Aug 1981 ('000)	Change Aug 1981- Aug 1983 ('000)	Change Aug 1974- Aug 1983 ('000)
Basic Metal Products	-16.2	+17.2	-16.0	-15.0
Fabricated Metal Products	-27.0	+18.1	-16.2	-25.1
Transport Equipment	-23.7	+12.9	-36.1	-46.9
Other Machinery and Equipment	-42.2	+13.4	-36.2	-65.0
Total Metal and Engineering	-108.5	+51.0	-94.5	-152.0

TABLE 3

METALS AND ENGINEERING INDUSTRIES

Female Shares of Employment (1974 to 1983) and Female Share of Job Loss (1974 to 1983) by Industry.

Industry	1974 %	1983 %	Job Loss %
Basic Metal Products	9.7	6.3	30.0
Fabricated Metal Products	19.1	16.2	31.5
Transport Equipment	13.5	12.4	16.0
Other Machinery and Equipment	28.5	24.9	36.5
Total Metals and Engineering Industry	19.2	16.1	28.7

TABLE 4

TOTAL METALS AND ENGINEERING INDUSTRY

CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEBRUARY 1978 TO FEBRUARY 1984

	1978	1979	1980	1981	1982	1983	1984	Change 1979-81	Change 1981-84	Change 1979-84
NSW	205984	203287	219820	235132	224299	187092	184165	+31845	-50967	-19122
VIC	174921	158333	170117	168033	171097	148713	146736	+9700	-21297	-11597
QLD	42637	40885	47668	51281	51807	51095	45282	+10396	-5999	+4397
SA	60117	59305	55778	57496	62107	45925	47756	-1809	-9740	-11549
WA	30851	26085	29699	30496	32273	27567	27292	+4411	-3204	+1207
TAS	7410	8590	7459	8437	7856	5609	7906	-153	- 531	-684
*AUST	523941	498499	532833	553533	551538	467523	460569	+55034	-92964	-37930

*Includes Northern Territory and the A.C.T.

Source: ABS unpublished statistics, Labour Force Estimates HUR 400 Various issues.

TABLE 5

TOTAL METALS AND ENGINEERING INDUSTRY

STATES' SHARE OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB. 1978 to FEB. 1984

	1978	1979	1980	1981	1982	1983	1984
N.S.W.	39.3	40.8	41.3	42.5	40.7	40.0	40.0
VIC	33.4	31.8	31.9	30.4	31.0	31.8	31.9
QLD	8.1	8.2	9.0	9.3	9.4	10.9	9.8
S.A.	11.5	11.9	10.5	10.4	11.3	9.8	10.4
W.A.	5.9	5.2	5.6	5.5	5.6	5.9	5.9
TAS.	1.4	1.7	1.4	1.5	1.4	1.2	1.7
AUST.*	100	100	100	100	100	100	100

* Includes N.T. and the A.C.T.

Source : ABS unpublished statistics, Labour Force Estimates HUR 400, Various issues

TABLE 6

TOTAL METALS AND ENGINEERING INDUSTRY

INDEXES OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB. 1984 (1979 = 100)

	1978	1979	1980	1981	1982	1983	1984
N.S.W.	101.3	100	108.1	115.7	110.3	92.0	90.6
VIC.	110.5	100	107.4	106.1	108.1	93.9	92.7
QLD	104.3	100	116.6	125.4	126.7	125.0	110.8
S.A.	101.4	100	94.1	97.0	104.7	77.4	80.5
W.A.	118.3	100	113.9	116.9	123.7	105.7	104.6
TAS.	86.3	100	86.8	98.2	91.5	65.3	92.0
AUST.*	105.1	100	106.9	111.0	110.6	93.8	92.4

* Includes N.T. and the A.C.T.

Source : ABS unpublished statistics, Labour Force Estimates HUR 400, Various issues

TABLE 7

BASIC METAL PRODUCTS INDUSTRY

Persons employed by sex Aug. 1972 to Aug. 1983 and

Indexes of Persons employed by sex Aug. 1972 to Aug. 1983 (1974 = 100)

AUG	NUMBER (000)			INDEXES (1974 = 100)		
	M	F	Persons	M	F	Persons
1972	97.6	5.9	103.5	101.4	57.3	97.1
1973	91.5	6.7	98.2	95.0	65.1	92.1
1974	96.3	10.3	106.6	100.	100.	100.
1975	88.0	7.8	95.7	91.4	75.7	89.8
1976	84.2	8.6	92.8	87.4	83.5	87.1
1977	84.7	8.0	92.7	88.0	77.7	87.0
1978	83.4	7.0	90.4	86.6	68.0	84.8
1979	91.4	7.5	98.9	94.9	72.8	92.8
1980	91.7	6.3	98.0	95.2	61.2	91.9
1981	100.4	7.1	107.6	104.3	68.9	100.9
1982	91.8	9.4	101.3	95.3	91.3	95.0
1983	85.8	5.8	91.6	89.1	56.3	85.9

TABLE 8

BASIC METAL PRODUCTS

CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER. FEBRUARY 1978 TO FEBRUARY 1984

	1978	1979	1980	1981	1982	1983	1984	Change 1979-81	Change 1981-84	Change 1979-84
NSW	48519	51087	62062	65449	55528	49943	45167	+14362	-20282	-5920
VIC	15479	9220	11715	10469	16321	12196	15241	+1249	+4772	+9021
QLD	8288	6851	5090	6311	8093	9631	7519	-540	+1268	+668
SA	11806	11911	11427	12907	12823	8312	9873	+996	-3034	-2038
WA	7400	5477	6428	7435	9269	6850	5903	+1958	-1532	+426
TAS	3536	4349	4015	4414	4188	3074	3693	+65	+279	+344
*AUST	95026	88894	100833	107125	106222	90007	88397	+18231	-18728	-497

* Includes N.T. and the A.C.T.

Source: ABS unpublished statistics, Labour Force Estimates HUR400, various issues

TABLE 9

BASIC METAL PRODUCTS

STATES' SHARE OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEBRUARY 1978 TO FEBRUARY 1984

	1978	1979	1980	1981	1982	1983	1984
NSW	51.1	57.5	61.6	61.6	52.3	55.5	51.1
VIC	16.3	10.4	11.6	9.8	15.4	13.6	17.2
QLD	8.7	7.7	5.1	5.9	7.6	10.7	8.5
SA	12.4	13.4	11.3	12.1	12.1	9.2	11.2
WA	7.8	6.2	6.4	6.9	8.7	7.6	6.7
TAS	3.7	4.9	4.0	4.1	3.9	3.4	5.3
*AUST	100.	100.	100.	100.	100.	100.	100.

*Includes N.T. and the A.C.T.

Source: ABS unpublished statistics, Labour Force Estimates HUR400, various issues

TABLE 10

BASIC METAL PRODUCTS

INDEXES OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER FEB 1978 TO 1984 (1979 = 100)

	1978	1979	1980	1981	1982	1983	1984
NSW	95.0	100	121.5	128.1	108.7	97.8	88.4
VIC	167.9	100	127.1	113.6	177.0	132.3	165.3
QLD	121.0	100	74.3	92.1	188.1	140.6	109.8
SA	99.1	100	95.9	108.4	107.7	69.8	82.9
WA	135.1	100	117.4	135.8	169.2	125.1	107.8
TAS	81.3	100	92.3	101.5	96.3	70.7	107.9
*AUST	106.9	100	113.4	120.5	119.5	101.3	99.4

*Includes NT and the ACT

Source: ABS unpublished statistics, Labor Force Estimates HUR400, various issues.

TABLE 11

FABRICATED METAL PRODUCTS INDUSTRY

Persons employed by Sex August 1972 to August 1983, and Indexes of Persons Employed by Sex August 1972 to August 1983 (1974 = 100)

Aug	Number ('000)			Indexes (1974 = 100)		
	M	F	Persons	M	F	Persons
1972	101.1	20.6	121.7	94.0	81.1	91.5
1973	97.1	27.2	124.4	90.2	107.1	93.5
1974	107.6	25.4	133.0	100.	100.	100.
1975	99.9	20.8	120.7	92.8	81.9	90.6
1976	104.4	21.6	126.0	97.0	85.0	94.7
1977	102.6	24.4	127.0	95.4	96.1	95.5
1978	86.2	20.5	106.6	80.1	80.7	80.2
1979	86.3	19.7	106.0	80.2	77.6	79.7
1980	92.6	15.4	108.0	86.1	60.6	81.2
1981	104.1	20.0	124.1	96.8	78.7	93.3
1982	98.1	19.1	117.8	91.7	75.2	88.6
1983	90.4	17.5	107.9	84.0	68.9	81.1

TABLE 12

FABRICATED METAL PRODUCTS

CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER FEB 1978 TO FEB 1984

	1978	1979	1980	1981	1982	1983	1984	Change 1979-82	Change 1982-84	Change 1979-84
NSW	43051	39001	39122	47991	47617	41630	35740	+8616	-11877	-3261
VIC	40179	32226	34049	35365	38181	38557	34472	+5955	-3709	+2246
QLD	11934	12032	16738	17807	17017	15868	13328	+4985	-3689	+1296
SA	9343	9825	9393	8538	11056	7717	5947	+1231	-5109	-3878
WA	9379	9085	9177	9472	10839	8479	9937	+1754	-902	+852
TAS	1698	2004	1396	1898	1716	1529	1696	-243	-65	-308
*AUST	116894	105742	111097	122695	127698	114349	102155	+21956	-25543	-3587

* Includes NT and the ACT

Source: ABS unpublished statistics, Labour Force Estimates HUR400 various issues

TABLE 13

FABRICATED METAL PRODUCTS

STATES' SHARES OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984 (PERCENT)

	1978	1979	1980	1981	1982	1983	1984
NSW	36.8	36.9	35.2	39.1	37.3	36.4	35.0
VIC	34.4	30.5	30.7	28.8	29.9	33.7	33.7
QLD	10.2	11.4	15.1	14.5	13.3	13.9	13.1
SA	8.0	9.3	8.5	6.9	8.7	6.8	5.8
WA	8.0	8.6	8.3	7.7	8.5	7.4	9.7
TAS	1.5	1.9	1.3	1.6	1.4	1.3	1.7
*AUST	100.	100.	100.	100.	100.	100.	100.

*Includes NT and ACT

Source: ABS Unpublished Statistics, Labour Force Estimates HUR400, various issues

TABLE 14

FABRICATED METAL PRODUCTS

INDEXES OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO 1984 (1979 = 100)

	1978	1979	1980	1981	1982	1983	1984
NSW	110.4	100.	100.3	123.1	122.1	106.7	91.6
VIC	124.7	100.	105.7	109.7	118.5	119.7	107.0
QLD	99.2	100.	139.1	148.0	141.4	131.9	110.8
SA	96.0	100.	95.6	86.9	112.5	78.5	60.5
WA	103.2	100.	101.0	104.3	119.3	93.3	109.5
TAS	84.7	100.	69.6	94.7	87.9	76.3	84.6
*AUST	110.6	100.	105.1	116.0	120.8	108.1	96.6

*Includes NT and the ACT

Source: ABS Unpublished Statistics Labour Force Estimates HUR400 various issues

TABLE 15

TRANSPORT EQUIPMENT INDUSTRY

Persons Employed by Sex August 1972 to August 1983 and Indexes of Persons Employed by Sex August 1972 to August 1983 (1983 = 100)

Aug	Number			Indexes (1974 = 100)		
	M	F	Persons	M	F	Persons
1972	133.4	13.4	146.7	98.9	63.8	94.0
1973	141.6	15.1	156.8	105.0	71.9	100.5
1974	134.9	21.0	156.0	100.	100.	100.
1975	120.0	14.2	134.1	89.0	67.6	86.0
1976	137.6	19.7	157.3	102.0	93.8	100.8
1977	132.2	17.0	149.2	98.0	81.0	95.6
1978	114.3	18.0	132.3	84.7	85.7	84.8
1979	123.5	19.4	142.9	91.6	92.4	91.6
1980	126.8	18.4	145.2	94.0	87.6	93.1
1981	118.9	18.6	137.5	88.1	88.6	88.1
1982	112.0	13.9	125.9	83.0	66.2	80.7
1983	95.6	13.5	109.1	70.9	64.3	69.9

TABLE 16

TRANSPORT EQUIPMENT INDUSTRY

CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984

	1978	1979	1980	1981	1982	1983	1984	Change 1979-81	Change 1981-84	Change 1979-84
NSW	36691	32986	40743	41624	42272	37725	38008	+8638	-3616	+5022
VIC	57481	59781	63359	63108	57642	54461	51426	+3327	-11682	-8355
QLD	12534	9741	14580	12762	11860	11837	9936	+3021	-2826	+195
SA	20889	21582	17099	21256	18111	17852	16671	-326	-4585	-4911
WA	5743	5565	5971	5263	4092	3213	3955	-302	-1308	-1610
TAS	1182	1312	1126	833	1166	542	479	-479	-354	-833
*AUST	134520	130967	143310	145377	135567	125905	120557	+14410	-24820	-10410

*Includes Nt and the ACT

Source: ABS Unpublished statistics, Labour Force Estimates HUR400 various issues

TABLE 17

TRANSPORT EQUIPMENT INDUSTRY

STATES' SHARE OF CIVILIAN EMPLOYMENT PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984 (PERCENT)

	1978	1979	1980	1981	1982	1983	1984
NSW	27.3	25.2	28.4	28.6	31.2	30.0	31.5
VIC	42.7	45.7	44.2	43.4	42.5	43.3	42.7
QLD	9.3	7.4	10.2	8.8	8.8	9.4	8.2
SA	15.5	16.5	11.9	14.6	13.4	14.2	13.8
WA	4.3	4.3	4.2	3.6	3.0	2.6	3.3
TAS	0.9	1.0	0.8	0.6	0.9	0.4	0.4
*AUST	100.	100.	100.	100.	100.	100.	100.

*Includes NT and ACT

Source: ABS Unpublished Statistics Labour Force Estimates HUR400 various issues

TABLE 18

TRANSPORT EQUIPMENT INDUSTRY

INDEXES OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984 (1979 = 100)

	1978	1979	1980	1981	1982	1983	1984
NSW	111.2	100.	123.5	126.2	128.2	114.4	115.2
VIC	96.2	100.	106.0	105.6	96.4	91.1	86.0
QLD	128.7	100.	149.7	131.8	121.8	121.5	102.0
SA	96.8	100.	79.2	98.5	83.9	82.7	77.2
WA	103.2	100.	107.3	94.6	73.5	57.7	71.1
TAS	90.1	100.	85.8	63.4	88.9	41.3	36.5
*AUST	102.7	100.	109.4	111.0	103.51	96.1	92.1

*Includes NT and the ACT

Source: ABS Unpublished Statistics Labour Force Estimates HUR400 various issues

TABLE 19

OTHER MACHINERY AND EQUIPMENT INDUSTRY

Persons Employed by Sex August 1972 to August 1983, and Indexes of Persons Employed by Sex August 1972 to August 1983 (1974 = 100)

Aug	Number			Indexes (1974 = 100)		
	M	F	Persons	M	F	Persons
1972	148.8	46.3	195.1	99.1	77.4	92.9
1973	154.2	53.6	207.8	102.7	89.6	98.9
1974	150.2	59.8	210.1	100.	100.	100.
1975	144.8	50.4	195.2	96.4	84.3	92.9
1976	135.2	48.3	183.5	90.0	80.8	87.3
1977	134.5	43.8	178.3	89.6	73.2	84.9
1978	122.9	45.1	167.9	81.8	75.4	79.9
1979	131.2	40.2	171.4	87.4	67.2	81.6
1980	143.8	37.5	181.3	95.7	62.7	86.3
1981	143.4	35.6	179.0	95.5	59.5	85.2
1982	135.3	42.5	177.8	90.1	71.1	84.6
1983	109.0	36.1	145.1	72.6	60.4	69.1

TABLE 20

OTHER MACHINERY & EQUIPMENT INDUSTRY

CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984

	1978	1979	1980	1981	1982	1983	1984	Change 1979-82	Change 1982-83	Change 1979-83
NSW	77723	80213	77893	80068	78882	57794	65250	-1331	-21088	-22419
VIC	61782	57106	60994	59091	58935	43499	45597	+1829	-15436	-13607
QLD	9881	12261	11260	14401	14837	13759	14504	+2576	-1078	+1498
SA	18079	15987	17859	14795	20117	12044	15265	+4130	-8073	-3943
WA	8329	5958	8123	8326	8073	9025	7497	+2115	+952	+3067
TAS	994	925	922	1292	741	464	1038	-184	-277	-461
*AUST	177501	172896	177593	178336	182051	137262	149460	+1955	-44789	-35634

*Including NT and the ACT

Source: ABS Unpublished statistics, Labour Force Estimates HUR400, Various issues

TABLE 21

OTHER MACHINERY AND EQUIPMENT INDUSTRY

STATES' SHARE OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984 (PERCENT)

	1978	1979	1980	1981	1982	1983	1984
NSW	43.8	46.4	43.9	44.9	43.3	42.1	43.7
VIC	34.8	33.0	34.3	33.1	32.4	31.7	30.5
QLD	5.6	7.1	6.3	8.1	8.2	10.0	9.7
SA	10.2	9.3	10.1	8.3	11.	8.8	10.2
WA	4.7	3.5	4.6	4.7	4.4	6.6	5.0
TAS	0.6	0.5	0.5	0.7	0.4	0.3	0.7
*AUST	100.	100.	100.	100.	100.	100.	100.

*Includes NT and the ACT

Source: ABS Unpublished Statistics Labour Force Estimates HUR400 various issues

TABLE 22

OTHER MACHINERY AND EQUIPMENT INDUSTRY

INDEXES OF CIVILIAN EMPLOYED PERSONS AGED 15 YEARS AND OVER: FEB 1978 TO FEB 1984 (1979 = 100)

	1978	1979	1980	1981	1982	1983	1984
NSW	96.9	100.	97.1	99.8	98.3	72.1	81.4
VIC	108.2	100.	106.8	103.5	103.2	76.2	79.9
QLD	124.1	100.	91.8	117.5	121.0	112.2	118.3
SA	113.1	100.	111.7	92.5	125.8	75.3	95.5
WA	139.8	100.	136.3	139.7	135.5	151.5	125.8
TAS	107.5	100.	99.7	139.7	80.1	50.2	112.2
*AUST	102.7	100.	102.7	103.2	105.3	79.4	86.5

*Includes NT and the ACT

Source: ABS Unpublished Statistics, Labour Force Estimates HUR400 various issues

TABLE 23

Industries Shares of Total Employment in the Metals and Engineering Industries: August 1974, 1978, 1981 and 1983. (PERCENT)

Industry	Aug 1974	Aug 1978	Aug 1981	Aug 1983
Basic Metal Products	17.6	18.2	19.6	20.2
Fabricated Metal Products	22.0	21.3	22.6	23.8
Transport Equipment	25.8	26.6	26.5	24.1
Other Machinery and Equipment	34.7	33.8	33.1	32.0
Metals and Engineering	100.	100.	100.	100.

PART 3 GROWTH POTENTIAL OF THE METALS AND ENGINEERING INDUSTRIES

3.1 IMPORT REPLACEMENT

3.1.1 Potential

In broad statistical terms, an industry's potential to expand through a reduction in imports depends upon both the level and the trend in the economy's propensity to import commodities which are similar, if not identical, to those of the local industry. The higher the specific import propensity, then the stronger is the prima facie case that industry assistance policies may be effective as a means of expanding domestic production. Such policies, however, must take into account the practicalities of the economy's bilateral trading position.

Table 3.1.1 (see Tabular Appendix to 3.1) shows that in 1982, within the import total, Australia had a very high propensity to import manufactured goods. For example, the share of manufactured goods in total imports was 87 per cent. Agricultural imports were minimal and, once crude petroleum is excluded from mining imports, these too become insignificant. In summary, the propensity of the economy to import products characteristic of the agricultural and mining sectors is negligible.

Table 3.1.3 (see Tabular Appendix to 3.1) shows the economy's propensity to import products characteristic of five manufacturing sectors in 1979-80. With the exception of the metal and engineering and other manufacturing sectors, they are relatively small. However, the economy's propensity to import metals and engineering products is at least twice that of the other sectors. Further, other manufacturing products consist of light to medium fabricated consumer non-durables (including clothing, textiles and footwear), of the type that are central to the development programs of the newly industrializing economies of the region. That is, the other manufacturing sector consists of industries which are the least likely to be able to expand into export-orientated growth. The broad features of the import shares of industries in the metal and engineering sectors have already been referred to in the description of the sector given above.

Table 3.1.3 (see Tabular Appendix to 3.1) shows the changes in import shares over the period 1966-67 to 1980-81 in individual industries. The import shares of the metals and engineering industries producing light to medium fabricated products are, in general both low and reasonably stable. The import share in the motor vehicle industry is a direct function of government policy on the industry, while the instability in the share of other transport equipment reflects defence and civilian transport re-equipment programs. As noted earlier, import shares in the remaining industries producing highly fabricated products are high, and in most cases, demonstrate a substantial increasing trend. For example, between 1966-67 and 1980-81, the import share in the appliance industry increased by 53 per cent, the electrical machinery import share increased by 52 per cent, agricultural machinery by 16 per cent and other machinery by 8 per cent.

Table 3.1.4 (see Tabular Appendix to 3.1) shows that between 1966-67 and 1980-81 the share of imports in the domestic supply of manufactured goods increased by 32 per cent, the metals and engineering import share increased by 41 per cent, while the non-metals and engineering import share increased by 23 per cent. The evidence shows a fairly clear pattern which seems to suggest that the more sophisticated is the product i.e. the more the basic materials are transformed through the repeated application of technically advanced production processes and skill levels, then the greater is the probability that there will be a higher level of import penetration in the Australian market for that particular good or service. Of course, it must be remembered that the metals and engineering sectors as here classified are themselves aggregations of a numerous group of industries. A more detailed analysis would, therefore, undoubtedly show that there are areas of metals and engineering production as technically advanced as anywhere in the world.

Nevertheless, the table does reveal a picture which strongly reflects the underdevelopment of Australia's technologically advanced producer goods sectors. Some of the factors underlying this underdevelopment will be discussed in later sections. What this section has aimed to show is that there is considerable potential within the domestic economy for the expansion and development of the metals and engineering group.

Just as Australia's imports are generally biased towards manufactures, and in particular metals and engineering goods and services, equally our imports are heavily biased geographically. Table 3.1.5 (see Tabular Appendix to 31), for example, shows that roughly 70 per cent of Austrlia's total imports of goods and services are sourced from just four locations: Japan, USA, EEC, and ASEAN.

The recession-induced decline in imports from the four locations taken together closely matched the overall decline in imports. Within the total, however, the picture is very different, with the USA and the EEC experiencing virtually the whole decline, and with imports from the ASEAN countries actually increasing.

Australia's import dependency on the four geographical areas outlined above tends to be reflected in the nation's export dependency, although there is a very uneven east-west pattern in Australia's balance of trade in goods and services. Table 3.1.6 (see Tabular Appendix to 3.1) shows the pattern of surpluses and deficits with the four locations over the periods 1981-82 and 1982-83.

Of central significance is the fact that Australia's imports from the four regions greatly exceed our exports to the regions. In 1981-82, for example, Australia was running a $4,500 million deficit with the regions, which was in fact more than $1,100 million greater than Australia's total import-export deficit. Furthermore, despite the fall in the deficit with the four regions of almost 58 per cent in 1982-83, this component of the total deficit fell at a rate of only slightly more than half the rate of the decline in the total deficit. Thus, whilst Australia's total import-export trade had moved rapidly into surplus in 1982-83, the deficit on our trade with the four regions was still running at almost $2,000 million.

The aggregate deficit with the four regions, however, is made up of a number of components. For example, over the 1982-83 period, Australia was running a surplus of around $1,900 million with both Japan and the ASEAN countries. Moreover, these surpluses had experienced growth rates of 107.5 and 82.4 per cent for ASEAN and Japan respectively over the period 1981-82 to 1982-83.

In contrast, Australia was running a total deficit with the EEC and the USA in 1982-83 of more than $3,800 million, and whilst the deficits experienced declines of 48.3 and 18.5 per cent for the EEC and the USA respectively, the imbalance is still extremely significant. Generalizing, it is possible to conclude that Australia is using its surpluses on its trade with the East Asian bloc of nations, together with its capital inflows and foreign borrowings, to finance the imbalance in its trade with the western bloc of nations.

Moreover, the East-West trade differentials underline a number of significant difficulties in expanding Australia's exports, whether they be comprised of primary or manufactured commodities.

For example, despite the fact that the ASEAN economies represent some of the fastest growing markets for technically advanced manufactures, Australia's surpluses with ASEAN make it difficult to expand our exports to the region without at the same time yielding to ASEAN pressure to further open up Australian markets to their exports (a difficult option in the context of high domestic unemployment). Similarly, despite Australia's deficits with the EEC and the USA, any attempt to expand Australia's share of primary exports to such regions would meet with intense political opposition, and would in any case exacerbate the already prevailing conditions of chronic oversupply, especially in the EEC. Moreover, attempts to reduce Australia's deficits with the West, through the expansion of exports of sophisticated manufactures, would meet with intense competition from an already highly developed industrial base operating at well below capacity levels of utilization.

Nevertheless, Australia's chronic deficits with the EEC and the USA do provide significant leverage for Australia to pursue a planned import-substitution strategy very specifically targeted in the first instance upon the more manageable components of our imports from the West, and oriented towards the establishment and growth of the technically advanced producer goods sectors.

Moreover, due to the secular tightening of Australia's balance of payments constraint, a reduction in Australia's deficits with the West becomes, in all probability, a condition for any corresponding reduction in our surpluses with the East. Equally, a reduction in such surpluses is a necessary condition for the success of any strategy to expand manufactured exports to the rapidly growing, newly industrializing countries in the East Asian region.

Furthermore, the evidence suggests that these latter countries, especially Japan, have now become a major source of import competition for Australia's metals and engineering industry. Hence, an import substitution strategy which focuses upon imports from the West can also, and at the same time, improve our competitiveness in relation to metals and engineering imports from Japan and other South East Asian countries

3.1.2 Import Replacement: Obstacles

The major obstacles to implementing an industry development policy which encompasses import replacement in selected metal engineering industries as a key policy objective are twofold. First, there is the problem of establishing the policy framework to promote import replacement. This involves specification of:

(a) principles for policy development

(b) objectives and criteria for selective and targeted policy interventions

(c) the selection of appropriate and complementary policy instruments

(d) the establishment of an appropriate institutional framework for tripartite policy formulation, implementation and evaluation.

Secondly, the policy framework must satisfy the necessary and sufficient conditions required for successful adaptation and change of the existing technological, behavioural and institutional structures of a modern industrial economy in a manner which enhances growth potential and competitive advantage. This later requirement is the subject matter dealt with here, while the policy framework is discussed in section 5.

To begin this section, it is necessary to expand on our earlier analysis of the potential for import reduction by examining the existing level of import competition, the source of import competition and, in broad terms, some of the changes that have occurred as a result in different metal engineering sectors. Having completed this part of the analysis we then focus on new forms of import competition and relate this to technological behavioural and institutional structures of Australia, and other modern industrial economies. Such an analysis is necessary for an understanding of obstacles that would confront a strategy of import replacement as advocated in this study.

(i) Import Competition in Australia's Metals Engineering Industry

As noted in the recent MTIA - Commonwealth Bank Survey, April 1984, a moderate easing of intense import competition had occurred by April 1984 in comparison to the situation that had existed for the previous three years.

"The proportion of companies regarding themselves vulnerable to import competition during March 1984 stood at 61.6% of respondents (representing 68.4% of total sales), compared with 77.0% in the July 1983 survey. Of these, 29.5% reported that the present level of this import competition was severe or very severe. The major sources of this competition were, in decreasing order of importance, Japan, South East Asian countries, USA/Canada and Europe.

Among the reasons for the apparent reduction in import competition are the greater operational efficiency of domestic producers, the generally lower exchange rate (notwithstanding the recent appreciating trend) and greater usage of imported component parts in domestic production processes". (p. 23) << The table below highlights recent trends in import competition:

TABLE 3.1.7 TRADE INDICATORS

Survey	% of firms who regard themselves as vulnerable to import competition	% of vulnerable firms regarding the competition as severe
June 1979	78.5	25.6
June 1980	76.9	22.6
May 1981	68.1	38.1
March 1982	72.0	42.0
July 1983	77.0	39.1
April 1984	61.6	29.5

(Source: MTIA - Commonwealth Bank: National Survey of The Metal Engineering Industry April 1984 (p.23))

On a state by state basis, the MTIA - Commonwealth Bank Survey suggested that for the metals - engineering industry:

"The degree of import competition faced by New South Wales producers continues to exceed the national average by a modest amount both in terms of vulnerability and severity". (p. 36)

"Victoria remains the state with the highest degree of vulnerability to import competition - 70.9% of respondents in the April 1984 survey. Also the proportion of respondents indicating only minor or moderate severity of the present levels of this competition (35.4%) was the lowest in Australia".

Thus the level of import competition is most severe and above the national average for the two states which account for 69% of employment in basic metal products, 71% of employment in transport equipment, 75% of employment in other machinery and equipment, and 65% of employment in fabricated metal products.

Considerable variation exists in terms of the source of import competition on a state by state basis and there are a number of methodological problems in using survey data to derive conclusions. Even with time series data from MTIA surveys, the best one can do is to provide a very general picture of the major source of import competition for each state. In this respect the MTIA survey material suggests of the companies reporting import competition:

. In both 1983 and 1984, Japan and South East Asia (including South Korea) together were the major source of import competition for more than 50% of companies, representing more than 66% of sales nationally.

. In both 1983 and 1984 the exposure of N.S.W. companies to import competition from Japan and South East Asia (including Korea) as the major source was above the national average, while Victoria was marginally below the national average in both years.

. In both 1983 and 1984, North America and Europe (including the U.K.) were the major source of import competition for 33% of companies representing between 21 and 24% of sales. While this national pattern applies generally to both N.S.W. and Victoria in 1983, there is considerable divergence from it during 1984.

At the sectoral level, MTIA Survey Data since 1978 suggested that there is a gradual but discernible shift in the major source of import competition away from North America, Europe and the U.K., to Japan and South East Asia (including South Korea), particularly in sectors such as heavy engineering and pumps and compressors, as well as in the industrial machinery and equipment sectors. Again, bearing in mind the serious methodological problems of using survey data (particularly given the change in categories in MTIA's 1984 Survey), the MTIA material does assist in focusing on the major source of import competition by sector.

This is indicated in the tables below.

The tables are derived by averaging the sector by sector results of two MTIA Surveys; the first being conducted in late June/early July 1983 and the second conducted in late February/early March 1984. In each survey all companies actually experiencing import competition identified the country which represented the major source of that competition. The percentages in the table have been expressed in terms of this group of respondent companies on the basis of the percentage of sales represented which is exposed to import competition (the results being the average of the two surveys conducted). Two sources of import competition have been aggregated.

1. Companies identifying Japan, South East Asia and South Korea as the major source of import competition.

2. Companies identifying U.S.A./Canada, Europe and the U.K. as the major source of import competition.

Table 3.1.8A Sectors where Japanese/S.E. Asia Import competition appears strongest: 1983-1984

	USA/Canada + Europe - UK	Japan + S.E. Asia - S. Korea
Fasteners - Metal	9.9	89.7
Motor Vehicle Parts + Accessories	10.4	87.6
Heavy Engineering Plant + Equipment	11.9	86.0
Electrical Consumer Products	17.5	81.8
Founding	25.0	72.1
Tool Making	19.4	70.9
Building + Construction Materials + Products	12.6	70.9
Die Casting	23.4	68.6
Industrial Machinery + Equipment	45.2	53.3
Heavy Electrical Plant + Equipment	29.4	43.1
Pumps and Compressors	37.4	40.6

Table 3.1.8B Sectors where the USA/Canada, Europe and UK import competition appears strongest: 1983-84

	USA/Canada + Europe/UK	Japan + S.E. Asia/Korea
Agricultural Machinery Equipment and Implements	79.3	15.7
Containers and Packaging	66.7	25.5

While these tables suggest that import competition faced by Australian domestic producers is largely from the Japanese - S.E. Asia - S. Korea countries, they do not indicate the existing import shares of the Australian market for metals and engineering products by country of origin. Time series data reflecting the changes that have occurred in import shares by country of origin (1978-79 to 1983-84) and analysis of these changes are provided in Appendix 3.1 and summarised below in order to assess the implications of the MTIA Survey material. The sectors chosen for this purpose are the four sectors used later in this section to examine the implications of import replacement. They include appliances and electronic equipment, electrical machinery and equipment, agricultural machinery and other industrial machinery.

Summary of Import Competition by Country of Origin. Appendix 3.1

There are a number of problems in deriving conclusions from our analysis of import competition by country of origin. The major problem is the difficulty in distinguishing between the cyclical (including in this instance resource related investment) and structural components of this shift in market share (or imports by country of origin). Cyclical factors would include:

1. Compositional changes in metal-engineering industry imports into Australia

2. Exchange rate fluctuations and the extent to which their impact on competitiveness is offset or augmented by technological, behavioural and institutional mechanisms affecting world trade (intra corporate trade, export finance subsidies, barter and counter trade, etc.)

The question is, to what extent are these shifts in import share by country of origin (between 1978-79 and 1983-84) a function of compositional changes or exchange rate fluctuations, and to what extent do they reflect structural change i.e. a significant shift in the source of import competition away from EEC and USA/Canada and to Japan, Taiwan, S. Korea, ASEAN and other S.E. Asian producers. The issues are complex and are simply noted here for further discussion.

(ii) Compositional changes in metal engineering industry imports into Australia

Tables 3.1.9 and 3.1.10 (see Tabular Appendix to 3.1) indicate the importance of undertaking an analysis of compositional changes when assessing changing import shares by country of origin. Most of the import shares by ASIC code remain very similar for the three years under consideration. Several significant changes are noticeable when comparing import shares for industrial machinery and equipment and construction machinery (ASIC 3369, 3362), where their share of total metal and engineering imports is considerablyy higher in 1980-81 (the peak of the resources boom) compared with 1983-84 or 1978-79 (the years just before and just after the resources boom). Other changes may be explained in part by the sharp increase in import penetration in certain sectors relative to others over the 1978-79 to 1983-84 period. Nevertheless, there is a surprising degree of similarity over the three-year period, which suggests that compositional changes may only explain a small part of the changing sources of import competition.

The major exception, however, is ASIC 3231-4 (motor vehicles etc.), which accounted for 23.5 per cent of total metal engineering imports into Australia in 1978-79, but only for 1.3 per cent in both 1980-81 and 1983-84. When one excludes ASIC 3231-4 from the rest of metals engineering, the results are striking, and strongly support the findings of the MTIA survy data and this report. As shown in Table 3.1.10, when ASIC 3231-4 is excluded from the calculations, then one finds for the rest of Australia's metal engineering industry:

. Between 1978-79 and 1983-84, Japan's share of imports into Australia's metal engineering industry as a whole increased by 71 per cent, from a share of 15.9 per cent in 1978-79 to 28.3 per cent in 1983-84. As the sectoral analysis in the appendix shows, this increase is broadly based across most sub-sectors of metals-engineering.

. Between 1978-79 and 1983-84, Taiwan's share of imports into Australia's metal-engineering industry increased by 50 per cent, from a share of 1.6 per cent in 1978-79 to 2.4 per cent in 1983-84. As the sectoral analysis and data in the Appendix have shown, Taiwan now has (in 1983-84) a significant market share of imports in transport equipment n.e.s. (20.99 per cent), boats (12.94 per cent), electric and telephone cable and wire (6.06 per cent), wood and metal working machinery (7.33 per cent) and other fabricated metal products (8.81 percent).

. Between 1978-79 and 1983-84, Korea's share of imports into Australia's metal engineering industry increased by 50 per cent, from 0.4 per cent in 1978-79 to 0.8 per cent in 1983-84. As the sectoral analysis and data in the Appendix have shown, Korea now has (in 1983-84) a significant market share of imports in non-ferrous metal basic products (7.58 per cent), structural metal products (5.67 per cent) and batteries (9.4 per cent).

. For the ASEAN countries, their import market share fell significantly from 1.4 per cent to 0.4 per cent. For ASEAN countries, significant market share of metal engineering products involves (in 1983-84): boats (17.7 per cent), sheet metal products (13.6 per cent), batteries (19.03 per cent) and commercial space heating and cooling equipment (10.01 per cent).

. Equally significant has been the decline (1978-79 to 1983-84) in the share of imports within Australia's metal engineering industry for the major market leaders for the past two decades - the United States, the UK and Germany. The USA share of imports fell by 25 per cent to 28.5 per cent, the UK share fell by 38 per cent to 7.2 per cent and Germany's share fell by 37 per cent to 7.4 per cent. As the material in the Appendix suggests, these declines are broadly based across Australia's metal engineering sub sectors.

To some extent, exchange rate fluctuations and compositi0onal changes may account for these changes. However, the MTIA surveys, this report, discussions with numerous employer, governm,ent and union officials suggest that it is part of a trend towards a major new source of import competition. Further investigation would require focusing on:

. The extent to which Japan and other non-USA/EEC countries have captured market share in sectors where import penetration is rising most rapidly

. The extent to which imports from Japan and other non-EEC/USA countries are components or completely built-up products.

. The phenonemon of modular importing and its impact on market share by country of origin.

This, and other work would, in the opinion of the authors of this report substantiate the argument that mainly Japan, but also other countries in the West-Pacific are becoming a major source of import competition in Australia's metals-engineering industry.

This in no way invalidates our previous analysis at the beginning of this section, which noted the pattern of our bilateral trade relations (deficits with the USA and EEC and surpluses with the Japanese and S.E. Asian countries) and its implications for a strategy of import substitution. The difference relates simply to over all levels as distinct from changes at the margin.

It is not, of course, sufficient to analyse import competition simply in terms of its intensity and the country of origin. To do so would ignore the most important dimension of import competition - namely, the phenomena of transnational production and trading companies, and the institutional, technological and behavioural structure of modern capitalist economies and world trade. As Table 3.1.11 (see Tabular Appendix to 3.1) suggests, in 1972-73 Australia's metals engineering industry had a high degree of foreign ownership and control, and this has increased significantly in recent years. Hence one must look more closely at the form of import competition, as well as its intensity and country of origin.

(iii) Import competition as an obstacle to a strategy for import replacement: the technological behavioural and institutional dimension

The changing pattern and effects of import competition must be understood in terms of the exising technological, behavioural and institutional structures of a modern industrial economy. The A.C.T.U. submission to the Review of the Industries Assistance Commission noted several factors as being of particular importance in developing a policy framework for dealing with import competition. The remainder of this sub-section is an extract from this submission: The Submission to the Review of the Industries Assistance Commission, Australian Council of Trade Unions, October 1982.

Institutional Structures of Trade

A recent UNCTAD study found that virtually all of international trade is in the hands of four types of trading enterprises:

. transnational production companies
. transnational trading companies
. transnational enterprises
. retailing companies

Specifically the report concluded that:

"In short, marketing and distribution channels in international trade are characterised more and more by oligopolistic structures".

For nearly all products, a comparatively small number of enterprises handle the bulk of world trade. The importance of particular agents varies from product to product, but it is increasingly difficult to draw a distinction on a product basis because of the diversified activities of the trading agents ... In all circumstances they wield dominant buying and/or selling power ... Frequently the formal and informal inter-linkages that exist between enterprises are the determining factor in a transaction".

Mechanisms of International Trade

Four main types of mechanisms by which trade takes place, and which contradict the assumptions of the IAC and ORANI, have been identified as:

. long term contractural arrangements

. counter trade and bartering
. international sub-contracting
. intra-corporate trade

1. Long term Contractual arrangements specifying price and/or volume are of special importance in some industries, especially minerals and energy. These arrangements also often cover agreements on shipping, insurance and sometimes technology and royalty payments.

2. Barter and Counter Trade is becoming prevalent as more countries experience foreign exchange difficulties. Barter trade is the direct exchange of goods in the absence of any transfer of funds, while counter trade is where the seller has to accept the supply of a certain volume of other products from the purchasing country or company. Between 25% and 30% of total world trade is accounted for by such transactions.

3. International sub-contracting: As many of the large companies internationalise both their production and distribution networks international sub-contracting has developed. It is more obvious in certain parts of the manufacturing industry, especially where the production process can be sub-divided more easily into labour intensive and capital intensive sections. In the main, it involves contractual arrangements where the 'buyer' absorbs all (or most) of the production and uses this substantial market power to maintain artificially low prices.

4. Intra-corporate trade is trade conducted within the corporate structures of international firms. Such trade is now estimated to account for 30-40% of all international trade. In Australia 40% of imports and 20% of exports are on an intra-corporate basis.

"Put another way, a growing proportion of international trade is not really trade at all but transfers within single multinational corporations. The prices on these intra-firm transfers are administered and not market prices, which in principle play quite a different role in economic activity to traditional market price. For international transfer prices are primarily concerned with the accounting allocation of value between different branches of the same firm. They do not represent new values appropriated by one firm from another (as was the case with international market exchange)."

Sanjaya Lall's rigorous statistical analysis based on "the massive study conducted by the U.S. Tariff Commission (1973) which contains by far the most comprehensive data on intra-firm trade by industry.

"found that a range of factors, other than the competitive market price, were responsible for corporate preferences in the international (and therefore national) allocation and use of resources, and for the preference of intra-corporate trade over 'arms length' arrangements.

These non 'competitive market price' factors were:

. Marketing requirements: A MNC may prefer to rely on affiliates for the sale of finished products abroad for various reasons. First, the desire to control distribution facilities; second, the need for specialised after sales service; third, direct representation in order to maintain government contracts, monitor or influence policy or win large orders.

. Unexploited capacity and economies of scale. A MNC which has spare capacity or unexhausted plant economies of scale would prefer to use its own facilities to supply affiliates rather than let them go to open markets. A firm may do this even where the cost of internal trading to the enterprise as a whole is higher than that of buying externally. In other words intra-corporate dumping.

. Specificity of product. The more specific is an intermediate input to the firm concerned, the more it will tend to rely on internal rather than external supplies. ('Specificity' refers to such characteristics as uniqueness, high quality and suitability to demanding or variable requirements.)

. Divisibility of production processes: Certain industries use processes which can economically be divided and parts of them relocated abroad to internalise cost advantages and capitalise on technological superiority.

. Risk and Uncertainty: Even for non-specific intermediate commodities the risks of disruption, delay, quality variation and price change can clearly lead firms to prefer internal sources of supply.

. Home and Host Government Policy. A plethora of government policies strengthen the desirability of intra-corporate trade (and associated administered prices) either to maximise their benefits or minimise their cost or regulatory effect.

. Transfer (or administered) Pricing. MNC's may wish to increase the extent of intra-firm trade simply in order to enlarge the scope for using transfer prices to remit profits or evade taxes or optimise internal global financial flows, requirements or arrangements.

Additionally, there is a substantial body of evidence (collected by UNCTAD and others) that both international and national conglomerates administer similar internal inter-industry regulatory devices and/or inter-industry 'subsidisation' or 'taxation'. (i.e. industries within the conglomerate are rendered 'assistance' by 'taxing' others within the conglomerate in order to maintain or advance market shares, or to drive out competitors prior to raising prices once an oligopolistic (or monopolistic) position is achieved. (Original 'sacrifices' can then be recouped). (End of extract).

(iv) Australia: The new wave of foreign investment and import penetration

In relating the previously discussed technological, behavioural and institutional structures within and between modern industrial economies to the Australian situation, one finds that comprehensive time series Australian data amendable to operationalisation and empirical testing of the effects of foreign ownership and new forms of "managed trade" on import penetration are not readily available. There are, however, case studies with important policy implications which demonstrate various aspects of these effects. For example, David Edgington in his recent paper "Some Aspects of Japanese Manufacturing Investment in Australia" has highlighted how Japanese foreign investment in Australia can inhibit the process of export expansion, import substitution and industry modernisation.

Edgington demonstrated that Japanese investments in Australia have been concentrated in resources development - largely coal and iron ore mining. Whereas Japan's total global direct overseas investment has been 31.9% for manufacturing and 19.4% for mining, in Australia the ranking of these two sectors has been reversed - only 25.9% invested in manufacturing but 42.3% invested in mining (p. 2)." Within Australian manufacturing itself, the distribution of Japanese direct foreign investment is far from even. Nearly 70% of its employment is in the transport equipment industry (mainly passenger vehicles and components) whilst most of the remainder is in the two other major groups 'other manufacturing and equipment' (mainly electrical equipment such as colour T.V.'s) and 'miscellaneous manufacturing' (accounted for by a single tyre producer, Bridgestone)." Transport equipment also accounts for two-thirds of Japanese manufacturing by capital value and a quarter of the number of companies.

In order to determine how the parent companies' corporate strategy determined the behaviour of Japanese subsidiaries in Australia with regard to imports, exports and research and development, Edgington undertook a survey of firms representing about 95% of total manufacturing employment in Japanese-controlled enterprises in Australia, (resource based enterprises and the behavioural characteristics and economic effects of Japanese controlled firms with a minority equity share in joint venture arrangements were excluded). In relation to imports the results of the survey suggest -

. Japanese subsidiary firms in Australia had high levels of imports of both components and finished products for resale.

"Of the total inputs of these firms (i.e. less labour and overheads) two-thirds reported that 25% or more supplied components from their parent company in Japan and nearly half replied that 50% or more came from the parent in Japan. In fact, twelve of the fifteen firms nominated their parent company as their number one supplier of components. The non-local multipliers from such a high rate of imports are considerable and result in a leakage of growth impulses from Australia back to Japan" (Edgington, p.10).

"Even more important is the very high percentage of imported finished goods as a proportion of total sales... nearly three-quarters of respondents imported more than 25% of their turnover. Most importing for resale is undertaken to maintain a full line of equipment and to maximise world sales in order to reduce Japanese marginal costs in the parent company's plant" (Edgington, p.10).

"Not only do these firms import from their parent company back in Japan but final products and components also come from affiliated companies in other countries of the Western Pacific." (Edgington, p.10).

Equally instructive was Edgington's observations concerning Japanese involvement in the car industry (which are discussed later in this section) and colour T.V. production. As the ACTU and others have noted the Japanese car producers particularly Nissan and Toyota are essentially importers and assemblers rather than manufacturers. While Australian produced vehicles as a percentage of total Australian sales were roughly 90% for Ford and G.M.H., the corresponding figures for the Japanese car plan producers ranged from 63% (Mitsubishi) to 49% (Toyota).

In colour T.V. production five of the six local producers are wholly or partly owned by Japanese TNC's "yet prior to the entry of Japanese firms into the Australian market local production of T.V. receivers involved fully integrated manufacture; most components were supplied from local sources and the firms with the least Japanese involvement - AWA and Philips were at that time the largest producers of components. After the introduction of colour T.V. transmission and the arrival of four Japanese producers, the bulk of components are now imported for local assembly. Due to minimum local content regulations in this industry the T.V. cabinet is the major item produced locally. It is significant, however, that the only manufacturer using local components at all at present is the subsidiary of Philips Industries, which has no Japanese equity."

In terms of export expansion, the Japanese case study encapsulates the constraints Australian industry faces generally in relation to technological, behavioural and institutional structures of world trade and foreign ownership - supply network linkages. As Edgington reported:

"The Japanese companies included in the survey generally operate as extensions of their parent firm. Their target is the local Australian market. They are poor exporters. 20% stated that they did not engage in any exports at all and a further 40% only exported less than one per cent of total sales. Only one firm reported exports greater than 5% of total sales.

Moreover, five of the twelve firms who did record some level of exports were tied to exporting their products either back to their parent company in Japan or a subsidiary elsewhere. That left just seven out of 15 who could be said to be penetrating export markets. Seven out of the 15 firms also recorded that they were subject to export restrictions imposed on them by their parent company. Usually restricting their territory to New Zealand, PNG and the South Pacific, rather than the lucrative and dynamic economies of the Western Pacific".

None of what has been said is to deny the view of the authors of this report that Japanese or other foreign companies can make, or have already made, a positive contribution to the Australian economy by -

i. alleviating balance of payments problems with direct foreign investment.

ii. providing technical and managerial skills

iii. promoting industrial and regional development.

Rather it is to emphasis that foreign ownership also involves industrial supply networks through intra corporate purchasing in both single firm and joint venture - consortia arrangements as well as transnational corporation - host government purchasing arrangements that can accelerate de-industrialisation and impose obstacles to an import substitution-export expansion-industry modernisation program. In this respect it can, in certain instances, constitute an obstacle to overcoming the balance of payments, capital stock and public sector borrowing requirement constraints discussed in the medium term forecast simulations prepared for this report. This can occur because:

(a) As will be discussed in Section 4 -given structural/trade constraints and the size of the potential for industry modernisation, the form of foreign investment activity described by Edgington and others will be self defeating since it will fail to create effective demand at the same rate that it adds to productive capacity given the leakage to imports and the restrictions on exports and modernisation.

(b) It will (depending particularly on the level and form of increased imports of capital goods) diminish the dynamic growth inducing influences of increasing returns and production complementarities that are characteristic of the metals-engineering industries.

(c) This in turn implies the truncation of dynamic processes that engender the diffusion of technology through product and process innovation, which means the benefits of the skill intensity of the metal engineering industry will be diminished with serious consequences for Australia's competitive advantage in skill intensive activities.

This third factor (c) is also empirically highlighted in Edgington's study where his survey found that for two-thirds of Japanese companies in Australia no expenditure was allocated for research and development work for product and process innovation, and six of the fifteen firms surveyed indicated no employees were presently involved on R. and D. work or even adapting imported technology to the Australian environment.

Edgington also found -

"In the case of Japanese manufacturing susidiaries not only is R. & D. in the hands of the parent company, but in the majority of cases decision making about new products, new markets and the provision of technical services is undertaken by or with the Japanese parent rather than independantly by the local subsidiary. This has serious implications not only for the innovativeness of the local subsidiary, but it also reduces the number of jobs the firm can offer locally and restricts the range of skills."

Table 3.1.12 Decision making related to innovations

Location / Decision	Taken Locally	Negotiated	Taken in Japan	Total
New Products	3 (20.0)	4 (26.7)	8 (53.3)	15 (100.0)
New Markets	5 (33.3)	4 (26.7)	6 (40.0)	15 (100.0)
Source of Technical Advice	2 (13.3)	5 (33.3)	8 (53.3)	15 (100.0)

Figures in brackets indicate percentages.

Source: Author's survey.

This truncation of corporate functional integration from the inception of the R. & D. function through to the marketing function can seriously diminish the dynamic effects of new processes, products and designs entering as 'components' into current production or as capital equipment designed to replace or expand the production processes of other industries. As noted in Part II, more than 80% of the total output of the metals and engineering industries is supplied in either of these forms.

For the purposes of this study, we would argue that Edgington's conclusion has implications beyond the Japanese case study; conclusions that are applicable to investment behaviour more generally. As such, his conclusion is worth quoting at length -

"In theory import substitution investment is supposed to benefit the host country by manufacturing locally what was previously imported, thereby saving foreign exchange and creating jobs. However, if Australian subsidiaries have to import large amounts of parts, equipment, research, design and technical services ... (then) due to the process of truncation, growth may occur in the Australian economy but technological development and development potential will be transmitted to the country containing the headquarters of the parent TNC...

This case study of Japanese manufacturing subsidiaries provides a general lesson: in the past Australia has relied too heavily upon importing technology in the form of direct foreign investment. Yet whilst the recent encouragement given to new indigenous research and development firms working in specified fields is a welcome policy response, it is also necessary to create industrial conditions that are conducive to the general development of Australia's innovative capacity. There is therefore a fundamental need for a broad strategy which will press for TNC's to restructure their activities in Australia in order to achieve a greater measure of import substitution and increased exports in a range of goods that compliment Australia's comparative or geographic advantages.....

(v) The vehicle industry: tooling and design

Edgington's study highlights the impact that corporate sourcing decisions and industrial supply networks at the international level have upon the potential development of Australia's technological and innovative capacity. As he points out, such strategies can diminish the skill intensities of domestic industry with consequent impact on the ability to generate competitive advantage.

The recent decline in tooling and design within the vehicle and automotive component industries are examples of this process.

Toolmaking is a highly skilled, craft activity transmitted by long periods of on-the-job training. It also requires a range of support skills such as drafting, design of tools and production engineering. The erosion of this skill base through loss of skilled crafts and reduced apprentice intakes combined with inadequate access to new technologies because of low investment puts at risk Australia's participation in these high skilled, high value-added areas of manufacturing production.

Between 1981 and 1983, tool room employment dropped by more than 35%. While this decline is partly attributable to changes in the technology which rationalises tooling input together with refined componentry design, a significant factor has been increasing dependence on imports. The precise nature and extent of impact is not reflected in import clearance statistics. Industry sources have confirmed that the offically recorded value of imported tooling significantly understates the level known to have been imported in recent years.

Increasing dependence on imports reflects the integration of domestic vehicle production into the world-wide sourcing decisions of the major vehicle producers.

The development of CAD/CAM technology facilitates a separation of the more highly specialised design and tooling functions from component manufacture. Increasingly local component manufactureres are being offered imported design and tooling along with the contract.

This process of technological dependence sets up a vicious circle of manufacturing sector decline. It not only diminishes the skill base needed to build upon, but leads to a lack of investment in new capital equipment as a result of uncertainty over future demand and sourcing.

Import pressures apply primarily to the timing of local design and tooling rather than as a result of price and cost factors. In the longer term, however, failure to upgrade technology will effectively undermine local component manufacture as domestic producers find it increasingly difficult to meet overseas componentry specifications or achieve cost competitiveness as the overseas industry re-invests in new generation technology.

CAD/CAM technology already enables tooling and design specifications to be programmed and refined at the point of design. Direct links with manufacture prototypes allow test results to be immediately incorporated into the design and tooling process. Increasingly, tooling and design specifications will be stored and supplied to component suppliers and tooling contractors on tape or disc which can be directly linked to the manufacture process, superseding the traditional engineering drawing.

A prerequisite for Australia's continued participation in the industry is access to the technology to link into overseas design and tooling specifications. This requires a massive program of re-investment. An industry survey of major producers with substantial tooling operations found that tooling equipment was relatively dated. These findings also indicate that the current loss of jobs is not due to capital/labour substitution within Australia, but, rather a transfer of design and tooling functions overseas.

This case study of tooling and design in the vehicle industry reinforces the conclusions drawn from the Edgington study.

An import substitution strategy must target those aspects of an industry sector with the capacity to develop and diffuse technology through product and process design. If this aspect of the process is carried out overseas, the potential gains both for the Australian components industry and, more broadly, for manufacturing in general through industry linkages, is greatly diminished. Tooling is a high value-added, labour-intensive activity. If therefore offers relatively greater employment potential per $1 of final cost than does the manufacture of components. A high value-added to weight also makes it a relatively attractive export. Without the maintenance and development of a local design and tooling capacity, Australia will be relegated to technological dependence in the performance of what remains primarily an assembly function. The potential for the technological innovation and diffusion through industry linkages will be lost.

The recent history of tooling and design within Australia confirms the need for specific government intervention. The re-investment in new generation technologies required will only occur by maintaining the linkage between domestic component sourcing and the associated tooling and engineering activities, complemented by measures to encourage large-scale capital investment. Given the scale of investment, the cyclical nature of domestic demand for tooling and design and the potentially smaller number of model changes, there is a need to promote joint use of facilities to achieve the necessary scale economies, productivity and cost competitiveness with overseas suppliers.

Not only is tooling and design at risk without such Government action, but so is the continued sourcing of a range of domestic componentry. Domestic sourcing will be increasingly re-routed overseas due to lack of skills, inappropriate technology and inadequate access to specifications as they occur overseas. Failure to reverse these trends locks the industry into increased technological inefficiency, decreased cost competitiveness and a process of circular and cumulative decline in the longer term.

Given that the major factors determining tooling requirements relate to the frequency and extent of model changes, and that the major expense in tooling up for car production is in the area of press dies and moulds, the Governments newly announced post 1984 car plan will need to ensure a close integration of the new South Australian design and tool room consortium with the corporate strategies of the plan producers and the component producers. Only in this way, can the new forms of import competition which lead to transfer of design and tooling functions overseas be confronted. Unions, through the ACTU, will be having extensive discussions with Government on trade union and worker involvement in this process.

(vi) Australia's heavy engineering industry: obstacles to import replacement

Definitions of what constitutes the heavy metal engineering industry vary considerably. As a working definition we have chosen to define the industry's coverage in terms of the Government's recent reference on the industry to the IAC:

"For the purpose of this reference the heavy metal engineering industries shall include the design engineering and manufacture of the plant, machinery and equipment (including parts) for industries such as those engaged in -

- mining, quarrying and mineral processing - cement manufacture - basic metals production - materials handling and port installations - railway rolling stock and locomotives - power station (including hydro-electric plants) - construction - chemical manufacture and processing, oil refining, petro chemicals and gas processing - compressor and pumping equipment - sugar processing machinery - heavy metal fabrication

The ferrous products industry comprises those engaged in iron and steel forging and casting. Specific exclusions from this reference are shipbuilding, ship repair and lift trucks."

In other words this industry constitutes the core of the capital goods sector.

In response to the crisis that the heavy metals engineering industry is confronting, the Machinery and Metal Engineering Council on July 26, 1984, submitted a detailed package of emergency measures to Government. In the introduction to it's submission, subsequently released to the Press, the Council noted:

"The economic crisis that exists in these sectors of industry was recognised at the recent ALP National Conference where the following resolution was unanimously endorsed:

"This Conference recognises the serious and deteriorating situation of the Heavy Engineering and Metals Manufacturing sectors in the Australian economy. This has led to substantial and continuing unemployment, the loss of vital skills and poses a serious threat to industries strategic to the economy, and requires an immediate Government response in the form of positive assistance measures and financial support.

Accordingly, Conference calls on the Federal Government:

1) to provide emergency funds in the forthcoming budget to be used for the revitalisation and restructuring of Heavy Engineering and Metals Industry sectors.

2) the development, through the relevant consultative bodies of medium and long term plans to develop this sector."

In addition, the Council welcomes the announcement by the Minister for Industry and Commerce of the Government's intention to maintain a Heavy Engineering Industry in this country.

The magnitude of the crisis that exists in Heavy Engineering was noted in a recent survey by the Department of Industry and Commerce which indicated:

* In the past 12 months there has been a substantial reduction in employment with some firms reducing employment by as much as 60-70 per cent.

* Significant retrenchments are anticipated over the next few months if demand remains at current levels and the general expectation is that demand will definitely not improve.

* Profitability and forward orders have slumped dramatically and capacity utilisation is estimated to be between 40 and 50 per cent.

* Investment has slumped and a higher number of closures have occurred.

In addition, the Council notes that import penetration of the domestic market has grown at an alarming rate, particularly since 1980-81, and is costing thousands of Australian workers their jobs, and leading to the closures of many efficient firms. As the Minister for Trade emphasised in a recent speech, the crisis in the Metals and Engineering Industry over the past two years has been more devastating than the 1981-82 drought in the rural sectors."

The significant loss of domestic producers market share to imports that the Council noted is highlighted in the table below, which indicates the extent of import penetration that occurred from the beginning of the resources boom (1979-80) to the present period (1983-84 - 9 months to March 1984).

Of course, the data are sensitive to the base years selected, but, in our view, it is substantiated by the analysis in this report which suggests a strong rising trend in import penetration.

Table 3.1.13 Australian industry's share of the domestic market in metals and engineering

	1979-80	1983-84	% Change
Manufactures of Metal (ASIC 31)	78.4%	75.3%	-4%
Industrial Machinery (ASIC 336)	30%	24.7%	-17.7%
Electrical Machinery and Appliances (ASIC 335)	61%	51.8%	-15.1%
Transport Equipment excluding Road Vehicles (ASIC 324)	64.2%	41.9%	-34.7%

(Source: Various Australian Bureau of Statistics Publications).

If the import share of the domestic market had remained the same in 1983-84 as it was in 1979-80, then the domestic producers contribution to gross product in 1979-80 prices for the four sectors would have been $585 million higher.

To assist in explaining this loss of domestic market share, it is necessary to look more closely at the new forms of import competition that developed during and after the construction phase of the resources boom.

New Forms of Import Competition in Australia's Heavy Metal Engineering Sector During and After the Resources Boom.

As noted by Hout and Magaziner in their study, Japanese Industrial Policy:

"Two broad industry trends have had a significant impact on industrial machinery businesses in the 1970's. The first is the development of so called 'systems businesses' or the sale of whole plants. Here various machines are assembled with construction materials into whole plants and are sold and installed as a package by one producer (though he may subcontract parts of it).

One reason for the growth of systems businesses has been the increasing importance of developing countries as markets for machines. As industrialisation proceeds in OPEC and COMECON and advanced developing countries, non OECD countries have come to account for roughly one half of all OECD machinery purchases. These countries are less able to design their own plants ... and prefer to buy them ready made...

The growth of systems businesses has also been accelerated by progress in process control. Co-ordinated systems now allow the computer centralised (or microprocessor distributed) control of a whole factory, increasing the effectiveness of industrial machines. Maximum efficiency in the overall process is achieved by designing an entire plant for a given application rather than by assembling well designed individual machines.

The development of the whole plant sale business has increased the significance of applications engineering in the overall cost structure of the industry. Because purchases are bigger, the importance of long-term buyer financing and insurance of seller's risk has also increased.

The other major development in the machinery industry in the 1970's has been the introduction of new technologies to be integrated into machinery design, particularly miniature electronics, lasers and ultrasonics. Intelligent control in machines, the use of laster cutting and printing and ultrasonic testing are examples. As a result, machinery makers have had to undertake massive research and development in unfamiliar fields in order to remain competitive in the industry".(P. 71-72)

Magaziner and Hout's summary provides a very concise overview of a major new form of import competition that Australia's heavy metals-engineering sector is facing. While the "whole plant sale business" or "modular importing" was evident during the mid to late 70's in Australia, (in the NW shelf project for example) it was really the construction phase of the resources boom and its aftermath that accelerated this trend. It is even more evident today where we see the modular importing of power stations into Queensland, the Brown Coal Liquefaction Plant in Victoria or the aluminium smelter and generating plant to be imported into Western Australia.

This new form of import competition is not simply a function of corporate strategy and technological innovation in the private sector, divorced from Government involvement, direction and support. As Magaziner and Hout have noted:

"In industrial machinery, the areas of intense competition and high growth have shifted away from single machine manufacture toward developing computer controlled production systems and supplying whole plants, particularly for the rapid growth export market. Accordingly, (Japanese) Government policy has focused less on industrial concentration and more on systems research and development and export financing..."(p 74)

Whole Plant Sales

A second major thrust of current industrial policy in machinery is to aid whole plant sales. Many of Japan's institutions work effectively together to promote whole plant sales. MITI has published a 400-page book on whole plant selling and has informally assisted the formation of groups of companies to study particular market opportunities. The industry association and trading companies also play an important role in co-ordination. The informal connections among MITI, the banks, the industry associations, and the companies, along with the legislation which enables cartels to be formed, allow a flexible mode of interaction very helpful in making the complex arrangements needed for whole plant sales.

Financing is crucial to the purchase of large plant, particularly in developing countries, which now account for about half of the market for machinery. Fully 60 per cent of Export-Import Bank loans are now directed to plant export; these loans are often supplemented by financing arranged through large banks (to which the government has close ties). The most significant form of financing assistance, however, is government-to-government credit (in yen), often indirectly tied to machinery sales.

Large national projects sold to the governments of other countries can be financed by mechanisms which fall under the broad heading of economic aid, and thus (in contrast to ExIm Bank loans) are not regulated by the OECD. In Japan, the agency responsible is the Overseas Economic Co-operation Fund, a public policy company funded via the FILP and under the direction of the Ministry of Finance, the Ministry of Foreign Affairs, and the Economic Planning Agency. Yen credits are a highly desirable form of financing from the borrower's point of view - very low interest is charged (three per cent and less); amounts can exceed the value of the narrowly defined project; and longer repayment terms than those of ExIm or private financing can be provided.

It is often difficult to discover an explicit link between a government-to-government or even a central bank-to-central bank financing package and a particular large machinery or plant order. Yet clearly such connections are there. Though the Japanese feel that the French are the masters at this type of activity, they themselves have devised a number of inventive financing measures, helped by the strength of the yen and Japan's large dollar balances.

Apart from sales arranged between governments, the trading companies play the most significant role in arranging financing, making three-cornered deals, and putting together packages for a sale as well as doing promotion and research, etc. The government may review prices or give guidance on selection of a particular subcontractor, but most of the work is done by the manufacturers and trading companies involved."(p 81)

This integration of public-private sector corporate strategy for export of whole plant, not only by the Japanese, but also by the South Koreans and other major overseas competitors that Australia's heavy metal engineering sector faces, has far reaching consequences. Some of these consequences were noted recently by the Bureau of Industry Economics in a paper presented to the Machinery and Metal Engineering Council. For example, in discussing the impact of import competition on Australia's Metal Fabrication Industry, the BIE noted:

"Fabricators with considerable in-house design capacity tend to be in areas where, until recently, import competition has not been great. They adapt their products to customers needs and this gives a fair measure of natural protection. Welding expertise is their special skill. However, in recent years the methods of letting heavy engineering contracts in Australia appears to have changed. Small contracts for items such as boilers are being subsumed in larger contracts which include boilers with turbines etc. Many of these larger contracts are being won by foreign firms (Japanese, South Korean, American). As a result, the boilers, as well as the tubines, are being made overseas, the whole module being imported into Australia."

In terms of future trends, the BIE in its discussion of the situation confronting Australia's modern structural steel fabricators and processors pointed out:

"...imported structural steel modules suggest possibly greater import penetration in the future, especially in large coastal mineral and offshore oil\gas structures... large mineral concerns concerned about delays and costs in on-site construction activities are exploring foreign turnkey/module possibilities."

There are an increasing number of examples of modular importing occurring in Australia today. One example is Victoria's Brown Coal Liquefaction Project.

The brown coal liquefaction project

The Coal Liquefaction Project being developed in the La Trobe Valley in Victoria is demonstrative of constraints that are placed on the potential import replacement, export expansion and industry modernisation capabilities of our industries by the importation of whole plant from Japan. The project is also instructive of the need for full consultation between government, industry and unions on major development projects in Australia.

Brown Coal Liquefaction (Vic.) Pty. Ltd., a wholly-owned subsidiary of Nippon Brown Coal Liquefaction Co. Ltd., is conducting the project in conjunction with the Victorian Government. The parent company is a consortium of five Japanese corporations, and has the firm commitment and financial backing of Japan's Ministry for International Trade and Industry (M.I.T.I.). The Victorian Government's provision of land, coal and other ancillary items is its contribution to the pilot project. The Foreign Investment Review Board approved the project on the understanding that any ensuing large-scale developments would be subject to 50% Australian equity.

The construction phase of the project comprises 'Stage 1: Coal to Slurry', and 'Stage 2: Slurry to Oil'. The present suspension of Stage 2 of the project is due to intervention by the A.M.F.S.U., in order to achieve higher local content.

The majority of fabricated structures for Stage 1 of the construction phase were sourced from Japan. A subsequent review of Stage 1 processes disclosed that local industry believed it had not been provided with reasonable opportunities to participate in the project. Conservative estimates of the proportion of tenders allocated to Japan are in the order of 80%, although it was accepted by B.C.L.V. that 'all of the construction work could be capably done in Australia'.

It is of note that the Victorian Department of Labour and Industry (D.L.I.) expressed concern over the standards of Japanese production from the perspective of safety, and the capabilities of Australian industry to supply the same products within the local regulatory framework. The result of D.L.I.'s inspection programme in Japan was the rejection of many larger pressure vessels, some valued at up to AS300,000. Subsequent efforts to comply with Australian standards produced a reduction of productivity in the Japanese establishments, a noteworthy factor when appraising the relative efficiency of Australian industries when producing for domestic markets. Had these and other factors been subjects of attention by Australian governments prior to the invitation of tenderers, such problems may have been averted by organising predominantly local industry participation based on the system of tendering for asistance packages as outlined in Section 5 of this report.

Modular Systems were a major element in the project's strategy, and proved to be a topic of dispute on the basis of the centralisation of design, fabrication, sub-assembly and expertise with the prime contractor which results from their importation.

In rejecting a total Modular System importation programme, negotiations are in train to achieve higher local content and a more substantial and meaningful local labour component than was originally foreseen by B.C.L.V. Of particular significance is a commitment to have all stainless steel and chrome alloy pipe spooling for the project fabricated in Australia.

The B.C.L.V. rationale for a high degree of centralisation of manufacture in Japan has been that the Computer Aided Design/Computer Aided Manufacture (CAD/CAM) technologies essential to the redesign process inherent in the pilot project necessitate such centralisation. The pivotal role of these technologies in the post-construction phase will be critical to the success of the project.

However, B.C.L.V.'s conclusion that CAD/CAM applicability requirements held equal weight at the initial construction phase as in the data collection phase to follow has already proved to be less valid than was originally assumed. Negotiations on local content have demonstrated a greater degree of flexibility in considering the manufacturing implications than was previously apparent and an increase in local content estimates of A$2 million has already been achieved.

The centralisation of the project's control in Japan also has important Research and Development (R & D) and Technology Transfer implications. The liquefaction pilot project is an R & D venture, funded by Japanese Corporations and M.I.T.I. Contingent on a fruitful outcome for the pilot project is a commercial demonstration plant of one hundred times the pilot plant's capacity, which could precipitate the most substantial energy development in Victoria's history.

One might anticipate that a forward-thinking government sharing sponsorship of such an R & D project would ensure that R & D benefits would impact upon domestic industry. However, the technology for the establishment and operation of the project will remain in Japan, in the absence of the implementation of specific agreements ensuring Autralian R & D participation and Technology Transfer. Inclusion of Australian personnel at the technical and design level would provide a ground floor opportunity for an upgraded engineering and energy R & D effort in Australia.

Potential exploitation of such opportunities has not received sufficient attention by governments; the only measures involving such participation concern site-works, rather than the major design elements of the project. Scope for Australian involvement in any subsequent large scale programmes has already been inhibited. The absence of Design, R & D and Technology Transfer programmes to ensure maximum domestic benefit needs to be addressed through the industry supply office proposals raised in Section 5 of this report.

Major development projects such as the Victorian Coal Liquefaction Pilot Plant need to be the subject of tripartite consultation and consensus from the earliest stages. Such processes were not dealt with adequately in the Victorian Government's deliberations on the B.C.L.V. project and industrial relations problems have resulted.

Investigations into direct hydrogenation of brown coal in Victoria date back to the previous government's studies in conjunction with three of the present members of the consortium. That government signed an agreement with the consortium in October, 1980; B.C.L.V. was formed in April, 1981. The present Labour Government supported the B.C.L.V. pilot project in June, 1982.

However, the Unions were unaware that Modular Systems were to be imported until representatives attended a study mission in Japan in May, 1984. Subsequent Union action has resulted in the opening of consultations on Stage 2 that would not have otherwise eventuated.

It is anticipated that some agreement will be attained in the near future. Appropriate consultative procedures, and an Industry Development agreement between the consortium, the government, local industry and Unions, would have assured consensus on levels of local content and prevented the necessity for the A.M.F.S.U. to instigate industrial action in order to open negotiations.

The experience of the B.C.L.V. project has been consistent with the technological, behavioural and institutional structures generally favoured by many multi-national corporations operating in Australia. The application of appropriate consultative and negotiating mechanisms in future major development projects requires the development of relationships between foreign investors and local parties that would be more beneficial to Australian industry development and stability in relations with our trading partners with whom negotiation and bargaining require high trust thresholds.

Power stations including hydro-electric stations.

There are a number of parallels between the modular importing involved in the Brown Coal Liquefaction project and recent contracts let to overseas firms for modularised power station importing into Australia. In Queensland recently the contract for three power stations with ten power generating units was awarded to C.ITOH - the trading house for the Japanese conglomerate Babcock Hitachi. As the result of a previous contract won by C.ITOH, there will be four power generating units at Tarong and two at Kallide. In the most recent contract won by C.ITOH, there will be four more 350 megawatt generating units at Stanwell. Because the power stations will come in as modular imports, the design and the major part of the higher value added fabrication work will be done in Japan. Apparently, there will not be any pressure vessels or parts fabricated in Australia for this project.

Australia's contribution to the Queensland power stations will involve erection, civil engineering and some limited amount of structural steel work. While estimates vary as to the all up cost of the power stations project, it is likely to be in excess of $2 billion (including civil works, roads etc.) with an import content of around 50%. While employers were not prepared to discuss details of the tendering involved in this project, discussion with academics and union officials suggest:

* The tendering specifications were built around the Babcock Hitachi bid in so far as small contracts for boilers, pressure vessels etc. were built into a larger contract with turbines as part of a single package. This is known as 'system specification tendering."

* This was unlike recent N.S.W. power station tendering practices, where, although another Japanese company (Mitsui) will have the leading role, there will be much higher domestic producer participation. In the N.S.W. case, the tender specifications apparently facilitated the lumping together of different and separate parcels of work rather than being let as a complete package (system specification tendering) as was apparently done in Queensland.

* The authors of this report were unable to obtain sufficient information to either validate or invalidate the suggestion that Japanese export finance was a key factor in the Japanese winning the Queensland contract, as was provision of access to primary product markets for Australian producers.

The policy implications this raises are addressed in Section 5 of this report. However at this stage it should be emphasised that in the absence of rules to unpackage system specification tendering; in the absence of joint venture - consortia arrangements amongst Australian producers backed up by appropriate changes to the Trade Practices Act and F.I.R.B. legislation, to facilitate successful participation in bidding for modular projects; and/or in the absence of mechanisms to cope with the offsets (such as market access for Australian mineral and agricultural produce) and financial packages that Japanese and other overseas firms can offer, this form of modular importing will increase. Modular power station imports are possible with the Northern Territory Channel Island power station contract and several other power stations, both public and private, where tenders will soon be let.

West Australian Aluminium Smelter Project

The West Australian Government has developed its original 1979 proposal for an aluinium smelter project comparable with that under construction at Portland in Victoria. The proposal has reached the stage of feasibility analysis. It is based on the expectation of reaching agreement with Korean and US venture partners to proceed with a two potline smelter. Commissioning would begin in 1988, the year that Portland is expected to begin production from its second potline.

An unusual feature of this project is its linkage with the North West Shelf gas supply to WA. The State Government has undertaken a $1200 million investment to supply gas from Dampier to Perth. Its Minister for Minerals and Energy, Mr Parker, has said publicly that the contracted gas supply may exceed initial demand by perhaps 30 per cent (National Times, 4th May, 1984). The use of gas for power generation to supply the smelter is seen as a solution to that surplus. However, natural gas is an expensive source of eletric power which is itself a large component of aluminium smelting costs. Aluminium is described often in the industry and elsewhere as congealed electricity. To provide economic power prices, the WA power authority would need to absorb some of the operating costs. It has been reported (The Age, 10th July 1984) that the Government proposes to sell gas into the smelter power supply at $1.00 a gigajoule, less than half the cost (2.50 a gigajoule). The operating susidy on gas alone would be of the order of $17 million a year.

The WA government has made an offer of infrastructure for the smelter project to Kukje/ICC, which was a contractor on the Dampier-Perth gas pipeline, Reynolds Metals will provide backup. Kukje is a Seoul-based Korean construction company. It has no experience of smelting or power station construction. Reynolds is a diverse US-based metals company with seven US aluminium smelters.

According to an analysis prepared for the WA Govenment's Aluminium Smelter Task Force, "The purchase of Korean manufactured generating plant will be sufficient incentive for the Korean Government to provide market access for the aluminium smelter production, on the proviso that the electricity tariff (or the cost of metal into Korea) will be internationally competitive." (Aluminium Smelter Task Force 1st May 1984). This assumption raises two issues. First, Kukje has no power plant construction experience in Australia, such as that which is centred in the large engineering teams employed by the State power authorities. In Victoria, at least, a large number of skilled people may become redundant with the completion of its Loy Yang program. The WA proposal assumes that US engineers, Burns and Roe, will provide Kukje with plant expertise using Westinghouse technology under licence. The Government's letter of offer to Kukje was prefaced with the assumption that finance for coal-fired power plant would be provided by the Korean Export-Import Bank. Which raises the second question.

The economics of power supply has long been a limiting factor in WA aluminium development. The State has very large economic reserves of bauxite, the basic resource of aluminium smelting. Bauxite is refined to produce alumina, which is the material smelted for aluminium. Although Alcoa, for example, has mined bauxite in south west WA for some years, it has chosen to locate Australian smelting in Victoria. The principal reason for that is Victoria's much larger power grid and consequently more favourable stability of power price and supply.

In making its offer to the prospective smelter partners, the WA Government has used a price based on costs at the third quarter of 1983. It fixes its base tariff at that period, escalated by the Perth CPI. The base tarriff is 1.5 cents a kilowatt hour and an escalation cap - an upper limit - fixes the maximum charge. In the first quarter of 1988, for example, the maximum tariff is 2.12 cents a kilowatt hour.

The first point to be noted is that this price would markedly undercut other Australian projects which are demonstrably viable and which aim to sell metal into the same markets. The recently completed negotiations in Victoria produced a flexible tariff formula - based on State Government equity participation - with a 1984 power price of 2.6 cents a kilowatt hour. With its locational advantages and this power deal, the WA plan could make substantial inroads into markets targetted by established smelters in Queensland, NSW and Victoria. It could also add to pressures for power subsidies in other States. The question then, is whether the plan is economic.

The uncertainty of WA power economics was made clear in November 1979, when the State Energy Commission and Department of Industrial Development outlined smelter prospects in a report sent to Federal Government. "The Commission's current plan program calls for the completion of Muja Stage C during the 1981-82 financial year, but the installation of further base load plant has been deferred until approximately 1985-86 due to the lower load growth which has been experienced over the past few years." To provide power for a smelter would require an extra 1.8 milion tonnes a year from the State's only known economic coal field, the collie field. Over 30 years that would absorb 13 per cent of economically winnable coal reserves. The WASEC proposed then that it build Muja D, two units of 200 megawatts capacity. The total capital cost was put at $250 million in 1979 dollars. Operating costs were estimated at $35 million a year, again in 1979 prices. The Government's 1979 submission, based on those prices, anticipated a power price of 1.8 to 1.9 cents a kilowatt hour at current (1979) costs.

Since 1970-80, inflation measured by the CPI has risen by more than 30 per cent. Yet the State Government now proposes to sell power at prices with a 1.5 cents a kilowatt hour base - and a maximum in 1988 prices of 2.12 cents a kilowatt hour. The current smelter proposal anticipates supply at 3154 gigawatt hours a year. On that basis, each 0.1 cents a kilowatt hour is worth a little over $3 million a year to the WASEC. Conversely, an error or deliberate subsidy of the power price would cost consumers or taxpayers (State or Federal) about $3 million a year by each 0.1 cents a kilowatt hour not fully recovered. It should be noted that the current proposal also operates on the assumption of about 400 megawatts of demand. (Demand is the output or capacity figure, consumption is an energy measure, a multiple of demand over time).

In order to evaluate the proposal, a simple analysis of operating costs is possible. On the State's figures, 1979 plant costs were $35 million. Inflation might have added $9 million to that, bringing simple recovery needs to about $44 million. Which means that a power price of about 1.45 cents a kilowatt hour would be required to meet operating costs alone. The current WA Government proposal has a base 1988 power price of 1.5 cents a kilowatt hour with a cap of 2.12 cents a kilowatt hour on escalation.

On the face of it, WA proposes to subsidise at least $300 million of capital and interest costs. It also plans a possible $17 million a year subsidy for the first 10 years during which gas is consumed for power. Escalation of power operations costs would also be subsidised. There is a further cost, identified in the Government's Task Force analysis. The plan assumes that coal may be supplied at $21 a tonne, escalating from 1984 at 85% of CPI. The task force was told that price escalation was a risk "especially when the existing knowledge of the coal field is considered to be inadequate.... The danger is that, over the 30 year power supply contract term, they may turn to SECWA or the Government and indicate that they can no longer supply as promised, and the only available supporter for the companies is the State". (Aluminium Smelter Task Force 1 May 1984)

In summary, the proposals's characteristics are: . a smelter and power plant are to be built with Korean labor and capital, using US engineers and US technology; . the project would result in a 10 per cent addition to WA power supply capacity and a 15 per cent addition to Australia's forecast aluminium smelting capacity; . the power price might pay power plant operating costs, but none of the capital or debt servicing; . gas used in the proposal would involve a subsidy of about $17 million a year; . there might be a need to subsidise coal supply in the future; . about 10 per cent of WA gas supply from the NW Shelf may be used over ten years in an applicaton which wastes about 70 per cent of the energy value of that premium fuel; . about 13 per cent of WA coal reserves would be consumed in the process; . a substantial commitment of gas without any recovery of the pipeline capital cost.

There are alternative approaches. In developing this plan, the State appears to have addressed two problems. On the one hand, it seeks a solution to the inherited surplus gas supply arising from its NW Shelf commitment. On the other, it aims to promote employment through resource development.

The first problem, the NW Shelf, has an external influence. Since its first commitment, the NW Shelf joint venture has faced uncertainty over its prospects for completing marketing agreements with Japanese utilities. The effects of recession have curtailed growth in Japanese energy consumption and structural changes in its markets have further curtailed future demand growth. An indication of this change was the 14 per cent average cut in Japanese utilities' capital programs in the 1984 planning round. This cut included growth in nuclear plant spending and therefore understates the effect on LNG-fired plant and, especially, coal-using plant. The NW Shelf is also facing competition for Japanese markets from other projects, some of which have direct Government-to-Government involvement.

The NW Shelf project has been excluded, on a bi-partisan basis - from minimum Australian equity requirements. As a result of the cost of delayed cash flows, the original Australian equity holder, Woodside Petroleum, has had its equity largely dissolved. BHP, the other Australian equity holder, is a minority interest.

The WA Government is therefore in a difficult position. If it cannot use the contracted gas, it must pay for it. Default would damage the viability of the existing Australian equity, as much as anything else, in the project. However, the use of gas for power generation at base load is a demonstrably inadequate option.

Since the WA Government must, in any case, pay for the gas there seems to be no reason that it should not opt against consumption. The cash flow - which would bolster Australian interests in the project - could be negotiated as equity. (In that context, it should be noted that the project proceeded on the basis of Japanese letters of intent which have proved valueless). Even if the export phase of the project remains weak, there are signs of domesic prospects.

Recent trends in natural gas prices suggest that the delivered price of NW Shelf gas at Perth compares favorably with East coast prices. The current resource base - aside from Bass Strait - is in the Cooper Basin, which has an established delivery network to NSW and, soon, to Queensland. With markets established and the likelihood that Australian oil supply will begin to fall in the 1990s, the economics of WA gas via Moomba may approach viability. In any case, the addition of State equity to the NW Shelf project would add bargaining advantages to the project as Japanese buyers have a demonstrable preference for government involvement.

The second ambition of the WA Government - employment generation - might be approached from another aspect. The State has suffered more than most from the unpredictability of commodity price movements. Further development of a capital intensive industry with high public capital exposure would be an extension of that experience. WA has never had a large manufacturing base. What it has had has suffered from the cyclical peaks and troughs of international and national resource prices. To escape that pattern, development strategy needs a new focus.

An alternative to expansion of capital intensive energy developments has developed out of the rising cost of energy itself. Conservation has become an economic investment alternative, the financial viability of which is demonstrated in the recent decisions of US power utilities to capitalise conservation as a book asset. The experience of Australian utilities, which have had to change many assumptions about demand growth because of consumer responses to price, is evidence of local responses. So far, utilities have been loathe to accept the financial implications of this for investment plans, but the potential for wider gain is also there.

If it is accepted that the cost of power plant construction and its effect on consumption and local economies may fail to generate satisfactory benefits, then savings in consumption which avoid the need for construction can have economic value also. So, for example, the Tennessee Valley Authority in the US has made investments and forecast a program of conservation spending which will not only avoid new additions to capacity but which will increase the returns from existing plant.

Assuming acceptance of conservation's economic value allows for another step. When a utility adopts a program for conservation, it adopts new investment criteria. The target is lower consumption and higher efficiency. Then it must find the means. Because of the cost of energy to small consumers, responses through innovation have been delayed until price rises became a public issue. Since 1975, industrial consumers have been seeking energy savings as a matter of course. Now that domestic energy consumption has become an issue, the experience of industrial users and the solutions they found have begun to be passed on. The result provides innovative opportunities for employment stimulation. Two specific cases are the development of high efficiency electric motors and the low consumption 18 watt light bulb to replace standard bulbs of 75 watts or more. Neither of these are in widespread use in Australia or, yet, overseas.

If a public utility adopted a conservation based strategy, its implementation would allow significant benefits in terms of employment growth. If for example, the WASEC decided to install 18 watt bulbs across its consumer base as an investment in capacity (lower demand equals higher potential output to alternative uses), it could choose a local supplier. That supplier would have a guaranteed domestic share market on which to build viability for an export market which has demonstrable potential - especially in the countries where energy costs are high. The WASEC decision would add to its economic performance, provide direct investment to the community and support the development of a potentially viable export-based local manufacturer using the latest technological base. In that case, the WA manufacturer would be at enormous international advantage as no other competitor is likely to be at such a great advantage.

In principle, that policy approach has even wider potential as one considers other Australian States. The experience of capital costs and their effect on prices in NSW, Victoria and Queensland power systems is adequate evidence of potential. A national policy based on that principle has the potential to support a dynamic export-based idustry in the electric/electronic field of technology without peer.

In assessing these options, the Government could look to its current proposal. The Kukje-Reynolds plan involves substantial subsidies on a large capital commitment. The number of workers to benefit in WA is small and the proposal, overall, gives the impression that WA capital is to be invested for the short and long term benefit of Korean consumers.

WA has a notoriously volatile employment base, linked historically to pitches in resources investment. With variations of up to 33 per cent across industry employment at times of high or low economic activity, the job experience of many WA workers must be one of great uncertainty. The smelter plan offers little added stability. In addition to the already clear picture of the State's financial exposure is the possibility further on that the smelter may close for periods because of the increasing volatility of the international aluminium market. One has only to look at the trend in active productive capacity since 1978 to adopt an appreciation of the uncertainties created in the market by the increasing dissolution of cartel power in what was a controlled market.

The alternative investment path offers benefits on two fronts. On the one hand, manufacturers would be able to plan development in line with the capital program and conservation targets of the WASEC. This would maximise stability and minimise inefficiency with a certainty that would enhance their ability to compete internationally.

Equally, employees of those firms would have a stability unusual in WA. With a conservation based approach, further developments in which WA had an advantage - such as solar power - would attract innovators to a supportive environment.

The employment potential of smelting is poor. Increasingly, the trend in technological innovation has reduced manpower requirements to the extent that new smelters are now essentially automated. The Tomago smelter in NSW is a good example of the newest technology. Other employment spin-offs are entirely imputed and have no greater meaning than simple capital multipliers.

In the alternative investment case, a program of promoting new electrical/electronic investment with an immediate market offers an opportunity to reverse the trend to imports in the Australian markets. Companies as different as Phillips at Newcastle, which closed, and Electrical Equipment in Melbourne offer examples of a receding industrial base. Even takeovers do not support prospects as they commonly result in transfer of research and development to the head office, reducing the long term innovative potential in Austalia, and can significantly increase import propensity through intra corporate trade.

The case for the smelter proposal in W.A is weak. The case for the alternative approach requires a change in thinking. The latter, at least, offers direct employment opportunities in WA with no leakage of domestic economic assets in subsidies to foreign consumers. More positively, the alternative path may be a bridge to a substantial manufacturing employment base in WA with export viability coupled with savings to domestic energy consumers.

(vii) The future of modular importing as a new form of import competition confronting the Australian producer

To what extent then does modular importing constitute a major new form of import competition and hence a major obstacle to a program of import replacement as advocated in this study? In other words, to what extent does modular importing of power stations into Queensland, power generating plant and aluminium smelters into Western Australia and brown coal liquefaction plant into Victoria constitute "once off" forms of import competition or a new and permanent force to be contended with by Australian trade unions, employers and policy makers.

The authors of this report would argue that modular imports, particularly from Japan, but from other countries as well, represent and will continue to represent a most serious challenge to both the heavy metal engineering industry and the metals engineering industry in general Table 3.1.15 (see Tabular Appendix to 3.1) summarizes the Japanese turnkey projects (or modular projects) that were either planned or underway for export from Japan to Western Pacific economies, including Australia, in 1981-82. The projects amount to a staggering $A9.6 billion. They involve modular imports into West Pacific countries of:

fertilizer plant and equipment	synthetic gasoline plant and equipment
integrated iron and steel mills	sugar refining plant
cold roll facilities	coal handling and transport facilities
cement plant and equipment	LNG complex
power plant and equipment	iron and steel plant
oil refinery plant and equipment	geothermal power plant
hydro power plant and equipment	
oil cracking plant	

The names of the Japanese companies (Mitsubishi, JGC, Mitsui, Kobe Steel, C.ITOH-Hitachi, Toshiba, Chiyoda Chemical, etc.) are self-explanatory, as are their consorting arrangements, the financial packages that they or MITI provide, and the other offsets (access for Australian mineral, energy and agricultural producers to Japanese and other markets through trading companies) that are used to secure contracts for these companies, regardless of the competitiveness or potential competitiveness of Australian and other West Pacific domestic producers.

When the authors of this report discussed the phenomena of modular importing with employers, government officials and Trade Unions (including overseas Trade Union organizations), it was constantly emphasized that, in their opinion, this was more a permanent than a "once off" form of import competition. This is confirmed by the work of Hout and Magaziner, which was discussed at the beginning of this section on heavy metal engineering, and strongly implied in both the tables in the Appendix and the analysis of this report generally. The policy response to modular importing is dealt with later in this section, as well as in Part V of this report, dealing with the policy framework.

(viii) Procurement practices and the project management - consulting engineer design function The significance of the ownership - supply network relationships previously discussed in this report with respect to investment/purchasing have another critical dimension which acts as a barrier to import replacement. This concerns the foreign ownership and control of the "project management"/consulting engineer function, particularly with respect to major mineral and resource development projects. It appears that this has led increasingly to project design and procurement practices organised around overseas "approved supplier lists" thus increasing import penetration of the metals-engineering industry. It has also meant increasing technological dependence as well as diminishing Australia's competitive advantage in skilled labour both in terms of craft skills and engineering/professional service skills.

Like foreign investment, there are a number of significant benefits that Australia derives from overseas participation in project management. In some cases this may involve access to imported technology embodied in certain state of the art capital equipment, as well as managerial and engineering expertise. However, the costs associated with foreign control of project management and consulting engineer functions in Australia's mineral and energy resource projects appear to have been considerable. As such it merits further analysis leading to policy changes. What follows is an overview of some of these problems that can act as an obstacle to import substitution programs. It is not intended to be definitive, but rather highlights some of the issues that are now central to the policy debate in Australia's heavy metal engineering industry.

The costs derive from the virtual exclusion of Australian "project management" Design and consulting engineering firms from significant involvement in major resource projects. Such projects are typically organised by large overseas owned project management - Design and Engineering consultant firms (which are often diversified conglomerates) such as:

* Bechtel Pacific Corporation Ltd.: The parent firm is Bechtel Civil and Minerals Inc. U.S.A., which is part of Bechtel Group Inc. based in San Francisco with subsidiaries in Brazil, Chile, Panama, Canada, Saudi Arabia, Taiwan, France, Spain, the U.K., Italy, Mexico and Australia.

* Raymond Engineers Australia Pty. Ltd.: The parent firm is Raymond Kaiser Engineers Inc. U.S.A., which is part of the Raymond International Inc. group with subsidiaries in the U.K., Venezuela, Egypt, Canada, Malaysia, Nigeria, West Germany, Panama, Liberia, Singapoe, Brazil, Taiwan and Australia.

* Davy McKee Pacific Pty. Ltd.: The parent firm is Davy McKee International (Holdings) Ltd.

* Fluor Australia Pty. Ltd. (Formerly Utah construction and Engineering Pty. Ltd.): The parent company is Fluor Corporation USA, with subsidiaries in Brazil, France, Saudia Arabia, Republic of Ireland, Virgin Islands, Spain, Bermuda, Canada, Venezuela, Liberia, Malaysia, Belgium, UK, France, West Germany, Hong Kong, Italy, Panama, Netherlands, Norway, Nigeria, South Africa, Chile, Japan and Australia.

An indication of the size and overseas supply structure of these firms is presented in Table 3.1.14 (see Tabular Appendix to 3.1) for Fluor Corporation U.S.A., a company founded in the United States in 1924. As noted in the 1982-83 Stock Exchange Official Yearbook London, Fluor Corporation "and it's principal subsidiaries are engaged mainly in engineering and construction of plants for petroleum, natural gas, chemical and electric power industries, offshore exploratory drilling, marine engineering and construction and civil mining engineering and construction. Through a subsidiary the company has diversified natural resource operations world wide." The table in the Appendix highlights the extensive corporate empire that Fluor established up to 1982 before the disinvestment of St. Joe Minerals Corporation and other changes.

Given the world scale operation of firms such as Fluor, Bechtal etc., there are understandable reasons why overseas owned consulting engineers and project management teams have tended to dominate the development of Australia's natural resources projects. As the ACEA noted at it's Annual General Meeting in 1983:

"As Australia's enormous natural resources were progressively uncovered, huge new industries began to develop. This has occurred in the main only over the last 20 years. Massive iron ore mines (and their transport and infrastructure), an oil and gas industry, coal export on a vast scale, uranium, bauxite and aluminium and synthetic fuels are most, but not all, of these new found industries.

These developments incorporated a number of factors which mitigated against the use of local consulting engineers and favoured the introduction of large, experienced engineer - constructors from overseas. In no particular order, the main factors were:

* They had highly developed process engineering skills (copper, hydro carbons, uranium).
* They were known to the offshore financing houses.
* They understood the sophisticated financing techniques inherent in developments on this scale.
* They had management techniques appropriate to the control of large projects.
* They had proven experience in engineering similar huge projects.
* They had experience in procurement, expediting etc., on a world scale."

In addition, Australian engineering firms had, prior to the major mineral and energy discoveries in the 1960's, been largely oriented to irrigation, water supply and other infrastructure projects. With the development of the mineral and energy discoveries in the 1960's, Australia's civil engineering organisations participated in infrastructure support for resource projects (water supply, roads, railways etc.), and locally owned firms participated in subcontractual engineering and construction.

However, Australian mechanical, electrical and process engineering firms and design teams were locked out of the core high mechanical, chemical, piping, electrical and instrumentation content of resource development projects. Australian firms had not had the opportunity to establish a proven track record with such projects, thus proving acceptable to off-shore financing houses, or gain project management experience and design expertise in the high technology often required (for example aluminium smelting technology, process technologies for chemical plants and oil refineries and many other forms of technology associated with manufacturing plant and processes). There are not enough examples of technology transfer that should have enabled the development of a high capacity for such participtation by Australian firms. And there appears to have been little R & D work undertaken by Australian firms to develop these critical technologies given their exclusion from significant resource project participation, and the absence of effective and enforced government policies to facilitate such participation so as to foster resource creation and develop competitive advantage.

The results of this development or lack of development were summarised recently in the following terms. As the President of the Association of Consulting Engineers noted recently in the Journal of the Institute of Engineers "I know of only one out of fourteen major resources projects in Australia where Australian Engineers are the prime consultants". By way of contrast the authors of this report had their attention drawn to developing countries such as Malaysia which have legislation that requires overseas firms to work through local consultants: that 30% of the equity of the association be owned by the local firm; and that the local firm must lead the project thus internalising the learning curve effects of managing development and technology transfer.

For Australian consulting engineers and design teams, the prospects are not at present particularly optimistic. Modular importing of complete power stations, smelters, coal liquefaction plant, etc., transfers more and more of the design and engineering work back to the overseas supplier. It is no longer a matter of simply being excluded from certain core, high technology functions. Modular importing goes considerably further in absorbing design and engineering work out of Australia.

This situation applies even more to offshore oil and gas related work. The second phase of the North West Shelf will be designed and engineered out of the United States, Japan and the Netherlands, although some Australian design teams will participate overseas. Nevertheless, the purchaser-overseas supply network will continue to encourage avoidable import penetration just as occurred in the first phase of the project. As the Hunter Development Board noted in its 1979 Report, 'A Study of the N.W. Shelf Gas Project and Bass Strait Production Opportunities',

'The North West Shelf project, when broken down into elements, does not offer as much to Australian industry as the large published expenditure figures first indicated.....The consortium will be forced to buy equipment from Japan as a condition of gas sales' (p.15) Given our assumption that Australian engineer, design and project management groups have a better understanding of the Australian manufacturing sectors capabilities and hence are more likely to eliminate available import penetration through domestic purchases (where this proves cost effective), their lack of participation has broader ramifications that requires an appropriate policy response. This matter is dealt with later in this section.

3.1.3 Policy Proposals

A major conclusion of this report is that the policies required to achieve the magnitude of import replacement or export expansion indicated in the simulations would be relatively costless. That is to say, there exists at the margin a significant amount of avoidable import penetration and unnecessary restrictions on export expansion. There are administrative and political costs in achieving this and other potential costs as well. But our conclusion is that after taking such costs into account on a cost-benefit basis a very large proportion of the import replacement or export expansion required to achieve the effects indicated in the domestic metals engineering industry expansion simulations would be costless. It simply requires commitment and tripartite consensus to develop the appropriate policy framework and policy instruments. The latter are capable of altering some of the detrimental effects of the technological, behavioural and institutional structures of a modern industrial economy, particularly in terms of non-tariff barriers in international trade, as well as corporate and government purchasing policies.

In developing policy proposals the authors of this report have been guided by the ALP Industry Development Platform which states in part:

"Labour recognises that government, unions and businesses have a mutual interest in expanding the opportunities for investment and employment and that each has a great deal to contribute. The basis for agreement is substantial and such agreement should lead to commitments by all parties in return for the benefits rendered".

Thus we have focussed on policies, wherever possible, that have a high consensual basis and are effective and efficient in achieving the objectives set in the domestic metals engineering industry expansion simulations.

The Need for a Combination of Demand Stimulus and Import Replacement

As noted in the MTIA April 1984 survey, the "sales expectations for the 12 months to December 1984 point to solid growth in:

. agricultural equipment

. diecasting
. motor vehicle parts and accessories
. industrial machinery, and
. electronic/light electrical products

On the other hand sectors exhibiting the weakest growth prospects are:

. founding
. pumps and compressors
. heavy electrical plant and equipment; and
. heavy engineering plant and equipment;
. general engineering."

(MTIA - Commonwealth Bank: National Survey of The Metal and Engineering Industry: April 1984)

A recent MTIA survey conducted in mid August 1984 suggested that the future of those sectors with the weakest growth prospects have in a number of instances grown worse. While the authors of this report have not had the opportunity to examine this survey, our understanding is that it presents a particularly grim situation. The survey was undertaken with firms on the construction side of the metal engineering industry, that is firms who also have a construction interest on-site. The survey thus presents both the on-site and off-site consequences of future demand. The survey indicates:

. In the 12 months to February 1984, employment fell by 17.1%.
. In the period February to December it is expected that employment will fall by a further 7.8%.

. Hence employment will be down 25% in the period February 1983 - December 1984.

. The expectation for 1985 is for a further fall in activity. This is indicated by the fact that less than 2 per cent of firms surveyed expect to be very busy in 1985 compared to 7.5 per cent of firms surveyed who expect to be very busy for the remainder of 1984.

. This massive job loss will impact on-site employment considerably harder than off-site employment. Although job loss in heavy and electrical engineering will be above the average, several employers and government officials discussed this situation with us and expressed serious concern at the consequences such a wave of retrenchments would have on the future of the industry and of the Prices and Incomes Accord.

Similar conclusions were reached by the Department of Industry and Commerce who in June 1984 surveyed fifty firms in the heavy engineering industry (firms in materials handling equipment, pumps and compressors, boilers and plate work, fabricated structural steel, power station equipment,mining equipment and railway rolling stock). As noted earlier, they concluded "significant retrenchments are anticipated over the next few months if demand remains at current levels and the general expectation is that demand will definitely not improve".

According to both the Bureau of Industry Economics and the Department of Industry and Commerce

. "Forward orders have slumped to a very low level with a large number of firms relying heavily on repair and maintenance to maintain employment. No improvement is expected for the next 18 months to 3 years in view of the lack of major projects in the planning stage by either the private sector or State Government Authorities" (Dept. of Industry and Commerce, June 1984).

. "... the main problem facing all Australian heavy engineers is the current low level of demand.... demand will remain low for quite a long period of time". (Bureau of Industry Economics July 1984)

However, based on the medium-term forecasts by the National Institute of Economic and Industry Research (NIEIR) the authors of this report would argue that demand deficiency is only a major problem for another 18 months, after which time demand will grow relatively strongly for metals and engineering in general, and heavy engineering in particular. The problem is one of how to bridge this 18 month gap by getting work into sectors such as heavy engineering now, to sustain it until the pick-up in demand occurs in 1986.

This argument is validated by the following forecasts from NIEIR:

. Real private investment in mining is projected to grow by an average annual rate of 24 per cent, 1986-1988.

. Real private investment in manufacturing is projected to grow by an average annual rate of 20 per cent, 1986-88.

. Within the Mining sector, a "resources boom" is projected for oil and gas, aluminium, and black coal. As a result, total mining investment (in 1979-80 prices) is projected to rise from a trough of $1639 million in 1985 to $2537 million in 1988.

The question is, what will be left of metals engineering subsectors such as founding, pumps and compressors, heavy electrical plant and equipment, heavy engineering plant and equipment and general engineering by the time the forecast "boom" eventuates? The recent MTIA survey suggests that the capacity of these sectors to respond to such demand will be seriously diminshed. In addition the implications of the narrowing of the skill base, followed by post 85 rapid expansion would have potentially serious implications.

Accordingly, the authors of this report strongly recommend that, firstly:

1. Given the decision of the Federal Government not to provide the short term demand stimulus to sub-sectors such as heavy engineering in the recent budget, State Governments undertake to shoulder this responsibility.

2. That State Governments bring forward, as rapidly as possible, heavy engineering project work, and, if fiscal constraints are a major consideration, that State Governments do this by reorganising their capital work programs to provide a more approprite balance between civil and heavy engineering projects.

3. That the Federal Government give an undertaking to the states to negotiate joint funding arrangements for additional heavy engineering project work, that is, additional to what would otherwise occur (ie. that results from other than a reorganisation of project mix between civil and heavy engineering). That this be premised on the Federal Government determining to provide an emergency package to the heavy engineering industry after the 3 month IAC inquiry.

Secondly; Provided that sufficient demand stimulus is forthcoming, that employers and unions should publicly undertake the following commitments:

. that the unions in the industry reiterate their no extra claims commitment, their willingness to set up the machinery to resolve demarcation disputes before they become a problem and to enter into discussions with employers and Government on improving industrial relations practices.

. that the employers in the industry publicly undertake to enter into meaningful negotiations with unions and government, with the objective of achieving an industry development agreement for the industry (such as the Steel Plan) over the next 12 months.

The authors of this report believe that only by giving such undertakings, from Government, unions and employers, can the principles of accountability, compensation and consultation (discussed in Section 5) be rendered meaningful and the forecast wave of retrenchments be replaced by planned growth and stabilisation policies with a high consensual basis.

Thirdly: In addition to project work, the most effective mechanism for stimulating demand will be through recovering offset obligations and tied trade aid, and this be undertaken as suggested later in this section.

Fourthly: Urgent action be undertaken to establish the industrial supply office within the policy framework recommended in this section and Section 5 of the report. It is essential to undertake this task now because:

. The forecast recovery in mining and manufacturing is already leading a number of key firms to begin preliminary planning of their sourcing/procurement policies. In black coal, aluminium, oil and gas and a number of manufacturing subsectors, purchasing of equipment is usually locked in 18 months to 3 years in advance, depending on the product specifications, delivery times etc.

. The structure of import demand for Metal engineering products as a result of the forecasted growth in oil, gas, black coal, aluminium and manufacturing investment (1986-88) will change considerably. As shown in the Appendix in Table 3.1.9, the demand for imported capital equipment is (on previous trends) likely to increase significantly in

. ASIC 3369 - industrial machinery and equipment n.e.s. . ASIC 3362 - construction machinery . ASIC 3357 - electrical machinery and equipment n.e.s. . ASIC 3245 -

transport equipment n.e.s.

Hence to benefit from this growth in demand through import replacement, where this is effective and efficient on a cost-benefit basis, it is essential that the industrial supplies office structure and policy framework be set in place quickly. To assist in the transition, industry supply offices at the state level are likely to be more effective and more quickly operational. Thus, mechanisms to co-ordinate state/federal supply office structures at an early stage should provide the catalyst for the overall policy framework to evolve as set out in section 5 of this report.

The following recomendations would reinforce the four previously discussed factors and, on a cost effective basis, achieve the results outlined in the metal engineering industry expansion simulations.

Industrial Supplies Office

As noted by the tripartite Machinery and Metal Engineering Council in its 26 July 1984 submission to Government Emergency Package of Support for the Heavy Engineering Industry:

"There is clearly room for greater co-operation between the Government and industry in private sector purchasing arrangements. The pilot program recently established between the Victorian Government and the Ford Motor Company, which involves the establishment of an ISO in Victoria, is an excellent example of the role large companies operating in Australia can play in increasing the access other Australian companies have to local manufacturing opportunities.

This concept has particular application to the machinery and metal engineering industry because of the high concentration of project work performed by this industry. The Council recommends that the Federal Government, in consultation with the Machinery and Metal Engineering Industry Council establish an ISO for the Australian machinery and metal engineering industry".

Such a proposal is consistent with the recently adopted ALP Industry Development Platform which emphasises the need to maximise the purchases by the private sector of domestically produced goods by creating appropriate industrial supplies structures with the necessary marketing and technical expertise to assist and advise both suppliers and purchasers of product and market availability and requirements. (Clause 12)

The mechanics of how the ISO would operate are outlined in detail in Section 5 of this report.

Offsets

As noted by the Machinery and Metal Engineering Council:

In formulating proposals for utilisation of current obligations the Council noted:

. That purchase of Australian heavy engineering products by an overseas supplier is consistent with the strategic and technological emphasis of the offsets program.

. That limited amounts of offset work has been directed into Australian heavy engineering (propeller shafts, ring forgings, muzzle brake castings etc) and that no systematic attempt has been made to do so.

. That some $1 billion worth of offset credits remain unutilised representing thousands of potential jobs.

. That the offsets Review Committee, established in May 1984 will submit a report to Government in November making recommendations on future directions for the offsets program.

In this context, the Council recommends that this Inquiry be requested to identify areas where outstanding offset obligations can be brought forward immediately and means by which the remainder can be effectively pursued. In terms of future offset undertakings, the Inquiry should address the need for more effective enforcement measures including tougher non-compliance provisions to be incorporated in any contracts let to overseas suppliers.

The Council believes that in the interim, a major initiative should be launched by Government to target offsets into the machinery and metal engineering industry by:

. Examining the purchasing needs of our overseas suppliers to identify where offset oportunities for heavy engineering can be found. That this be backed up by industry offset missions where appropriate.

. That Government should assist the enforcement of offsets commitments and support industry to have placed within Australia substantial offset and tied trade aid work within the next twelve months.

Developing Country Preferences

As noted by the Machinery and Metal Engineering Council

"The Council recommends that the Developing Country Preference scheme be altered to comply with its original objective which was that this form of tariff preference be:

designed to assist developing countries overcome disadvantages they might experience in competing with other countries for access to the Australian market.

Such action is urgently required so that tariff preferences are withdrawn from all developing country imports which are clearly competitive with third country imports.

In making this recommendation, the Council notes that:

. currently some 165 countries enjoy tariff preferences on many of their manufactured imports into Australia.

. The IAC has indicated that DC Preferences have increasingly eroded levels of assistance for Australian industry and that the industries most seriously affected by developing country imports were those with a low level of protection.

. A recent study of the World Bank has shown that while the developing countries share of the Australian manufacturers market rose at an average annual rate of 12% between 19780 and 1979, their share of the industrialised countries examined as a whole grew by only 3.1% per annum.

. Since the scheme was first introduced in 1966, a number of recipient countries have developed sophisticated technologically advanced industrial structures which have allowed them to compete successfully in third countries and also undercut Australian metal and engineering companies in their domestic market.

The Council recommends that the Developing Country Tariff Preferences scheme should be re-oriented to its original objective and that tariff preferences should be withdrawn from all DC imports which are obviously competitive with third country imports".

Dumping

As noted by the Machinery and Metal Engineering Council:

"At present the complainaint industry is responsible for providing information on material injury, tentative "normal values" and export prices, while the importer is responsible for providing information on "normal values" and export prices after a prima facie case has been established.

It is submitted that the emphasis of this process should be changed from the Australian manufacturer to the importer.

Measures must be introduced to prevent importers from exploiting the advantages given under the GATT & through the Australian anti-dumping system in terms of obstructing or delaying the provision of important information.

The Council also suggests that the Government should consider more effective measures to assist companies to obtain pricing information in order to establish a prima facie case of dumping."

CER and Australia-New Zealand Relations

As noted by the Machinery and Metal Engineering Council:

"The Council notes with concern the existing CER arrangements particularly in the context of the recent 20% devaluation of the New Zealand dollar and the fact that the New Zealand export incentive scheme is not due to be phased out till 1987. Already, since the New Zealand devaluation, Australian firms have lost orders to New Zealand manufacturers. In this context the Council recommends that:

. The Australian Government should negotiate for the immediate abolition of the New Zealand export incentive scheme.

. That in the context of reviewing the CER arrangements with New Zealand attention be given to some of the inadequacies of the existing licensing arrangements as they relate to the metals and engineering industry.

In terms of purchasing and preference arrangements between Australia and New Zealand the Council also recommends that:

. The Commonwealth Government renegotiate the status of Australian made products under purchasing preference arrangement to ensure that those Australian products are given local manufacturing status consistent with this concession currently offered by Australia in the case of New Zealand products.

. And that the New Zealand Government should implement this policy independent of current negotiations with Australian States regarding existing preference arrangements.

. That if Australian States ultimately give local industry status to New Zealand products under purchasing arrangements that this be done strictly on a reciprocal basis with New Zealand taking into account any differences between preference margins."

Machine Tool Building

As noted by the Machinery and Metal Engineering Council:

"The Minister for Industry and Commerce is requested to convene at a very early date, a meeting of senior representatives of the major purchasers of machine tools. The major purchasers include General Motors Holden, Ford, Mitsubishi, Toyota, Nissan, B.H.P., Department of Defence Support, Department of Defence, and State Government Departments and Instrumentalities. The purpose of the meeting is to seek a commitment from the major purchasers to Australian made equipment where this is economical.

Specifications and Tendering

Council recommends there should be urgent consultation between Australian Machine Tool Manufacturers and State and Federal Government end users such as

Department of Defence Support, Department of Defence, TAFE colleges and other statutory authorities and instrumentalities to seek agreement to ensure that specifications are wherever technically possible written around Australian equipment, and that local manufacturers are always given the right to tender.

In addition, the consultations should encourage purchasing authorities to make sufficient budget allocations to allow for implementation of Australian preference in Government purchases.

Another benefit from such consultation would be to provide a mechanism for standardising of requirements based on feedback from end users to local manufacturers."

Modular Importing

A number of measures are required to increas Australian competitiveness in relation to modular imports of power stations, coal liquefaction plant, smelters etc. They include:

. Adoption of alternatives to system specification tendering until such time as changes to the Trade Practices Act and Foreign Investment Review Board guidelines have facilitated the development of viable consortia arrangements amongst domestic producers to participate in system specification tendering.

. More public accountability and tripartite consultation be built into the deliberations of committees such as the W.A. Aluminium Smelter Task Force and proper cost-benefit feasibility studies of existing and potential domestic manufacturing capability be undertaken.

. More public accountability and tripartite consultation is required in relation to overseas tender applications and the export financing and offsets that are being offered to secure contracts in Australia.

. As noted by the Machinery and Metal Engineering Council "The Government should develop a policy to ensure much greater participation of Australian professional services in all major Australian projects. Such participation should be required from the preliminary engineering stages of natural resource, processing defence and infrastructure projects whether work is performed overseas or in Australia".

3.2 EXPORT EXPANSION

3.2.1 Opportunities for Export Expansion

Opportunities for increasing Australian exports are critically dependent on the nature, pattern and growth of world demand. This is, unlike the situation in the domestic economy where aggregate and even sectoral demand may be affected by government policy, world demand is exogenous.

This section of the report therefore considers the historical evidence relating to trends in world demand before going on to outline our expectations of the future pattern of world demand.

(a) World Production and Trade

As noted above the opportunities for the expansion of Australian exports are critically determined by the pattern of, and trends in, world demand. Figure 3.1 in the appendix to this section shows world output of agriculture, mining and manufactured goods, along with total material output from 1960 to 1981. Ideally, data on world consumption should be used, but over such a relatively long time-frame, output is a very good proxy for consumption.

It can be seen that world output of manufactures increased more rapidly than the other components of world output — an average annual rate of 5.4per cent between 1960 and 1981. World output (and hence consumption) of agricultural goods and mining products increased at the significantly slower rates of 2.4per cent and 3.1per cent respectively. In other words, over the two decades to 1981 global consumption patterns changed significantly with the demand for manufactures growing most quickly.

Further, the data presented in Figure 3.1 suggest that on average manufactured goods successfully embodied less raw materials over the period. That is to be expected as value-added in the manufacturing process (i.e. design, technology and product development related costs) increased strongly. For example, in 1960 if 1 unit of mining product input was required to produce 1 unit of manufacturedoutput , by 1981 the amount of mining products required had fallen to 0.63.

There are some problems associated with the data used for such analyses and hence a number of qualifications need to be made. However, the underlying trends are clear: there has been a significant shift in the pattern of world output away from raw materials and toward manufactures. That shift is due to changing consumption patterns. Furthermore it is considered that the shift identified above is concomitant with economic growth and will continue into the future.

As a final point it should be noted that, in the advanced industrial countries especially, there has been a further shift in consumption patterns resulting in a greater proportion of income being spent on services. Unfortunately, data of global services production or consumption are not available, and thus it has not proved possible to quantify the importance of the shift towards the consumption of services. However, the increased consumption of services implies that the proportion of income spent in agricultural and mineral raw materials has fallen – it is expected to continue to fall, and at increasing rates.

Turning now to trade patterns the first observation to be made is that world trade has increased at a faster rate than world output. For example, in the three periods 1960-70, 1970-81 and 1960-81 world output increased at annual average rates of 5.2, 4.1 and 4.6 per cent respectively (see Table 3.2.1 in the appendix to this section). The implication of the above data is that growth in world trade has played a big role in increasing in world consumption (or output) and hence GDP.

The composition of world trade has also changed over the last two decades. The overall change in composition towards manufactures and away from commodities, reflects the change in the pattern of world output. However, the rate of that change is much faster for trade than for output. Tables 3.2.2 and 3.2.3 in the appendix to this section show the key trends in this process.The trends in world trade for agricultural products, minerals and manufactures are reviewed in more detail below.

Agricultural Products

The world agricultural sector became more trade-oriented between 1960 and 1981. Over this period the volume of exports of agricultural products grew at 3.7per cent, exceeding growth in output of 2.4per cent on an average annual rate (aar).

The value share of total exports accounted for by agricultural products declined steadily over the review period from 31.3per cent in 1960 to 14.7per cent in 1981. This fall in share of over 11 percentage points was due largely to the increasing share of manufactures exports during the 1960s and minerals' exports during the 1970s.

Over the review period, the annual average value of exports of agricultural products rose by 9.9per cent. Value growth was relatively rapid during the 1970s relative to the 1960s with annual average growth of 14.7per cent in the 1970-81 period compared with 4.8per cent between 1960 and 1970 (Figure 3.1)

The most significant factor influencing the value growth of agricultural exports has been unit value changes. Over the review period, unit value rose 6.0per cent aar significantly exceeding volume growth (3.7per cent aar). This trend however was not uniform over the review period with unit value growth of 10.3per cent aar between 1970 and 1981 (compared with only 1.4per cent aar during the 1960s). In line with the relatively buoyant market conditions for many agricultural commodities, there were strong unit value increases in the period 1972-74 and 1978-80. The volume of agricultural exports grew slowly over the reivew period at 3.7per cent aar.

The price of agricultural products exports relative to manufactures exports (real price) remained virtually unchanged between 1960 and 1981. Although real prices rose in the boom years (1972-74), these gains were eroded over the rest of the decade to a point in 1981 where real prices were about equivalent to the levels of the early 1960s.

Minerals

The world minerals sector did not show any tendency over the review period to become more trade-oriented although significant fluctuations did occur. Between 1960 and 1970, the growth in export volumes (6.9per cent aar) outstripped output growth (3.7per cent aar). This trend was reversed in the 1970s with export volumes actually declining (-0.2per cent aar) while output grew at 2.5per cent aar. Although the growth figures were affected by substantial declines in export volumes in 1980 and 1981, a trend of less trade-orientation in the world minerals sector was generally evident over the decade.

Explanations for the trend reversal in the 1970s are not readily identifiable. The figure would suggest that one (or a combination) of the following occurred over the last decade:

Major minerals importers reacted to the strong growth in minerals prices by developing and consuming domestic deposits, hitherto undiscovered or uneconomic.

- Significant growth in demand for minerals took place in countries that were already major minerals producers (i.e. these countries consumed a greater proportion of their domestic product and hence exported proportionately less)

- Strong price growth led to an increased proportion of demand being met by running down domestic stockpiles

- Increasing transport costs and energy prices led to a greater proportion of mineral ores being processed domestically in the source country.

Further research would be necessary to identify which (if any) of the above adequately describes the slow growth in minerals exports relative to output evidenced during the 1970s. The share of the value of total world exports accounted for by minerals rose substantially over the review period from 16.4per cent in 1960 to 27.4per cent in 1981. Minerals share remained virtually unchanged over the 1960s but rose 11.1 percentage points during the 1970-81 period. Between 1960 and 1981, the value of minerals exports rose strongly by 16.7per cent aar. The growth rate increased dramatically from 9.2per cent aar in the 1960s to 23.9per cent aar in the years 1970-81. Particularly rapid growth occurred in the 1973-74 and 1978-80 periods.

Unit value growth is the principal explanatory factor behind the value growth of minerals exports observed over the review period. Between 1960 and 1981, unit value rose 13.1per cent aar with particularly strong growth (24.0per cent aar) in the 1970-81 period. The peak value growth periods of 1973-74 and 1978-80 were attended by corresponding strong rises in unit value (a phenomena clearly linked with the two oil price shocks).

The volume of minerals exports grew relatively slowly (3.1per cent aar) over the review period, with significant differences in the rates observed in the 1960-70 (6.9per cent aar) and 1970-81 (-0.2per cent aar)

The real price of minerals exports increased 6.8per cent aar between 1960 and 1981. However most of the increases were confined to the 1973-74 and 1978-81 periods when real prices rose 91.3per cent and 91.5per cent respectively. Real price growth between 1960 and 1973 was slow (1.6per cent aar) relative to the boom years of the 1970s.

Manufactures

Of the three sectors under examination, the world manufactures sector showed the mostmarked trend to trade-orientation over the review period. While the volume of manufactures output grew at 5.4per cent aar between 1960 and 1981, export volumes rose 8.1per cent aar over the same period. The share of the value of total world exports accounted for by manufactures rose from 50.0per cent in 1960 to 56.9per cent in 1981.

Manufactures share peaked in 1972 at 62.3per cent but thereafter fell due to sharp rises in the value of minerals exports.

Between 1960 and 1981, the value of manufactures exports rose 14.5per cent aar. Value growth during the 1960s was due primarily to volume increases of 9.7per cent aar. However the 17.3per cent aar value growth evidenced between 1970 and 1981 can be attributed to strong increases in both unit value (10.0per cent aar) and volume (6.7per cent aar).

Summary

The world economy over the past two decades has become significantly more trade-oriented, especially in the manufactures sector. The only apparent deviation from this trend occurred in the minerals sector during the 1970s, when, in response to exceptional price circumstances, the growth in trade volumes fell well below output growth.

The compositional pattern of world exports (by value) changed substantially over the two decades under review. While agricultural products share of world trade fell progressively, the shares of both minerals (in the 1970s) and manufactures (in the 1960s) rose significantly.

By value of exports, the fastest growing category was minerals with very rapid growth experienced during the 1970s. Although recording the strongest growth during the 1960s, the value of manufactures exports increased less rapidly than minerals exports both during he 1970s and over the review period as a whole. Agricultural products was the slowest growing export category in each of the decades under review.

In volume terms, manufactures registered the strongest export performance over the review period. Agricultural products exports recorded relatively even and moderate growth between 1960 and 1981. Minerals exports grew relatively strongly during the 1960s but recorded a net decline in volume between 1970 and 1981.

Minerals exports recorded the strongest unit value performance over the review period with very strong growth evident during the 1970s. Unit value of exports of agricultural products and manufactures grew at roughly equivalent rates between 1960 and 1981.

The real price of minerals exports rose over the review period with especially strong growth recorded during the 1970s. Although some variation were evident, the real price of agricultural products exports were roughly equivalent at the end of the review period to their level at the beginning.

(b) Manufactures Trade

The above analysis of broad categories indicates the critical importance of manufactures trade. This section considers export expansion opportunities for manufactures in more detail.

Table 3.2.4 in the appendix to this section shows the elasticity of world trade with respect to international economic activity. In the capital equipment (machinery) industries, the elasticity is nearly double the elasticity for food, and more than double that of raw materials.Between 1970 and 1979, exports of capital goods from the OECD increased in real terms at an average annual rate of 12.1 per cent, whilst total Manufactures increased at slower (but still high) rate of 9.3 per cent per annum in real terms. The details of this development are given in Table 3.2.5 in the appendix to this section.

A second characteristic of the growth in manufactured exports is the success of Japan in boosting technological exports. The results are quite striking. For example, the ratio of technology exports to imports has increased almost three-fold in the nine years to 1980. This is illustrated in Table 3.2.6. Two factors emerge as making major contributions to the success of both the OECD and Japan in the export of technology.

First has been the deliberate targeting of markets: the bulk of the exports of capital goods from the OECD were, for instance, destined for the OPEC countries and the newly industrialising countries of the Western Pacific Region (WPR0). In the period 1970-79 exports of capital goods and equipment to OPEC countries helped to boost exports of capital equipment to developing countries to over 40per cent of total exports of these goods from OECD countries. At the same time, developing countries have been the destination for only about one quarter of the OECD's exports of total mmanufactured goods.

Second, and in Japan's case, has been the deliberate targeting of particular goods for export. It is this willingness to actively promote the development of high-quality and competitive export products (combined with institutional ability to adjust its industrial structure to take advantage of growth sectors in the international economy) which lies at the base of Japan's favourable economic performance in the 1980-83 period. It is also true that, while the USA remains the major market for

Japanese exports, the Middle East and Western Pacifc Region economies also rate highly as destinations.

The imports of capital goods in Western Pacific Region Economies account for a large proportion of their total imports, as set out in Table 3.2.7. For example, capital goods imports account for almost 50per cent of Indonesia's imports and roughly 30 per cent for Malaysia, Philipines, Singapore and Thailand.

In conclusion, it appears that Australia is well-positioned to take advantage of the large potential for exports of capital goods. It has been suggested in the previous section that Australian industry could be re-developed if a range of assistance measures were applied. However, on their own, these assistance measures would – at least – have limited effect without their integration into a total development package.

The experience of both the OECD and Japan indicate which factors can contribute to a successful package. First, it is a necessary element that particular industry sectors receive precise and directed policy attention. In contrast to previous attempts to boost Australian industry by concentrating on the general economic environment (roughly, macro-economic policy), it is now necessary to concentrate on those industries which show the greatest potential. In Australia's case, this would appear to be capital goods.

Second, it is necessary to concentrate on specific markets. Again, from the available evidence, in Australia's case the natural geographic comparative advantage it has in the Western Pacific Region, indicate that concentration on this region provides a national basis on which to support the more direct assistance outlined in the previous section.

3.2.2 Australian Exports

a) The Pattern of Australian Trade

In world terms, Australia is a middle-ranking trading nation. In 1983 we ranked 19th in the world in value of world trade and exports accounted for about 15per cent of Australia's GDP. It is perhaps more significant, however, that on these measures Australia's performance over recent years has not kept pace with similar countries. In fact, in absolute trade terms we have slipped five places in the last five years. The share of Australia's GDP accounted for by exports has remained virtually unchanged since the early 1960s while the shares of other fast growing countries have increased markedly.

Australia's relatively low (and slow growing) dependence on trade compared to most similar sized countries is due to a number of factors including our relative geographical isolation (although this is becoming less of a constraint with the rapid expansion of the Western Pacific Region), the import replacement strategy of the post-war era which was designed to foster development of domestic manufacturing industry and our concentration on the slower growing areas of world trade (viz. primary products).

Notwithstanding the above, aggregate measures of world trade tend to mask the extremely important position Australia holds as a supplier of primary commodities. Australia is among the leading world suppliers of a wide-range of important primary commodities including wool, beef and veal, wheat, sugar, coal, iron ore, bauxite, alumina and nickel. In addition, for key sectors of the Australian economy exporting is the predominant activity. Australia's relatively small population and the comparative advantage of our rural and mineral industries have meant these industries have expanded to supply world markets with large proportions of their output being exported.

Australia is one of the world's most efficient producers of agricultural and mineral commodities. These industries were largely developed in Australia to supply overseas markets. Together the agricultural and mining industries account for only 11per cent of Australia's GDP and 8per cent of the labour force. These industries, however, have traditionally provided the bulk of our export earnings with about 80per cent of our exports being primary products. This share has remained virtually unchanged over the last twenty years or more, although the relative contributions of the rural and mining sectors have changed considerably.

Australia's manufacturing industry accounts for around 20per cent of GDP and 18per cent of employment. This represents a significant decline from the level of 10-20 years ago. This trend is consistent with the trends in most developed countries and reflects the fundamental restructuring which has occurred in manufacturing industry in Australia over this period. This restructuring has coincided with reductions in protection which have exposed Australian manufacturing industry to increased overseas competition. Overall between 1968/69 and 1981/82 the effective rate of assistance accorded the manufacturing industry in Australia has fallen from 36per cent to 26per cent.

The export orientation of Australia's manufacturing sector is low and has not increased significantly for most industries over recent years. The IAC estimates that the export to turnover ratio of the manufacturing industry as a whole is only around

10per cent, and for around 70per cent of Australia's manufacturing industry the ratio is only 5per cent. Exporting, to the extent it has been carried out at all, has traditionally been viewed as a peripheral activity and not central to the operation of the firm or industry.

The most significant feature of Australia's post war trading experience has been the dramatic changes in the structure of Australia's exports, both in terms of composition and direction. Australian exports historically have dependend on a large contribution from the rural sector, although this share has gradually declined. In the 1950s rural exports accounted for 70per cent of export earnings but have since shown a steady decline. In 1982-83 rural exports accounted 40per cent of export earnings.

The main reasons can be identified for the decline in rural exports. Firstly, in value terms agricultural exports were the slowest growing category of world trade. Agricultural products failed to benefit significantly from the various post-war trade liberalisation rounds and this has undoubtedly restricted the expansion of world agricultural trade. Indeed, the protectionist devices applied in major developed country markets to agricultural products intensified over the period. In particular, the EEC's Common Agricultural Policy and agricultural protection in Japan and the USA have restricted the rate of growth of agricultural exports from efficient producers such as Australia. Secondly, the income elasticity of demand for basic agricultural products is low; that is, as incomes rise relatively less of the incremental income is spent on food. In the developed countries, this has been an important restraining force on the growth of agricultural trade.

The decline in the share of rural exports has been matched by a strong growth in exports of minerals and fuels, which now account for about 40per cent of Australia's exports (c.f. about 5per cent in the last 1950s). The rapid growth in these industries since the 1960s has coincided with the strong growth of the Japanese economy. Japan now takes over 40per cent of our mineral and fuel exports.

While the share of manufactures in Australia's exports has been traditionally about 20 per cent, there have been some short-term cyclical trends about this level. The manufacturing sector's share of exports fell sharply in the mid 1970s, coinciding with a decline in Australia's international competitiveness at that time, before recovering in recent years. The share of manufactures fell from abut 24per cent in the early 1970s to about 18per cent in 1975/76 and 1976-77, but has since recovered somewhat to stand at around 20per cent.

The low proportion of manufactured products in Australia's total exports is unique amongst developed economies. In world terms exports of manufactures predominate, and account for about 60per cent of world trade. For developed economies as a whole the share of manufactures in total exports is even high at 75per cent. Even among the non-oil developing countries, manufactures account for 43per cent of total export earnings.

Not only is the composition of Australia's exports significantly different from the world as a whole but Australia's manufactures export performance contrasts sharply with world trends. As noted earlier, growth in manufactures has been the driving force behind world trade for most of the post-war period. Although the rate of growth of manufactured exports in the 1970s and early 1980s was considerably less than the growth achieved in the 1960s, in real terms manufactures remained the fastest growing component of world trade. In the period 1973 to 1982 the volume of world trade in manufactures grew at an annual average rate of 4.5per cent. This compares with rates for minerals and fuels of 2.5per cent and agricultural products of 4.0per cent.

The performance of Australia's manufactured exports has, however, been markedly different. Between 1971-72 and 1976-77 manufactures were the slowest growing category of Australian exports, increasing at an annual average rate of 12per cent (compared with annual average growth in rural products of 14per cent and minerals and fuels of 25per cent). Australia's share of world manufactures trade declined from 0.6per cent in 1971 to 0.4per cent in 1976. Since that time the situation has improved with manufactures exports growing more quickly than both minerals and fuels and rural exports.

Changes in Australia's pattern of trade have not been confined to composition. Significant changes have also occurred in the direction of trade during the post-war period. The major development has been a substantial decline in our markets in the EEC, reflecting the sharp reduction in exports to the UK (from around 10per cent in 1972-73 to about 5per cent in 1982-83) and diversification of Australian exports towards markets in the rapidly expanding Western Pacific Region and in the Middle East.

Japan emerged as Australia's major export market in 1966-67 and continued to increase in importance during the first half of the 1970s, with its share of Australia's exports peaking at 34per cent in 1976-77. Since that time Japan's share has contracted standing at 27per cent in 1982-83. Japan still remains, however, our largest export market. For several important export products Japan is of even greater importance, accounting for about 75per cent of exports of iron ore and 65per cent of coal.

The other significant trend in the direction of exports has been the increasing importance of developing countries as markets for Australia's products. Overall, in the past twenty years the proportion of Australia's exports to developing countries has risen from about 18per cent to just under 34per cent. Much of this growth has been accounted for by the major South East Asian developing economies, although exports to the Middle East have also grown strongly.

b) Australian Manufactured Exports in a World Context

In previous sections the dominance of manufactured exports in world trade was noted, and the pattern of Australian trade was discussed. This section draws those two themes together and briefly looks at Australia's manufactured exports in a world context.

Growth in manufactured exports has been the driving force behind world exports growth over the past two decades. Between 1960 and 1981 world manufactured exports grew at an annual average rate of 14.5per cent, compared with 13.9per cent for total world exports. By 1981 manufactures exports accounted for 57per cent of total world exports (up from 50per cent in 1960).

Australia's export experience is in marked contrast to that of the world. Between 1971/72 and 1982/83 the value of Australian manufactures exports grew from \$1,048m to \$3,817m, on average by 12.5per cent pa compared with total exports growth of 14.5per cent pa on average. Consequently, the share of manufactures in total Australian exports declined from 22.2per cent in 1971/72 to 18.3per cent in 1982/83.

While the share of manufactures in total Australian exports has declined, it should be noted that the performance of Australian manufactures exports has not been uniformly poor. In fact, 3 distinct phases can be identified during the 1970s:

- the period from 1971-72 to 1976-77 was a lacklustre period for exports of Australian manufactures – manufactures share of total exports exhibited a declining trend, falling from 22.2per cent to 17.4per cent.

- the period from 1976-77 to 1979-80 saw significant growth in Australian manufactures exports, with their value increasing from \$1,975m to \$3,502m

(Australian produce basis) and their share of total exports growing from 17.4per cent to 19.2per cent.

- between 1979-80 and 1982-83 the rapid growth which occurred in the previous period slowed and manufactures' share of total exports remained fairly stable at slightly above 18per cent.

In the world context, Australia's manufactures exports performance has been uninspiring in recent years. Australia's share of the world market peaked at 0.39per cent in 1979, but has drifted down since then, recording 0.38per cent and 0.37per cent in 1980 and 1981 respectively.

Australia's share of world manufactures exports is considerably smaller than Australia's share of total exports. For example, in 1979 Australia's share of world exports was 1.23per cent but weakened in 1980 and 1981 to 1.18per cent and 1.19per cent respectively. In 1982 Australia's share of world exports increased to 1.26per cent (that increase, however, reflects the fall in the value of world trade in 1982 as a result of the global recession, rather than growth in the value of Australian exports).

Australia's much smaller penetration of the world manufactures export market than its penetration of the total world export market reflects, in large part, Australia's specialisation in the production and export of raw materials (including fuels) and foodstuffs.

That specialisation is demonstrated by, inter alia, the fact that whilst the UN Standard International Trade Classification provides for some 1,741 manufactured goods, Australia recorded exports (including re-exports) in 941 of those groups in 1981. Furthermore, 86per cent of Australia's manufactured exports were accounted for by the 250 largest groups.

The bulk of Australia's manufactured exports in 1981 (some 53per cent) comprised Basic Manufactures (SITC Division 6), this contrasts with the composition of world manufactures exports – only 25per cent were Basic Manufactures. Basic Manufactures were the slowest growing component of world manufactures exports between 1979 and 1981. In general terms Basic Manufactures are comprised mainly metals and simple metal manufactures (i.e. ingots, slabs, plates etc.)

c) Recent Australian Export Performance

During the 1970s Australia's export performance was far from satisfactory, and potential of exports to provide a basis for economic growth in Australia was not realised. Australia's dismal export performance in the 1970s was documented by research by the Department of Trade which showed:

* Australia's share of world trade fell from 1.68per cent in 1970 to 1.18per cent in 1982, this was a continuation of downward slide since 1950 when Australia's share stood at 2.92per cent.
* Australia's international ranking as an exporter tell from 12th to 17th over the same period.
* of the 33 largest exporters (which accounted for 86per cent of world exports in 1980) all but 3 recorded faster rates of exports growth than Australia in value terms.
* of the 26 largest exporters (for which data were available) all but 6 recorded faster rates of export growth than Australia in real terms.
* of those 6 countries recording slower growth 5 were oil exporters
* of 67 countries to which data were available, Australia's share of their total imports declined in 41 cases.

In 1980-81 Australian exports afforded smaller commmand over international resources than they did in any year of the decade other than 1970-71; no trend increase in Australia's command of international resources was found. The prime reason for Australia's less than satisfactory export performance was the composition of Australian exports. Generally, Australia specialised in the production of goods for which world demand grew relatively slowly. The typical composition of Australian exports (vis-a-vis the composition of world exports) was estimated to have accounted for a major part of the disparity between Australia's and the world's export growth rate.

However, Australian exports failed to grow as quickly as world exports even in the product areas in which Australia specialised. The degree of processing (valued added) was found to be critical to export performance.

Generally, Australian exports were found to be less highly processed than world exports and it was shown that, with the exception of fuels, for the world the value of more highly processed exports grew more quickly than the value of less highly processed exports.

d) Balance of Payments Considerations

Reflecting the existing structure of the Australian economy, Australia's current account has traditionally been made up of a trade surplus and a larger deficit on the invisibles account. This deficit on the current account is offset by a surplus on the capital account, which is used to augment domestic savings and finance the consumption of imports. It has been postulated that the net invisibles deficit is required to avert the creation of a long-term BOP surplus (i.e. accumulation of official reserves) which could be better utilised to acquire real goods and services; or that the building up of foreign reserves would inexorably lead to the revaluation of the Australian dollar and thus threaten Australian exports and boost import substitution.

However, leaving aside these (probably) overstated dangers associated with reversing the current account deficit, it is important to note, due to the complementarities between goods and services (the latter being one component of invisibles) that an expansion of the markets for goods will probably lead to an expansion of the markets for services. The employment-generating affects of this are outlined in a previous section. As the OECD has pointed-out, the transfer of high technology "products" can involve many other exchanges, included in the invisibles component of the Current Account. Examples would include the provision of consultancy or construction services.

3.2.3 Obstacles to Export Expansion

Despite Australia's dismal record of realising the potential of exports to contribute to employment and output in the domestic economy we believe that exports can provide an engine of growth for the economy as a whole. Whether or not exports will in the future play a more positive role depends on two factors: (a) overcoming existing obstacles and (b) providing adequate and appropriate assistance

a) Obstacles

The major obstacle to strong export growth is the composition of Australian exports. As noted in previous sections Australia has speciaised in the export of commodities (with the exception of coal during the last 10 years) for which world demand has been slowly growing relative to demand for manufactures. Significantly increasing Australia's exports of rural and mineral commodities in the face of a relatively declining world market is not likely to be an efficient or effective means of providing stimulus to the domestic economy, to say the least.

Consequently, manufactures exports must be those to be targeted in any export expansion component of industry policy. Important obstacles to increasing manufactured exports are:

Scale considerations: these take a number of forms e.g. optimal plant size, size of export orders relative to total domestic production and so forth. With a few exceptions (mainly island states such as Hong Kong and Singapore) successful manufactures exporters are underpinned by a secure domestic market. The development of Japan and the Republic of Korea provide classic examples export-led growth based on a secure domestic market. Security in the domestic market enables scale considerations to be addressed.

As note elsewhere in the report import penetration of the domestic market for manufactures is high – especially in the case of the metals and engineering industries. In addition, severe fragmentation exists in the domestic industry; estimates of the number of firms in the metals/engineering industry as high as 10,000 have been made. These factors are not condusive to exporting.

Two factors can be identified which have assisted in bringing about that situation (a) the operations of the tariff and (b) the effect Australian trade practices legislation Well known and well demonstrated effects of tariff protection are to encourage foreign firms to set-up behind the 'tariff wall' and to reduce the minimum eficient scale of operations of a firm; this has been compounded by State Government preferential policies. The overall result is a larger number of smaller firms than would otherwise be the case.

Further, trade practices legislation in Australia is premised on conventional concepts of perfect competition. Important in this regard is the idea of a large number of buyers and sellers. The result of this is legislation which acts to discourage mergers, cartels and other arrangements which assist in overcoming problems associated small-scale production units.

Policy Proposals – Scale Considerations

In order to address the problems noted above we advocate amendments to the Trade Practices Act and the enactment of new legislation to encourage mergers and other changes in corporate structures. Foreign investment policy and legislation should acknowledge the problems of market fragmentation and prohibit, except on national interest grounds, new corporate entities establishing operations in manufacturing industry other than on a joint venture basis with existing firms.

Export franchise restrictions are arrangements whereby a parent, technology licensor or product licensor prohibits its subsidiary or licensee from exporting certain products or permits exports to designated markets only. They have not been regulated in

Australia although a number of existing legal instruments could have been used to regulate their incidence and so reduce their impact on export capability and performance. Of particular importance in this regard is the foreign investment review procedures where export franchise restrictions could have been addressed under the economic benefits test applied in the assessment of proposals under the foreign investment guidelines. For various reasons including the import replacement apprroach to industry development and the lack of indigenous technological research and development export considerations have not been given their appropriate weighting in foreign investment proposals.

Export franchise restrictions are associated with foreign investment, the transfer of technology and industry development and as such their negative impact on Australia's export capability and performance must not be considered in isolation but within the overall costs and benefits of foreign investment, technology transfer and industry development. The restrictions have, however, detracted from Australia's export capability and performance in the manufacturing sector.

It has long been recognised that export franchise restrictions have implications for Australia's export performance. As long ago as 1965, the issue was addressed in the Vernon Committee report. Later in 1975, the question was again addressed in the Jackson Committee report on the manufacturing industry. In the euphoria of the mining boom the problem was swept under the carpet.

Currently, the Government is developing and implementing a number of trade development initiatives, aimed at revitalising Australia's export performance. Underlying this policy is a recognition that expanding export-oriented manufacturing and services sectors provide a basis for employment growth. Export restrictions are inconsistent with this policy. Such restrictions impair the development and threaten the competitiveness of industry.

The Trade Development Council's (TDC) report entitled "Export Franchise Restrictions" (1983) indicated that export franchise restrictions are an important constraint on Australia's capacity to increase it export performance. The Report identified 900 firms which were subject to export franchise restrictions involving 5,400 exportable products. Subsequent research by the Department of Trade has shown that of 7,000 exportable items with promising markets, 1,000 are subject to export franchise restrictions of one form or another.

The negative effects of export franchises in the metals and heavy engineering industries is severe. Department of Trade data on firms with which it has had contact indicates that the export/output ratio for firms without franchise restrictions is around 30per cent, whereas for firms with franchise restrictions the export/output ratio is around 10per cent. These ratios imply that exports foregone by the metals and heavy engineering industries amount to over $500m p.a. Such a level of exports is consistent with employment, both directly and indirectly of over 15,000 persons.

The estimates above understate foregone exports and employment since the sample of firms is biased towards those interested in exporting as reflected in their contact with the Department of Trade. The ultimate effects of franchise limitations could well be an order of magnitude higher.

Policy Proposals

Export Franchising

The most urgent need is to improve the existing data base on export franchise restrictions. Without more complete data on the incidence of these restrictions it is impossible to determine their overall impact. We support the call by the TDC for the registration, with the Departent of Trade, of all existing and future export franchise arrangements.

More specifically we recommend that Government policy should have elements of a "carrot and stick" approach to encourage the liberalisation of franchise restrictions:

* consultations with firms to widen franchise restrictions or to grant world product mandates
* under CER export franchses should be widened automatically to cover NZ
* Government purchasing to be used as a means of encouraging firms to remove restrictive franchise arrangements
* Government encouragment of subsidiaries to approach overseas parents about franchise restrictions

Export franchise restrictions are very closely linked with the question of restrictions on the transfer of technology generally to Australia.

* we believe that export franchise restrictions should be addressed as a priority but we agreed with the Department of Science and Technology that there is a need for integrated industry, technology and export policies. We agree in principle that registration should cover not only franchise restrictions but any restrictions in technology licencing that may affect the future ability or capacity to export.

* the creation of a data-base of Australian suppliers in order to assist the Trade Department and the proposed OTC in matching overseas demand with Australian supplies.
* povision in the relvant legislation to the OTC and Trade Commissioners to take a more active role in commercial negotiations.

b) Assistance Measures.

It is a major contention of this report that exports of manufactures can and should be assisted by the Government.

Before reviewing the options for assistance it is appropriate to briefly state the case for governmental assistance. That case is promised on a number of factors. The nature of the world trading environment, the neoclassical arguments in favour of free trade and their implications are accepted, however, it msut be recognised that the real world trading environment does not accord with the assumptions of the neoclassical model and thus neoclassical trade theory provides an inadequate and even counter productive basis for trade policy.

It is clearly inappropriate in this report to launch into a long digression into the irrelevance of neoclassical trade theory. However, it is appropriate to list a few key realities:

* corporate buying practices depart severely from the neoclassical model. Available data on such practices were presented earlier in this report, nonetheless a key fact is worth repeating: UNCTAD estimates that 40per cent of world trade is conducted between related corporations.
* government procurement policies; the world trade environment is further distorted by government purchasing regimes. These are manifested as both preferential purchasing arrangements and, most importantly, the growing incidence of government-to-government trading activities counter-trade; the available evidence, albeit scanty, indicates that counter-trade is a growing activity. Counter-trade, of course, takes many forms and is manifested in government-to-government trade, in offsts, and in trade between non-affiliated corporations
* foreign trade policies, trade policies operated by Australia's customers and competitors effectively manipulate the trading environment to their advantage and thus to Australia's detriment. Examples of such policies abound – a few examples will suffice:
* export credits, and cheap loans are routinely granted to effectively subsidise the purchase price of exports

* tied aid is really a form of export credit.

In view of the obstacles to export expansion mentioned in the previous section and he non-market aspects of the world trade environment adumbrated above it is clear that it is totally unrealistic to expect export expansion to occur of its own accord, government assistance is required.

The second part of the case for government assistance for export expansion rests on the positive contribution export expansion would make to the economy as a whole

Three pieces of evidence support that view:

* the results of the simulation presented elsewhere in this report
* independent research conducted by the Department of Trade into the employment creating effects of exports.
* the development strategy and experience of such fast growing countries as the Republic of Korea, Japan, Taiwan etc. etc.

The design of an export expansion assistance package is outside the scope of this report, we consider that such a package can only be constructed after consultation between exporters, unions and the Department of Trade. Nonetheless, it is useful to briefly review the wide array of instruments available to the government in this regard.

i) Export Market Development Grants Scheme: we consider this scheme to have been a most effective instrument of export expansion. It does, however, contain a number of weaknesses which could be easily overcome, thereby enhancing its effectiveness. In particular, provision should be made for eligible expenditure by firms to be cleared with the Board in advance; this would facilitate planning and assist with the speedy settlement of claims. The claims procedure should be investigated with a view to speeding up settlement. The present situation where claims may not be settled for up to two years after incurring expenses undermines the effectiveness of the scheme. In this regard additional funds should be made available for the settlement of claims in the year, and preferably within the quarter of the year in which they are made.

In addition, to assist in bringing about the results indicated by the simulation presented elsewhere in this report an extension of the scheme, involving higher rates of cost recovery, should be afforded to the metals and engineering sector.

(ii) Export Finance: increasingly the financial package offered by an exporter to potential customers is becoming critical to achieving sales. In this regard Australian firms are placed at a marked disadvantaged to their overseas competitors. It is vital that arrangements be made for ensuring Australian exporters can compete effectively in the supply of financing packages – to this end it is recommended that EFIC be given the necessary powers and resources.

(iii) Export promotion: expenditure is vital to achieving increased exports. It is recommended that export promotion expenditure for manufactures especially engineering goods, be increased.

(iv) Foreign Aid: Australian foreign aid should be tied the purchase of Australian exports. This policy should be phased-in over three years in respect of existing aid disbursements. Any increases in aid disbursements should only occur in respect of tied aid. In drawing up aid programs preference should be given to manufactures, especially engineering,exports.

(v) Offsets: the government should redouble its efforts to obtain offsets. Further, the commitment to make offset purchases should be made legally enforceable and enforced. At the same time, the range of goods acceptable to the government for export as offsets should be widened to encompass all manufactures, but with emphasis on engineering products, as well as technology goods.

(vi) NZCER: the agreement with NZ on closer economic relations should be re-negotiated to provide a more equal distribution of benefits, in particular improved access for Australian manufactures in the NZ market should be obtained.

(vii) An Overseas Market Information System: should be established, the system comprising quantitive and qualitative data on export opportunities should be comprehensive and access for all exporters should be readily available. It is envisaged that this could best be achieved in the form of an on-line, real-time computer data-base.

3.3 A CASE STUDY OF THE EFFECTS OF INDUSTRY ASSISTANCE TO METALS AND ENGINEERING INDUSTRIES

There are various instruments for encouraging growth in the metals and engineerinig sector. The effects of an undefined, but successful, policy are given below, in terms of both the macroeconomic and microeconomic effects. There is no attempt here to evaluate the relative effectiveness of the range of possible instruments. However, two key assumptions are made. Firstly, real wages are assumed to remain constant in response to all shocks imposed on the model. Secondly, monetary policy is accommodating, that is, the nominal rate of interest is held constant.

The particular industries selected for the analysis are producers of highly fabricated products: the appliances and electronic equipment, electrical machinery and equipment, agricultural machinery and the other industrial machinery industries. It is assumed that the development policies result in a direct increase in the domestic output of these industries, that is, the increase may be achieved either by import replacement or by export expansion, or by a combination of both.

It is important to note that because of this, the analysis is a partial one only. It is also partial because the costs of the assumed policy or policies have not been included.

Industry Profile

The particular industries included in the case study are defined according to the ASIC classification given in Table 2.1.1. In 1979-80, the four industries accounted for just under 10 per cent of total manufacturing gross output (that is, including materials input) and for 6.8 per cent of total manufacturing exports and nearly one-third of total manufacturing imports. Nearly 14 per cent of manufacturing employment was in these industries. Table 3.3.1 shows the historical and projected (in terms of the forecast presented in Part I of this study) levels of total supply, total imports and total exports for the four industries selected for this study.

The Control and Disturbed Solutions

The sensitivity study reported in this paper is based on a comparison of the results of a control and a disturbed solution of the IMP model at the University of Melbourne. The model used was the model documented in Peter J. Brain, The Structure of the Australian Economy, which is in 1966-67 prices. This is not exactly the same model used for the projection in Part I, since the model has been updated and converted to a 1979-80 price base. However, the control solution for the documented model was made to be as near as possible to the control solution previously presented.

For tradeable goods industries, the effect of industry development programs is to expand domestic production, either from an expansion of exports and/or from the substitution of domestic production for imports. The shock imposed on the model to generate the disturbed solution was to assume that undefined, and uncosted, industry development programs are simultaneously applied to the four nominated industries. The programs are assumed to be successful in expanding domestic production for the four industries by an amount equal to 5 per cent of the control solution values for total supply (domestic production plus imports). For example, Table 3.3.1 shows the increase in domestic production for the four industries, given 1981-82 total supply values. In the case of the industrial machinery industry, total output is increased directly by $263m in 1979-80 prices. This magnitude represents either a reduction in the import share of 5 percentage points, or just on a doubling of exports. For computational ease, the shock is treated as a reduction in import share. However, because this is assumed to be costlessly achieved, the results would be the same if exports were increased by an equivalent absolute amount. The only difference would be the causal factors underlying the change in the net trade balance. The shock is once-off, that is, it is applied in the first year of the disturbed solution (1982-83) and maintained at this level for the remainder of the projection period. Thus, in any given year of the disturbed solution, the import share is 5 percentage points for each of the four selected industries below the corresponding control solution value. Alternatively, if the shock had been applied to exports, exports in the disturbed solution would have to have been increased above their control solution values by an amount equal to 5 per cent of total supply in the control solution.

TABLE 3.3.1 : IMPORTS, EXPORTS AND TOTAL SUPPLY
$1979.80m

	Year	Appliances and Electronic Equipment	Electrical Machinery and Equipment	Agri-cultural Machinery	Other Industries Machinery
Total Supply (a)	1974.75	4253	2133	790	4333
	1981.82	5179	2433	903	5253
	1988.89	6722	2669	643	4708
Total Imports	1974.75	2084	516	263	1770
	1981.82	2442	738	386	2560
	1988.89	3689	779	233	2269
Total Exports	1974.75	180	139	88	276
	1981.82	334	96	60	230
	1988.89	408	209	129	369
Impact Disturbance to Domestic Production	1981.82	260	122	45	263

Sources: NIEFR. The values 1974.75 and 1981.82 are actual Data points. The values for 1988.89 underline the main economic projections outlined in Part 1 of this study.

NOTES: (a) Domestic Production plus imports.

The Macroeconomic Implications of Domestic Output Expansion in Selected Metals and Engineering Industries

Tables A.1 to A.14 and B.1 to B.14 in the Appendix C of this study show the effects of the once-off development policy in the four industries on major macroeconomic and industry variables, the results being expressed in terms of differences between the disturbed and control solutions of the model, per cent differences in the first set of tables and absolute differences in the second. For example, Table A.2 shows that by year five, gross domestic product increases by 1.4 per cent while Table B.2 shows the increase to be $615 billion in 1966-67 prices. If year five is taken to be 1988-89, then the 1.4 per cent can be applied to level of GDP in 1988-89, shown in Table 1.13, to obtain the disturbed solution value of GDP in 1988-89 as $149.2 billion, or $2.1 billion (in 1979-80 prices) higher than the control solution value.

Table A.2 in the Appendix shows that the increase in GDP in the first year is 0.8 per cent but the fifth year increase is 1.4 per cent. This gradual widening of the differences from the control solution values is the result of the lagged adjustments in the employed factors of production and in expenditure levels. The increase in domestic production comes as the reduction in imports (or increase in exports) increases the desired level of employment and of capital and inventory stocks, but for a number of reasons there are lags in the adjustment of the actual values of the vaiables to their desired values. The results given in Tables A.2 and A.7 show private investment, inventory investment and employment all exceed their control solution values by more in the fifth year than in the first year. In particular, the lagged employment adjustment means that there is a lagged adjustment in real disposable income, shown in Table A.3, and as a result the first-year increase in private consumption expenditure is only one-third of its increase in the fifth year. Further lags in private consumption expenditure are another source of the gradual nature of the build-up in enconomic activity over the period (the changes in the savings ratio are shown in Table A.3).

Table A.4 shows that prices in the second and subsequent years are lower in the disturbed than in the control solution. This is because the higher level of economic activity allows the benefits of higher returns to scale to operate (shown in the tables by higher labour productivity in the disturbed solution), hence unit production costs and the price level are lower. This is on the assumed basis that real wages are the same as they were in the control solution, except for the partial flow-on of the productivity increases. The effects of this partial adjustment are shown in Table B.3: by the fifth year the share of wages in GDP at facor cost is 0.4 percentage points lower than in the control solution, while there is a corresponding increase in profit, equally distributed to trading and unincorporated enterprises.

The effect on different industry groups of the reduction of the import share in the machinery producing industries is shown in Table A.6. In the agricultural and mining sectors, the effect is relatively minor since these sectors are both export-oriented. Not surprisingly, the strongest response is made in the manufacturing sector, where total output by the fifth year of the projection is 2.7 per cent higher than in the control solution. In the tertiary sector, total output was just over 1 per cent in the utility and construction industries and the distribution and services industries.

The effect on individual manufacturing industries is shown in Table A.14. In the food processing industries, the increase in output by the fifth year was less than 1 per cent; in the five wood, furniture and paper industries it was between 1 and 2 per cent. In the building and construction materials industries, the increase was generally 2.5 per cent or more, while it was 4.2 per cent in the iron and steel industry. In the four industries where import penetration was lowered, agricultural machinery and equipment output increased by 8 per cent and the output of the remaining three industries increased by 10 per cent.

Total employment by the fifth year is 0.5 per cent higher than in the control solution (Table A.7), which represents the employment of 35,000 more people (Table B.7). There is, however, a reduction of only 19,000 in recorded unemployment (Table B.7), because the increase in activity induces people who were previously part of the hidden pool of unemployment to re-enter the workforce. The distribution of the increase in employment across the broad industry groups is shown in Table B.9. The manufacturing sector accounts for 30 per cent of the increase, the utility and construction and the distribution industries each account for about 20 per cent and 27 per cent is in service industries. The remaining 3 per cent is in primary industry.

The characteristics of the increase in employment by age, sex, qualifications and occupaion, and the distribution of employment by industry, are given in Tables C.1 to C.6. Two-thirds of the increase is in male employment and a similar proporion is aged less than 40. Table C.3 shows that by the fifth year about half the additional employment opportunities call for no formal qualifications, while nearly two-thirds of the remaining opportunities required trade or certificate qualifications. A detailed breakdown of the employment increase by occupation is given in Table C.5.

The effects of a more sustained policy of expansion can also be calculated, and a comparison of the once-off policy and a policy that is sustained over a three-year period are shown in Table 3.3.2 below. In quantitative terms, there is a five percentage point reduction in import share in each of the three years. In terms of possible development strategies, this could be an import replacement policy followed by an export expansion policy. The table shows that GDP will be just under 4 per cent higher than the control solution by the fifth year of the projection period (given an incremental growth rate of just under 1 per cent per annum). As shown in the table, employment will be 1.2 per cent higher.

Table 3.3.2 GDP and employment: the effects of once-off and sustained development policies

	Once-off policy		Three year sustained policy	
	GDP	Empl	GDP	Empl
	%	%	%	%
Year 1	0.8	0.3	0.8	0.3
Year 2	0.9	0.3	1.7	0.6
Year 3	1.1	0.3	2.8	0.9
Year 4	1.3	0.4	3.3	1.0
Year 5	1.4	0.5	3.8	1.2

There are, however, two key factors that need to be considered before the overall impact of these industry assistance policies can be assessed, as was noted in the first section of this paper.These are the effects on the balance of payments and on the public sector borrowing requirement of the policies. Table 3.3.3 shows these effects by the fifth year, assuming that the required level of foreign reserves is the same in the disturbed and the control solutions. The effects of both a once-off and a sustained reduction in import shares are shown in the table, the data being taken directly or calculated from year five data in the B group of tables in the Appendix. The table shows, for example, that the once-off policy reduces the public sector borrowing requirement by \$570 million in 1979-80 prices and the required level of capital inflow by a similar amount. The impact of the sustained three-year policy is between 2.3 and 2.8 times the impact of the once-off program.

To avoid exchange rate appreciation, a number of fiscal policy instruments can be chosen to expand the economy as the industry assistance policies become effective. Indeed, in a regime of floating exchange rates, complementary fiscal expansion is essential, in order to neutralize exchange rate movements. If complementary fiscal expansion is not undertaken, the exchange rate will appreciate, compared with where it would otherwise have been, the competitiveness of the economy generally will be reduced and the rationale for industry development programs undermined. The effects of two such policies are also shown in Table 3.3.3. The first is an increase in public authority capital expenditure of $100 million in 1979-80 prices and the second is an increase of the same amount in current government expenditure on administration: the results of these two solutions are given in detail in the D to G sets of tables in the Appendix C. In each case, the disturbed solution was obtained by uniformly increasing the appropriate demand component by $100 million, in 1979-80 prices, above the corresponding control solution values in each of the five years beginning in 1982-83. It should be noted that these examples are but two of the many possible fiscal instruments that could have been used equally as well. For example, there could have been a reduction in income taxes or in sales taxes, or different expenditure components could have been increased.

Table 3.3.3 The PSBR and the balance of payments of industry assistance and expansionary fiscal policies

	Public sector borrowing requirement	Required capital inflow
	Difference from control solution $m, year five	
Once-off development policy	- 571	- 562
Sustained development policy	-1580	1286
$100m increase in public authority capital expenditure (1979-80)	83	82
$100m increase in public administration expenditure (1979-80 prices)	98	83

The table shows that, by the fifth year after the increase in public authority investment expenditure, the public sector borrowing requirement will be $83 million, in 1979-80 prices, above the control solution value and that Australia will need $82 million, in 1979-80 prices, additional capital inflow in order to maintain the same level of foreign reserves as were in the control solution. The current government expenditure statistics can be given the same interpretation.

Table 3.3.4 is important, in that it shows what increases in the fiscal instruments can be sustained without having any effect on the fifth-year value of either the level of capital inflow or the public sector borrowing requirement. For example, to keep the public sector borrowing requirement to its control solution value in year five, that is, to offset the impact on the public sector borrowing requirement of the once-off industry assistance policy, public authority capital expenditure can be increased by a sustained $687 million in 1979-80 prices over the control solution values. Similarly, to keep the level of capital inflow to its control solution value, an additional $685 million of capital expenditure is possible and, if this expenditure is introduced simultaneously with the once-off industry assistance policy, then the balance of payments and the public sector borrowing requirement will be no different from what they would have been without the industry assistance policy. Thus, if these two factors were constraints in the context of the control solution then these constraints will not have been violated by the increases in expenditure, providing the industry assistance policies are as successful as is assumed here. Similar calculations can be made relating to the sustained industry assistance policy or to the increase in current government expenditure. As an example of what this statement means, from Table 3.3.4, government consumption expenditure can be increased by $677m to maintain balance of payments equilibrium at control solution values and hence the exchange rate at the control solution level. If year five is taken to be 1988-89, from Table 1.13, the level of current government expenditure can be $25.1b in 1979-80 prices, instead of $25.4b as shown in the table. Similarly, in the intervening years, the level of current government expenditure can be increased by $677m above the respective control solution values. Because the balance of payments equilibrium target is year five, it follows that, in practice, there may be some divergence between the control and the disturbed solution exchange rates.

Table 3.3.4 Industry assistance and complementary fiscal expansion

	The difference from the control solution, year 5	
	Public authority capital expenditure	Public administration current expenditure
	$m(1979-80 prices)	$m(1979-80 prices)
Balance of payments constraint		
Once-off policy	685	677
Three-year policy	2055	2031
PSBR constraint		
Once-off policy	688	582
Average of constraint values		
Once-off policy	687	630
Three-year policy	2061	1890

Finally, Table 3.3.5 shows the employment implications of the effects of the industry assistance policies with complementary fiscal expansion, using the average expenditure values given in Table 3.3.4 above. The table shows, for example, that a once-off import replacement program with the simultaneous expansion of public administration expenditure will, by the fifth year, increase total employment by nearly 100,000; if public authority capital expenditure is increased, the increase in employment is nearly 80,000. Using the data in Table 1.15, an increase in public administration expenditure would mean that total employment by 1988-89 would be 7,056,600 instead of 6,959,400. The sustained, three-year policy has effects which are about 2.4 times greater than the once-off policy effects. If a strict, equilibrium interpretation is applied, in terms of Table 3.3.2, the effects are approximately 3 times greater. The calculations in Table 3.3.5, which show the employment increases under a three-year policy, are derived on the assumption of an equilibrium interpretation.

Table 3.3.5 The employment effects of complementary fiscal expansion

	Increase in employment	
	Once-off policy	Three year policy
	'000	'000
Direct increase in employment	34.9	104.7
Indirect increase in employment		
Public authority capital expenditure	44.4	133.2
Pulic administration expenditure	62.3	187.8
Total increase in employment		
Public authority capital expenditure	79.3	237.6
Public administration expenditure	97.2	292.5

As noted earlier, the above analysis is a partial one only. It is partial in the sense that only a narrow range of policy options has been considered but, more importantly, it is partial because the costs of the industry assistance policy have not been quantified.

However, the costs of an industry assistance policy can easily be incorporated into the analysis, once they have been calculated. By way of example, suppose a once-off program is estimated to cost $100 million in 1979-80 prices, whether in the form of subsidies to domestic producers to compete with imports or as export subsidies that would have the same output effects. In this case, the public sector borrowing requirement could only expand by $471 million, and not the original $571 million; in effect, the increase in expenditure would be 18 per cent lower. Thus a once-off policy that cost $100 million to implement would increase total employment by 86,000 rather than the original 98,000, if public administration expenditure was increased at the same time as the industry assistance policy. The previous sections have assessed the cost of a policy that would underline the sensitivity study given here, in terms of the analysis of Sections 3.1 and 3.2. It must be borne in mind, however, that a fundamental proposition put in this study is that the cost of assistance should be of limited duration only, and should therefore cut out after a five to seven year period.

The basic assumptions of constant real wages and interest rates are of course also critical to the outcome of this study.

Although the costs of introducing assistance policies have not been taken into account, there are several factors concerning economic benefits which have been underestimated in this analysis. These factors concern the technological dimension, the industrial relations dimension and the social dimension.

The technological dimension

One of the benefits noted earlier was that there were spin-off effects from a policy of metals and engineering development, in that the technological base of the tradeable goods sector in general was strengthened. No allowance for this was made in this model run. Since the effect of such an improvement would be to improve the competitive position of these industries, greater export expansion and import replacement than has been shown here could be expected. Consequently, GDP and employment can be expected to be greater than has been shown.

The industrial relations dimension

In the current Australian economic and policy environment, the effects of policy initiatives cannot be properly assessed without considering their impact on industrial relations or the prices and incomes accord in general, and on the particular policy target of constraining nominal wage growth. From the detailed tables attached to the appendix of this paper, it can be seen that, subject to lags in the wage-price adjustment process, real wages remain constant after both industry development and fiscal expansion. This is a critical aspect of the projection. In the past, the IMP model has been used to show that, when an economy is subject to one or more of the constraints referred to in the first part of this paper, further increases in nominal wages will not result in any significant increases in *ex post* real wages, but may have significant, adverse effects on employment and real output. For example, if the balance of payments constraint is operative, and with a given policy stance, Brain and Schuyers (*Energy and the Australian Economy*, Longman Cheshire, 1981, pp.216-18) have shown, that for every 1 per cent increase in nominal wages, real GDP will fall by at least another half a percentage point. Given the current prospects for the medium-term environment, and given the rates of inflation in our major trading partners, a rate of nominal wage growth of, say, 12 per cent instead of the assumed rate of 8 per cent would result in stagnation, with a recorded unemployment rate of 12 to 14 per cent towards the end of the decade. Holding wage increases within the guidelines of the accord is critical and will benefit all sectional interests.

If industry development policies can play a role in holding the accord, or even in lowering the nominal wage level below what it might otherwise have been, the benefits to the Australian economy will be substantial, both in terms of living standards and of employment. Thus, to calculate the costs of industry development assistance, the advantages of any assumed nominal (not necessarily real) wage trade-off should be included in the numerator of the benefit to cost ratio.

Nominal wage increases can only be translated into real wage increases, that is, into an increase in demand, if constraints to growth are reduced. Successful industry assistance policies do reduce constraints and so allow nominal wage increases to increase real incomes. Hence a successful policy can enable a combination of tax reductions, expenditure expansion and real wage increases. It need not be limited simply to fiscal expansion. In any case, a trade-off between fiscal expansion and wage increases may be necessary to generate a stable macroeconomic environment, an essential prerequisite for the success of any policy initiative.

The social dimension

The Institute of Family Studies has estimated that between 1978-79 and 1981-82, the number of income units below the povery line rose from 1.4 to 1.6 million, or from 1.8 to 2.8 million people. These numbers would, no doubt, be substantially greater in 1981-82, given the increase in unemployment; the distribution of income has thus been deteriorating over the period. The most effective way of achieving greater equality in the distribution of income, and of improving the social climate generally, is to reduce unemployment. The income tax system cannot be used as an effective means of redistribution, in that it cannot greatly affect those outside the workforce. To effect significant reductions in unemployment, there must be effective policies to develop industry.

Industry development and the traditional export industries

Exporting industries should find their competitiveness, and hence the level of their exports, unaffected by policies designed to develop other industry, so long as the following requirements are fulfilled: there are idle factors of production; there is direct compensation to those exporting industries whose costs are increased as a result of the policies; fiscal expansion offsets the balance of payments impact of the policies; and, finally, nominal wage increases are constrained to productivity increases. Indeed, there may be an increase in the domestic demand for the output of exporting industries, in which case there will be a positive stimulus to their overall level of output.

It would be wrong to assume that there is a basic conflict between the traditional export industries and the industries selected for development. While high immediate returns may be made in the selected industries, and while new exporting industries may be established, growth in these areas can be complementary with growth in established exporting industries, so that expansion can occur across a broad front.

The State Implications

The State structure of employment increases for total employment and for employment increases for the metals and engineering sector are given in Table 3.3.6 and 3.3.7 respectively. The estimates were prepared using the State Module of the University of Melbourne's IMP Module. For both the total and Metals and Engineering Employment the structure of employment increase for the direct effect, that is with no complementry fiscal expansion, is weighted towards NSW and Victoria. That is from the two tables these two states combined account for three quarter of the total employment increase and four fifths of the Metal and Engineering Employment increase. Thus for the once off case, of the 34.9000 direct jobs created, 26.200 are in NSW and Victoria. This is simply a function of the relative size of the Metals and Engineering sector in the two states compared to the other states and the intrastate relative size of the Metals and Engineering Sector in NSW and Victoria.

However once the indirect employment effects are taken into account, that is the employment increases stemming from the complementry fiscal expansion, the structure for the increase in total employment more closely resembles the structure for the States total employment share. That is complementry fiscal expansion has the effect of redirecting the benefits of Metals and Engineering Industry Development Programs to the smaller states. From the Tables in Appendix C, a third of the total employment increase for the direct effect occured in the Metals and Engineering Sector. That is for the once of case just under 12000 jobs are created in the Metals Engineering sector. This increases to a level in the vicinity of 50,000 for the three year program when coupled with complementry fiscal expansion. This represents just under 19% of the total employment increase. Since this is based on an "equilibrium" interpretation of a three year program for the fifth year, the actual time required to achieve this result would be over a five to seven year horizon.

TABLE 3.3.6

TOTAL EMPLOYMENT STRUCTURE AND LEVEL BY STATE

	Structure of Employment Increase Across States: Direct Employment Effect (Percent)	Structure of Employment Increase Across States: Total Employment Effect (Percent)	Employment Increase Across States: Total Employment Effect Three year Program Program (a) ('000)
NSW (inc. ACT)	46.0	33.4	88.5
VIC	29.2	25.5	67.6
QLD	10.4	16.7	44.3
SA (inc. NT)	8.0	10.4	27.6
WA	5.1	11.0	29.1
TAS	1.3	3.0	8.0

Source: IMP State Modules

Notes: (a) Based on means of total employment increase given in Table 3.3.5. That is, the absolute numbers apply to the mean of the range for the three year program given in Table 3.3.5, which is 265,000.

TABLE 3.3.7.

EMPLOYMENT STRUCTURE AND LEVEL BY STATE: METALS AND ENGINEERING SECTOR

	Structure of Employment Increase Across States: Direct Employment Effect; Metals and Engineering Sector (Percent)	Structure of Employment Increase: Total Employment Effect Metals and Engineering Sector (Percent)	Employment Increase Across States: Total Employment Effect (Three year program) Metals and Engineering Sector ('000)
NSW (inc. ACT)	51.4	48.0	24.4
VIC	30.2	30.9	15.7
QLD	5.4	6.3	3.2
SA (inc. NT)	8.9	9.3	4.3
WA	3.7	4.8	2.73
TAS	0.3	0.7	0.34

Source and Notes: As per Table 3.3.6.

APPENDIX 3.1

i. Changing Import Shares by Country of Origin: Other Machinery and Equipment

ii. Tables

iii. Raw Data

Appendix 3.1 Changing Import Shares by Country of Origin: Other Machinery and Equipment

As noted in Part II of this study, imports into the metals-engineering industry constitutes a high proportion of total manufacturing imports and a high proportion of total imports into the Australian economy. In 1979-80, metals engineering imports constituted 51.2% of total manufacturing imports and 45% of total Australian imports. Within the metals engineering industry in 1979-80, three sub sectors accounted for 36.4% of total manufacturing imports and 32.4% of total Australian imports. These sectors were Motor Vehicles and Parts (ASIC 3231-4), Appliances and electric equipment (ASIC 334, 3351-3354) and Other Industrial Machinery and equipment (ASIC 3362-69). In 1979-80 these three sub-sectors accounted for 71.1% of total metal-engineering imports into Australia.

The other Industrial Machinery and Equipment Sector accounted for 20.5% of Australia's metals-engineering imports in 1979-80, and 24.33% of Australia's metals engineering imports in 1983-84. In 1979-80 this sector accounted for 10.5% of the manufacturing sectors imports and 9.4% of total Australian imports. The different sub-sectors of the Other Machinery and Equipment sector and the changing pattern of import penetration in those sub sectors is highlighted in Table A3.1.1. Before continuing, it should be emphasised that between 1979-80 and 1983-84 domestic producers' share of the industrial machinery market in Australia fell by a further 17.7%. Hence the trends depicted in columns 1A, 1B and 1C of the table have accelerated rapidly.

The major trends highlighted in the table may be summarised as follows:

. Australian domestic producers have suffered a very large loss of domestic market share to imports over the period 1972-73 to 1981-82. Ths trend has accelerated in the period 1978-79 to 1983-84.

. By 1981-82 imports accounted for 40% or more of the domestic market for six of the eight subsectors, and were particularly high for the Construction and Earthmoving Machinery and Equipment sub-sector (82%) and the wood and metal working machinery sub-sectors (62.8%).

. In construction and earthmoving machinery and equipment the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 53% (1978-79 to 1983-84) to 33.8% while the EEC, USA/Canada share fell by 16% to 61.5%.

. In materials handling equipment the Japanese, ASEAN, Taiwan and S.Korean share of imports in the Australian market increased by 1% (1978-79) while the EEC, USA/Canada share fell by 47% to 34.5%.

. In wood and metal working machinery the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 25% (1978-79 to 1983-84) while the EEC, USA/Canada share fell by 10%.

. In pumps and compressors the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 224% (1978-79 to 1983-84), while the EEC, USA/Canada share fell by 18%.

. In commercial space heating and cooling equipment the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 12% (1978-79 to 1983-84) while the EEC, USA/Canada share fell by 58% to 24.7%.

. In dies, saw blades and machine tool accessories the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 91% (1978-79 to 1983-84) to 24.9%, while the EEC, USA/Canada share fell by 24% to 52.8%.

. In food processing machinery the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 1780% (1978-79 to 1983-84) to 9.4%, while the EEC, USA/Canada share fell by 5% to 79%.

. In industrial machinery N.E.S. the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 91% (1978-79 to 1983-84) to 19.9%, while the EEC, USA/Canada share fell by 14% to 69.6%.

The major trends highlighted in Tables A3.1.2 and A3.1.3 below may be summarised as follows:

. With the exception of food processing machinery, Taiwan increased its share of imports in seven of the eight other machinery and equipment sub sectors. Nevertheless only in one subsector, (wood and metal working machinery) of other machinery and equipment did Taiwan achieve an import share in excess of its 2.4% share of Australia's metal engineering imports as a whole. In wood and metal working machinery, Taiwan increased its share of imports in the Australian market by 97% (1978-79 to 1983-84) to 7.3%.

. With the exception of food processing machinery ASEAN increased its share of imports in seven of the eight other machinery and equipment sub sectors. In four of the other machinery and equipment subsectors ASEAN now has import shares in excess of its .4% share of Australia's metal engineering imports as a whole. These three subsectors and ASEAN's market share of imports in 1983-84 included commercial space heating and cooling equipment (10.01%), wood and metal working machinery (.77%), dies, saw blades, and machine tool accessories (1.28%) and industrial machinery and equipment N.E.C. (.93%)

. While S. Korea increased its share of imports in all eight sectors, seven of the eight sectors remained below S.Korea's share of Australia's metal engineering imports as a whole (.8% in 1983-84). The only exception to this trend was materials handling equipment where S.Korea's share is approximately 2%.

. With the exception of materials handling equipment Japan increased its share of imports in seven of the eight other machinery and equipment subsectors. However in only two subsectors has Japan obtained a market share of imports above its import share for Australia's metals engineering industry as a whole (28.3% in 1983-84). These sectors were the construction machinery subsector, where Japan's import share increased by 52% (1978-79 to 1983-84) to 33.6% and wood and metal working machinery where Japan's import share increased by 16% to 33.6% in 1983-84.

. With the exception of dies, saw blades and machine tool accessories and industrial machinery N.E.S. the USA experienced a decline in its share of metal engineering imports in six of the eight subsectors making up other machinery and equipment. These declines in market share included, -17.7% in construction machinery, -34% in materials handling equipment, -8.5% in wood and metal working machinery, -19.2% in pumps and compressors, -58.2% in commercial space heating and cooling equipment and -16% in food processing machinery. Despite this setback, the USA maintained a dominant market share in five of the eight subsectors, with import shares in four subsectors above its share of Australia's metals engineering industry as a whole.

. With the exception of construction machinery, Germany experienced a decline in its share of metal engineering imports in seven of the eight subsectors making up other machinery and equipment. Two of the subsectors exhibiting the most significant declines were wood and metal working machinery (-26%) and dies, saw blades and machine tool accessories (-64%).

. The UK experienced a decline in import share in all eight subsectors, with the largest declines occurring in commercial space heating etc. (-97%), materials handling equipment (-71%) and dies, saw blades and machine tool accessories (-62%). This has left the UK with a market share in three subsectors above the UK import share of Australia's metals engineering sector as a whole. These subsectors include pumps and compressors (import share 8.4% - 1983-84), food processing machinery (import share 11.1% - 1983-84) and industrial machinery N.E.S. (10.7% - 1983-84).

. New Zealand experienced an increase in import share in six of the eight subsectors of other machinery and equipment. In five of the eight subsectors New Zealand had an import share greater than its share of Australia's metals engineering indusry as a whole (1.7% in 1983-84). These subsectors include materials handling equipment (import share 2.4% - 1983-84), wood and metal working machinery (import share .8% -

1983-84), commercial space heating etc. (import share 7.7% - 1983-84), food processing machinery (import share - 2.4% - 1983-84) and dies, saw blades and machine tool accessories (4.1% - 1983-84).

Changing Import Shares by Country of Origin: Appliances and Electronic Equipment

The appliances and electronic equipment sector accounted for 43.74% of metal engineering imports in 1983-84 compared to 27.73% of metal engineering imports in 1979-80. In 1979-80 this sector accounted for 14.2% of manufacturing imports and 12.6% of total Australian merchandise imports. This sector has exhibited a share rise in import penetration with the import share of the domestic market rising from 39.47% in 1967 to 50.43% in 1981, an increase of 27.8%. In some of the subsectors import penetration is well above the group average (photo professional and scientific equipment at 63% (1981-82)).

The major trends highlighted in Table A.3.1.4 may be summarised as follows:

. In photographic, professional and scientific equipment, the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 30.3% (1978-79 to 1983-84) to 31% while the EEC, USA/Canada share increased by 4.9% to 57.9%.

. In radio and TV receivers, audio equipment, the Japanese, ASEAN, Taiwanese and S. Korean share of imports in the Australian market increased by 11.9% (1978-79 to 1983-84) to 79.8% while the EEC, USA/Canada share fell by 27.5% to 13.7%.

. In electronic equipment N.E.S., the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 18.8% (178-79 to 1983-84) to 30.4%, while the EEC, USA/Canada share fell by 11% t 59.4%.

. In refrigerators and household appliances, the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 24.5% (1978-79 to 1983-84) to 43.9%, while the EEC, USA/Canada share fell by 65% to 14.8%.

. In water heating systems the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 350% (1978-79 to 1983-84) to 3.5%, while the EEC, USA/Canada share fell by 6.9% to 86.7%.

Tables A3.1.5 and A3.1.6 below focus more closely on the appliances and electronic equipment sector in terms of:

(a) a country of region's share of total metal engineering imports in the Australian market (in the table below, this is highlighted by the figure in brackets; for example Japan, in 1983-84 had 28.3% of the import share of all metal engineering except for ASIC 2963, 3141, 3143, 3152, 3153, 3162, 3164, 3168, 3231 and 3234 which were not included in this study).

(b) a country or regions share of imports in various metal engineering sectors (in this case the five subsectors making up appliances and electronic equipment).

The major trends highlighted in Tables A3.1.5 and A3.1.6 may be summarised as follows:

. With the exception of radio and TV receivers and audio equipment, Taiwan has significantly increased its share of imports in four of the five subsectors, and has a 4% share of imports in refrigerators and household appliances which is above its 2.4% import share for metals engineering as a whole.

. South Korea has developed strongly in all sectors, with two sectors now above its national share for metals engineering as a whole (radio, TV receivers and audio equipment - import share of 3.2%, and photographic, professional and scientific equipment with a 1.3% import share).

. For the ASEAN countries, despite the fall in import share for refrigerators and household appliances, all categories now have in excess of ASEAN's national share for metals engineering, including a 3.1% share for radio, TV and audio equipment.

. For the United States, there was a substantial fall in import share in both radio, TV, audio equipment as well as refrigerators and household appliances. The USA maintained and in fact extended its import market share predominance in both photographic professional and scientific equipment as well as electronic equipment.

. Germany experienced a particularly large drop in market share in four subsectors but maintained its market share dominance in water heating systems, despite a decline from 63.2% of the import share to 43.9%. Germany also experienced strong market share growth in photographic, professional and scientific equipment.

. The UK generally maintained its market share in three of the five subsectors, but experienced share declines in both photographic, professional and scientific equipment and refrigerators and household appliances.

. While New Zealand's market share fell sharply in electronic equipment, its 9.4% share in refrigerators and household appliances and its 8.3% share of imports of water heating systems were well in excess of its national share of metal engineering imports in the Australian market (1.7%).

. As mentioned previously, Japan experienced strong growth in its market share of imports in all sectors, with its two major subsector market shares being radio, TV and radio equipment (70.1%) and refrigerators and household appliances (37.6%), which were both well above its national share of metal engineering imports in the Australia market (28.3%).

Changing import share by country of origin: Agricultural equipment

The agricultural equipment sector accounted for 3.7% of metal engineering imports in 1979-80 and 4.5% of metal engineering imports in 1983-84. This subsector has experienced a steadily rising trend in import penetration, from 26.6% in 1967 to 41.54% in 1983-84, an increase of 36%. Trends within the import share by country of origin are highlighted in Table A3.1.7.

Changing Import Shares by Country of Origin: Electrical Machinery and Equipment/Appliances and Electronic Equipment

Electrical Machinery and Equipment

The electrical machinery and equipment sector accounted for 7.76% of Australia's metals-engineering imports in 1983-84 and 7% in 1979-80. In 1979-80, this sector accounted for 3.6% of manufacturing imports and 3.2% of total Australian imports. The different sub sectors of the electrical machinery and equipment sector are highlighted in the Table A3.1.8.

The major trends highlighted in the table may be summarised in the following terms:

. In electric and telephone cable and wire the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market fell by 23% (1978-79 - 1983-84) to 28.9%, while the EEC, USA/Canada have maintained their share at 56%.

. In batteries, the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 73.3% (1978-79 to 1983-84) to 50.8%, while the EEC, USA/Canada share fell by 36% to 38.8%.

. In electrical machinery and equipment N.E.S., the Japanese, ASEAN, Taiwanese and S.Korean share of imports in the Australian market increased by 71% (1978-79 to 1983-84) to 27.9, while the EEC, USA/Canada share fell by 14.4% to 58%.

TABLE A3.1.1

CHANGING IMPORT SHARES BY COUNTRY OF ORIGIN: OTHER MACHINERY AND EQUIPMENT 1978-79/1983-84

	1			2			3		
	A	B	(C)	A	B	(C)	A	B	(C)
CONSTRUCTION AND EARTHMOVING MACHINERY + EQUIPMENT	47	82	(+74)	33.8	22.1	(+53)	61.5	73.1	(-16
MATERIALS HANDLING EQUIPMENT	21	36	(+71)	21.9	21.6	(+1)	34.5	65.7	(-47
WOOD AND METAL WORKING MACHINERY	54.1	62.8	(+16)	42.6	34	(+20)	45.8	50.9	(-10
PUMPS AND COMPRESSORS	31	40	(+29)	22.4	6.9	(+224)	71.7	87.7	(-18)
COMMERCIAL SPACE HEATING AND COOLING EQUIPMENT	1.7	15.5	(+811)	39.1	34.9	(+12)	24.7	58.9	(-58)
DIES, SAW BLADES AND MACHINE TOOL ACCESSORIES	28.4	41.9	(+48)	24.9	13	(+91)	52.8	69.3	(-24)
FOOD PROCESSING MACHINERY	28.5	47.7	(+67)	9.4	.5	(+1780)	79	82.9	(-5)
INDUSTRY MACHINERY AND EQUIPMENT NES	38.1	44.5	(+17)	19.9	10.4	(+91)	69.6	80.8	(14)

NOTE: Table Code

Column 1: Imports as a share of the Domestic Market.
A: 1972-73
B: 1981-82
C: Percentage Increase 1972-73/1981-82

Column 2: Import share by country of Origin - Japan, ASEAN, Taiwan, South Korea.
A: 1983-84
B: 1978-79
C: Percentage change 1978-79/1983-84

Column 3: Import share by country of Origin - EEC (including Europe), USA/Canada.
A: 1983-84
B: 1978-79
C: Percentage change 1978-79/1983-84

TABLE A3.1.2

		JAPAN 1983-84/1978-79	ASEAN	TAIWAN	S. KOREA
ASIC	3362	33.6/22.1	.24/.01	.01/-	-/-
	3363	19.9/21.5	.07/.10	- /1.9	1.97/-
	3364	34.4/29.7	.77/.55	7.3/3.7	.18/.05
	3365	19.7/ 5.3	.15/.06	2.3/1.5	.23/-
	3366	28.2/25.7	10.01/9.2	.2/-	.77/-
	3367	21.7/11.7	1.28/0.47	1.8/.85	.12/-
	3368	9.1/-	.13/.29	.12/.19	.08/.05
	3369	18.2/ 9.8	.93/.37	.7/.26	.10/.01

TABLE A3.1.3

		USA 1983-84/1978-79	GERMANY	UK	NEW ZEALAND
ASIC	3362	47.3/57.5	5.7/ 4.0	3.0/ 7.0	.3/.08
	3363	18.5/28.0	3.7/12.6	3.7/12.8	2.4/3.7
	3364	14.9/16.3	12.7/17.1	6.2/ 9.5	1.8/1.3
	3365	34.4/42.6	7.6/ 8.8	8.4/18.6	1.1/1.8
	3366	19.9/47.6	.33/ 1.5	.23/ 8.4	7.7/ .9
	3367	31.4/26.8	6.5/18.1	6.0/15.9	4.1/1.5
	3368	23.6/28.1	20.0/20.8	11.1/13.9	2.4/1.5
	3369	36.0/33.2	14.1/18.2	10.7/18.5	1.2/ .8

TABLE A3.1.4

	1			2		
	A	B	(C)	A	B	(C)
- PHOTOGRAPHIC, PROFESSIONAL & SCIENTIFIC EQUIPMENT (ASIC 3341-3)	31.0	23.8	(30.3)	57.9	55.2	(4.9)
RADIO & TV RECEIVERS AUDIO EQUIPMENT (ASIC 3351)	79.8	71.3	(11.9)	13.7	18.9	(-27.5)
ELECTRONIC EQUIPMENT N.E.S. (ASIC 3352)	30.4	25.7	(18.8)	59.4	66.8	(-11)
REFRIGERATORS & HOUSEHOLD APPLIANCES (ASIC 3353)	43.96	35.3	(24.5)	14.8	41.8	(-65)
WATER HEATING SYSTEMS (ASIC 3354)	3.51	.01	(350)	86.7	93.1	(-6.9)

NOTE: TABLE CODE:

Column 1: Import Share by Country of Origin - Japan, Taiwan, ASEAN, S. Korea.
A: 1983-84
B: 1978-79
C: Percentage Increase 1978-79/1983-84

Column 2: Import Share by Country of Origin - EEC (including Europe and USA/Canada.
A: 1983-84
B: 1978-79
C: Percentage Increase 1978-79/1983-84

TABLE A3.1.5

	1983-84	3341-3 1983-84/ 1978-79	3351	3352	3353	3354
JAPAN	(28.3)	27.2/22.4	70.1/61.4	26.8/23.9	37.6/27.9	2.3/.01
TAIWAN	(2.4)	1.5/ .7	3.4/ 5.0	1.6/ .7	4.0/ 2.6	.4/-
S. KOREA	(.8)	1.3/ .3	3.2/ 2.5	.4/ .2	.2/ .16	-/-
ASEAN	(.4)	1.1/ .4	3.1/ 2.4	1.6/ .1	2.2/ 4.6	.8/-
IMPORTS AS % OF TOTAL METAL	(100)	9.9	9.1	18.7	6.0	.04
ENGINEERING IMPORTS (1983-84)						

TABLE A3.1.6

	1983-84	3341-3	3341	3352	3353	3354
USA	(30.1)	34.2/32.8	8.2/12.2	43.2/42.8	8.8/18.2	21.8/21.4
GERMANY	(7.5)	7.4/ 1.1	2.4/ 3.8	4.2/ 7.2	4.6/ 7.0	43.9/63.2
UK	(7.1)	7.7/11.3	1.4/ 1.2	5.9/ 5.8	2.0/ 6.9	2.8/ 2.9
NEW ZEALAND	(1.7)	1.2/ .6	.4/ .3	.4/ 6.2	9.4/ 9.5	8.3/ .6

TABLE A3.1.7

	1978–79	1983–84	% CHANGE
JAPAN	3.79%	6.29%	+66%
ASEAN	.18%	.14%	–22%
TAIWAN	.08%	–	–100%
KOREA	.04%	.10%	+150%
USA	47.15%	47.18%	+.04%
CANADA	4.91%	6.82%	+ 71%
GERMANY	7.03%	12.03%	+ 71%
ITALY	7.62%	6.44%	–· 10.8%
UK	16.62%	7.65%	–53.9%
OTHER	12.58%	13.35%	+6.1%

AS THE TABLE SUGGESTS THE IMPORT SHARE OF AGRICULTURAL EQUIPMENT IS STILL DOMINATED BY USA, GERMANY AND THE UK (DESPITE ITS 54% LOSS OF MARKET SHARE). HOWEVER A STRONG JAPANESE PRESENCE IS DEVELOPING, PARTICULARLY IN THE SMALLER TRACTOR SECTOR OF THE MARKET.

TABLE A3.1.8

	1			2		
	A	B	(C)	A	B	(C)
ELECTRIC AND TELEPHONE CABLE & WIRE (ASIC 3355)	28.96	37.6	(-23)	55.97	56.36	(-1)
BATTERIES (ASIC 3356)	50.84	29.33	(73.3)	38.81	60.58	(-36)
ELECTRICAL MACHINERY & EQUIPMENT N.E.S. (ASIC 3357)	27.85	16.29	(71)	57.99	67.76	(-14)

NOTE: TABLE CODE:

Column 1: Import Share by Country of Origin - Japan, ASEAN, Taiwan, South Korea.
A: 1983-84
B: 1978-79
C: Percentage Increase 1978-79/1983-84

Column 2: Import Share by Country of Origin - EEC (including Europe), USA/Canada.
A: 1983-84
B: 1978-79
C: Percentage Increase 1978-79/1983-84

INPUT/OUTPUT INDUSTRY CLASSIFICATION (1977-78 EDITION)

IN TERMS OF ASIC 1978

1-0 Code	1-0 Description	ASIC Code	ASIC Description
29.02	Non-ferrous Metals etc	2951-7	Basic non-ferrous metals
		2961-3	Non-ferrous metal basic products
31.01	Structural Metal Products	3141-3	Structural metal products
31.02	Sheet Metal Products	3151-3	Sheet metal products
31.03	Other Metal Products	3161-8	Other fabricated metal products
32.01	Motor Vehicles etc	3231-4	Motor vehicles and parts
		3245	Transport equipment n.e.s.
32.02	Ships and Boats	3241	Ships
		3242	Boats
32.03	Railway Rolling Stock etc	3243	Railway Rolling Stock and Locomotives
32.04	Aircraft	3244	Aircraft
33.01	Scientific Equipment etc	3341-3	Photographic, professional & scientific equipment
33.02	Electronic Equipment	3351	Radio and TV receivers; audio equipment
		3352	Electronic equipment n.e.s.
33.03	Household Appliances etc	3353	Refrigerators and household appliances
		3354	Water heating systems
33.04	Other Electrical Equipment	3355	Electric and telephone cable and wire
		3356	Batteries
		3357	Electrical machinery and equipment n.e.s.
33.05	Agricultural Machinery	3361	Agricultural machinery
33.06	Construction Machinery etc	3362	Construction machinery
		3363	Materials handling equipment
33.07	Other machinery etc	3364	Wood and metal working machinery
		3365	Pumps and compressors
		3366	Commercial space heating and cooling equipment
		3367	Dies, saw blades and machine tool accessories
		3368	Food processing machinery
		3369	Industrial machinery and equipment n.e.s.

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1978/79)

ASIC	ASEAN	EEC	OTHER C'TRIES	JAPAN	N.Z.	USA/ CAN	TAIWAN PROV.	S. KOREA
2951-7	11.49	23.71	44.07	1.88	9.66	9.16	-	0.03
2961-3	0.12	43.02	5.78	15.91	3.80	31.09	0.28	-
3141-3	1.12	35.58	4.92	0.39	20.17	35.57	2.25	-
3151-3	32.10	16.24	17.25	10.33	1.46	20.99	1.46	0.17
3161-8	1.51	34.90	16.63	17.15	0.76	21.65	5.59	1.81
3231-4	0.74	28.04	2.06	46.28	1.25	17.82	3.73	0.08
3245	0.09	13.33	11.56	69.93	0.30	2.86	0.94	0.99
3241	9.72	17.50	21.93	-	0.01	50.37	0.06	0.41
3242	12.52	6.94	14.68	0.11	19.74	30.95	14.33	0.73
3243	-	46.06	14.13	23.19	0.03	16.59	-	-
3244	0.11	6.20	1.74	0.04	0.20	91.71	-	-
3341-3	0.43	21.72	20.36	22.36	0.61	33.52	0.72	0.28
3351	2.40	6.56	9.57	61.37	0.26	12.31	4.99	2.54
3352	0.98	22.45	1.29	23.86	6.23	44.32	0.70	0.17
3353	4.59	23.24	13.33	27.94	9.53	18.59	2.62	0.16
3354	-	71.59	6.26	0.01	0.64	21.50	-	-
3355	0.23	21.95	3.47	33.33	2.51	34.41	4.09	0.01
3356	3.76	12.70	8.62	22.81	1.47	47.88	2.34	0.42
3357	0.85	42.33	14.42	13.97	1.53	25.43	1.26	0.21
3361	0.18	37.46	4.81	3.79	1.58	52.06	0.08	0.04
3362	0.01	14.82	4.69	22.14	0.08	58.26	-	-
3363	0.10	36.92	7.42	21.50	3.34	28.82	1.90	-
3364	0.55	33.85	13.87	29.71	1.28	17.03	3.66	0.05
3365	0.06	40.95	3.54	5.33	1.84	46.75	1.53	-
3366	9.24	10.61	5.26	25.74	0.87	48.28	-	-
3367	0.47	38.91	16.18	11.69	1.51	30.39	0.85	-
3368	0.29	54.30	15.04	-	1.54	28.59	0.19	0.05
3369	0.37	45.80	7.95	9.78	0.84	34.99	0.26	0.01

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1983/84)

ASIC	ASEAN	EEC	OTHER C'TRIES	JAPAN	N.Z.	USA/ CAN.	TAIWAN PROV.	S. KOREA
2951-7	3.66	5.84	62.11	2.90	5.12	20.36	-	0.01
2961-3	1.16	26.88	18.54	15.99	11.29	18.23	0.33	7.58
3141-3	0.27			1.35	31.92	29.82	-	-
3151-3	13.59	23.77	16.90	8.20	7.36	22.47	1.98	5.67
3161-8	1.69	25.71	10.8	24.46	3.24	23.29	8.81	2.00
3231-4	1.97	23.40	1.5	54.90	2.29	12.96	2.77	0.21
3245	0.14	10.11	2.16	62.05	0.43	4.04	20.99	0.06
3241	1.23	63.55	3.11	32.11	-	-	-	-
3242	17.72	19.64	21.21	0.34	19.61	8.54	12.94	-
3243	-	54.66	10.15	13.03	0.19	21.97	-	-
3244	.09	37.44	1.44	0.05	0.44	60.54	-	-
3341-3	1.13	22.92	9.83	27.17	1.19	35.04	1.46	1.26
3351	3.05	5.39	6.15	70.11	0.41	8.28	3.40	3.21
3352	1.61	15.32	9.8	26.84	0.39	44.06	1.58	0.40
3353	2.17	5.39	31.86	37.57	9.34	9.36	3.99	0.23
3354	.76	61.74	1.51	2.34	8.28	24.96	0.41	-
3355	2.95	17.16	9.41	19.29	5.66	38.81	6.06	0.66
3356	19.03	13.26	9.82	20.49	0.53	25.55	1.92	9.40
3357	1.15	31.31	12.14	23.25	2.02	26.68	3.05	0.40
3361	.14	34.54	3.91	6.29	0.12	54.00	-	0.10
3362	.24	12.28	4.38	33.56	0.30	49.23	0.01	-
3363	.07	15.7	41.2	19.91	2.38	18.77	-	1.97
3364	.77	30.34	9.8	34.37	1.75	15.46	7.33	0.18
3365	.15	36.66	4.79	19.74	1.11	35.07	2.25	0.23
3366	10.01	4.35	28.51	28.16	7.68	20.33	0.19	0.77
3367	1.28	18.21	18.27	21.74	4.05	34.55	1.78	0.12
3368	.13	53.46	9.1	9.06	2.43	25.62	0.12	0.08
3369	.93	33.24	9.38	18.21	1.17	36.37	0.70	0.10

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1978/79)

ASIC	Indo-nesia	Malay-sia	Philip-pines	Singa-pore	Thai-land	Japan	Taiwan Prov.	U.S.A.
2951-7	-	5.10	-	4.66	1.73	1.88	-	6.32
2961-3	-	0.07	-	-	0.05	15.91	0.28	28.61
3141-3	-	1.12	-	-	-	0.39	2.25	24.29
3151-3	-	9.53	1.54	12.02	9.01	10.33	1.46	20.99
3161-8	-	0.48	0.32	0.49	0.22	17.15	5.59	21.00
3231-4	-	-	0.76	0.02	-	46.28	3.73	17.26
3245	-	-	0.01	0.08	-	69.93	0.94	2.84
3241	-	-	-	9.82	-	-	0.06	25.01
3242	0.03	0.25	2.68	9.55	0.01	0.11	14.33	29.87
3243	-	-	-	-	-	23.19	-	15.58
3244	-	-	-	0.11	-	0.04	-	90.43
3341-3	-	0.08	0.08	0.25	0.02	22.36	0.72	32.83
3351	0.06	0.15	0.02	2.17	-	61.37	4.99	12.22
3352	-	0.27	-	0.70	0.01	23.86	0.70	42.83
3353	-	2.75	-	0.74	0.10	27.94	2.62	18.23
3354	-	-	-	-	-	0.01	-	21.45
3355	0.02	-	-	0.21	-	33.33	4.09	32.62
3356	-	0.46	1.51	1.53	0.26	22.81	2.34	45.46
3357	-	0.09	0.01	0.74	0.01	13.97	1.26	23.15
3361	-	0.16	-	0.02	-	3.79	0.08	47.15
3362	-	-	-	0.01	-	22.14	-	57.53
3363	-	-	0.01	0.09	-	21.50	1.90	27.00
3364	-	0.01	-	0.53	0.01	29.71	3.66	16.28
3365	-	0.02	-	0.04	-	5.33	1.53	42.57
3366	-	9.24	-	-	-	25.74	-	47.60
3367	-	-	-	0.47	-	11.69	0.85	26.75
3368	-	0.06	-	0.23	-	-	0.19	28.12
3369	-	0.01	0.01	0.20	0.09	9.78	0.26	33.23

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1978/79)

ASIC	Canada	New Zealand	Belgium Luxemb.	Denmark	France	F.R. Germany	Greece	Iceland
2951-7	2.84	9.66	0.40	-	0.37	17.88	-	-
2961-3	2.48	3.80	1.71	-	0.96	6.91	-	-
3141-3	11.28	20.17	-	0.14	0.15	4.00	-	2.28
3151-3	-	1.46	0.31	0.36	3.29	2.41	-	-
3161-8	0.65	0.76	0.13	0.61	1.87	9.51	0.16	0.80
3231-4	0.56	1.25	0.04	0.01	1.82	13.23	-	-
3245	0.02	0.30	-	0.02	0.84	2.15	-	-
3241	25.36	0.01	-	6.91	-	7.92	-	-
3242	1.08	19.74	-	-	0.22	0.30	-	0.31
3243	1.01	0.03	0.17	-	0.21	32.58	-	-
3244	1.28	0.20	0.08	0.01	1.40	0.13	-	-
3341-3	0.69	0.61	1.58	0.77	1.44	1.06	0.01	0.59
3351	0.09	0.26	0.11	0.48	0.26	3.75	0.05	-
3352	1.49	0.23	1.41	0.19	3.33	7.23	-	0.02
3353	0.36	9.53	0.20	0.66	1.85	6.99	-	0.07
3354	0.05	0.64	-	0.26	5.12	63.17	-	-
3355	1.79	2.51	0.89	0.18	0.74	7.56	-	-
3356	2.42	1.47	0.09	0.01	2.65	1.60	-	-
3357	2.28	1.53	0.64	0.51	2.68	14.73	0.01	0.15
3361	4.91	1.58	3.85	0.76	0.93	7.03	-	-
3362	0.73	0.08	-	-	1.69	4.01	-	-
3363	0.83	3.74	0.76	0.52	2.23	12.59	-	0.45
3364	0.75	1.28	0.41	0.52	1.27	17.11	-	-
3365	4.18	1.84	5.76	0.93	0.90	8.75	-	0.28
3366	0.68	0.87	-	-	0.03	1.46	-	-
3367	3,64	1.51	0.60	0.54	1.03	18.05	-	0.33
3368	0.47	1.54	0.32	3.26	2.21	20.75	0.01	-
3369	1.76	0.84	0.79	0.48	3.06	18.19	-	0.01

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1978/79)

ASIC	Italy	Nether-lands	U.K.	Korea Rep.	Total all Countries
2951-7	0.16	0.41	4.49	0.03	
2961-3	5.78	0.07	27.59	-	
3141-3	1.45	2.85	24.71	-	
3151-3	0.09	0.52	9.18	0.17	
3161-8	3.16	0.60	18.06	1.81	
3231-4	1.46	0.02	11.46	0.08	
3245	4.18	0.08	6.06	0.99	
3241	-	2.50	0.17	0.41	
3242	0.07	0.07	5.97	0.73	
3243	6.53	0.30	6.27	-	
3244	0.18	0.78	3.62	-	
3341-3	1.13	3.81	11.33	0.28	
3351	0.15	0.57	1.19	2.54	
3352	2.85	1.65	5.77	0.17	
3353	5.92	0.68	6.87	0.16	
3354	0.17	-	2.87	-	
3355	0.77	1.71	10.10	0.01	
3356	0.56	0.15	7.64	0.42	
3357	3.24	2.52	17.85	0.21	
3361	7.62	0.65	16.62	0.04	
3362	2.07	0.07	6.98	-	
3363	5.92	1.65	12.80	-	
3364	7.05	0.56	9.47	0.05	
3365	3.54	0.31	18.64	-	
3366	0.67	0.01	8.44	-	
3367	2.14	0.34	15.88	-	
3368	8.89	4.94	13.92	0.05	
3369	3.27	1.54	18.46	0.01	

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1983/84)

ASIC	Indo-nesia	Malay-sia	Philip-pines	Singa-pore	Thai-land	Japan	Taiwan Prov.	U.S.A
2951-7	-	2.61	-	1.05	-	2.90	-	13.63
2961-3	-	1.07	-	0.09	-	15.99	0.33	15.13
3141-3	-	0.17	-	.10	-	1.35	-	28.01
3151-3	-	-	-	3.26	10.33	8.20	1.98	22.18
3161-8	-	0.04	0.48	0.81	0.36	24.46	8.81	22.10
3231-4	-	-	0.23	1.17	0.57	54.90	2.77	11.70
3245	-	0.10	0.02	0.02	-	62.05	20.99	3.53
3241	-	-	-	1.23	-	32.11	-	-
3242	0.04	0.05	0.26	17.07	0.30	0.34	12.94	8.48
3243	-	-	-	-	-	13.03	-	21.20
3244	0.02	-	-	0.07	-	0.05	-	58.51
3341-3	0.02	0.10	0.18	0.77	0.06	27.17	1.46	34.24
3351	-	0.47	0.05	2.53	-	70.11	3.40	8.23
3352	-	0.23	0.06	0.13	0.02	26.84	1.58	43.19
3353	-	0.44	-	1.69	0.04	37.57	3.99	8.79
3354	-	-	-	0.76	-	2.34	0.41	21.81
3355	-	0.96	-	1.36	0.63	19.29	6.06	37.46
3356	-	1.10	2.35	15.49	0.09	20.49	1.92	25.36
3357	0.01	0.06	0.04	0.95	0.09	23.25	3.05	25.10
3361	-	0.10	-	0.04	-	6.29	-	47.18
3362	-	-	0.02	0.22	-	33.56	0.01	47.34
3363	-	-	-	0.07	-	19.91	-	18.45
3364	-	0.02	-	0.75	-	34.37	7.33	14.90
3365	-	0.01	-	0.14	-	19.74	2.25	34.35
3366	-	2.60	-	0.76	6.65	28.16	0.19	19.90
3367	-	-	0.03	1.25	0.01	21.74	1.78	31.44
3368	-	0.02	-	0.11	-	9.06	0.12	23.62
3369	0.07	0.02	0.02	0.74	0.08	18.21	0.70	35.99

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1983/84)

ASIC	Canada	New Zealand	Belgium Luxemb.	Denmark	France	F.R. Germany	Greece	Ireland
2951-7	6.73	5.12	0.11	-	0.12	1.02	-	-
2961-3	3.10	11.29	0.37	0.03	1.82	8.72	-	-
3141-3	1.81	31.92	0.91	0.03	5.86	13.10	-	1.67
3151-3	0.29	7.36	0.15	0.01	3.01	3.87	-	-
3161-8	1.19	3.24	0.22	0.65	1.03	8.42	0.07	0.03
3231-4	1.26	2.29	0.42	0.01	1.96	13.54	-	-
3245	0.51	0.43	0.02	0.06	0.21	4.66	-	-
3241	-	-	-	0.02	-	5.44	-	-
3242	0.06	19.61	0.05	0.06	2.79	4.19	-	-
3243	0.77	0.19	-	-	0.22	33.77	-	-
3244	2.03	0.44	-	0.01	22.43	0.14	-	1.85
3341-3	0.80	1.19	1.43	0.76	1.74	7.41	0.01	0.66
3351	0.05	0.41	0.29	0.33	0.18	2.44	0.04	0.18
3352	0.87	0.39	0.27	0.29	1.82	4.23	-	0.08
3353	0.57	9.43	0.13	0.65	1.55	4.55	-	0.07
3354	3.16	8.28	-	-	14.28	43.95	-	-
3355	1.35	5.66	0.12	0.24	0.79	7.93	-	0.10
3356	0.19	0.53	2.70	0.01	1.91	1.30	-	-
3357	1.58	2.02	0.92	0.41	2.86	12.37	0.07	0.09
3361	6.82	0.12	3.41	0.97	2.67	12.03	-	-
3362	1.89	0.30	0.54	0.01	1.20	5.69	-	0.05
3363	0.32	2.38	0.31	0.57	4.85	3.73	-	0.48
3364	0.56	1.75	0.39	0.38	2.72	12.72	-	-
3365	0.72	1.11	3.38	1.79	1.14	7.56	-	0.06
3366	0.43	7.68	-	1.17	0.08	0.33	-	-
3367	3.11	4.05	2.06	0.29	0.68	6.52	-	0.38
3368	2.00	2.43	0.46	2.37	3.39	19.98	0.03	-
3369	1.38	1.17	0.80	0.74	1.87	14.08	-	0.17

TABLE

IMPORTS BY ASIC OF SELECTED COMMODITIES

FROM VARIOUS COUNTRIES

(Percent of Total: 1983/84)

ASIC	Italy	Nether-lands	U.K.	Korea Rep.	Total all Countries
2951-7	-	1.23	3.35	0.01	
2961-3	1.65	0.88	13.41	7.58	
3141-3	4.32	0.60	28.01	-	
3151-3	7.12	-	9.61	5.67	
3161-8	2.86	0.54	11.89	2.00	
3231-4	1.38	0.18	3.62	0.21	
3245	2.74	0.16	2.26	0.06	
3241	38.68	-	19.41	-	
3242	1.59	8.34	2.62	-	
3243	0.52	0.36	19.86	-	
3244	0.58	8.61	3.82	-	
3341-3	0.97	2.21	7.73	1.26	
3351	0.15	0.35	1.43	3.21	
3352	1.89	0.81	5.93	0.40	
3353	2.83	0.57	1.99	0.23	
3354	0.74	-	2.77	-	
3355	0.35	1.06	6.57	0.66	
3356	0.25	0.22	6.87	9.40	
3357	2.32	1.44	10.83	0.40	
3361	6.44	1.37	7.65	0.10	
3362	1.77	0.06	2.96	-	
3363	1.43	0.66	3.67	1.97	
3364	6.78	1.15	6.20	0.18	
3365	3.17	11.20	8.36	0.23	
3366	1.42	0.35	0.23	0.77	
3367	1.98	0.30	6.00	0.12	
3368	12.07	4.05	11.11	0.08	
3369	3.90	1.18	10.67	0.10	

TABULAR APPENDIX

TO SECTION 3.1 : IMPORT REPLACEMENT

3.2 : EXPORT EXPANSION

TABLE 3.1.1 STRUCTURE OF IMPORTS

	Year Ended June 1982
	%
Agriculture	1.3
Mining	8.9
Manufacturing	87.2
Other industries	1.6
Non-merchandise	1.0
Total	100.0

Source: ABS, Catalogue No. 5406.0

TABLE 3.1.2 IMPORT SHARES (A) IN AUSTRALIAN MANUFACTURING SECTORS, 1979-1980

	%
Food	5
Construction materials	4
Metals and engineering (b)	24
Industrial chemicals and petroleum	13
Other manufacturing	25

Source: N.I.E.I.R.

Note:

(a) Imports divided by gross Australian production plus imports

(b) Excluding structural metal products (included in construction materials) and including furniture.

TABLE 3.1.3 THE SHARE OF IMPORTS IN DOMESTIC SUPPLY IN ELEVEN METALS AND MANUFACTURING INDUSTRIES (a)

	1	2	3	4	5	6	7	8	9	10	11
	%	%	%	%	%	%	%	%	%	%	%
1967	5.86	4.14	3.49	0.64	12.46	16.71	35.62	39.47	16.58	26.60	33.55
1968	7.34	4.16	2.27	0.37	13.53	18.23	34.95	40.40	16.41	28.71	34.17
1969	7.37	4.09	1.93	0.34	12.61	17.95	35.79	39.64	17.51	27.53	32.20
1970	6.79	2.93	1.21	0.38	12.87	18.49	36.13	43.52	17.18	25.84	34.47
1971	8.87	3.34	2.09	0.35	13.37	18.53	34.36	45.18	18.06	25.10	37.06
1972	8.49	2.74	1.54	0.43	13.02	15.82	22.86	42.21	19.13	25.77	31.74
1973	7.15	2.99	1.04	0.53	13.12	17.13	28.86	41.85	17.48	27.16	30.15
1974	10.57	3.21	0.75	0.43	14.72	21.21	38.95	47.88	21.47	27.05	35.48
1975	8.94	3.54	0.72	0.66	16.29	25.27	27.59	52.40	26.91	35.45	41.57
1976	6.83	3.07	0.76	0.64	17.16	25.58	17.12	49.94	25.32	38.92	38.77
1977	7.90	4.02	0.94	0.71	19.94	25.21	18.63	45.76	26.18	42.21	40.75
1978	9.16	3.55	0.53	0.80	20.02	23.49	17.32	48.93	24.93	37.81	38.52
1979	8.04	3.99	0.48	0.74	20.97	23.49	39.47	50.08	27.31	34.82	43.97
1980	7.95	5.36	0.66	0.72	22.36	25.42	22.40	48.91	26.38	39.79	40.47
1981	9.98	5.33	0.52	0.81	23.25	25.26	18.75	50.43	28.92	41.54	45.50

Industry Classification

1 Basic iron and steel
2 Non-ferrous metal products
3 Fabricated metal products
4 Sheet metal products
5 Cutlery
6 Motor vehicles
7 Other transport
8 Appliances
9 Electrical machinery
10 Agricultural machinery
11 Other machinery

Source: N.I.E.I.R.

Note : Imports divided by gross output less exports plus imports, calculated in 1979-80 dollars.

TABLE 3.1.4 THE SHARE OF IMPORTS IN DOMESTIC SUPPLIES BY MANUFACTURING SECTOR

	Metals and engineering industries	Non-metals and engineering industries	Total manufacturing sector
	%	%	%
1967	18.3	14.1	16.0
1968	17.0	14.0	16.3
1969	18.5	13.9	16.1
1970	19.1	14.7	16.8
1971	19.6	15.3	17.3
1972	17.2	15.2	16.1
1973	17.6	15.3	16.4
1974	21.4	17.0	19.0
1975	23.9	16.9	20.1
1976	23.0	16.5	19.5
1977	22.9	18.0	20.3
1978	22.4	17.3	14.6
1979	24.9	18.5	21.4
1980	24.0	17.5	20.3
1981	25.8	17.3	21.1

Source: N.I.E.I.R.

Note: (a) Imports divided by gross output by exports plus imports calculated in 1979-80 dollars.

TABLE 3.1.5 SOURCES OF AUSTRALIAN IMPORTS

	Year ended June		
	1981-82	1982-83	% Change
ASEAN	1516250	1549678	+2.2
EEC	4805937	4382765	-8.8
JAPAN	4527496	4504416	-0.5
U.S.A.	4764367	4764367	-9.2
(a) Total	16099053	15201226	-5.6
(b) Total imports	23004930	21810338	-5.2
(c) (a) (b)	70%	70%	-

TABLE 3.1.6 THE CHANGE IN THE PATTERN OF TRADE DEFICITS OR SURPLUSES

	1981-82 $'000	1982-83 $'000	% Change
ASEAN	179889	373310	107.3
EEC	-2449145	-2266729	- 48.3
JAPAN	823893	1502923	82.4
USA	-3094855	-2522517	- 18.5
Total four regions	-4540218	-1913013	- 57.9
Total	-3429724	394908	-111.5

Source: ABS

TABLE 3.1.9.

SECTORAL SHARES OF IMPORTS IN AUSTRALIA'S METAL ENGINEERING INDUSTRY: 1978-79 to 1983-84

ASIC	1983-84	1981-80	1978-79	1978-79 without ASIC 3231
2951	.06	.94	.6	.78
2961	.08	1.15	.58	.76
3141	.004	0.05	.11	.14
3151	.01	0.15	.12	.16
3161	3.2	3.78	5.5	7.2
3231	1.3	1.36	23.5	-
3245	1.8	2.62	1.3	1.7
3241	3.4	0.79	3.3	4.3
3242	.02	0.21	.08	.10
3243	.02	0.19	.16	.21
3244	5.1	4.21	7.1	9.3
3341	9.9	10.3	7.8	10.2
3351	9.1	6.5	.46	.6
3352	18.7	13.7	10.4	13.6
3353	6.0	4.6	4.7	6.1
3354	.04	.05	.04	.05
3355	.03	.51	.3	.39
3356	.03	.40	.24	.31
3357	7.7	8.6	6.5	8.5
3361	4.5	5.3	3.3	4.3
3362	2.9	6.9	3.5	4.5
3363	1.8	2.7	1.7	2.2
3364	2.5	4.1	2.8	3.7
3365	2.2	2.3	1.5	2.0
3366	.03	.21	.2	.26
3367	1.5	1.6	1.2	1.6
3368	1.4	1.4	1.5	2.0
3369	13.5	15.4	12.7	16.6

TABLE 3.1.10

IMPORT SHARE BY COUNTRY OF ORIGIN WITHIN AUSTRALIA'S METAL ENGINEERING INDUSTRY

	1983-84	1983-84 (without Asic 3231-4)	1978-79	1978-79 (without Asic 3231-4)
USA	30.1	28.5	29.5	38.0
Japan	28.3	27.2	26.7	15.9
Germany	7.5	7.4	12.2	11.8
U.K.	7.1	7.2	11.7	11.7
Taiwan	2.4	2.4	2.1	1.6
New Zealand	1.7	1.7	1.4	1.8
Korea	.8	.8	.3	.4
ASEAN	.4	.4	1.1	1.4

TABLE 3.1.11

FOREIGN OWNERSHIP AND CONTROL

	Foreign Ownership %	Foreign Control %
Basic I & S	27.3	16.8
Non f. metal basic prods	46.8	79.1
Fab struct met prods	14.2	19.1
Sheet met prods	12.5	11.0
Other Fab met prods	19.2	20.5
M.V. & parts	75.9	77.8
Other Trans equip	11.6	10.7
Photo, Prof, sci equip	50.7	52.4
Appl & elect equip	40.3	46.1
Indust mach & equip	32.5	35.8
Leather & L prods	6.9	8.1
Rubber prods	41.4	41.8
Plastic & related prods	34.0	41.1
Other manuf	14.2	14.1

(Source ABS F.O & L in Man.Ind. 72/3 5322.0)

TABLE 3.1.14

FLUOR CORP. 3833 Michelson Dr. Irvine, Ca.

Daniel Internation Corp.	
American Equipment Co. Inc.	
Applied Engineering Co.	
Bond Transmission & Controls Inc.	
D B Inc. of Greenville	
Daniel Construction Co. Inc.	
Daniel Consruction Co. International	
Daniel Internacional do Brasil Constructors Ltda	Brazil
Daniel Internacional, S.A.	
Daniel International (Canada) Ltd.	
Daniel International (France) SARL	France
Daniel International (Saudi Arabia) Ltd	Saudi Arabia
Daniel/McCarthy Ltd.	Republic of Ireland
Daniel/McCarthy International Ltd.	Republic of Ireland
Daniel, V.I. Inc.	Virgin Islands
Davcon Ltd.	
Daniel Financial Services, Inc.	
Daniel Industrial Services, Inc.	
Daniel Navarra, S.A.	Spain
Daniel Realty Corp. of Texas	
Davis Constructors & Erectors, Inc.	
Delcon Corp.	
Dincon Corp.	
Fabrication Services, Inc.	
The Fortis Corp.	
International Maintenance Organization Ltd	Bermuda
International Maintenance Organization (Canada) ltd	
Trans-Canada Maintenance Ltd.	Canada
Materiales y Equipos Auxiliares para la Construccion S.A. (A)	Spain
Fluor Apartments, Inc. (d)	
Fluor Constructors Inc	
Fluor Distribution Co's Inc.	
Aftermarket Diesel Inc.	
Amarillo Freightliner Sales Inc.	
Fluor Pipe & Piling Co.	
Fluor Supply Co.	
Goldston Inc.	
Electric Transport Inc.	
Goldston Transfer Inc.	
Jacksonville Truck Center Inc.	
Kilsby-Roberts Co.	
Oklahoma City Freightliner Inc.	
The Republic Supply Co. of California	
Triad Freightliner Inc.	
Fluor Drilling Services Inc.	
Coral Drilling, C.A. (d)	Venezuela
Fluor South America Ltd.	Liberia
Fluor Subsea Services Inc.	
Western Offshore Drilling & Exploration Co.	
Western Offshore Drilling & Exploration Co. Sdn. Bhd.	Malaysia
Fluor Engineers Inc.	
Deer Park Equipment Co.	
Eastern Synfuels Corp. (dP	
Fluor Alaska, Inc.	
Fluor Arabia Ltd.	Saudi Arabia
Capricorn Trading Co. Ltd.	Bermuda
Fluor California Inc.	
Flueor Engineering Corp.	
Fluor Holdings Ltd.	
Fluor Asia Inc.	
Fluor Atlantic Ltd.	Bermuda
Fluor Belgium N.V. (d)	Belgium
Fluor Canada Ltd.	Canada
Fluor (England) Ltd. (d)	U.K.
Fluor Carribean Inc.	
Fluor China Inc.	
Fluor Colombia Ltd. (d)	
Fluor Continental Ltd.	Bermuda
Fluor Cyprus Ltd.	Cyprus
Fluor Denmark Ltd.	
Fluor East Asia Inc. (d)	
Fluor Eastern Inc.	
Fluor Eastern Ltd. (d)	Bermuda
Fluor Euroasia Inc.	
Fluor Europe Inc.	
Fluor Europe Ltd.	U.K.

Fluor (Great Britain) Ltd.	U.K.
Fluor Ocean Services Ltd.	U.K.
IMO Services Ltd.	U.K.
Stanhope Management Services Ltd.	U.K.
Fluor European Equipment Co. Inc. (d)	
Fluor France SA.	France
Fluor GmbH	West Germany
Fluor Group Ltd.	
Fluor Hong Kong Ltd. (d)	Hong Kong
Fluor Indonesia Inc.	
Fluor Intercontinental Inc.	
Fluor International Inc.	
Fluor International Ltd.	Bermuda
Fluor International SA (d)	Panama
Fluor Italia Srl	Italy
Fluor Japan Inc. (d)	Japan
The Fluor-Korea Corp. Ltd.	South Korea
Fluor Latin America Inc.	
Fluor (Malaysia) Sdn. Bhd.	Malaysia
Fluor Mideast Ltd.	Bermuda
Petrochemical Engineering Ltd.	Saudi Arabia
Fluor Nederland B.V.	Netherlands
Fluor Norge A/S	Norway
Fluor (Nigeria) Ltd. (d)	Nigeria
Fluor Norge Ltd.	
Fluor North Atlantic Ltd	
Fluor (S.A.) Pty Ltd.	South Africa
Fluor Services Inc. (d)	
Fluor South Africa (Pty.) Ltd.	
Fluor Technical Services Inc.	
Fluor Technical Services Ltd.	
Fluor Texas Inc.	
Fluor Transvaal Inc.	
Fluor Transvaal Ltd.	
Fluor de Venezuela C.A. (d)	
Fluor Venezuela S.A. (d)	Venezuela
Fluor Western Sales Corp.	
Fluorven Ltd.	
Middle East Fluor	
Trans Pakistan Engineering Ltd. (d)	
Fluor Iran	Iran
Fluor Northwest Inc.	
Fluor Southeast Inc.	
Fluor Synfuels Corp. (d)	
Fluor Washington Inc. (d)	

Liquefied Coal Development Corp.	
Western Synfuels Corp (d)	
Fluor Engineers S.A. (Pty.)Ltd.	South Affrica
Fluor Finance N.V.	Netherlands Antilles
Fluor Mining & Metals Inc.	
Civil & Mechanical Maintenance Pty. Ltd.	Australia
Constructors Utah, Cia	
Fluor Australia Pty. Ltd.	Australia
Green Square Investments Pty. Ltd.	Australia
Fluor Cascade Inc.	
Fluor Chile, inc.	
Fluor-Chile Ingenieros y Constructores Ltds.	Chile
Fluor Mexico Inc.	
Fluor Mine Services Inc. (d)	
Fluor Mining & Metals International Inc.	
Fluor Mining & Metals Ltd.	
Fluor Panama S.A.	Panama
Fluor Southeast Ltd.	Bermuda
Peruvian Associates	
Pilbara Industries Pty. Ltd.	Australia
Fluor Ocean Services Inc.	
Fluor Ocean Services International Inc.	
Fluor Oil & Gas Corp.	
Cal Oil Ltd.	U.K.
Dominican Oil Inc.	
Espana Oil Inc. (d)	
Fluor Oil & Gas Ltd.	Canada
Haiti Oil Inc.	
Hellenic Oil Co. Ltd.	
North Sea Oil Inc.	
North Sumatra Oil Inc.	
Pacific Oil Marketing Inc.	
Panay Oil Inc.	
Peru Oil Inc.	
Sabah Offshore Oil Inc. (d)	
Selva Oil Inc.	
South Pacific Oil Inc.	
Tasman Oil Inc.	
Westmont Oil Inc.	
Fluor Power Services Inc.	
Fluor Power Services International Inc.	
Fluor Properties Inc. (d)	
Metropolitan San Jose Properties, Inc. (d)	
St. Joe Minerals Corp.	

- Allegheny Coal Corp.
  - Massey Coal Co.
    - A.T. Massey Coal Co. Inc.
      - A.T.M. Inc.
        - T.C.H. Coal Co.
- Allburn Coal Co. Inc.
- Anchor Coal Co. Inc.
- Ben Creek Coal. Co.
- Big Bear Mining Co.
- Blackberry Creek Coal Co.
- Capstan Mining Co.
- Clark Elkhorn Coal Co. Inc.
- Cline & Chambers Coal Co. Inc.
- East Kentucky Energy Corp.
  - Sun Coal Co. Inc.
- Elk Run Coal Co. Inc.
  - Bishop Mine Development Co.
  - Black Castle Mine Development Co.
  - Black King Mine Development Co.
  - Black Knight Mine Development Co.
  - Chess Process Co.
  - Knight Mine Development Co.
- Hopkins Creek Coal Co.
- Kermit Coal Co.
- Leslie Coal Co. Inc.
- Mansfield Carbon Products Inc.
- Marrowbone Development Co.
- Martin CountyCoal Corp.
- Massey Coal Export Corp.
- Massey Coal Sales Co. Inc.
- Massey Coal Services Inc.
- Massey Coal Terminal Corp.
- Massey Coal Terminal S.C. Corp.
  - Shipyard River Terminal Inc.
- Massey DISC Corp.
- Massey Fuels Corp.
- Massey Stores Inc.
- Menefee Land Co. Inc.
- Nicco Corp.
- Omar Mining Co.
- Ora Mae Coal Co. Inc.
- Peerless Eagle Coal Co.
- Peter Cave Coal Co. Inc.
- Pike County Coal Corp.
- Piney Creek Coal Co.
- Raleigh Six Coal Co.
- Ratcliff Elkhorn Coal Co. Inc.
- Rawl Sales & Processing Co.
  - Crystall Alma Corp.
    - Sycamore Mining Co.
      - Big Bottom Coal Co. Inc.
      - Bluesprings Coal Co.
      - Bonnie Coal Co. Inc.
      - P.M. Charles Coal Co.
      - Joboner Coal Co.
      - Lobata Coal Co.
      - Maxann Coal Corp.
      - Pikco Mining Co.
      - Pond Creek Mining Co.
      - Rocky Hollow Coal Co.
- Robinson-Phillips Coal Co.
- Royalty Smokeless Coal Co.
  - Douglas Pocahontas Coal Corp.
  - IMEC Inc.
  - Russel Fork Coal Co.
  - Shannon-Pocahontas Mining Co.
- SC Coal Corp.
  - SC Ventures Inc.
- Simron Fuel Co. Inc.
- Sprouse Creek Processing Co.
- Tennessee Consolidated Coal Co.
  - Chestnut Coal Co. Inc.
  - Coal Transit Co.
  - Grundy Mining Co. Inc.
  - TCC International Inc.
  - Virginia Mining Co. Inc.
  - Walnut Coal Co. Inc.(A)
  - Whitwell Coal Corp (A)
- Town Creek Coal Co.
- Tug River Coal Co. Inc.
- Utility Coals Inc.
- Virginia Crews Coal Co. (A)
- Winston Coal Co.

Wolf Creek Collieries Co.	
Wyomac Coal Co. Inc.	
Energy Research Corp.	
Mineracao Bonanca Ltda	Brazil
Mineracao Sao Jose Ltda (d)	Brazil
Mineracao Alabastro Ltda. (d)	Brazil
Mineracao Alpina Ltda. (d)	Brazil
Mineracao Baliza Ltda. (d)	Brazil
Mineracao Centauro Ltda. (d)	Brazil
Mineracao Dardo Ltda. (d)	Brazil
Mineracao Radiante Ltda. (d)	Brazil
Mineracao Sao Bernardo Ltda. (d)	Brazil
Mineracao Sao Felix Ltda. (d)	Brazil
Mineracao Sao Franciso de Assis Ltda	Brazil
Mineracao Sao Leonardo Ltda. (d)	Brazil
Mineracao Sao Mateus Ltda (d)	Brazil
Pea Ridge Iron Ore Co. Inc.	
Placer Service Corp.	
St. Joe American Corp.	
St. Joe Carbon Fuels Corp.	
St. Joe Coal Corp.	
St. Joe International Corp.	
International Minerals Ventures Inc.	
Jododex Australia Pty. Ltd.	Australia
Minera Aguila S.A. Cia	Argentina
Maria Albina Sociedad Ltda	Urugua
Metalurgica Austral Argentia SACIy F Cia (a)	Argentina
Minera San Jose S.A. Cia	Uruguay
Pachon S.A. Minera	Argentina
Retamosa Sociedad Ltda	Uruguay
Santa Barbara Sociedad Ltda	Argentina
Minera San Jose Inc. Cia	
Minera San Jose Ltda Cia.	Chile
Minera Cerro Amarillo Cia.	Chile
Minera Sancarron Cia (A)	Chile
Minera El Indio Cia	Chile
Minera Nevada Cia	Chile
Minera Rio Seco Cia	Chile
Minera San Jose del Peru SA Cia	Peru
Mineral Resource Development Corp.	
Minerales Santander Inc. Cia	
St Joe Australia Pty. Ltd. (d)	Australia
St. Joe (Torrington) Pty. Ltd.(d)	Australia
St. Joe Canada Inc.	Canada
St. Joe Explorations GmbH	West Germany
St. Joe Gold Pty. Ltd.	Australia
St. Joe Recherches SARL	France
St. Joe South Pacific Pty. Ltd.	Australia
Woodlawn Properties Pty. Ltd. (A)	Australia
St. Joe Trading Corp	
St. Joe International Trading Corp.	
St. Joe International Trading Ltd.	U.K.
St. Joe International Petroleum Corp.	
Coquina Oil Corp.	
St.Joe Petroleum (U.S.) Corp.	
St. Joe Petroleum Corp.	
St. Joe Egypt Exploration Corp.	
St. Joe Petroleium (Aruba) Corp.	
St. Joe Petroleum (Colombia) Corp.	
St. Joe Petroleum Egypt Corp.	
St. Joe Petroleium Guatemala Corp.	
St. Joe Petroleium-Holland Inc.	
St. Joe Petroleium (Indonesia) Corp.	
St. Joe Petroleium (Netherlands) Corp.	
St. Joe Petroleum (Papua New Guinea) Corp.	
St. Joe Petroleum Philippines Corp.	
St. Joe Petroleum Spain Corp.	
St. Joe Petroleum (U.K.) Corp.	
St. Joe Lead Co. Inc.	
St. Joe Magnesium Corp.	
St. Joe Resources Corp.	
St. Joe Zinc Co. Inc.	

TABLE 3.1.15

TURN-KEY PROJECTS IN THE WESTERN PACIFIC REGION

(AS AT SEPTEMBER 1982)

NAME OF COUNTRY	DATE OF CONTRACT	UNIT $Am	NAME OF CONTRACTOR	REMARKS
Malaysia				
Fertiliser	July 1982	$224.6	Kobe Steel	ASEAN Project
Integrated Iron and Steel Mill	November 1981	$315.3	Nippon Steel Corp. - Daido Steel - Mitsubishi Heavy Ind. - Chiyoda Chemical	
Cold Roll Facility		$212.8	Nippon Steel Corp. - Kawasaki Steel	
Cement		$157.7	IHI - Kawasho Corp.	
Power Plant	Won 1st tender	$275.9	Mitsubishi Corp. - Mitsubishi Heavy Ind.	
New Zealand				
Oil Refinery Plant	January 1982	$788.2	Chiyoda Chemical	The largest contract amount in Oceania Region
Synthetic Gasoline	December 1981	$236.5	Nissho Iwai	Total set of plant machinery and equipment
Hydro Power Plant	September 1982	$ 19.7	Marubeni and Hitachi	600,000 KW/annaul
Singapore				
Oil Cracking Plant (Heavy nature)	November 1981	$ 31.5	JGC	

NAME OF COUNTRY	DATE OF CONTRACT	UNIT	NAME OF CONTRACTOR	REMARKS
		$Am		
Indonesia				
Oil Refinery Plant	Preparing for tender	$2364.8	JGC, Chiyoda Chemical and others	Two separate business talks including one in Jakarta
Fertiliser	March 1982	$ 197.1	Tomen - Kobe Steel, etc.	Machineries and equipments only
"	December 1981	$ 153.7	Mitsubishi Corp. - Hitachi Shipbuilding	Phosphate (600 mt/day), etc.
Sugar Refining Plant	December 1981	$ 27.6	Hitachi Shipbuilding	2,000 mt/day
Natural Gas Processing Facility	November 1981	$ 51.2	JGC	
Hydro Power Plant	October 1981	$ 67.0	Mitsubishi Electric	Power Generator
"	October 1981	$ 30.0	Toshiba Corp.	Turbine
Fertiliser	October 1981	$ 161.6	Mitsui & Co. - TEC	Ammonia 1,000 mt/day Urea 1,725 mt/day
Cement	October 1981	$ 86.7	Marubeni Corp.	10 billion yen purchase of machinery and equipment from Kawasaki Heavy Ind.
China				
Coal Handling and Transport Facilities	June 1982	$ 39.4	Mitsui & Co. - IHI	Japanese Government credit
South Korea				
LNG Complex	July 1982, informal	$ 29.6	JGC - Marubeni Corp., etc.	Pipeline

NAME OF COUNTRY	DATE OF CONTRACT	UNIT $Am	NAME OF CONTRACTOR	REMARKS
Thailand				
Natural Gas Cracking	June 1982 (informal)	$ 173.4	Randoll (U.S.) - TEC	Yen credit (¥15 billion) from OECF
Fertiliser	Calling tender for second time	$ 591.2	Mitsui & Co., etc.	Urea, 500,000 m/t annual, etc.
Philippines				
Cement	June 1982	$ 59.1	Mitsui & Co. - FL Smith	
Geo-thermal Power Plant	April 1982	$ 47.3	Mitsubshi Heavy Ind.	Japanese Government yen credit
Iron and Steel Plant	Preparing for tender	$1182.4	Kobe Steel, Kawasaki Heavy Ind., etc.	1st direct reduction method will be adopted in this country
Australia				
LNG	June 1982	$1970.7	JGC - Kerogg - Raymond (Australia)	
Coal Power Plant	November 1981	$ 118.2	C. Itoh - Hitachi Ltd.	700,000 kw, for use of aluminium smelting
Taiwan Province				
Oil Refinery Plant	Calling Tender in September 1982	$ 59.1	Chiyoda Chemical and JGC, etc.	Heavy oil, direct desulphurisation

(Source: The Nikkei Sangyo Shimbun)

TABULAR APPENDIX TO PART III, SECTION 2.

TABLE 3.2.1 GROWTH IN WORLD OUTPUT AND EXPORTS (VOLUMES) 1960 to 1981

	Average Annual Growth Rate (%)					
	Ouput			Exports		
	1960-70	1970-81	1960-81	1960-70	1970-81	1960-81
Agricultural Products	2.5	2.3	2.4	3.7	4.0	3.7
Minerals (a)	3.7	2.5	3.1	6.9	-0.2	3.1
Manufactures	6.6	4.4	5.4	9.7	6.7	8.1
TOTAL	5.2	4.1	4.6	7.9	5.0	6.4

Source: GATT, International Trade, Various Issues

(a) Including fuels and non-ferrous metals.

TABLE 3.2.2 VALUE OF WORLD EXPORTS: COMPOSITION

	% of Total		
	1960	1970	1981
Agricultural Products	31.3	20.5	14.7
Minerals (a)	16.4	16.3	27.4
Manufactures	50.0	60.9	56.9
Other	2.3	2.3	1.0
TOTAL	100.0	100.0	100.0

Source: GATT, International Trade, Various Issues

(a) Including fuels and non-ferrous metals.

TABLE 3.2.3 GROWTH OF WORLD EXPORTS: 1960 TO 1981

	Average Annual Growth Rate (%)								
	1960-1970			1970-1981			1960-1981		
	Value	Volume	Unit Value	Value	Volume	Unit Value	Value	Volume	Unit Value
Agricultural Products	4.8	3.7	1.4	14.0	4.0	10.3	9.9	3.7	6.0
Minerals (a)	9.2	6.9	2.1	22.7	-0.2	24.1	16.7	3.1	13.1
Manufactures	11.5	9.7	1.6	15.9	6.7	10.0	14.5	8.1	5.9
TOTAL	9.4	7.9	1.3	18.2	5.0	12.6	13.9	6.4	7.1

Source: GATT, International Trade, Various Issues.

(a) Including fuels and non-ferrous metals.

TABLE 3.2.4 ELASTICITY OF TRADE WITH RESPECT TO GDP IN MARKET ECONOMIES (1960-78)

Food	1.0
Raw Materials	0.8
Fuels	1.3
Chemicals	2.3
Machinery	1.8

Source: United Nations Statistical Yearbook.

TABLE 3.2.5 VALUES AND ANNUAL COMPOUND GROWTH RATES IN BROAD INDICATORS OF OECD TECHNOLOGY EXPORTS

	Values (1980 $USb)					Average Annual Growth Rate 1970-79	
	1970	1976	1977	1978	1979	Current Values	Constant Values
Receipts for technology (balance of technological payment basis)	0.68	1.55	1.66	2.04	2.28	14.4	3
EXPORTS							
Capital goods	16.7	69.2	78.3	94.8	102.8	22.4	12
Manufactured goods	34.1	122.6	144.4	180.4	202.0	21.8	9
Net foreign direct investment	3.7	7.9	9.5	11.2	13.5	15.5	4

Source: North-South Technology Transfer, OECD, Paris 1981.

TABLE 3.2.6 JAPANESE TECHNOLOGY EXPORTS

	1972	1973	1974	1975	1976	1977	1978	1979	1980
Technology exports $USm	140	187	196	224	281	348	580	608	704
Technology exports as % of imports	24	29	36	39	47	49	64	55	67

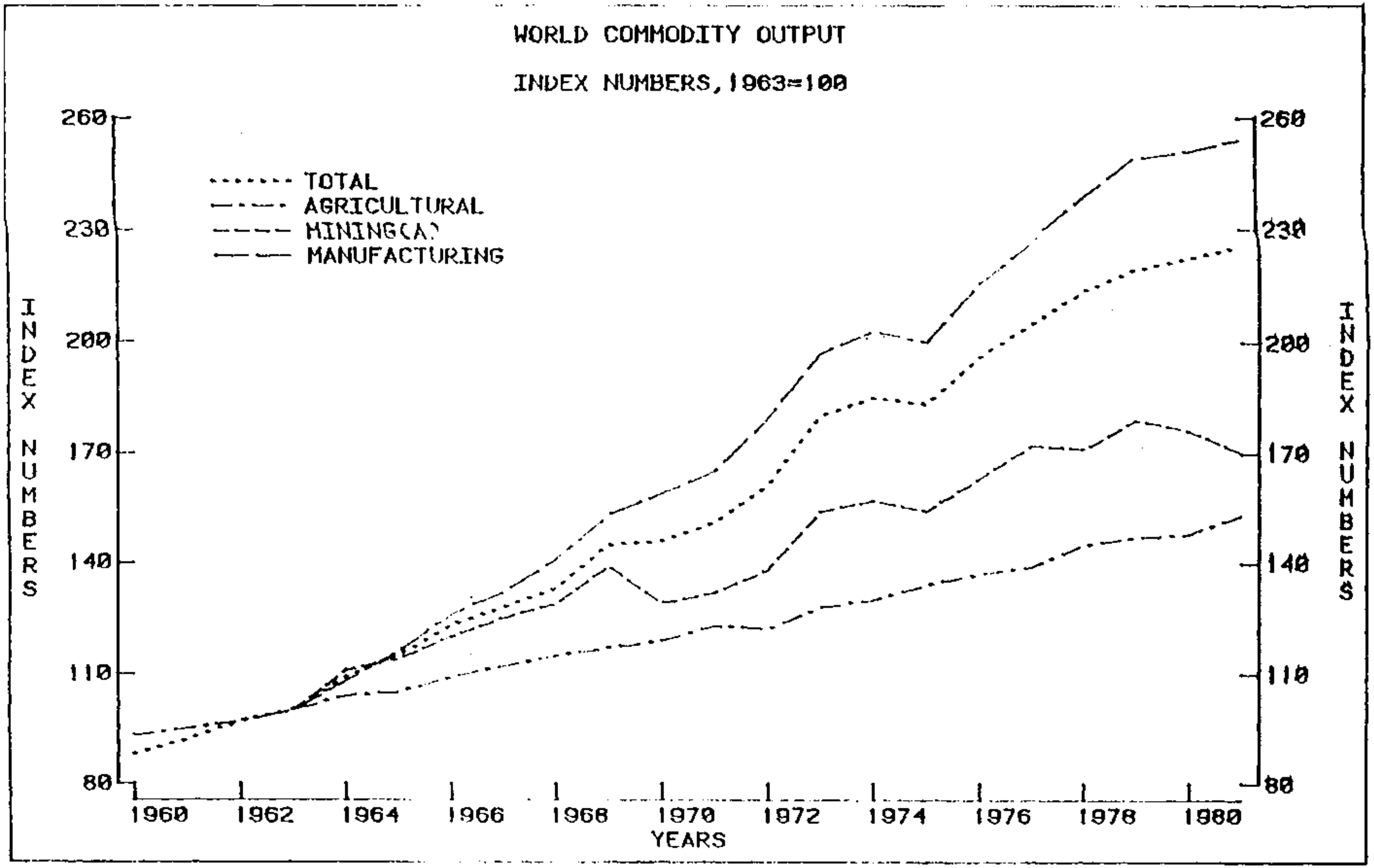
Source: The Transfer of Industrial Technology to Western Pacific Developing Countries, Hill and Johns, Prometheus Vol 1 No 1 June 1983 p.60.

TABLE 3.2.7 SHARE OF CAPITAL GOODS IN TOTAL IMPORTS - SELECTED WPR COUNTRIES (1976)

Country	Designation	Share (%)
Indonesia	Capital goods	48.2
Malaysia	Machinery and transport	34.5
Philippines	Capital goods	31.0
Singapore	Machinery and transport	25.9
Thailand	Machinery	29.7

Source: Bureau of Industry Economics Industrialisation in Asia - Some Implications for Australian Industry, AGPs (1978).

FIGURE 3.1



(A)INCLUDING FUELS AND NON-FERROUS METALS
SOURCE: GATT, INTERNATIONAL TRADE, (VARIOUS ISSUES)

PART 4 INDUSTRY MODERNISATION AND DEVELOPMENT

4.1 MODERNISATION

4.1.1 Two Decades of Stagnation

According to the Crawford Report [1] postwar development policy, at least in terms of its own objectives, was successful. Bolstered by chronic balance of payments problems industrial development policies concentrated almost exclusively on import replacement and as a result the 1950s and 1960s were periods of almost continuous growth, especially in manufacturing.

The success of the import replacement strategy, argued Crawford, rested largely upon rapid population growth, and adequate growth in exports needed to pay for essential imports. Full employment and high living standards were achieved together with rapid growth in the range and sophistication of manufacturing industry.

Three factors, however, have combined to undermine the '...logic of post-war development policy..... namely: [2]

* the Australian minerals boom

* the world energy crisis

* the rapid growth of less developed countries as sources of labour-intensive manufactured products.

What, hitherto, had been a wide range of sophisticated manufacturing industries had given away, by the 1970s, to "...a very diverse and rather fragmented industrial structure...". Yesterday's modern factories had become today's structural problems.

Hence, according to Crawford, "...Much, although by no means all, of the equipment used in Australian factories is old-fashioned and in need of replacement. Some manufacturing buildings are old and not well designed for current purposes. On average, productivity in Australian factories is not good by international standards"[3].

Until the early 1970s these factors had been masked by generally bouyant economic trends, but a sharp rise in both inflation and unemployment in 1973-74, the subsequent recession and intensification of import competition and, finally, the sharp increase in costs brought the need for structural adjustment into 'sharp relief'.

Crawford's view of the need to replace much of the manufacturing sectors capital stock seems to be adequately borne out by the evidence. According to the Institute of Applied Economic and Social Research [4] net investment as a proportion of the net manufacturing capital stock had fallen almost continuously from 6.8 per cent in 1964 (year ended June) to 0.2 per cent in 1976. Moreover, gross fixed asset expenditure of manufacturing companies had, over the period, grown at a much slower rate than that of non-manufacturing companies, "... and a relatively high proportion of this expenditure by the manufacturing group has been for replacement of plant and equipment wearing out." [5]

The rate of capital asset formation is complicated by the practice of leasing capital equipment as distinct from outright purchases. Thus where data is given on an 'industry of ownership' basis as distinct from an 'industry of use' basis the actual volume of capital assets employed in manufacturing will be significantly understated. Nevertheless, the above article concluded that "...Measured in constant prices, the trend in total net investment in manufacturing, including leasing, takes on a quite different bearing. Instead of being at a peak in 1974-5, net investment was in that year well down on the levels reached in the 1960s, and lower than in 1963-4. But for many years before 1974-75 net manufacturing investment has been flat, showing no sign of substantial sustained increase. The result has been that for many years the rate of increase in the net capital stock of the manufacturing industry has been steadily declining". [6]

These factors are reinforced by later national accounts figures [7] which show, for example, that equipment investment by the manufacturing sector grew steadily, in current price terms, between 1970 and 1977 (and thereafter), but that this growth failed to match the decline in the equipment capital stock as measured by depreciation[8]. Indeed from 1974 onwards the equipment capital stock of manufacturing industry begins to contract. This factor is, of course, offset by equipment leasing which is not shown in the national accounts figures.

Nevertheless, trends in the age of the manufacturing capital stock suggest that the leasing factor, over the above period, was insufficient to offset the decline in net investment. It has been estimated,[9] for example, that between 1968-69 and 1976-77 the average weighted age of the manufacturing sector's plant and machinery capital stock (including leased assets) increased from 9.3 years to 10.42 years, an increase of more than 12 per cent over the period.

Moreover, Haig concludes that "... In general the average age of capital in plant and machinery has declined since 1948-49. In the 1970s, however, the average age rose, reflecting a slow-down in the rate of increase in investment. The average rose in most manufacturing industries although there are some divergent trends. For example, there has been a large and consistent fall in the age of capital in food industries since 1948-49, while the average age of capital in chemicals has risen substantially in recent years". [10] Haig's estimates suggest, also, that the average age of the capital stock of the metals industries increased at a rate in excess of that for manufacturing taken as a whole over the same period.

Increases in the average age of an industry's capital stock have a number of significant implications for the industry's overall efficiency, costs and hence profitability. For example, contrary to the canons of conventional economics (discussed in more detail below) technological change and productivity growth cannot be treated as "residual elements", rather improvements in productive techniques are embodied in capital equipment and new production processes, and are realised once such proceses are installed and operating. Increases in the average age of an industry's capital stock, therefore, imply that the industry is failing to keep abreast of the latest technological opportunities, and thus the 'technology gap' between the industry and its international competitors will, in general, be widening with adverse consequences for the local industry's overall competitiveness.

Secondly, out of date equipment tends to become progressively more susceptible to breakdowns, which not only entail lost production, but also involve disproportionate increases in the costs of maintenance and repair. Additionally, such equipment, even when operating, tends to produce poorer quality output (for example, specified tolerances become more difficult to achieve) which, in turn, entails higher reject and re-working rates thus significantly increasing the need for, and cost of, quality control.

On one particular facet of the decline in manufacturing – private industrial research and development – Crawford expressed particular concern. The Report argues that the evidence suggests that private IR and D effort "... has deteriorated substantially in recent years". [11], so much so that, according to the then President of the Australian Academy of Technological Sciences, "...Australian industry is now at a lower level of technology (relative to overseas countries) than it was in 1939". [12]

The evidence, then, does appear to support the Crawford view that much of the equipment in use in Australian manufacturing is 'old fashioned, and in need of replacement'; and that, moreover, this has an adverse effect upon efficiency and competitiveness.

The next section considers the deteriorating performance of Australian manufacturing in the context of the rapid growth in technological opportunities arising particularly from the wide range of new product and process applications of microelectronic based technology.

4.1.2 Rapid Expansion of Technological Opportunities in Manufacturing

The rapidly falling price of computer memory coupled with advances in the fields of robotics and computer control of machine tools are giving rise to revolutionary changes in the organisation of many branches of production. Whilst still at a very early stage the potential of the new forms of manufacturing technology appears almost limitless.

Mass production technologies, moreover, whilst highly efficient, tend to be extremely inflexible since their transfer to alternative processes and products is a costly and time consuming activity. The stand-alone machine tool, on the other hand, whilst extraordinarily flexible is not very efficient. The increasing application of computer technology to manufacturing processes (computer aided manufacture) has, however, allowed design and production engineers to achieve extremely significant gains in term of both efficiency and flexibility – especially for medium volume production runs which, importantly, are fairly characteristic of Australian production levels.

At the centre of these advances are the revolutionary developments over the last decade or so in the field of microelectronics. Rapid technical progress in the miniaturisation of electronic circuitry has made it possible to put the essential elements of a modern computer on to one silicon chip – the microprocessor. Other standard chips have been developed to act as memory and input-output control devices, and the three elements taken together produce a micro-computer which is as powerful as it is cheap.

The scope for low cost computer applications in most manufacturing activities is considerable. A recent survey, [13] of the extent of product and process applications of microelectronics in Britain found, for example, that the range of applications already extends far beyond those which are traditionally associated with the electronics industries such as computers, radios, TV s and defence equipment. Such product applications include:

machine tools	lifts
process control equipmment	security alarms
precision instruments	energy control systems
mechanical handling systems	weighing machines
equipment for vehicles and aircraft	vending machines
farm equipment	petrol pumps

drills	freezers
pumps	cookers
printing machinery	washing machines
photogaphic equipment	clothes dryer
medical equipment	hair dryers
wheelchairs	

Of central importance was the finding of the survey that microelectronic applications in production processes (as opposed to products themselves) are in use or planned, in a much larger proportion of the establishments in the sample. Furthermore, many of the product applications are in productive equipment which represents a product application to the establishment making it, but a process application for other establishments which buy it and use it in making their products.

The survey describes the extent of the scope for applications as "all-pervasive" and found a wide range of establishments using microelectronics to monitor and/or control an equally wide range of processes, including:

Mixing	Hot-rolling	Dyeing
Blending	Melting	Glueing
Colour control	Casting	Riveting
Counting	Milling	Stitching
Size sorting	Turning	Winding
Weighing	Machining	Weaving
Balancing	Punching	Knitting
Moisture control	Guillotining	Fabric cutting
Fermentation	Sawing	Paper making
Heating	Planing	Printing
Cooking	Sanding	Equipment cleaning
Thermo-fixing	Glass surfacing	Mechanical handling
Inspection	Plating	Filling
Extrusion	Anodising	Wrapping
Section forming	Painting	

Product Applications: The survey found sharp differences between industries. For example, in the electrical and instrument engineering industry some 58 per cent of firms in the sample were using microelectronics in their products; for mechanical engineering the proportion was 29 per cent, and for vehicles the figure was down to 16 per cent.

Process Applications: For this set of users the survey found that the application of microelectronics was much more widely distributed across the whole range of industries. Particularly high proportions were found, however, in the electrical and instrument engineering sector (60 per cent), food and drink (56 per cent), clothing and leather (21 per cent) and textiles (31 per cent).

The narrow spread of usage at the product application level probably reflects the absence of scope in some industries. The differences in process applications, however, given the extent of their potential and actual usage outlined above, probably reflects a lack of awareness and expertise in industries remote from the electronics sectors.

Lack of awareness was also cited as a key problem by the Cashman Committee in its recent report to the Federal government entitled "Report on the Need for the Establishment of an Advisory Service on Computer Assistance in the Manufacturing Industry". Among other things the Committee recommended that there is an urgent need to establish a nationwide advisory service in order to co-ordinate existing services for the upgrading of technology in the manufacturing sector. The service would be called the Manufacturing Advisory Service in Computer Assisted Manufacturing. Some of the themes of the Cashman Report will be dealt with in the following section.

This section has dealt very briefly with the potential and indeed the need which recent technological developments have created for an across-the-board program of industry modernisation. We have given illustrations of the very wide range of product and processes applictions for which microelectronic technology has an equally wide range of uses. Neither section 4.1.1 nor this section, however, have dealt with the factors which in general tend to promote industrial modernisation and productivity growth. The next section, therefore, remedies this deficiency with an examination of the relations between growth and efficiency.

4.1.3 Relation Between Growth and Efficiency

In its submission to the Crawford Report the Department of the Treasury said:

> Government can best assist change through macro-economic policies aiding full employment and economic growth while ameliorating any regional or compositional imbalances in factor markets through such general micro-economic programs as labour re-training, placement and mobility schemes. [14]

Whilst acknowledging that buoyant economic circumstances facilitate the task of structural adjustment Crawford argued that the Treasury view "...under-estimates the problems that exist today. ...The Group believes that stimuli, not normally included in macro-economic policy, are required". [15] As a general statement the Crawford view, as far as it goes, is strongly supported by the thrust of this Report. However, the evidence suggests that the Crawford approach of targeting policy almost exclusively on improvements in technical efficiency in the expectation that, if successful, industrial growth will automatically follow actually reverses the order of cause and effect.

Crawford's major achievement, it will be remembered, was its definition of an 'industrial adaptation policy'. This policy had three major themes, namely:

– encouraging the emergence of a more competitive manufacturing sector

– promoting flexibility and adaptability in the economy and the workforce,and

– easing the adverse consequences of adjustment

Policies designed to achieve a more competitive manufacturing sector would require, in part, 'direct' measures which encourage industry to develop greater technical and managerial efficiency, improved skills and a stronger export orientation. They would also require 'indirect' measures involving gradual reductions in protection which, among other things, would "...provide a spur towards restructuring, modernisation and greater competitiveness in the highly protected industries themselves". [16]

Whilst the emphasis, clearly, is placed upon improvements in technical efficiency and competitiveness as pre-conditions of medium term industrial growth – especially expansion into export markets, Crawford is sufficiently realistic to acknowledge some of the institutional barriers to increased exports outlined earlier in our Report. Equally, it is suggested that general reductions in protection should not occur whilst unemployment remains in excess of 5 percent. Thus Crawford's policies aimed at improving manufacturing efficiency were set in the context of other policies designed at least partially, to offset the unemployment consequences of lower protection and increased productivity. Nevertheless, the strong impression given by Crawford, and certainly by some of his less cautious adherents, is that policies which improve technical efficiency are the primary prerequisites of growth.

The Crawford view is echoed to some extent by the views expressed by some on the Cashman Commitee. In particular, 'competitiveness' is seen as the key to survival in the international marketplace; and competitiveness, in turn, is critically dependent upon the introduction of new manufacturing technologies. Lack of awareness and information on new technology, it is argued are the principal barriers to its accelerated adoption, and as a result manufacturing is becoming progressively more technolgically backward.

We might agree that an economy becoming comparatively less technically efficient will probably lose ground in both the domestic and international marketplace, but it does not follow that policies designed to improve technical efficiency in such circumstances will inevitably be successful i.e. that firms and industries will actually increase the rate at which they exploit new technological opportunities. Nor does it follow that, even if they did, they could thereby successfully overcome the many non-competitive factors which constrain the rate at which a firm or an industry can achieve and maintain a given market share, especially in the international arena.

We would argue that the Crawford view is a somewhat attenuated version of the conventional approach to the relation between efficiency and growth. Put simply, this view sugests that the casual sequence runs from differential rates of 'unexplained' technological change and hence productivity growth to differential shifts in the pattern of relative costs and prices and consequently relative rates of growth of output. [17]

Many studies [18] over extended periods have indeed found strong correlations between output and productivity growth. [19] A recent study in Britain [20], for example, found that:

> In the case of manufacturing industry the pace of productivity growth depends not so much on fundamental technological advance, relative to which actual practice lags far behind, but on the rate of investment, the pace of reorganisation of both management and production processes, and the spreading of overheads through high volume production. *All of these vary quite closely with the growth of output.* (emphasis added)

Such joint variation, however, sheds no light on the direction of causality. For example: "....Some say the direction of causation could be from fast productivity growth to fast output growth because fast productivity growth causes demand to expand faster through relative price changes. In this view, all productivity growth would be autonomous. But if this were so, argues Kaldor, how can we explain large differences in productivity growth in the same industry over the same period in different countries?" [21] Equally such a view would be a denial of the existence of dynamic scale economies and increasing returns. However, Thirlwall suggests that Kaldor would concede that there is an interaction process at work through cost and price changes.

A recent Australian study [22] set out to test for the existence of the Verdoorn relation (that is, the relation between growth and efficiency) in Australian manufacturing industry, the direction of causation, and the strength of the interaction and feed-back – if any. The authors of the study aimed to test both the Kaldor view and the Salter view of the process. Kaldor, they argue, has causation running from output growth to productivity growth, with output growth chiefly dependent upon exogenous growth in demand. The Salter view, by contrast, suggests that causation runs from productivity growth to output growth. The uneven incidence of exogenous technological development explain the distribution of productivity growth, and differences in the latter are reflected in differences in the movement of relative prices and subsequent changes in the pattern of output.

The authors conclude that:

> The results confirm the relevance of the Verdoorn Law to Australian manufacturing experience with statistically significant productivity elasticities that lie in the range found in other economies. Industries with above average output growth do experience above average rates of productivity growth. The Verdoorn relationship is strongest for the period 1950-51 to 1964-65, a period of rapid expansion in Australian manufacturing. The relationship is weakest for the post 1968 period with a productivity elasticity substantially lower than in the previous period.[23]

> And on the direction of causation they conclude that:

> ...relative price changes can at best only account for a small part of the observed pattern of output change in Australian manufacturing. This clearly weakens the force of any Salter based argument which suggests that it is exogenous changes in production technology which are the prime generator of structural change.[24]

These findings lend empirical support to the view of this Report that the sluggish growth of manufacturing output over the past decade is the principal cause of its deteriorating technical efficiency and competitiveness. We would agree with Crawford on many of the factors at work, but we would also emphasise the view that the stance of domestic industry policies over the last decade have contributed significantly to the deterioration — especially policies based on the view espoused by Crawford *et al* that general reductions in protection will act as a spur to modernisation and hence improved efficiency. The principal objection to this view is very adequately captured in the following quotations [25].

> Slow growth of sales discourages investment in new capacity and, by depressing profits, reduces the ability of firms to finance investment expenditure. Low profits tend also to retard product innovation and to reduce expenditure on industrial training. This in turn further diminishes the ability of home manufacturers to compete with overseas counterparts and is liable to lead to a continuing loss of market shares.

> As trade performance deteriorates, governments have been forced to hold down growth of domestic expenditure to avoid balance of payments problems, reinforcing the downward spiral.

And finally:

> In such a situation, conflict between management and the labour force has become acute. Not only is there strong pressure on managers to hold down wages as a means of compensating for declining sales, but also productivity gains in the context of a stagnant market almost inevitably entail job losses. It may not be too surprising that workers should resist

> the introduction of new technology and changes in working methods if this is the only way they have of trying to safeguard their employment.

Accordingly, policies which, for whatever reason, lead to slower growth in sales will tend to weaken manufacturing competitiveness, and 'direct' policies, such as investment allowances, which in the above context might be introduced to compensate for such weakening in competitiveness by accelerating the rate of adoption of new technoloiges will tend to exacerbate an already difficult industrial relations and employment environment. The orthodox approach thus seems fraught with difficulties.

Treasury, in fact, in emphasising demand management policies designed to achieve full employment were implicitly acknowledging the fundamental link between economic growth and industrial efficiency developed in this Report. To that extent we believe Treasury were more correct in their approach. Nevertheless, as we have shown earlier, there are binding constraints on the achievement of faster macroeconomic growth. Growth must be achieved, therefore, via a combination of policies designed to expand the output of import competing industries with significant under-utilised capacity and backed up by complementary fiscal growth.

In this section we have examined a number of approaches to the objective of industry modernisation. We have shown, on the basis of Australian and overseas evidence, that the key to higher manufacturing productivity growth is higher overall output growth. We have argued that, given this relation, the traditional aproach to structural adjustment and modernisation is significantly deficient in a number of key respects. Indeed, it is likely to have precisely the opposite result to that intended. We have concluded that growth, in a constrained macro-economic environment, is best achieved via the type of industry expansion strategies outlined in the earlier sections of this Report.

In the next section we develop the view that if such strategies were pursued it would be necessary to plan for the simultaneous expansion of the metals and engineering industries beyond simply the absorption of their excess capacity. Without such an expansion, we argue, a number of factors will combine to undermine the overall growth process.

4.1.4 Implications of the Failure to Expand the Metals and Engineering Sectors

Very little research, if any, has been conducted in Australia on the macro-economic and industrial implications of the economy's comparatively unintegrated industrial structure (unintegrated in the sense of having a comparatively underdeveloped capital equipment producing sector). Earlier sections of this Report have drawn specific attention to Australia's high propensity to import manufactured goods (more than 80 percent of total imports), and within manufactured imports the equally high propensity to import comparatively sophisticated capital equipment. We have also shown that more than 51 percent of domestic sales of such equipment is, in aggregate, sourced from overseas. The proportions for some types of capital goods is running much higher.

We have also drawn out the inherent difficulties in expanding exports of our traditional primary commodities in the context of a sluggish world market for such commodities, and in the context a world market in which such commodities are accounting for a progressively smaller proportion of overall trade.

In such circumstances rapid industrial growth engendered by the types of industry expansion and complementary fiscal strategies outlined above, especially growth strategies which stimulate an across-the-board industry modernisation response, are likely to be self defeating. Ironically, the higher the modernisation response then the greater the likelihood of eventual stagnation.

The reason is, of course, that given Australia's capital equipment import propensities, and given the very size of the potential for industry modernisation, capital expansion under such circumstances is likely to be self defeating since through leakages into imports, it would fail to create effective demand for domestic production at the same rate that it creates productive capacity. In a recent paper [26] a useful analytical model is developed for the evaluation of economies which "...appear to be strongly biased towards the production of consumer goods and some of the intermediate inputs required by this production". It is argued that the lack of a well developed capital goods sector which has resulted from the 'uneven nature of the process of import substitution' has two major consequences for the process of growth':

(i) most of the multiplier effects of new investment are exported in the form of increased imports of capital goods, in other words, investment in these circumstances, expands productive capacity but fails to create additional effective demand, [27] and

(ii) secondly, indirect multiplier effects are bound to appear whenever the creation of productive capacity occurs in industries which substitute local production for imports. Thus the extent to which investment generates effective demand for domestic goods depends upon the composition of investment among industries.

These factors combined with stagnant or slow growing exports imply that "...the process of economic expansion will be closely dependent on the structure of investment and the indirect multiplier effects that follow from the creation of capacity in industries which substitute local production for imports. This seems to us to be the reason why the process of industrial growth appears as a succession of 'waves' of import substitution, i.e. periods of high and sustained growth when investment is directed towards new industries which produce goods previously imported, interrupted by periods of slow and less stable growth with significantly less structural change in production and investment and greater balance of payments and budgetary problems". [28]

The basis of such sustained expansion, according to the above authors, stems from the fact that the allocation of investment towards 'new industries' expands capacity and hence reduces import needs thus offsetting the negative impact of imports on profitability. This mechanism increases effective demand both directly and indirectly with positive effects on profits which in turn are fed back into further capacity expanding investment and so on in a cumulative process.

Government can, for a time, through appropriate demand management policies maintain effective demand and hence profitability and investment. They will do so, however, only at the expense of ever-increasing trade and public sector deficits, and eventually economic stagnation. With relatively stable import propensities, and with a given level of exports, growth in income will inevitably lead to falling trade surpluses or increasing trade deficits. In this context, the share of profits in gross domestic product can only be maintained by progressively greater public sector deficits.

In policy terms, the authors conclude that the most important implication of their analysis concerns the limitations of a policy of aggregate demand management "...in an economy with a scarcely developed capital goods industry and with a structure of trade in which exports come predominantly from primary sectors and imports consist mainly of manufactures. Fiscal policy in this context will be able, in the short run, to defeat the trend towards stagnation which stems from the failure of investment to stimulate domestic production. However, the maintenance of a high rate of growth would involve increasing financial problems for the public sector and the balance of payments".[29]

Importantly, the authors conclude that an industrial policy which succeeded in establishing a capital goods industry would have positive macro-economic effects in terms of:

(i) strengthening the multiplier effects of investment on domestic output, and

(ii) lowering the level of imports required to sustain any given level of activity,

but it would also "...create the basis for an endogenous core of technological progress, the absence of which is partly responsible for the poor export performance of the past".

We believe the above analysis is of some considerable significance. In summary, given Australia's high propensity to import manufactures, especially capital goods; and given its sluggish export performance a high rate of economic growth – even one engendered by the approaches suggested earlier in this paper – could not be sustained for any lengthy period because of the disproportionate leakage of effective demand into imports. Ironically, the more successful the growth and modernisation process then the more likely that the very factors underlying such success would undermine the process.

In the medium term, therefore, plans would have to be made to ensure that the same volume of imports supported a higher level of economic activity. Thus the absorption of spare capacity in the metals and engineering industries, whilst necessary, is not sufficient to ensure sustained growth. Ultimately, the domestic metals and engineering industries must expand their share of gross domestic product.

Section 4.1 has aimed to show that in addition to the growth potential for the metals and engineering industries arising from existing domestic and world market opportunities, there is also a very significant potential arising from the need to achieve a more modern manufacturing sector especially given the very rapid and extensive developments in the field of micro-electronic product and process applications. In the light of the modernisation objective, the factors which govern the growth of productivity were discussed and the conclusion reached that productivity growth is heavily dependent upon output growth. Policies, therefore, which in the name of improved efficiency tend to dampen output growth, e.g. prior reductions in protection, must inevitably be self defeating.

Finally, it was argued that growth could be achieved on the basis of import replacement/export expansion strategies backed up by complementary fiscal policies, but that given Australia's import propensities such growth could not be sustained in the longer term unless a given volume of imports – consistent with the volume of exports – could be made to support a higher gross domestic product via policies designed to achieve a significantly higher share of GDP for the metals and engineering industries. Such an outcome, it was suggested, would at the same time greatly enhance Australia's technological base. It is to the implications of this latter factor that Section 4.2 now turns.

4.2 DEVELOPMENT

Earlier sections have concluded that growth policies targeted on absorbing spare capcity in the metals and engineering sectors in the short run, and targeted on expanding metals and engineering capacity in the medium to longer term were necessary to achieve high and sustainable rates of growth of both output and productivity. The previous section touched on the question of the link between the development and expansion of the domestic capital equipment sectors and the overall technological development of the economy. This section picks up this theme in some detail.

Beginning with an evaluation of conventional views of the industrial development process, we move on to suggest that the conventional approach to development has a number of serious limitations. We argue, for example, that the pre-occupation of conventional economics with such concepts as factor and commodity substitution, alloction of 'scarce' resources, and diminishing returns entails a significant failure to consider the far more useful concepts of industry complementarity and increasing returns — two ideas which lie at the centre of any fruitful explanation of the growth and industrial development process. Finally we consider the role of the metals and engineering sectors as industries specialising in the skill intensive manufacture of comparatively sophisticated capital/technology products.

We conclude by suggesting that the Metals and Engineering industries represent a key sub-set of a wider group of industries and institutions which collectively have responsibility for Australia's technological performance and development. Their principal function, it is suggested, is the active development and provision of capital equipment and other industrial supplies which embody relatively high professional, technical and craft skill content. Through the processes of transfer, adaptation and diffusion of technology the industries establish economy wide forward linkages with other industries which, in turn, facilitates the general process of economy-wide industrial development.

4.2.1 Limitations of Conventional Analysis

Despite wide ranging and extended discussions on the nature of technological change in Australia, there appears to be scant recognition of the significance of the technological division of labour[1] for the process of technological change and industrial development. This weakness, in turn, inhibits adequate research into the factors which bear upon technological development. For example, even the more sophisticated general equilibrium econometric model builders in Australia treat 'technological change' as if it were 'manna from heaven'. That is to say, technological change is introduced into their models of the economic system via the arbitrary and 'unexplained' adjustment of various parametric coefficents.

The problematic way in which technological change is handled in conventional economic analysis, as outlined above, has no simple solution. The problem, in fact, stems from the way in which conventional general equilibrium models of the Australian economic system are specified. In particular, key assumptions are made about the nature of the system's production processes, and the preferences of its consumers, namely that each is subject, respectively, to diminishing returns. That is to say, in general:

(i) equal proportionate increases in the input of all factors of production will lead to equal proportionate increases in output (the constant returns to scale assumption), but increases in the input of any one particular factor other things being equal, will lead again to increases in output but at a diminishing rate (the diminishing marginal productivity assumption).

(ii) equal proportionate increases in the commodities consumed by households will yield equal proportionate increases in consumers' satisfaction (the constant returns to scale assumption), but increases in the consumption of any one particular commodity, other things being equal, will lead to increases in consumers' satisfaction but at a diminishing rate (the diminishing marginal utility assumption).

Over-riding emphasis, in such systems, is placed upon the factors which govern the ways in which producers and consumers will substitute one commodity for another. Elasticities of substitution are elevated to the central principle, and become the basis upon which both the price and production system are explained.

The 'shape' or form of production and preference functions (that is, the functional relationships between factor inputs into production and the consequent commodity outputs, or the commodity 'inputs' into consumption and the consequent 'output' of consumer satisfaction) are straightforward reflections of the 'axioms' or first principles of conventional economics. These axioms, in turn reflect the pre-occupation of conventional economics with:

(a) the factors which govern the allocation, at any given time, of scarce productive resources among alternative uses; and, in particular,

(b) the ways in which a fully competitive private enterprise economy will, if left to itself, automatically achieve an 'optimal' allocation of such scarce resources.

'Optimality' is defined as the situation where every particular productive factor simultaneously contributes as much, if not more, to output in its current use than it could in any alternative use. Once the optimum has been reached the economy has achieved a state of 'general equilibrum'. It is emphasised that the outcome of simultaneous balance across all product and factor markets is critically dependent on the assumption of 'diminishing returns'. The absence of such an assumption means that, in general, such models simply fail to generate even remotely sensible results. Hahn[2], for example, has noted that:

> The whole theory is at risk if there are increasing returns whch are 'large relative to the size of the economy'. :..This risk is not only due to the cicumstance that large increasing returns are usually associated with large firms and hence, monopoly power, which is excluded by the hypothesis (of general equilibrium models) that agents take prices as beyond their control. It arises from the fact that, even if firms continue to act as price takers, there may exist no equilibrium prices.

Equally, many years earlier, Hicks[3] had pointed out just how critical the assumption of diminishing returns really is when he wrote that: "...unless we can suppose that marginal costs generally increase with output at the point of equilibrium... the basis on which economic laws can be constructed is shorn away".[4]

According to Kaldor, the assumption that, in general, the production of any one commodity, or any one group of commodities is subject to increasing returns to scale is very far reaching. And "... the first and most important casuality is that of 'general equilibrium' as such"[5]. Certainly the evidence suggests that whenever economic activity involves the progressive transformation of basic materials increasing returns abound.

Increasing returns – the achievement of a progressively greater output per unit input – assume many forms. The first and perhaps best known are the increasing returns associated with the scale of an industry's operations. The volume of a container, for example, increases disproportionately faster than the area of the material required to enclose the space. The cost of the container is linked to the area whilst revenues generally are linked to its carrying capacity or volume. As the size of the container increases revenues will, other things being equal, therefore tend to increase disproportionately faster than costs.

A second key source of increasing returns arises from the evolution of a progressively finer division of labour, which in turn facilitates specialisation and the breaking down of complex processes into simpler ones some of which lend themselves to more capital intensive, and hence more productive processes. This idea can be traced directly to Adam Smith, but it was Alyn Young who first pointed out that the evolution of the division of labour in its modern form is associated with the process of an ever-finer inter-industry technical specialisation. This form of increasing returns is extremely significant in the context of industrial development and technological change, and it will be dealt with in more detail in later sections.

Yet other sources of increasing returns are the inventions and innovations 'induced by experience' i.e. the process of 'learning by doing'. For example, as Kaldor puts it "...The advance in scientific knowledge in physics or in the science of engineering in the laboratory cannot by itself secure the innumerable design improvements that result from the repeated application of particular engineering principles"[6].

Another limitation of conventional analysis is its preoccupation with 'allocative efficiency', and the factors which lead producers to substitute one productive resource for another, or consumers to substitute one commodity for another. The principal weakness with this emphasis is that it ignores factors which, in practice, may well be far more significant. Productive resources, for example, are more often complements than substitutes. Thus expansion of a particular productive activity will in general require inputs of a wide range of productive resources usually, but not necessarily, in relatively fixed proportions. Similarly consumers tend to purchase a wide range of different commodities, again often in fairly fixed proprotions, and whilst, for example, coffee and milk might, under certain circumstances, be substitutes, more often they are complements. Increases in consumption of the one will therefore lead to increases in the consumption of the other.

This basic complementarity between factors of production and commodities in consumption can and does give rise to some of the strongest inducements to growth or decline. Complementary linkages are the networks along which impulses to expansion (or contraction) generated in specific industry sectors are transmitted throughout the economic system overall.

Finally, when the concepts of 'production complementarities' and 'increasing returns' are combined in a considerably more realistic and dynamic model of economic growth the irrelevance of general equilibrium economics is doubly highlighted. For example, as Chenery[7] has pointed out:

> ...In dynamic analysis, it may not be possible to state that a country has comparative advantage in producing steel without specifying also the levels of production of iron ore, coal and metal working over time. In short, we are forced to compare alternative patterns of growth rather than separate sectors, and we cannot expect to find simple generalisations of the Heckscher-Ohlin type concerning the characteristics of individual lines of production.

A little later Chenery makes the same point in a slightly different way:

> ...if a group of investments will only be profitable when undertaken together, comparative advantage can only be determined for alternative combinations of investments...not only do market prices fail to produce the best investment allocation in this situation but any structure of equilibrium prices may also be an inadequate guide in the presence of economies of scale.

Clearly, the interrelated processes of economic growth, industrial development and technological change are each determined from 'within' the system. And yet it is in relation to these factors that general equilibrium economics is at its weakest, since, according to Kaldor general equilibrium models assume:

> ...that economic forces operate in an environment that is 'imposed' on the system in a sense other than simply being a heritage of the past
>
> – one could almost say an environment which, in its most significant characteristics, is independent of history.[8]

The implications of this approach are extremely significant since on these assumptions.

> ..Continuous economic change can only be conceived of as some kind of 'moving equilibrium' through the postulate of an autonomous (and unexplained) time rate of change in the exogenous variables of a kind consistent with 'continuous equilibrium' through time – such as a given shift per unit of time in the production functions of the so-clled 'Harrod-neutral' type, or in the supply of resources; an exogenous rate of growth in the labour force and/or in the rate of increases in 'capital' though the very meaning of the latter concept has given rise to insoluble problems.[9]

It would appear for example, that a similar idea lay behind the Crawford view that much of Australian industrial growth in the 1950's and 1960's was based on rapid population growth. And yet much of the population growth itself arose from immigrant inflows, made possible by the rapid growth of new job opportunities arising, in turn, from the industrial development policies being pursued at that time. Immigrants finding jobs and spending their incomes, of course, added significantly to effecive demand and this, in turn, generated further impetus to industrial expansion and jobs growth. The point is that in the Australia context 'population' cannot be regarded as a 'parameter', that is: an external characteristic of the environment in which economic forces operate. Clearly, in this instance, rates of population growth were intrinsically bound up with rates of industrial growth, and the separation of cause and effect is difficult if not impossible.

The same point can be made about the 'technology' of the economic system. Reiterating the point made earlier, industrial efficiency and productivity growth depend not so much on fundamental technological advances in relation to which actual practice lags far for behind, rather it depends upon forces operating within the system which govern the rate at which the stock of known technology and innovations are taken up and employed within the system. These forces, and in particular the technological division of labour, are themselves the products of the particular pattern of evolution of industrial system which in turn feed back, positively and negatively, into the evolutionary process. This aspect is considered in some detail in the final part of this section. The next part of this section, however, presents a more detailed account of the ways in which technical production complementarities and increasing returns are closely linked in the process of industrial growth.

4.2.2 Production Complementarities, Increasing Returns and Industrial Development

A common, and often expressed, view in Australia and indeed elsewhere is that the scale of industry and thus the achievement of technical efficiency is governed by the size of the market in which industry sells its goods and services, (the confines of the domestic market, of course, can be overcome via the increased penetration of export markets).

Young[10], however, long ago saw that this proposition was only partially true. It is neither area nor population, but buying power '...the capacity to absorb a large annual output of goods' which governs the extent of the market. Young goes on to say that:

> In an inclusive view, considering the market not as an outlet for the products of a particular industry, and therefore external to that industry, but as the outlet for goods in general, the size of the market is determined and defined by the volume of production. If this statement needs any qualification, it is that the conception of a market in this inclusive view –

> an aggregate of productive activities, tied together by trade – *carries with it the notion that there must be some sort of balance, that different productive activities must be proportioned one to another.* (Young ibid pg. 533, emphasis added).

Thus, Young argues, the view that the size and technical efficiency of industry is constrained by the extent of the market reduces to the proposition that the extent of the market is governed by the extent of the market – not, on the face of it, a very useful idea. Nevertheless, the key to its usefulness lies in the reference to 'balance' in the previous quotation.

Many economists, for example, have repeatedly drawn attention to the dual income and capacity creating effects of investment. That is, the expansion of productive capacity (supply) through capital spending also, and at the same time, increases consumption capacity (effective demand) through the increase in incomes generated by the multiplier effects of such capital spending.

Providing the aggregate savings ratio, and the aggregate capital output ratio are known, it is possible, for simple economic models, to estimate the required investment growth rate which will generate a 'balanced' growth in both demand and supply. What is true at the aggregate level is, in this case, equally true at the disaggregated industry level – providing the pattern of consumer spending, the pattern of input-output coefficients and the pattern of capital-output coefficients (i.e., the inter-industry proportions) are known it is possible to estimate the 'warranted' growth rate such that demand and supply are, and remain, precisely 'balanced' along the growth path.

The concept of 'balanced growth', based on inter-industry complementarities, was thought to have special relevance to under-developed areas. Thus Rosenstein-Rodan[11], writing on the problems of industrialisation in Eastern and South Eastern Europe, argued that complementarity of different industries provides the most important set of arguments in favour of large-scale planned industrialisation. For example, if a single industry were to expand its output only a fraction of the additional incomes generated would be spent on the output, of the industry. The industry would thus face severe problems of oversupply. However:

> If, instead, one million unemployed workers were taken from the land and put, not into one industry, but into a whole series of industries which produce the bulk of the goods on which the workers would spend their wages, what was not true in the case of one factory would become true in the base of a whole system of industries. The industries producing the bulk of the wage goods can therefore be said to be complementary. The planned creation of such a complementary system reduces the risk of not

> being able to sell, and, since risk can be considered as cost, it reduces costs. It is in this sense a special case of 'external economies'.

Ragnar Nurkse[12], citing Young, argued that the size of the market is determined by the general level of productivity. But the level of productivity depends largely on the use of capital in production, and the use of capital in production is inhibited, to start with by the small size of the market. The principal problem for Nurkse was to find a way out of this circle. The solution, he argued, was to achieve:

> ...a more or less synchronised application of capital to a wide range of different industries. Here the result is an overall enlargement of the market and hence an escape from the deadlock. People working with more and better tools in a number of complementary projects become each others customers. Most industries catering for mass consumption are complementary in the sense that they provide a market for each others products, and thus support each other. This basic complementarity stems, of course, from the diversity of human wants. The case for 'balanced growth' rests ultimately on the need for a 'balanced diet'. (Ragnar Nurkse ibid)

Hirschman[13], probably one of the strongest critics of the doctrine of 'balanced growth', argued that one of the major problems with the doctrine in the context of underdeveloped economies was "...that its application requires large amounts of precisely those abilities which we have identified as likely to be in very limited supply in underdeveloped countries". (Pg 53) The doctrine, however, is considerably more applicable in developed economies experiencing high unemployment, "for the industries, machines, managers and workers, as well as the consumption habits, are all there, only waiting to resume their temporarily suspended functions and roles".

Whether centrally planned or market oriented, industrial structures, overtime, do exhibit strong tendencies to move in step. Hischman argues that this is a result of a continuous process of uneven advances in one sector followed by the 'catching up' of other complementary sectors, and that "...if the catching up over-reaches its goal, as it often does then the stage is set for further advances elsewhere". (Pg 63)

Unlike the 'convergence to equilibrium' exhibited by general equilibrium models, and unlike the 'continuous equilibrium' of such models through time, the actual process, according to Hirschman, is an interaction not only between two industries, but 'up and down and across' the whole of an economy's input-output matrix, for many decades. Indeed, the process is the opposite of 'convergence to equilibrium'.

> ....There is a virtually infinite sequence of repercussions. The process of development is one of tension, disproportions and disequilibria with the sequence moving away from 'equilibrium' more often than toward it. Each move in the sequence is induced by a previous disequilibrium, and

> in turn creates a new disequilibrium that requires a further move. (Hirschman ibid, pg. 67)

Kaldor argues, in the previously quoted article, that the principal difficulty with general equilibrium economics is its emphasis upon the 'theory of value'. According to Kaldor this has meant that economists have focused attention on the allocative function of markets to the exclusion of their creative function – "as an instrument for transmitting impulses to economic change".

Young, for example,, writing three decades before Hirschman cites an almost identical process to that outlined above.

> ...Every important advance in the organisation of production, regardless of whether it is based upon anything which in a narrow or technical sense, would be called a new 'invention', or involves a fresh application of the fruits of scientific progress to industry, alters the conditions of industrial structure which in turn have a further unsettling effect. *Thus change becomes progressive and propogates itself in a cumulative way.* (Young, ibid, pg 533, emphasis added)

The principal type of change associated with the growth of industrial production is that of 'industrial differentiation'. Thus, according to Young, the increase in the complexity of the 'apparatus of living', as shown by the increase in the diversification of consumer products is more than matched by the increase in the diversity of 'intermediate products', and of industries manufacturing special products or groups of products. Young cites the printing industry which illustrates just how far the process of industry specilisation and differentiation has progressed. Evolving out of early printing activities were producers specialising in:

– specific types of printing
– wood pulp
– different types of paper
– inks and their different ingredients
– type and type metal
– illustrations
– specialised printing tools
– printing machinery

Between the consumer of the final product and the producer of the raw materials, then, there evolves an increasingly complex web of specialist activities.

Taking the metals and engineering group as a whole, for example, for every dollar spent on the purchase of 'intermediate' inputs some 43 cents will be spent on purchases from within the metals and engineering group. The dispersion around this average is, however, quite interesting. At the bottom of the hierarchy of complementarity , for example, the metal products group allocate some 26 cents in the dollar, whilst the 'intermediate' machinery and equipment group allocate some 47 cents in the dollar, and finally at the peak of the hierarchy the 'final goods' industries (the transport sector) allocates as much as 62 cents in the dollar to the metals and engineering group.

The mechanism generating this progressively finer industrial differentiation, according to Young, is the scope which 'roundabout' methods have for realising increasing returns: "....certain roundabout methods are fairly sure to become feasible when their advantages can be spread over the output of the whole industry". Thus activities once undertaken 'in-house', but common to a number of firms, become separated-off and subsequently undertaken by specialist firms. Such specialists, taken together, eventually constitute a new industry.

The advantages of this process stem not so much from the 'scale' of operations of the new industries – indeed many of them, at least at the outset, are quite small; rather it is the 'differential gain' in efficiency arising from the specialisation/differentiation process itself, and in particular the application of more productive techniques. The increasing returns which this process releases are sufficient to allow the provision of a cheaper, and often better quality, product to the end user whilst still allowing the specialist an adequate rate of return.

Young, agreeing with Adam Smith, argues that the driving force behind the phenomenon of increasing returns is the progressive division of labour. But, he suggests, the principal economies of the division of labour, in its modern forms, are the economies which are to be had via roundabout or indirect production methods, and which are realised via the process of industrial differentiation outlined above.

But just how far can this process go? Young argues that the scope for the division of labour is still constrained by the size of the market – not a very convincing argument, in the long run, for the very reasons which Young himself identifies. Hirschman, on the other hand, envisages a virtually unending sequence of disequilibria, which at each step allows an industry to take advantage of external economies created by previous expansions, and which at the same time creates new external economies to be exploited by other firms. Such factors can facilitate the growth in profitability over extended periods despite the fact that 'capital' as a factor of production may be expanding at a rate faster than the other factors of production, (general equilibrium models would invariably show declines in profitability in such circumstances since the 'marginal product of capital' would be diminishing).

Contrary to the view that increasing returns are confined to that early stage when an economy is accumulating its initial capital stock, beyond which the only offsets to diminishing returns are organisational and technological improvements, Hirschman believes that production complementarities are extremely important in offsetting diminishing returns over protracted periods. "Perhaps," he argues "...an economy is never quite through creating its 'indivisibilities', i.e. *its complex of complementary economic activities!*" (Hirschman ibid, pg. 75, emphasis added)

This section, so far, has examined in some detail the conventional approach to industrial development and technological change. This approach, we have argued, is seriously deficient in terms of the ways in which it specifies the production processes and consumer preferences of the economic system. As a result of this weakness the conventional approach also fails to capture the many dynamic, inter-related, and endogenous elements which together make up the growth and development processes of actual economies – especially the way in which the industrial structure and technological capabilities of an industrial system evolve overtime. The remaining part of this section considers in more detail, in the context of the Australian economy, the ways in which these two latter elements especially are interrelated.

4.2.3 The Technological Division of Labour and the Metals and Engineering Industries

Young, following Adam Smith, argued that the principal source of increasing returns was a dynamic growth process involving a progressively finer division of labour which facilitates greater specialisation and the introduction of more productive 'capital intensive' techniques of production. Indeed Young argued that capital/labour ratios in production have very little to do with relative factor prices, rather they are linked to the extent to which an economy has achieved on advanced division of labour. In modern industrial economies, furthermore, the principal form which the division of labour assumes is that of a progressively finer inter-industry division of production responsibilities. Some industries, for example, manufacture consumer goods, whilst other manufacture the technologies required to produce consumer goods. Yet other industries manufacture components and supplies which all industries might require – albeit in varying proportions. This specialisation allows production to occur in a considerably more efficient manner than it might otherwise have done.

Part 2 of this report has shown on the basis of the most recent input-output data, that the metals and engineering industries supply the bulk of their total production to other industries either as 'components' entering into current production, or as capital equipment designed to replace or expand the production processes of other industries. More than 80 percent of the total output of the metals and engineering industries is supplied in either of these forms. Other producer goods industries are also identified such as the Energy or Distribution sectors but it is shown that whilst these latter sectors supply' intermediate' products and capital equipment in the ratio of 17 to 1, the corresponding ratio for the metals and engineering sectors is very much lower at 2 to 1. The evidence thus suggests that the metals and engineering industries lean much nearer to the capital equipment end of the spectrum.

Part 2 also shows that three major groups of industries supply the bulk of all capital goods and services purchased in Australia, and that the metals and engineering group supplies roughly one-third of all capital goods directly. The importance of the 'Other Construction' industry is identified also as a supplier of capital equipment, but it is also shown that this latter industry is critically dependent on the metals and engineering group of industries for its industrial supplies. Part 2 concludes that once such direct and indirect linkages are taken into account the importance of the metals and engineering group as the principal suppliers of capital equipment and services etc. is established beyond question.

The inter-industry responsibility thus assigned to the metals and engineering industries is that of providing the technologies which other industries will use to manufacture their own products. *The products of the engineering industries are the processes of the rest of the economy.*

In like manner, the specific role of the metals and engineering industries is reflected in the skill intensity of its workforce. Part 2, for example, shows, on the basis of Victorian data, that the industries collectively employ the most skill intensive workforce of any group of industries in Australia. For example, whereas the industries account collectively for just over 8 percent of the total workforce in Victoria they account for more than 34 percent of the employment of 'professional mechanical engineers', and more than 13 percent of the professional group which accounts for electrical, electronic and communications engineers.

At the technician level the industries collectively account for 23 percent of Statewide employment of draftsmen and tracers, and almost 50 percent of all mechanical engineering technicians. Finally, at the craft skill level the industries account for 46 percent of fitters and turners, 73 percent of machine-tool and die makers, 56 percent of sheetmetal workers, and more than 50 percent of welders and boilermakers. Part 2 also gives very detailed descriptions of the respective functions of this range of occupations at the levels of professional engineers, technicians and craft skills.

We conclude that the engineering industries collectively have by far the largest concentration of occupations essential to the technological 'well-being' of a modern industrial economy. This concentration exists along a spectrum ranging from the university trained, tertiary qualified professional engineer, through a wide range of technical occupations, to the largest single concentration of craft skills of any industrial sector.

As with any industry the skills and expertise of its workforce, and the sophistication of its technology are embodied in the goods and services which the industry produces. Given the two key characteristics of the Metals and Engineering group outlined above, the industries collectively, therefore, are engaged in a process involving the physical embodiment of the engineering skills of their workforce into the technology which the industries produce; as well as the physical transfer of the skills of their workforce via the sale of their output as inputs into other industries. The industries collectively, therefore, are involved in as continuous process of transfer, adaptation and diffusion of technology throughout the entire industrial system.

Despite the widespread – and extended – debate on the importance of technology in Australia there is virtually no recognition of what is, perhaps, one of the most significant features of the process of technical and technological progress in advanced industrial economies, i.e. the importance of the modern technological division of labour – the concentration of key technological skills in specific industrial sectors, known collectively as the 'technology sectors'. Technology, as a concept, has many different definitions. The OECD, for example, argue that:

> Technology means systematic knowledge for the manufacture of a product, for the application of a process, or for the rendering of a service, including any integrally associated managerial and marketing techniques. (North-South, Technology Transfer, OECD, Paris, 1981)

Similarly, Cornwall in his book "Modern Capitalism" defines technology as 'a stock of knowledge relating to the production of goods and services'. The stock of 'technology' defines which goods can be produced, and the processes available for producing them. The operational component of the 'technology stock' consists of a set of techniques, with each technique consisting of a set of actions or decision rules for transforming inputs into outputs. The potential output of the economic system is a function of this stock of technology. Technology is embodied in the workforce and the organisational structure of the economy. This structure includes (i) entrepreneurial capabilities, (ii) the stock of physical capital, and (iii) the necessary materials needed to produce inventions and innovations.

The 'technology' of advanced industrial economies is concentrated in a narrow range of industries known collectively as the 'capital goods' sectors. Historically, these sectors have consisted of a collection of firms engaged in the manufacture of, for example, machine tools, non-electrical machinery and other capital equipment. They have been responsible for much of the 20th Century's mechanisation and productivity growth. In the post-war period other technology industries such as the electrical, electronic and chemicals sectors have become a key source of technological progress.

Early views of the process of technological change assumed that the process was almost entirely demand determined i.e. that the technology sectors would respond passively in terms of the supply of inventions and innovations to investment stimuli arising from industries experiencing rapid growth. It is now recognised that whilst necessary, demand-side stimuli are not always sufficient to evoke appropriate technological responses, i.e. the supply of inventions and innovations is not infinitely elastic. Increasingly, the capital goods, or technology sectors themselves (the supply side) are being recognised as active agents in the process of technological change.

The principal role of the technology sectors is linked very closely to their capacity to adapt technology to the domestic context; and, where appropriate, to adapt the domestic context to the technology. Inventions and innovations are seldom adopted without modification and, as Cornwall points out, this requires large numbers of people with the knowledge to innovate, together with the materials, capital goods and skills. The technology sector plays a key role in determining the extent to which the potential benefits of adapting the technology of the industrial leaders is realised.

The identification of what can be transferred directly and what can be adapted is the key function of the technology sectors, and this in turn hinges upon the stage which an economy has reached in its technological development, i.e. upon the extent to which an economy has evolved an appropriate technological division of labour. Solo[14] identifies a hierarchy of development that begins with what he terms the 'cognition of mechanism', or more simply the widespread familiarity with machines. The second stage relates to the development of mechanical and technical skills, which in turn generates a capacity to respond to technological leadership, and to adapt and adjust to advanced technology. The third stage relates to the ability to grasp the inter-relations between machines, materials, the workforce and efficient organisation (the 'cognition of process'), and involves the ability to organise and to control innovative activity. The peak of the hierarchy is reached when the economy has developed the ability to apply research methods and scientific knowledge to the fundamental questions of technical advance – when it has developed widespread abilities in the area of science-based development engineering.

The early stages of the development of the technology or producer good sectors involves activity aimed at adjustment or simple modification of machines, processes and techniques. But such techniques embody a wide range of information and knowledge. Mastery of such information and knowledge generates a considerably greater potential for adaptation and assimilation of a much wider range of techniques than hitherto may have appeared possible. However, technological change is a dynamic process, technological information and knowledge is changing continuously. Ultimately, to be successful, an economy must develop a capacity to produce knowledge that is adequate. The problem solving, information producing apparatus must be modified to facilitate the application of analytical and other research methods to the assimilation problem[16].

The commercial application of inventions – the innovation process – is the outgrowth of conscious activity on the part of firms, individuals and research organisations.

It involves a continuous process of reworking, testing, and evaluation of the original design. It invariably involves the modification of the innovation as a result of a learning process. This process, and the eventual diffusion of the innovation throughout industry, is critically dependent upon the level of development of the economy's technology sectors. Their expansion and development represents the well-spring from which increasing technological awareness, and greater practical orientation arise.

Importantly, for example, the fact that the core engineering sectors are themselves the largest users of microelectronic applications in both their processes and products illustrates, again, the role of the capital goods sectors in terms of their active involvement in the process of transfer, adaptation and diffusion of new technology throughout the economy.

This view is strongly reinforced by the already quoted British Microelectronic Survey findings which showed that of the establishments with applications in their products (largely the capital goods sectors) some 35 percent design and make their own microelectronic equipment for their products, 33 percent have it made to their specifications by outside contractors, and 49 percent use standard catalogue items – some establishments of course do all three.

For process applications, however, the picture is completely different, only 9 percent design and make their own microelectronic equipment, 29 percent set their own specifications for outside subcontractors, and no fewer than 74 percent rely on buying standard items "...for example, in the form of electronic controls built into machine tools or process plant". (Survey ibid Pg. 14)

We have also highlighted, yet again, how important a well developed metals and engineering capital goods sector is in the process of technological change. The fact that such industries are the first to apply such technology in their production processes, and that, in turn, such processes are geared to the provision of machinery and equipment etc., also embodying in this case a high proportion of microelectronic applications, which enters into the production processes of other industries highlights very clearly the central role of the producer goods sectors in the process of industrial development and technological change. Complementing and very largely underwriting, the industry modernisation strategy, therefore, must be an equally comprehensive program of planning designed to expand and develop Australia's metals and engineering sectors.

This section has built upon the description in Part 2 of the Metals and Engineering industries, as the most significant sub-set of the national economy's skill intensive, producer goods industries, by developing the concept of the technology or capital goods sector. It was argued that a large proportion of Australia's technological capabilities and technological potential, as in all other modern industrial economies, resides in its Metals and Engineering sector.

A multi-stage process of technological evolution was discussed beginning with the ability to make simple adjustments to pre-existing technology, and ending with the ability to apply advanced scientific research techniques to engineering development problems. The critical role of the technology sectors in this evolution was highlighted and it was argued that the development of the technology sectors is virtually a pre-condition of this wider evolutionary process. It was concluded that the underdevelopment of Australia's capital goods industries was the single most important contributing factor to the economy's poor overall technological performance.

4.3 FIRM SIZE AND INDUSTRIAL DEVELOPMENT

A major theme of this report is that economic growth, industrial development and technological change are not determined by factors external to the environment in which economic forces operate – rather they should be seen as interdependent elements of a process which is determined primarily from within the economic and industrial system.

Key aspects of this process which can bear upon the overall success of the economy are: flexibility, adaptability, the facility to identify and exploit new and/or innovative product and process opportunities, and the ability to generate new jobs whilst retaining old ones. Acknowledging the importance of the above characteristics many argue that industry policy, as a matter of priority, should be directed to improving the performance of Australia's numerous small firms. Small firms, it is suggested, are comparatively autonomous and can (and do) therefore provide much of the flexibility and adaptability required in a modern industrial economy. As a result, equally, many argue that small firms provide the bulk of the new jobs generated within the economy.

The following section briefly reviews some of the key issues in this discussion. In summary, we argue that much of the view that small firms generate the most new jobs rests upon research in the United States (The Birch Study) whch pointed strongly in this direction. We show that subsequent research, also in the U.S., has thrown this view into serious question. Further, we cite recent evidence from the United Kingdom and Australia which, equally, throws into sharp question the view that small firms are independent, autonomous and therefore more flexible and adaptable.

The evidence suggests that most small firms are disproportionately dependent upon larger private and public sector organisations for the bulk of their production and sales, and that this dependence strictly limits the autonomy of most small firms.

Later parts of this section consider the key forms of thiis dependency, i.e. dependency on a small number of customer types, dependency on a small number of customers, and dependency on local markets. Part 2 of this report has shown on the basis of ABS data the pattern of large and small firms in manufacturing and, particularly, in the Metals and Engineering industries.

The evidence, we argue, therefore suggests that, whilst small firms do account for a significant proportion of total employment, their dependency upon a comparatively small number of large enterprises implies that the economic and industrial performance and behaviour of the latter should be regarded as very relevant to policies aimed at enhancing overall economic and industrial performance.

The additional difficulties that are generated when a significant proportion of the larger firms are themselves, subsidiaries of even larger international corporations are discussed in more detail in the sections dealing with the obstacles to export expansion and import replacement.

4.3.1 Small Business and the Jobs Generation Process

A major study in the United States[1] aimed to penetrate the aggregate statistics in order to discover how the behaviour of individual firms at the microeconomic level causes jobs change at the macroeconomic level. The study was based on the establishment of a detailed data file tracing the evolution of each of 5.6 million business establishments over the period 1969 to 1976. The author concludes that the results are clear:

"On the average about 60 percent of all jobs in the U.S. are generated by firms with 20 or fewer employees, about 50 percent of all jobs are created by independent, small entrepreneurs. Large firms (those with over 500 employees) generate less than 15 percent of all net new jobs"[2].

According to the author the job generating firm "....is small. It tends to be independent. It is volatile. This profile does not vary much across industries and regions". (Pg. 41) Thus despite the well known problems which small firms have in obtaining access to finance on terms equivalent to their larger counterparts; and despite the inherently higher 'death' rates of smaller firms they are, according to this piece of research, still the major generators of new jobs.

Further research on this issue in the U.S.[3], however, employing the same (but apparently modified) data base came to strikingly different results. The authors argue that despite the widespread belief that small business is a powerful force for technological innovation, for stimulating depressed regions and for job generation, these views are in fact "...based on a very limited amount of knowledge about the dynamics of small business activities, as well as incomplete data. There are major obstacles to an accurate assessment of the real impact of small businesses on the economy and, consequently to the formulation of appropriate public policies". (Pg. 14)

Between 1978 and 1980 the authors of the latter study found that private sector employment in the U.S. increased by 8.7 percent or about 4.3 percent per annum. "...About 78 percent of this increase occurred in establishments employing only 49 percent of the private sector labour force. On an establishment basis, therefore, small businesses employ about half the nation's workforce, but generate nearly eight out of ten new jobs. *These figures indeed support the conventional wisdom that small businesses create most new jobs*". (Pg. 14, emphasis added)

Whilst these estimates were based on size of establishment clearly the 'establishment' is not always identical to the 'firm' or 'enterprise'. For the U.S., according to the study, 91 percent of businesses have only a single location "...so that their firm size and establishment size are the same. However, the other 9 percent that are multi location firms employ 62 percent of the private sector workforce and consquently have a substantial impact on aggregate measures".

Thus when employment growth is measured by the size of the firm rather than by the size of the individual establishment "...a sharply different picture of the role of small business in the job creation process emerges".

"When 'small business' is defined as all establishments in firms with fewer than 100 employees, then small businesses employ 36, not 49, percent of the labour force and generate 39, not 78, percent of net new jobs". (Pg. 15)

The authors found that the rough correspondence between the small business job share and its share of the jobs growth (36 and 39 percent respectively) holds for most regions and most industry divisions. The exceptions appear to be in the slower growing regions and industries where small business accounts for a much higher share of the available growth and, hence, it tends to increase its share of the employment total.

Over the period of the study the expansion of existing businesses created nearly twice the number of jobs as 'births' of new businesses. Coupling this to the evidence which suggests that the majority of new business establishments do not survive beyond four years leads the authors to raise doubts about the effectiveness of policies designed to facilitate the birth of new enterprises (or to prevent their failure), suggesting instead that policies targetted on expansion are more likely to lead to non-temporary employment gains.

The evidence, then, certainly for the United States, on the relative job generating potential of small firms, is inconclusive. Once the necessary distinction between 'firm' and 'establishment'[4] is made it appears that small firms generate new jobs roughly in proportion to their share of total employment. Hardly a basis in itself for attributing over-riding policy priority to small firms. And, given the paucity of Australian evidence, hardly a basis for accepting the view that "...the bulk of employment growth in the foreseeable, future will, and can only, come from smaller and new firms"[5].

Moreover, despite the claims of Birch to have developed an 'economic microscope' enabling the researcher to 'reach beneath the aggregate statistics' to identify the key players in the 'jobs generation process', properly speaking Birch was not attempting to define and empirically establish a 'process' at all. Certainly, this is true if by 'process', in this context, we understand not only the quantum and types of certain economic entities (firms), but also the form and extent of the relations between such entities. Even if, for example, small firms were statistically responsible for the greater part of all new jobs generated, a far more important question would be "what are the causes"?, and we cannot answer this question at all clearly without examining the linkages between small and large businesses – an examination which, unfortunately, was only very partially undertaken by Birch.

Some research, however, has been undertaken on the wider question of the linkages between large and small business, and especially upon the patterns and levels of dependence. A major study[6] in the United Kingdom, for example, found among other things that":

"The 'domino' effect of a substantial decline in performance of a few large firms in one industry can be devastating on the survival of their small suppliers. For instance, it has been argued that the employment impact of withdrawing state support from certain large British manufacturers (such as British Steel Corporation and British Leyland) would extend far beyond the large firms themselves to their small component suppliers. The combination of such large-scale failure of both small and large firms would then impact undesirably on the environment and the local community"[7].

In the next section we examine the major findings of this important survey in some detail. In addition, we show that its findings are more than adequately supported in most key respects by a similar survey carried out in the northern suburbs of Melbourne.

The Relation Between Large and Small Firms

The conventional view of small firms is that they are comparatively independent entities; which, therefore, provide much of the flexibility and adaptability required in a modern industrial economy. Studies in the U.S. moreover claim to show that 'small firms' have been responsible for much of the jobs growth in recent years.

The adaptability and flexibility of small firms, however, is brought into question by the heavy dependency of many small firms upon a small number of large customers. This dependency not only manifests itself in the case of sales turnover, but also in the areas of technical, marketing and financial linkages.

Purchasing policies of large firms

The Camden Survey found that the purchasing activities of large corporations were centralised in the buying departments of both multiplant group and unitary organisations. The purchasing criteria were in most cases very comprehensive 'in theory' and involved requirements that the supplier:

- produce bank and trade references as evidence of an acceptble track recod
- produce evidence of the quality and reliability of the product or service
- provide an adequate guarantee of the firm's ability to produce the goods and services in the required quantities according to agreed delivery schedules
- submit the factory premises to scrutiny, especially where specific health standards were involved

Once these criteria had been met the firm was generally placed on an 'approved list' of suppliers whch ensured future consideration as a 'preferred' supplier.

Anecdotal evidence suggests that such stringent criteria are rarely applied to the letter in actual practice. Buyers interviewed in the survey suggested that much depends upon the individual buyer, the determination of the potential supplier and the 'embryonic relationship' at a personal level between the two parties. Nevertheless, such criteria could discriminate unfairly against small firms in a number of ways:

- for a new firm there are no trade references or a track record to measure its credibility. Nor can reliability, quality or ability to delivery the right quantities on time be gauged.
- the problem of indivisibilities is especially acute for small firms, and where the proposed order is large in relation to current production it might require the redeployment or acquisition of 'lumpy' factors of production. This will often require firm commitments from the large purchaser.
- large orders which exceed the capabilities of small firms individually, but which might have been met by a number of small firms acting in concert was ruled out by the practice of large firms refusing to engage in 'multiple' sourcing.

Several forms of cost have been identified in the relation between large and small firms which are judged to impede the formation and growth of the latter. These include:

- large and largely fixed transaction costs involved in identifying, investigating, evaluating and either accepting or rejecting new small suppliers.
- the administrative costs of monitoring and maintaining contact with small firms is higher where a larger quantity of them are on the approved supplier list.
- a high proportion of new and young firms do not survive the first few years and the costs of lost or late supplies may be substantial. The renogotiation of contracts in the event of small firm failure imposes yet additional costs.

Smaller firms, however, have a number of advantages which tend to offset the costs associated with the above factors. Where the combined benefits of local deliveries and short distribution channels outweigh the costs of transactions and scale economies the small firm will tend to be preferred. Indeed, the specific factors operating to reduce the costs of dealing with small firms are greatest where rapid delivery, personal service, small but specialised production runs and local availability of supplies are significant factors for the larger purchaser.

The survey found that the attitudes of large companies towards their small suppliers varied from the supportive to the obstructive.

- some large firms refused to take on suppliers who would need to devote their entire production to the large customer, despite the fact that according to the survey "...many established, dynamic firms owe their initial success to their complete dependence of one customer, and the special advantages that accrue from this relationship". (Pg. 25)

- 'cultural differences' between large and small firms were thought to be significant. The 'flexibility' of the owner-manager appeared to contrast sharply with the 'formal and lengthy decision making process' of the large customer.
- through their exclusive emphasis on 'value for money' purchasing criteria many large firms were found to exhibit behaviour "...inherently conservative and failure averse, and not conducive to the birth and growth of small firms, many of which are one product, one market firms with little appreciation of the market and the behaviour of buyers". In such circumstances the buyer may be critical to the survival of the small firm in terms of the feedback which the former might provide on, say, pricing and product presentation.
- some large firms were prepared to offer direct financial assistance to small firm suppliers. Large firms, for example, are sometimes in a position to exercise their not inconsiderable market power to ensure that their small firm supplier obtains equipment and materials on more favourable terms. The survey concluded, however, that "... such a sympathetic attitude was not usual. The reverse was more often true. Several buyers admitted that their organisations were slow in paying their small suppliers particularly where they were supplying a non-essential commodity". (Pg. 26)

The authors of the survey concluded that market-related problems of the type summarised above were of 'major' concern to small firms "... ranking behind labour problems as the most important issues facing firms at the time". (Pg. 26) According to the survey, much of the market place is dominated by large firms and public sector organisations with considerable procurement needs, and large organisation procurement policies and practices '... tend to inhibit the entry and growth of small firms'. Moreover, because many of these practices tend to covert they tend to be overlooked as a factor in the decline of small business. The former point, at least, is confirmed by Australian data.

Despite the qualities of 'flexibility, vigour and adaptability' often attributed to small firms the authors conclude that a consequence of high dependence "... is likely to be inflexibility and inertia ... which are inimical to rapid economic change". (Pg. 26)

Form and Extent of Dependency of Small Firms on Large Firms

1. Dependency on one or a few customer types

The Camden Survey referred to above found that many small firms were dependent on a narrow range of industry and customer types. For example,, about one-third of all firms were supplying one or two customer types. Where large firms in a particular industry are, for one reason or another, experiencing decline, the 'domino' effect upon a large number of small dependent suppliers can be very serious. The extent of the risk is, however, dependent to some extent upon the pattern of diversity exhibited by the major purchasers.

2. Dependency on one or a few customers

The Survey also found that many small firms were highly dependent on one or a few large customers who were often large organisations in either the public or the private sectors. For example, while most firms (54 percent) were dependent on their major customer for less than 10 percent of their turnover, a significant proportion were heavily dependent on their major customer. Almost 17 percent of firms were wholly dependent on five major customers, while nearly 50 percent were dependent on their five major customers for more than 50 percent of their total annual turnover.

The relevance of these findings are confirmed in the Australian context by a recent survey conducted in the northern suburbs of Melbourne[8] which found that the patterns of dependency on one or a few customers corresponded very closely to that of the Camden survey: "...Manufacturers were heavily dependent upon a few customers located within the Melbourne metropolitan area". (Pg. 4)

According to the Camden Survey this type of dependency arises from a number of factors including both market conditions and the internal characteristics of the small firm. The external characteristics include:

- the industry sector
- the strength of competition
- historical ties between buyer and seller
- The internal factors include:
- relatively short planning horizons
- managerial volition
- little or no marketing strategy

Many of these internal factors have little or nothing to do with factors such as 'quality' of management etc. For example, increased marketing effort requires a substantial commitment by the small business, and invariably involves the redeployment of what to the small firm are a large proportion of its internal resources. This is one important aspect of the 'indivisibility' problem (i.e. many of the incremental resources required in the process of growth are indivisible and at the margin they constitute an unwanted overhead) which most small firms, of necessity, are forced to confront. Thus "...the indivisibility of incremental marketing resources tends to strengthen the dependence of the small firm or its existing customers". (Camden Survey, Pg. 21)

Whilst this type of dependency might actually be necessary for small firms in the very early stages of their establishment and growth, it may be detrimental to their longer term prospects in terms of their responsiveness to 'structural decline', the avoidance of complacency and the development of entrepeneurial abilities, and the flexibility which a small firm has in its approach to research and development.

3. Dependency on local and regional markets

The Camden Survey found that small firms were generally dependent on local and regional markets, and this was amply confirmed by the Melbourne study which found that "...their dependence on the local market is even more pronounced than that identified in the Wilson and Gorb Study". In this latter study such firms considered that the main locational advantage of the area was its proximity to the marketplace, and the very smallest firms (five employees or less) were relatively more dependent on the proximate market than their larger counterparts.

More than 20 percent of the firms surveyed in Camden were dependent on the local area for their major market, and "...some 75 percent of all firms were dependent on the local and regional markets for their major customer.

Notes

4.1 Modernisation

1 Crawford J.G. et al. "Study Group on Structural Adjustment" AGPS 1979

2. Crawford, ibid page 15

3. Crawford, ibid page 16

4. Rose and Sheehan "Company Prodits, Finance and Capital Expenditure" *Australian Economic Review*, 4th Quarter 1975, page 9.

5. Rose and Sheehan, ibid, page 13.

6. Rose and Sheehan, ibid, pae 14.

7. Gross Fixed Capital Equipment Expenditure by Private Manufacturing Industry. *Australian National Accounts, National Income and Expenditure* 1981-82

8. Current - Cost and Constant - Cost Depreciation and Net Capital Formation. ABS *Occasional Paper* July 1981.

9. Haig B.D. "Capital Stock in Australian Manufacturing. 1920-1977"

10. Haig, ibid page 34

11. Crawford et al, ibid page 7.21

12. Crawford et al, ibid page ?

13. Northcolt and Rogers, "Microelectronics in Industry", Policy Studies Institute, March 1982.

14. Quoted in Crawford Report page 6.8

15. Crawford et al., ibid

16. Crawford et al, ibid page 23 'overview'.

17. See ACTU 'Submission to the Review of the Industries Assistance Commission", October 1983, Appendix 1, page 13.

18. Thirlwall, A.P. "A Plain Man's Guide to Kaldor's Growth Laws" Mimeo 1981.

19. Verdoom, P.J. "Factors That Govern the Growth of Labour Productivity", L'Industria 1949.

20. *Cambridge Economic Policy Review*, "Return to Full Employment" March 1978 page 25.

21. Thirlwall, A.P. ibid

22. Metcalfe, J.S. and Hall, P.H. "The Verdoorn Law and the Salter Mechanism: A Note on Australian Manufacturing Industry", Australian Manufacturing Industry", *Australian Economic Papers*, December 1983.

23. Metcalfe and Hall, ibid page 366

24. Metcalfe and Hall, ibid page 371. Nevertheless, the authors make the point that relative price might be becoming more significant, and that in any event the two views should not be seen as mutually exclusive.

25. *Cambridge Economic Policy Review*, Vol. 8, No. 1, page 22, April 1982.

26. Casar, J.I. and Ros, J. "Trade and Capital Accumulation in a Process of Import Substitution", *Cambridge Journal of Economics*, December 1983.

27. Casar, J.I. and Ros, J. ibid page 258

28. Casar, J.I. and Ros, J. ibid page 259

29. Casar, J.I. and Ros, J. ibid page 267

4.2 Development

1. See Part 2 for an extended discussion of the relative skill intensity of the metals and engineering sector.

2. Hahn, F. "Reflections on the Invisible Hand", Fred Hirsch Memorial Lecture, Warwick University, November 1981.

3. Hicks: "Value and Capital", Oxford 1939, pages 88-9

4. For an extended critique of general equilibrium models in Australia see the ACTU's submission to the Uhrig Review of the IAC.

5. Kaldor ibid, page 1244

6. Kaldor ibid, page 1243

7. Chenery, H.B. "Comparative Advantage and Development Policy", *Surveys of Economic Theory*, Vol. II, page 129.

8. Kaldor, N. "The Irrelevance of Equilibrium Economics", *Economic Journal*, December 1972.

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10. Young, A. "Increasing Returns and Economic Progress" *Economic Journal* December 1926.

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12. Nurkse, R. "some International Aspects of the Problem of Economic Development". *American Economic Review*, May 1952.

13. Hirschman, A. "The Strategy of Economic Development". Yale University Press, 1972.

14. Solo, J. "The Capacity of an Economy to Assimilate Advanced Technology", Quoted in *The Econoics of Technological Change*, Penguin Books, 1971.

15. Solo, ibid.

4.3 Firm Size and Industrial Development

1. Birch D.L. "The Jobs Generation Process". Mass. 1979.

2. Birch, ibid pg. 29.

3. Armington, C. and Odle, M. "Small Business, How Many Jobs?" *The Brookings Review*, Winter 1982.

4. Birch, however, also acknowledges this distinction and has attempted to aggregate establishments into firms, the difference between the two sets of results thus appears to be methodological. Clearly, more work remains to be done.

5. Mr D. Gibbons, Executive Director, Council of Small Business Organisations of Australia, Speech to the National Small Business Conference, August 1984.

6. Wilson, P. "Employment and Small Business in Camden" A. Survey. London Business, London Business School, 1980.

7. Gorb, P. et al "Small Business Perspectives "Institute of Small Business, London Business School, 1981.

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PART 5 PRINCIPLES OF POLICY DEVELOPMENT AND MACHINERY OF GOVERNMENT

In this report, we believe we have established a strong case for industry assistance and development policies. We have, however, rejected the conventional neoclassical and competitive models of growth and development in favour of a model which reflects much more accurately the way in which modern industrial economies function. Along with this rejection, we have also shown the conventional arguments against industry assistance policies to be deficient. Criticisms of the types of industry assistance policies pursued throughout much of Australia's postwar development are not, we believe, sufficient to dispel the need for industry assistance *per se*. They do, however, highlight the need for policy reform, both in terms of the principles underlying policy design as well as the processes of policy development and implementation.

A number of specific policy initiatives have been outlined in earlier sections of this paper. This section considers, at a very general level, a number of key principles which should be central to the design of effective policies. In particular, a number of the principles are considered, among which are the principles of accountability, compensation and co-ordination. Secondly, an example of a possible machinery of government framework, which embodies these principles, is outlined.

5.1 PRINCIPLES OF POLICY DEVELOPMENT

Accountabliity

Policies must embody the principle of accountability, that is, policy recipients must be prepared to account to the responsible agency for the ways in which they employ policy resources. For example,, policies should be structured in such a way as to facilitate the incorporation of readily measurable performance criteria. Such criteria should be defined as unambiguously as possible and recipients of assistance should be required to report back periodically, in terms of such criteria on progress towards goals. Without such accountability, there are the obvious dangers of misallocation etc. In addition, the responsible agency has no adequate way of assessing whether or not the policies are effective, that is, whether or not they are producing the intended result.

Strict accountability, moreover, renders the use of policy resources more visible and is likely, therefore to improve the efficiency with which the resources are used. Hence, for any particular policy resource input, the strict application of the principle of accountability is likely to produce a measurably greater output in terms of the achievement of policy goals. Accountability is thus an essential component of policy efficiency and effectiveness.

Compensation

Policies must embody the principle of compensation, that is, where they have undesirable consequences, whether direct or indirect, they should embody a degree of counterbalance designed to offset the impact of such undesirable consequences. For example, the introduction of tariffs may increase input costs in customer industries, which then have to bear the costs of the assistance policy and which may have to transmit them in the form of an increase in relative prices and/or unemployment. The principle of compensation would require that such customer industries should be protected from bearing the whole cost of the new policy. In this instance, a preferable policy would be to allow bounties on domestic or export sales, so that the cost of the policy was borne by the exchequer and not by a limited group of economic agents.

The principle of compensation is important for a number of reasons. Firstly, if effective, that is, if directed to the appropriate persons and firms, and if provided in adequate amounts compensation should offset the negative impact of development policies and thus reduce social, economic and political opposition to their introduction. Secondly, and in any event, great efforts should be made prior to the introduction of such policies to identify the level and incidence of any negative impacts, both direct and indirect, not only to facilitate the appropriate compensation measures, but also to facilitate a proper comparison of costs and benefits associated with such policies. Thus, if incorporated into policy design, the principle of compensation will have the effect of ensuring that the implications of policy measures are carefully throught through prior to their implementation.

Policies which fail to incorporate the principle of compensation and which are thus implemented without a true picture of their probable costs may often appear to be far more efficient (that is, have a lower cost to benefit ratio) than they actually are in practice. Wrongly assessed cost-benefit ratios will not only lead to inefficient policies but may also allow their persistance for some considerable time.

Consultation

Policies should be designed in such a way that they have regard for specific interests. The policy-making agency, therefore, should aim to identify clearly the interests that may be affected by such policies, and should enter into comprehensive consultations with their relevant representatives to obtain both information and advice on costs, benefits, possible options and alternative policy formulations.

Most successful postwar industrial economies, especially Japan, have instituted very elaborate policy consultation processes, and the evidence would suggest that, whilst this tends to slow down the early stages of policy design, the policies ultimately adopted have a considerably greater probability of achieving their stated goals. By contrast, much Australian policymaking in the industry arena, whilst paying lip service to the principles of consultation, has not effectively harnessed the power of effective consultation, and this has often led to significant degrees of economic and political opposition, loss of confidence in the policy-making process and, consequently, an emasculation of effective policy.

Information

Effective policy design requires large quantities of relevant information and advice, much of which can be obtained from an efficient consultative process. But policy designers are themselves often in possession of information and data, for example, access to the files of the ABS, customs, etc., which in the normal course of events are denied, in any digestible form, to other key interest groups. Hence the provision of usable Information and advice from interest groups to policymakers may in fact hinge on the prior circulation of relevant statistics, data and other information from policymakers to interest groups. Indeed, efficient policy design rests largely on an information-sharing process that is both iterative and circular, a process of 'successive approximations' towards a common understanding or, as the Japanese put it, a 'shared perception' of both the problem and the policies most likely to lead to its solution. Without such information sharing or 'consensus building', the introduction of policies, especially on complex and sensitive issues, will in all probability appear alien and arbitrary.

Representation

For consultation and information-sharing to be efective and manageable, it must be conducted within a representative framework wherein delegates from the principal interest groups have a voice in the process of policy design. Representation is the channel along which information and advice flow, in both directions, between the interest groups and the policymaker. An effective representative must be able to determine, define and articulate the interests of the group represented. This is best achieved where the group has a well-defined organisational and decision-making structure, and where the representative is either elected or appointed via such a structure. The absence of such a structure makes effective representation impossible, since any such 'representative' will, in effect, be 'self-appointed'. More importantly, such representatives will have no clear view of the 'policy stance' of the group. Equally, they will have no clear way of interacting with the group and, most significantly, they will thus be unable to give undertakings, or to accept them, on behalf of the group they claim to represent.

Such 'representation' cannot be part of a process involving the design of effective policies because, in the final analysis, it cannot play a role in achieving the intended outcome of the policy. Indeed, in terms of influencing interest group behaviour, it cannot influence the policy outcome at all. Moreover, insofar as provision for such representation involves costs, the resultant policies are likely to have a lower benefit to cost ratio and are, consequently, likely to be less efficient.

Flexibility

The principle of flexibility requires that policy authorities should not be required to depend upon a narrow range of instruments. As argued previously in this paper, efficient and effective industry development policies are likely to require the use of instruments, either singly or in combination, which are outside the traditional industry assistance policy instruments of protection and broad-based taxation incentives.

Such instruments could include:

- relative investment incentives
- cash flow stabilization measures (via the taxation system or short-term finance)
- assistance for targeted R and D programs
- specific skill training and retraining programs
- Firm/industry rationalization, mergers, cartels, co-operative agreements.
- foreign investment controls
- specific export incentives, and assistance with promotion and marketing.
- targeted bounties and subsidies.

along with the more specific policies noted in the export expansion, import replacement, and Industry Modernization sections of this study.

The causal sequence in the design of a policy (industry development program) for a targeted industry should run from the quantification of feasible development objectives to the selection of the cost/effective instrument set for achieving the objectives. In the past, the policy instrument characteristics have determined policy design.

Co-ordination

Representative, informational and consultative structures will have little meaningful effect if co-ordination is absent. The requirement for co-ordination operates at various levels. At the highest level, co-ordination requires that industry assistance resources are allocated in the most rational manner possible. In Australia at present, substantial resources are allocated to industry assistance. The assistance given ranges from price support schemes for agricultural products, town and railway construction and service support for mining companies, subsidies for aluminium producers, high tariff and quota protection for selected manufacturing industries, and general tax concessions for producers.

Little attempt is made to justify the resources so devoted in terms of whether greater returns would be achieved if the resources were put to alternative uses. Little attempt is made to assess whether the structure of assistance is complementary or compatible (other than the narrowly based analyses of the IAC). That is, no attempt is made to analyse whether or not assistance given to an industry is diminished or offset by other assistance measures, and no attempt is made to assess whether the general thrust of assistance is consistent with the development of an efficient, competitive industrial structure.

The lesson from the Japanese approach to industry assistance is that a key element for success is the changing pattern of the distribution of assistance resources over time. Assistance in general moves through different phases i.e. basic rationalization, establishment of international levels of efficiency and expansion of export penetration. The fourth phase is the refocusing of industry targets. It is in this latter phase that assistance resources are reallocated towards newly targeted industries, either because of the potential created by preceding development programs (e.g. because of technical production complementarities) or because the industries would appear to have significant potential in their own right. Both at any given point in time and over time co-ordination is necessary condition for a flexible policy response.

Industry development is comprised of a complex of elements for which many government structures already exist. Many of the structures, however, have evolved in a very ad hoc manner and were designed to address limited issues and problems of the day. They therefore tended to have narrow foci because of the limited perception of the problems they were designed to address. This has given rise to a government structure in which most of the key requirements for successful industry development strategies appear to already exist. The problem then is more a question of whether the right level of resources devoted to industry development has been achieved, whether they exist in the right proportions and whether they have achieved the necessary degree of co-ordination and consistency within and between themselves. Following sections of this part of the report advance a number of proposals which we believe will greatly improve both the structure and the functions of the industry development machinery of government.

Specific Policy Initiatives

In this report, a prima facie case has been established that a range of new policy initiatives should be focused on the metals and engineering sector. However, the evidence presented in the report also shows that the metals and engineering group is a large, complex and heterogeneous set of industries. It follows that considerably more work remains to be done in order to identify the particular industries which are likely to yield the greatest return for each assistance dollar invested. Clearly, it would be impossible for us to address that task in this report. This is properly the function of government and the numerous agencies and resources that are already allocated to the task. Equally, it would be wrong for us to propose a set of definitive policy initiatives before such a detailed industry-by-industry analysis had been completed.

The reasons for our modesty concerning these specific policies is that industries differ in their institutional, behavioural and technological features as well as in their competitive constraints and market prospects. Hence, effective industry policies must differ also. Effective design of such policies will require considerable research, analysis and consultation at the level of the industry under consideration. In general, this process should be conducted within a consultative framework, embodying the key principles of the policy development process outlined above.

It is impossible to prescribe the introduction of industry-specific policies without further, detailed information. It is, however, possible to state firmly that the principles of policy formulation outlined above should be taken seriously by all participants in the formulation process.

It is also possible to recommend that the performance criterion be expressed in terms of the target market share of the selected industry over what is considered to be a reasonable period, say, a five-year period. The market share in this case should include exports in the denominator. The value of this concept is that it allows the target guideline to be met by either import reduction or export expansion, or by a combination of both, as the analysis given above suggests is likely. The principal criterion by which the effectiveness of policies are measured will then be the extent to which they are successful in achieving this target.

Further, policies should be flexible enough to allow for a progressive series of objectives to be attained over successive periods. The first stage of the policy strategy for a given industry will, in general, be concentrated heavily on achieving international standards of competitiveness, which will in consequence ultimately render protection against imports unnecessary. In the second phase, policy can be directed towards export expansion, with policies designed to achieve the target rates of export growth considered feasible within a given time frame. The final phase is to withdraw the assistance from the selected industry and to transfer the resources to the next industry, or set of industries, selected for development.

5.2 MACHINERY OF GOVERNMENT – INDUSTRY DEVELOPMENT

This section will sketch examples of possible structures and mechanisms which accomodate the necessary principles for the design and implementation of industry development policies for the manufacturing industry in general and the metals and engineering sector in particular. The examples are just that, examples. However, they are put forward to initiate a debate about an what is an effective policy structure.

The machinery to design and implement a flexible and targeted strategy for industry assistance should be based on the following functional steps:

(i) Identification of target industries

(ii) Design of policy and selection of instruments

(iii) Identification and selection of recipient enterprises

(iv) Sourcing and allocation of assistance

(v) Monitoring

(vi) Evaluation

One example of such an institutional structure is given in chart 5.1. At the apex of the chart is the present Commonwealth Manufacturing Cabinet Sub-Committee. The sub-committee should consist of the Ministers of Industry and Commerce, Trade, Employment and Industrial Relations, Science, Finance, the Treasurer, with other Ministers attending when matters falling within their portfolios are scheduled for discussion. Below the sub-committee, there should be a broader council, incorporating all the members of the Cabinet Sub-Committee, as well as the relevant State Ministers. Apart from this addition, this institutional structure presented in the chart incorporates mostly existing agencies, with the single addition of an Industry Supply and Development Office under the umbrella of the Department of Industry and Commerce. It is proposed here that the Office should be divided into two branches, and Industrial Supply Branch and and Industrial Development Branch. The former would co-ordinate the State Industrial Supply offices either already established or scheduled for establishment. The latter would design and implement industry development programs.

The role of the Australian Manufacturing Council is a general one. Its functions would include establishing a case for manufacturing industry assistance; developing guidelines for allocating assistance resources; identifying constraints which require the attention of other Government Agencies (Science, Education, Immigration etc), recommending macroeconomic policies to complement industry assistance policies, and requesting IAC enquiries (via the Cabinet Sub-Committee) into the reallocation of industry assistance (as represented by tariffs and quotas) in order to achieve a more efficient protection structure.

On advice from the AMC, Cabinet would determine what resources would be available for the new industry assistance measures, in the normal course of budget preparation. The Cabinet Sub-Committee would establish guidelines for allocating the resources across industry groups, again on advice from the AMC. The function of the remaining agencies in the process of policy development is explained in the following sections in terms of the six functional steps given above.

Identification of Target Industries

An essential pre-requisite to allocating industry assistance resources efficiently is to target those industries which will give the highest return per assistance dollar. Thus effective targeting requires the availability of appropriate and suitably organised data. Without information organised in a form to meet the requirements of the

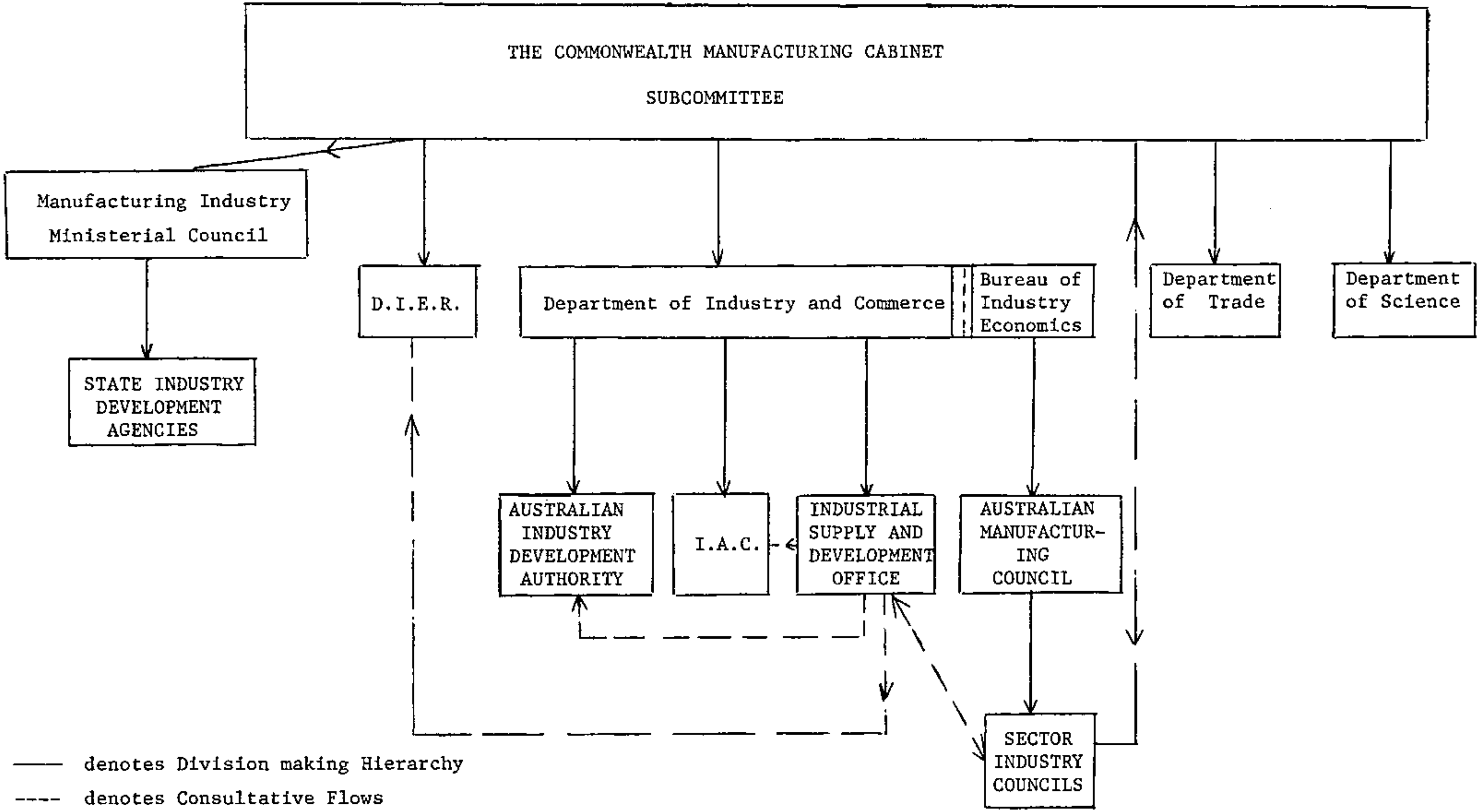


CHART 5.1: EXAMPLE OF AN INSTITUTIONAL STRUCTURE.

decision-making agencies, it is unlikely that effective industry assistance strategies can be developed at all.

The minimum information required, in terms of its type and desired intra agency flows, is illustrated in Chart 5.2. The data collection division in the Department of Trade, for example, could be given the additional function of constructing a comprehensive data base for manufacturing industry. Manufacturing data collections are presently held by various bodies and are frequently incompatible with each other in terms of their classification systems, coverage, etc.

Initially, the data base would be established by standardising the data collected by other government bodies (Department of Trade, Customs, BIR, BLMR, etc.) to conform to the Australian Bureau of Statistics' system of data classification. That is the ABS data base would be augmented. The object of the exercise is to organise the data in a useable form. To do this, detailed statistical commodity profiles would have to be developed. Each profile would include information such as:

(i) the structure of costs and factor inputs for best practice technology,

(ii) the composition of product material (expressed in economic and engineering terms),

(iii) the structure of material input suppliers,

(iv) the structure of sales markets,

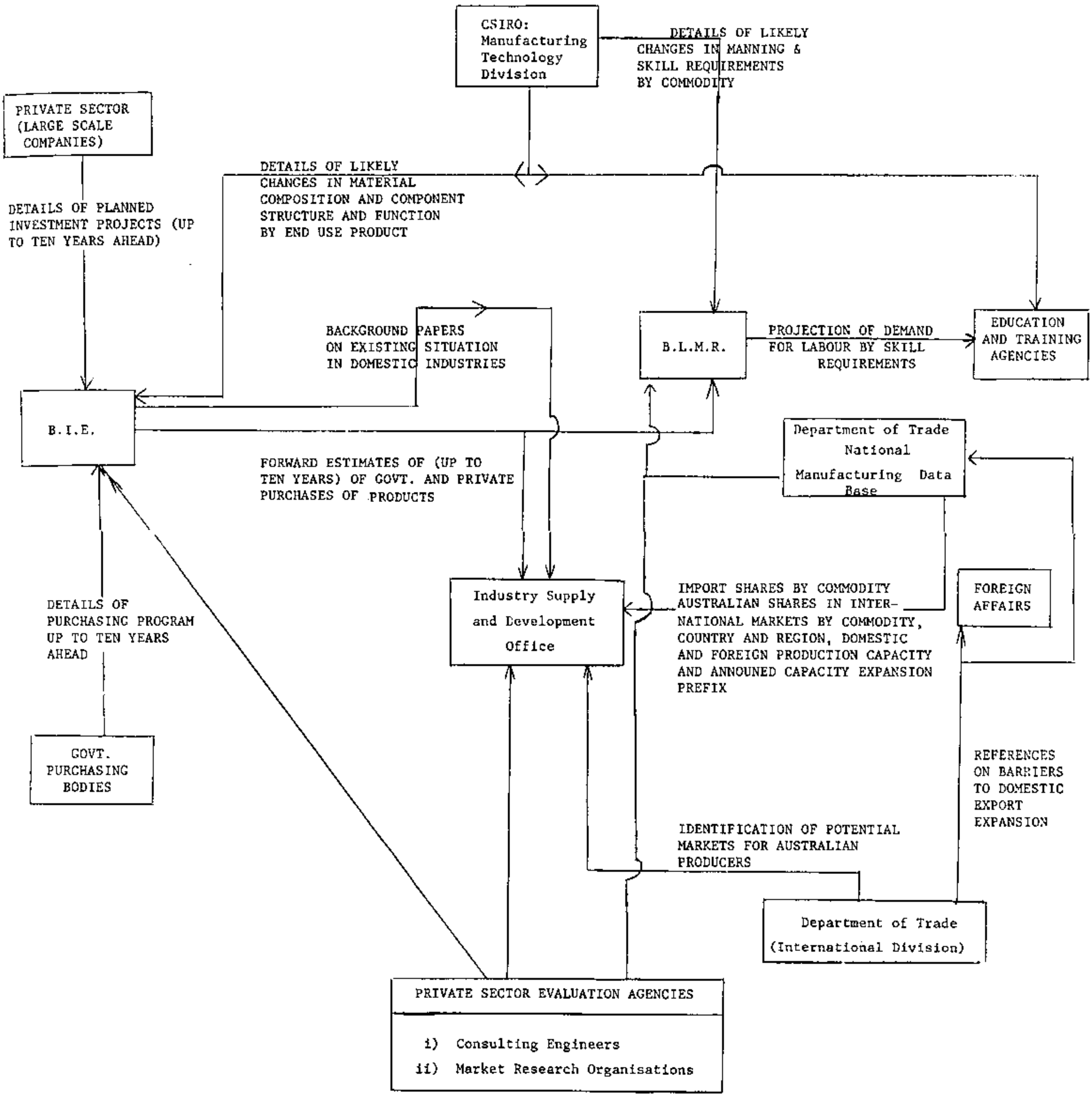
(v) the level and quality of domestic capacity, and

(vi) labour requirements and the structure of required skills.

Export expansion policies require further information on the structure of foreign production and on demand. Further information on the structure of foreign costs, capacity installed (and, where appropriate, decisions to expand capacity) and intra and inter company relationships in domestic and foreign production and distribution is essential. The responsibility for data collection would continue to rest with existing agencies; data collection would not be the responsibility of data collection managers. If the existing data collections are inadequate, or are not available for general use (as is sometimes the case for ABS data) then the data bank managers shouldsupplement the collection, either directly or by using the services of market research bodies. Foreign data collection could be made the responsiblity of the international division of the Department of Trade.

As shown in the chart, the commodity profiles are a key input into the agency directly concerned with designing and implementing industry development programs ,that is: the Industry Supply and Development Office. However, commodity profile data could also be held on a real time, on-line computer and thus made available to all interested

CHART 5.2: GENERAL INFORMATIONAL FLOWS BETWEEN AGENCIES



public and private sector bodies, on a full cost recovery subscription basis. The development of a national manufacturing data base should mean a reduction in resources devoted to data collection in Australia, when significant resources are presently being devoted to reconciling and supplementing available data. The present system is uncoordinated and data prepard is usually only available on a restricted basis.

Historical information available from the national manufacturing data base should be supplemented by technical profiles prepared by the CSIRO manufacturing division, either from its internal sources or from research undertaken by other public and private organizations. The CSIRO division would prepare technical profiles on future (on a 10 to 15 year time horizon) best practice technology, factor input and material composition, as well as on changes in product end-users, product functions and component configurations, etc. Again, the information could be made generally available on a full cost recovery subscription basis. The efficient development of a technological data bank would result in a saving of the resources currently devoted to this activity.

The essential purpose of collecting this data is to provide relevant information in a way that allows the identification of potential market opportunities for domestic producers, whether or not these opportunities will require assistance for their exploitation. The Department of Industry and Commerce already carries out surveys in order to identify the expenditure-time profiles of large scale investment projects, over a 10 to 15 year horizon. If this kind of analysis were extended to cover government investment purchasing decisions (including defence) and also the general investment purchasers of large-scale organisations then, in conjunction with the commodity profiles discussed above, it would be possible to break down the presently published profiles of aggregate expenditure into expenditure profiles at the commodity or commodity group level. The commodity profiles so developed would be mainly of products of the metals and engineering sector. The co-ordinating function could be given to an exisitng agency, such as the Bureau of Industry Economics, with no significant expansion in resource inputs being required.

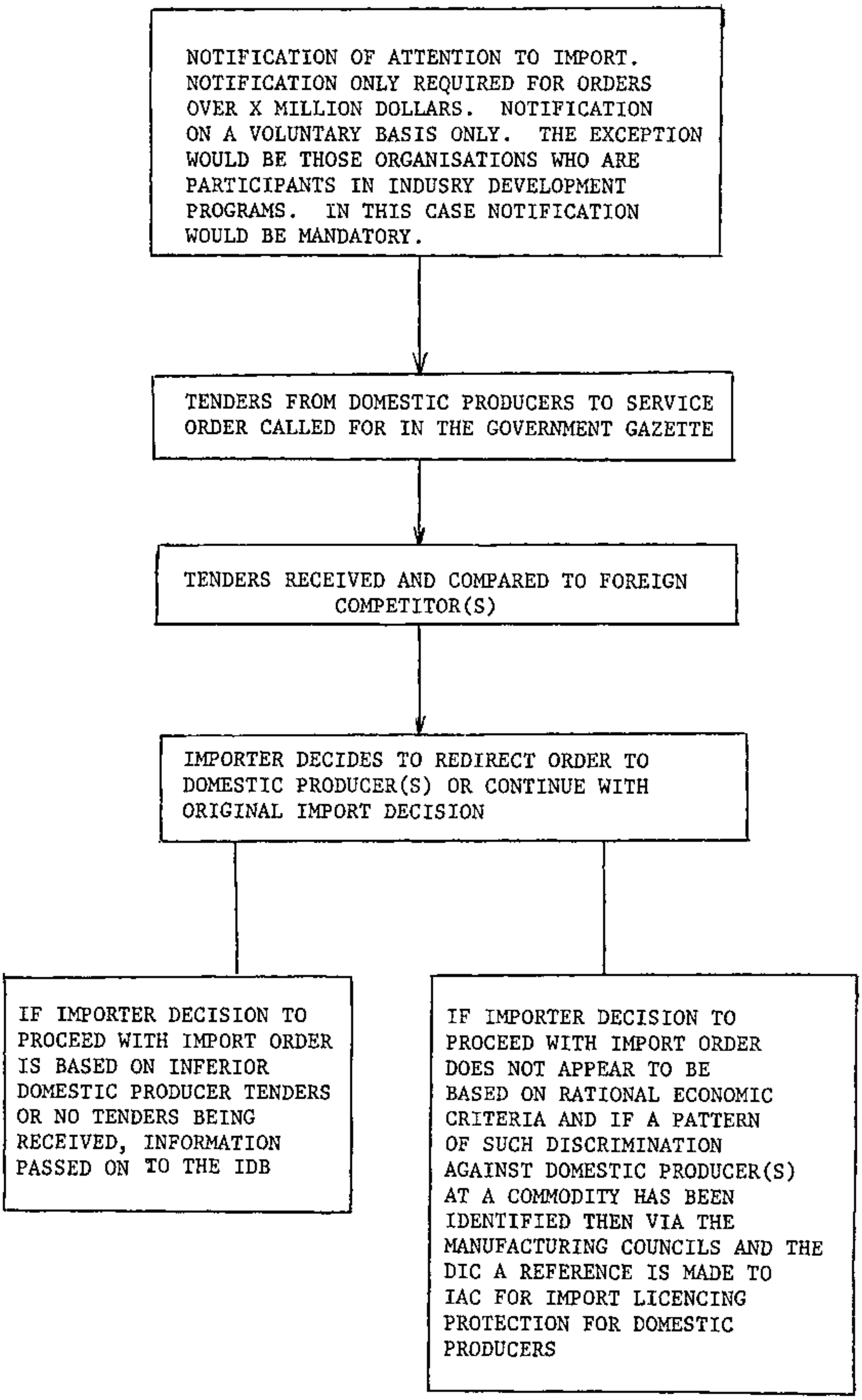
In broad terms at least, the identification of overseas markets could be the responsibility of the International Division of the Department of Trade. It could be the task of this agency, for example, to monitor the development plans of the developing East Asian economies, to translate these plans and their likely outcomes into opportunities for selected products, and to monitor the development strategies of the various organisations and governments that compete with Australian producers in domestic or international markets. This kind of information is essential to any organisation concerned with identifying target industries. It would also be useful to such agencies as the Bureau of Labour Market Research, since it could be used in conjunction with future technological profile to develop projections of the future structure of labour demand by skill and occupation. By this means, there could be an invaluable upgrading of the information base presently used for planning by educational and vocational training agencies.

Initially, the information requirements illustrated in Chart 5.2 would be restricted to a narrow range of commodities. However, the range would be expanded considerably over time. This in itself would be of substantial assistance to Australian Industry.

An additional and major source of information could come from the activities of the Industrial Supply Branch and the State Industrial Supply Offices. The broad operation of these agencies is illustrated in Chart 5.3. On the whole, these agencies would operate on a voluntary basis, in which participating organisations would notify the Branch State Officers of their intentions to import products of a given specification. Such notification would be mandatory however for those organisations currently in receipt of industry development resources from industry development programs, or who were in receipt of any State Government assistance. Upon notification, the function of the Branch would be to locate competitive tenders for the supply of the required product by local producers within a reasonable time period. The time period would be uniformly fixed, and the tender search would cease on the specified date of expiry. If a competitive domestic tender was located, the importing organisation could still decide to place an overseas order. However, the Industrial Supply Branch (ISB) should be empowered to make recommendations to the Cabinet Sub-Committee for an IAC enquiry whenever there is evidence of consistent discrimintation against competitive, domestic producers. If the IAC supported the ISB assessment, then limited-term import licensing protection would be introduced. It would be maintained so long as the domestic producer or producers remained competitive and the withdrawal of protection would allow the continuation of discriminatory practices. *The use of protection in this instance is an inversion of the historical rationale. Protection instruments are used here to force the market to work as the textbooks say it should, and not to distort market forces.*

However, a major benefit of this function of the Industrial Supply Branch will be the information that will become available when no domestic tender can be located or if domestic tenders are uncompetitive. In this situation, follow-up investigations could reveal the capacity,or lack of it, of Australian industry to produce commodities of a given specification. They would also enable capacity constraints and the sources of

CHART 5.3: INDUSTRIAL SUPPLIES BRANCH: FUNCTIONAL SEQUENCE



uncompetitiveness to be identified. This information would be invaluable when targeting industries for development.

After all the available information has been collated, the Industry Development Branch (IDB) nominates potential targets, using the established guidelines given by the Sub-Committee and the results of an iterative consultative process between the Sector Industry Councils and private and public bodies. Thus the Industry Development Branch identifies industries where development programs of limited duration could establish, refurbish, or expand domestic capacity in a cost effective manner.

Policy Design, Selection of Instruments, Identification of Recipients and Allocation of Assistance

A theme of the import replacement section of this paper was that a significant proportion of component orders in large-scale investment projects currently goes to overseas suppliers, but that these orders could be filled by domestic producers if they were given adequate lead times in which to expand or redesign capacity and if an intermediary facilitated contact between principals, project managers and potential domestic suppliers. In this situation, the Industry Supply Branch/State Supply Offices could act as a catalyst in alerting domestic producers to the potential of particular projects or groups of projects. They could also provide a forum in which the functions of producers and consumers in the Australian economy could be integrated.

Such an intermediary would not seek preferential treatment for Australian manufacturers. Rather, the aim would be to ensure that they are not denied access to profitable production and employment opportunities for reasons other than their technical and commercial competitiveness.

Overseas experience has shown that such non-competitive factors include:

(i) exclusion from an expansion project in the period prior to it becoming locked into a set group of suppliers.

(ii) use of non-Australian standards and specifications

(iii) imposition of unrealistic and unnecessary specifications and delivery times.

(iv) early or preferential access to project information by overseas suppliers

(v) unwillingnes to accept Australian equivalents.

None of this should be taken to mean that all of the problems lie with the purchasers. Indeed, overseas evidence has again shown that when intermediary industrial supply structures have been established one of the principal results has been the comparative ease with which they are able to identify very specific supply-side deficiencies and/or outright gaps in supply capabilities. They thus represent an efficient mechanism for identifying targets for industrial development. *As noted above, this factor provides the rationale for integrating the supply office and development office functions.*

Chart 5.4 outlines a proposed functional sequence for the Industrial Development Branch of the Industrial Supply and Development Office when supply deficiencies require the formulation of an industrial development program. The chart is largely self-explanatory, and is designed to illustrate a proposed sequence of actions, beginning at the most general level with the identification of potential development targets, the construction of sectional programs and their implementation at the enterprise level.

We would suggest that the proposed policy and decision-making framework, while very schematic, illustrates how our principles of cost-effective policy design and implementation, outlined above, might actually operate. For example, consultative structures are built into the framework at every relevant stage. Similarly, the principle of accountability is built into the framework, both where across-the-board policies are required and/or, even more importantly, where direct provision of selective financial assistance is extended to individual enterprises. In this case, the decision is based on standard commercial practices of tendering, with the selection by the AIDC being based on standard financial criteria. Thus the market determines whether both the assistance target and the level of assistance is practicable. The framework we suggest is the minimum required to achieve the other key principles of policy design, that is, co-ordination, consistency and flexibility. Consistency is built into the framework via the comprehensive facility for co-ordination of decision-making at all levels. The institutional structure is flexible, since it was specifically designed to deal with a wide range of issues on a number of different levels.

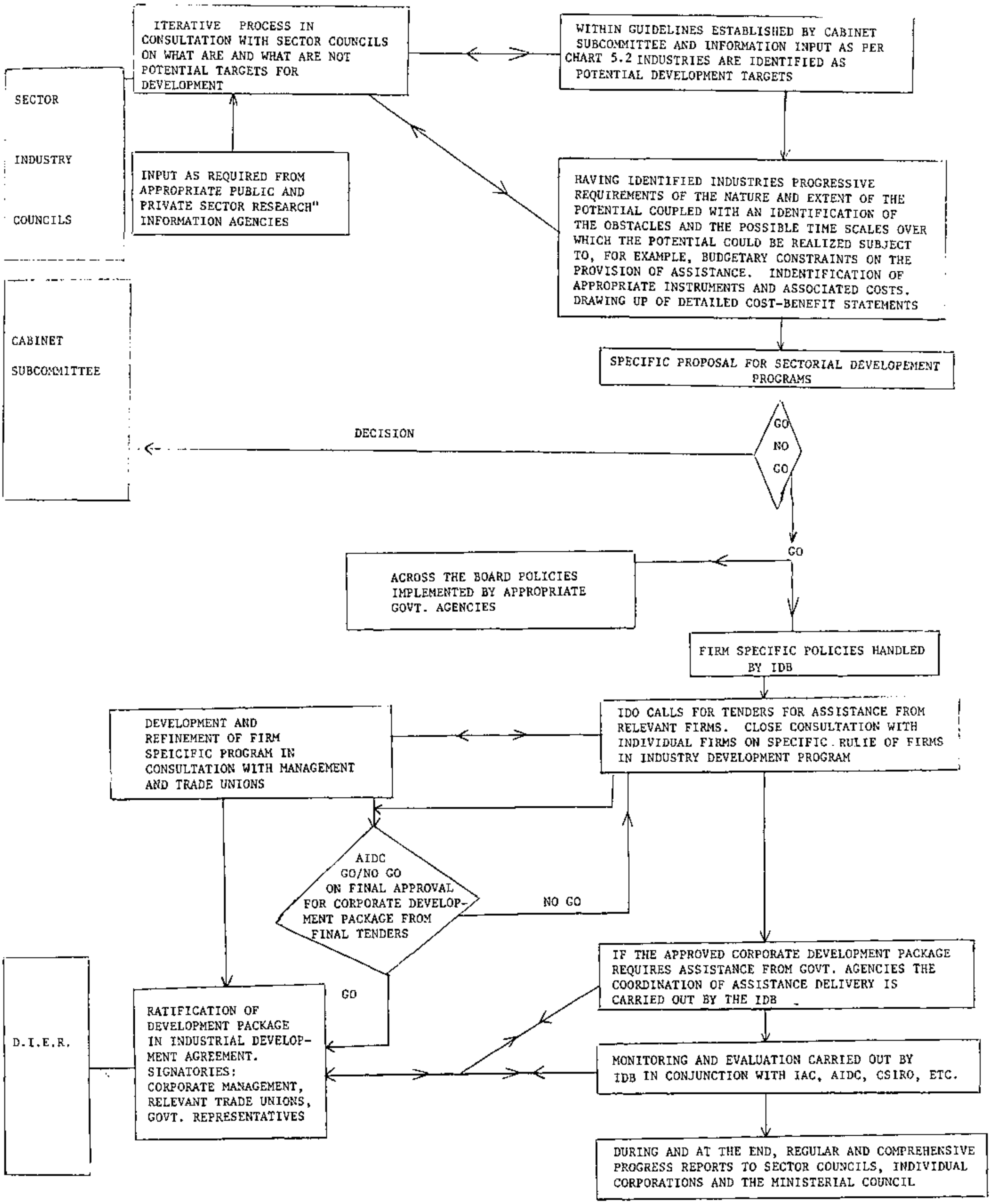
It is intended that the issue of compensation be dealt with and conceived of as an integral part of the process at the sectoral development program design stage. If compensation is likely to be required, then an IAC reference can be prepared, to assess the required level of compensation.

Monitoring and Evaluation

The principle of accountability is again an integral component of the framework, and as can be seen from the chart, is dealt with in a very comprehensive manner. The IAC might be given a major role in evaluating individual development programs at the expiry date. If the development program requires an extension, it should only be given if competent management of the assistance resources has been exhibited by the

INDUSTRIAL SUPPLY AND DEVELOPMENT OFFICE

CHART 5.4 INDUSTRIAL DEVELOPMENT BRANCH: FUNCTIONAL SEQUENCE



recipients in the initial phase of the program. In addition, where the program is designed to facilitate change from the domestic expansion to the export expansion phase, an evaluation is carried out at the change-over point.

5.3 INDUSTRIAL DEVELOPMENT AGREEMENTS

The reader will note from the chart that extensive provision is made within this framework for consultation with the private sector in the design of sector development programs and the corporate development packages arising from these programs. One key dimension of this process is employee and Trade Union involvement. The Trade Unions' preferred option in this area is that where selective financial assistance is provided to enterprises via corporate development packages, it will simultaneously be ratified through a comprehensive, Corporate Development Agreement, struck between government, corporate management, the workforce and its Trade Union representatives. The magnitude of the task to be undertaken and the dislocations which will necessarily occur in existing corporate and industry structures in the process of positive industry development, as well as the benefits arising from such development, make it absolutely essential that the workforce and its Trade Union representatives be centrally involved in this process.

Industrial Development Agreements - The Trade Union Viewpoint

The ALP platform on Industry Policy states that the Party in government is commited to 'promote and establish the rights of employees to participate in the process of developing and implementing industry policy at enterprise level with particular emphasis on decision-making in new technology, employment, work organization and industrial health and safety.

It is clear that frequently the rights referred to, are yet 'rights' in name only. Without substantial support for Trade Unions from Government and co-operation from employers, these rights will remain empty claims without either acceptance or recognition. In order to ensure that such rights are translated into practical, effective forms of trade union involvement in the industrial development process a change in the traditional relations between employers and trade unions is required.

The following proposals have been developed on the assumption that workforce involvement in the development of corporate strategies involves a co-ordinating role for Trade Unions in the introduction of appropriate representative structures at the corporate level and the securing of rights of participation for workers through Industrial Development Agreements. The two main areas of concern which provide a substantive focus for workforce involvement are company information systems and their implications for investment decisions and secondly Management decisions about new technology and their implications for job security and work practices.

Technological Change and Consultation between Employers & Trade Unions

Trade Unions are keenly aware of the need to produce goods and services efficiently; for firms to be competitive, and for an upturn in the economy in order to achieve a return to full employment. Where there are differences they are often based upon the degree to which Trade Unions consider that technological change can sometimes be used by management to disadvantage the workforce, to fragment jobs, and to limit Union coverage of the workforce.

In order for Trade Unions to play a positive role in the introduction of new technology, management should be prepared to consult with unions on the most comprehensive range of issues and at the earliest possible time.

In the recent judgement on the 'Termination, Change and Redundancy Case', Conciliation and Arbitration Act 1904 (C. No's 3690, 3735, of 1981: 127 of 1983) Melbourne 2 August 1984, the Commission's decision recognized that the voluntary approach to consultation based solely upon guidelines had failed to ensure minimally adequate management consultation with workers and their representtives.

Moreover the Commission did not accept that consultation on matters such as technological and organizational change was solely part of the role and function of management and thereby beyond the jurisdiction of the Commission.

The Commission is now prepared to insert award requirements for consultation about 'major changes in production, program, organization, structure or technology, which are likely to have significant effects on employees.'

Although this establishes minimum enforceable conditions, through notification in writing to 'the employees concerned and their representatives (of) all relevant information about the nature of the changes proposed,' it is significant that this excludes 'confidential' information and that the general consultation requirement aplies *after* decisions have been taken by employers.

A new development which opens the way for individual unions to participate in matters previously considered to be exclusively within the management domain is the High Court's Decision of Tuesday 21 August to uphold the Federated Clerks Union award provisions of consultation in relation to planned technological change (the award concerned is the Commercial Clerks Award No.3 of 1982).

For Trade Unions and their members to participate in the industry development process in accord with ALP policy, it is necessary to go beyond these minimum conditions to obtain relevant information well before final decisions are made, ie. when they are still at the formulation or proposal stage.

It is equally essential that the confidentiality requirements are not used to deny trade union access to relevant information. An approporiate framework for consideration of 'confidentiality' is found in the National Labour Consultative Council's *Guidelines on Information Sharing* (AGPS 1984) where it is suggested (p. 16) that confidential information may be discussed with elected representatives only, once agreement is reached on mutually developed information plans.

Moreover, the information provided should be prepared in such a way that it can be disaggregated and the impact of change on different sections of the workforce and working environment, adequately evaluated.

In order to prevent Trade Unions and their members being overwhelmed by large amounts of information it is imperative that Trade Unions be adequately resourced to analyse data, and given time to formulate a considered response. The federal Government should provide assistance to Trade Unions through permanent or seconded staff in relation to Industrial Development Agreement initiatives. Pilot projects may then be jointly developed.

Such Government assistance should concentrate on leading areas of technology to ensure adequate Trade Union involvement in the most advanced developments. Appropriate areas of technology relevant to the metals and manufacturing industry include the following:

a. Computer and Communications technologies in the metals and manufacturing industries with specific reference to micro processor controlled machinery, control systems designed to replace conventional microprocessor machinery, control systems designed to replace conventional micro-electronic timing devices and other control techniques, the incorporation of self-diagnostic functions to reduce maintenance, robots deployed on their own or in combination with numerically controlled machines.

b. Computer aided design (CAD) and Computer aided manufacture (CAM) in relation to product design and development and integrated production systems utilising extensive communication networks.

c. The use of micorprocessors and mini-computers in ironmaking, steel making, rolling and finishing mills and well as research and development (on both raw materials and chemical processes) and their implications for work practices and production methods.

It is clear that Trade Unions and their members are extremely concerned about new technology, job fragmentation and job security. In order for Unions to play a positive role in these matters it is essential that Pilot Projects be considered as part of a comprehensive set of industrial development initiatives and such proposals are not restricted to ostensibly technical-financial decisions which are exclusively under the direction of management.

To this end the Trade Union movement should be involved at the earliest possible stage, when technical and organizational changes are planned, and workers should be given special training by employers for new work tasks as soon as possible and without loss of pay.

Industrial Development Agreements and Corporate Information systems:

Implications for Investment

The development of a framework for Tade Unions and workers' participation in corporate development policy in line with ALP platform, requires extensive access to corporate information and it also supposes an understanding of companies information systems within which such information is collected and processed.

It is essential for Trade Unions to understand how their own members' tasks and their performance are depicted in Companies Information and Control systems in order to evaluate the strengths and weaknesses of such systems. It is little use expecting greater investment if obsolete cost accounting frameworks are utilised in Companies which implicitly distort product costs, omit significant indirect costs (machine downtime, labour turnover, poor product quality), use simplistic measures of labour productivity (unrelated to product lifecycle) and focus upon short term returns rather than long term strategy based on market share.

Moreover, increasingly Companies must be concerned not only to compete in their own industry, they also have to be concerned about the state of capital markets and the concentration of investment funds in the hands of large institutional investors who generally use short term criteria of return on investment and in the process often undervalue company's productive assets.

As part of their involvement in corporate development initiatives, Trade Unions will need to look very closely at the bias implicit in Corporate Information systems *against* new products, research and development and througput efficiencies and *towards* asset reshuffling and short term returns.

A pilot project on the relationship between company information systems, return on Investment techniques (hurdle rates, etc) and long term investment needs of the Metal and Manufacturing Industry should be undertaken with Federal Government support.

The terms of reference of this project should include the following areas of concern which need extensive investigation:

a. The incidence of cost accounting systems and management control systems among Companies which are inadequate for today's competitive environment.

b. The amount of information collected by companies on non-financial aspects of manufacturing performance including - direct quality indicators, (defects, breakdowns, rework required), work in process inventory estimates, average batch sizes, inventory of purchased items and flexible productivity estimates which allow for gains from more efficient use of capital, energy, managerial effort, workforce skills and training.

c. The reliance on discounted cash flow techniques in projected Return on Investment (RO1) calculations in relation to detailed examination of company divisional operations and technology.

d. The bias towards trading in finance markets rather than better asset management, in research and development, promotion, distribution, quality improvement, applications engineering, human resource development and sales and delivery.

e. The imbalance between short term profits and longer term strategy based upon the intangible assets which are only seldom included in the conventional reporting of a company's economic health.

f. Alternative information systems of cost and human resource accounting which provide a focus on factors critical to long term corporate success in areas such as job and product quality, flexible manufacturing systems and the appropriate mix of financial and non-financial economic indicators.

Such pilot projects would provide an important basis for Government, Trade Union and Employer co-operation built upon a comprehensive picture of organizational investment policies and allowing for an extensive educational campaign among union members to increase their economic literacy and participation in higher levels of decision-making.

APPENDIX C

IMP MODEL SIMULATION RESULT:

SUMMARY TABLES

SUMMARY TABLE A1 INTERNATIONAL AGGREGATES

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4440	TOTAL WORLD GDP 1970 $ BILLION	.01	.01	.01
4542	WORLD MANUFACTURING TRADE PRICE INDEX (YEAR 0 EQUALS 100.0)	0.00	.00	-.00
2825	WEIGHTED AVERAGE EXCHANGE RATE	0.00	0.00	0.00
4543	WEIGHTED AVERAGE TARIFF RATE - PERCENTAGE POINT	.32	.16	.29
4544	INDEX OF COMPETITIVENESS (YEAR 0 EQUALS 100.0)	-.30	.61	1.30
3743	TERMS OF TRADE	.08	-.01	-.18

SUMMARY TABLE A2 MACRO ECONOMIC AGGREGATES - 1966.67$M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR		
421	TOTAL PRIVATE CONSUMPTION EXPENDITURE	.26	.48	[illegible]
438	TOTAL GOVERNMENT CONSUMPTION EXPENDITURE	0.00	0.00	0.00
442	PRIVATE HOUSING EXPENDITURE	.37	.68	.57
2037	TOTAL PRIVATE INVESTMENT	1.47	-.06	3.86
2038	TOTAL PUBLIC INVESTMENT	.38	.80	.74
440	NON-FARM STOCKS	8.67	21.22	9.16
447	IMPORTS OF GOODS AND SERVICES	-1.81	-1.51	-1.36
446	EXPORTS OF GOODS AND SERVICES	.02	.09	.10
450	GROSS DOMESTIC PRODUCT	.84	.88	1.39
443	FARM PRODUCT	-.00	-.00	.07
449	GROSS NON-FARM PRODUCT	.92	.96	1.51
1896	GROSS DOMESTIC PRODUCT - COMPOSITE	.71	.91	1.36

SUMMARY TABLE 43 INCOME FORMATION AND CAPITAL ACCOUNT

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4423	WAGES AND SALARIES : SHARE IN GDP AT FACTOR COST - (P.P.)	-.17	-.51	-.83
4424	COMPANY SURPLUS : SHARE IN GDP AT FACTOR COST - (P.P.)	1.48	1.70	1.38
4425	UNINCORPORATED ENTERPRISE: SHARE IN GDP AT FACTOR COST - (P.P.)	-.23	1.74	1.94
4426	DWELLING SURPLUS : SHARE IN GDP AT FACTOR COST - (P.P.)	-.60	.83	.99
4460	PUBLIC UTILITIES : SHARE IN GDP AT FACTOR COST - (P.P.)	-.14	-.08	-.91
4580	PRIVATE SECTOR SAVING MINUS PRIVATE SECTOR INVESTMENT	13.94	1.72	-1.12
4581	GOVT SAVING LESS INVESTMENT	-1.21	-5.31	-9.38
4582	FOREIGN SAVING	-31.18	-182.87	212.80
4583	PRIVATE SECTOR SAVING OUT OF INCOME	-.15	-.70	-.02
4418	CORPORATE SECTOR INTERNAL FUNDING RATIO - (P.P.)	1.13	.76	-1.84
4559	REAL HOUSEHOLD RECEIPTS - 1979.80 $M	.44	.73	1.07
2078	HOUSEHOLD SAVING RATIO - (P.P.)	.71	1.38	.92
4560	REAL HOUSEHOLD DISPOSABLE INCOME - (1979.80 $M)	.41	.72	.98
2840	HOUSEHOLD LIABILITY - CURRENT RATIO	[illegible]	[illegible]	[illegible]

SUMMARY TABLE 47 SELECTED INDICATORS

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4546	IMPLICIT CONSUMPTION DEFLATOR (YEAR 0 EQUALS 100.0)	.05	-.07	-.69
1559	NOMINAL WAGE RATE PER MALE UNIT PER WEEK - DOLLARS	.32	.22	-.42
3711	REAL WAGE RATE (YEAR 0 CONSTANT DOLLARS)	.27	.29	.27
2054	AGGREGATE PRODUCTIVITY (EMPLOYMENT BASED) (YEAR 0 EQUALS 100.0)	.62	.63	.86

SUMMARY TABLE A5 GOVERNMENT SECTOR - 1979.80 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Differences between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
2053	H"HOLD INCOME TAX RATE-PERCENT OF H"HOLD RECEIPTS LESS CASH BENEFITS	-.02	-.02	-.04
1038	COMPANY TAX RATE - RATIO	0.00	0.08	0.00
4427	INDIRECT TAX RATE PERCENT OF GDP	-1.02	-.64	-.67
4561	INDIRECT TAX REVENUE $M	1.17	[illegible]13	3.36
4626	DIRECT TAX REVENUE	.52	1.40	1.65
4632	COMPANY TAX AS PERCENT OF COMPANY G.O.S	1.88	5.39	.90
4564	NET INTEREST PAID $M	-.17	-.64	-3.03
4565	TRANSFERS TO PERSONS	-.59	-.11	-.46
4627	CURRENT GOVERNMENT EXPENDITURE	0.00	0.00	0.00
4552	TOTAL INVESTMENT OUTLAY $M	.38	.80	.74
4567	PUBLIC SECTOR BORROWING REQUIREMENTS $M	-.97	-4.54	-7.82
3700	PUBLIC SECTOR BORROWING REQUIREMENTS : PER CENT OF GDP	-1.84	-5.45	-9.22
4634	TOTAL HOLDINGS OF GOVT DEBT - 1979.80 $M	-.22	-.38	-1.79
4635	DOMESTIC HOLDINGS OF GOVT DEBT AS PERCENT G.D.P	.13	.37	.07

SUMMARY TABLE A6 INDUSTRY OUTPUT - 1966.67 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

SERIES NO	TITLE		YEAR 1	2	5
			Percentage Difference between Control and Disturbed Solution		
2151	AGRICULTURE	- 1966.67 $M	.06	.04	.10
2152	MINING	- 1966.67 $M	.40	.53	.83
2153	MANUFACTURING	- 1966.67 $M	2.02	2.18	2.71
4620	UTILITIES/CONSTRUCTION		.70	.44	1.11
4621	DISTRIBUTION		.49	.54	1.01
4622	SERVICES		.40	.53	1.08
2162	OWNERSHIP OF DWELLINGS	- 1966.67 $M	-.00	[illegible]	.12
2163	TOTAL INDUSTRY PRODUCT		.72	.75	1.23

SUMMARY TABLE A7 LABOUR MARKET

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

SERIES NO	TITLE		YEAR 1	2	5
			Percentage Difference between Control and Disturbed Solution		
173	TOTAL LABOUR FORCE	- HUNDREDS	0.00	.16	.22
170	TOTAL EMPLOYMENT	- HUNDREDS	.33	.25	.52
172	UNEMPLOYMENT (ACTUAL)	- HUNDREDS	-7.48	-.91	-3.51
2227	UNEMPLOYMENT RATE (ACTUAL)	- PERCENTAGE POINT	-7.48	-1.07	-3.72
2230	UNEMPLOYMENT (POTENTIAL)	- HUNDREDS	-3.68	-2.12	-3.69

SUMMARY TABLE A8 FOREIGN ACCOUNT 1979.80 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	3	5
4628	BALANCE OF TRADE	- $M	41.44	18.75	12.14
4568	NET OFFICIAL MONETARY MOVEMENT	- $M	1.00	1.00	1.00
4629	BALANCE OF CURRENT ACCOUNT	- $M	-21.86	-71.75	-108.74
4569	PROPERTY INCOME TO OVERSEAS	- $M	.01	1.30	-1.69
4570	FOREIGN INVESTMENT : GOVERNMENT SECTOR	- $M	-130.75	229.88	50.93
4571	NET PRIVATE INVESTMENT	- $M	3.64	-1.23	3.54
3713	NET APPARENT CAPITAL INFLOW : PERCENT OF GDP		-22.63	-71.05	-108.69
4630	TOTAL OVERSEAS BORROWINGS.	-$M	1.00	1.00	1.00
4631	TOTAL OVERSEAS BORROWING AS A PERCENT OF GDP		-4.04	-6.10	-18.97

SUMMARY TABLE A9 EMPLOYMENT BY INDUSTRY GROUP HUNDREDS

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	3	5
158	PRIMARY	HUNDREDS	.00	.00	.02
159	MINING	HUNDREDS	.44	.50	.82
160	MANUFACTURING	HUNDREDS	1.33	.62	.77
4623	UTILITIES/CONSTRUCTION	HUNDREDS	.63	.23	1.04
4624	DISTRIBUTION		.20	.08	.37
4625	SERVICES		-.20	.20	.44

SUMMARY TABLE A10 OCCUPATIONAL DEMAND FOR LABOUR

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	2	5
2974	PROFESSIONAL AND TECHNICAL	- HUNDREDS	.16	.22	.72
2975	ADMIN.MANAGERIAL.CLERICAL	- HUNDREDS	.09	.17	.33
2976	FARMER.FISHERY.FORESTRY	- HUNDREDS	.02	.02	.06
2977	MINERS	- HUNDREDS	.50	.82	.94
2978	TRANSPORT AND COMMUNICATION WORKERS	- HUNDREDS	.32	.26	.50
2979	TRADES AND PRODUCTION WORKERS	- HUNDREDS	.73	.37	.76
2980	SERVICES.SPORTS AND RECREATION	- HUNDREDS	.04	.10	.68
4567	UNALLOCATED	- HUNDREDS	.54	.20	.44

SUMMARY TABLE A11 FINANCIAL AGGREGATES - 1979.80 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4539	SHORT TERM (2 YEAR) BOND RATE - PERCENTAGE POINT	0.00	0.00	0.00
4540	LONG TERM (10 YEAR) BOND RATE - PERCENTAGE POINT	.01	-.01	-.03
4584	REAL LONG TERM INTEREST RATE (POST-TAX)	-2.36	3.98	7.09
4572	DEMAND FOR MONEY (M2) $M	.91	.97	1.56
4573	NON CENTRAL BANK HOLDING OF GOVT SECURITIES $M	.65	.43	1.06
4574	CENTRAL BANK HOLDING OF GOVT SECURITIES $M	7.33	5.79	2.72
4439	SRD RATIO	-5.50	13.21	1.47

SUMMARY TABLE A/8 COMMODITY ACTIVITY

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	3	5
949	CRUDE OIL IMPORTS 1000" KILOLITRES	[illegible]	[illegible]	[illegible]
1201	BLACK COAL EXPORTS 1000" TONNES	0.00	0.00	-.06
1152	ALUMINA PRODUCTION 1000" TONNES	0.00	0.00	-.07
*153	ALUMINIUM PRODUCTION 1000" TONNES	0.00	0.00	-.28
11**	IRON ORE PRODUCTION 1000" TONNES	0.00	.02	.14
103A	URANIUM EXPORTS 1000" TONNES	0.00	0.00	-.16
J331	CONCENTRATE MINING EXPORTS 1974.75 $M	-.03	[illegible]	.01
J339	PROCESSED MINING EXPORTS 1974.75 $M	-.15	-.10	-.35
1204	LNG EXPORTS - MILLION THERMS	1.00	1.00	0.00

SUMMARY TABLE A/9 PRIVATE INVESTMENT BY INDUSTRY

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

DECREASE IN IMPORTS

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4575	AGRICULTURE - 1979.80 $M	-.63	.96	2.24
4576	MINING - 1979.80 $M	.06	.58	2.64
4577	MANUFACTURING - 1979.80 $M	4.40	-4.53	6.02
4578	TERTIARY SECTOR - 1979.80 $M	.26	1.03	1.98
4579	TOTAL PRIVATE INVESTMENT - 1979.80 $M	1.47	-.06	3.86

SUMMARY TABLE A4 INDUSTRY OUTPUT [illegible] - 1966.67 $M

DECREASE IN IMPORTS

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Percentage Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
251	MEAT PRODUCTS	-.08	[illegible]	-.14
252	MILK PRODUCTS	0.00	0.00	0.00
253	FRUIT AND VEGETABLES	0.00	.12	.68
254	MARGARINE	.29	.31	.51
255	FLOUR MILL	.32	.26	.36
256	BREAD,CAKES	.09	.13	.13
257	BEVERAGES	.36	[illegible]	.99
258	TOBACCO	.09	.20	.52
259	PREPARED FIBRES	0.00	.00	.00
260	MAN-MADE YARNS AND FIBRES	.88	1.22	1.58
261	TEXTILE FINISHING	1.28	1.44	1.55
262	TEXTILE FLOOR COVERING	.85	.88	1.19
263	KNITTING MILLS	.52	.75	.89
264	CLOTHING	.41	.57	.71
265	FOOTWEAR	.67	.93	1.23
266	SAWMILL PRODUCTS	.85	.79	1.53
267	JOINERY AND WOOD PRODUCTS	.76	.61	1.35
268	FURNITURE	.76	.88	1.14
269	PULP,PAPER AND PAPERBOARD	.88	.95	1.11
270	PRINTED MATTER	1.00	1.07	1.86
271	INDUSTRIAL CHEMICALS	1.56	1.42	2.11
272	PAINTS	1.42	1.43	2.08
273	SOAP	.35	.45	.88
274	OTHER CHEMICALS	.47	.46	1.06
275	PETROLEUM AND COAL PRODUCTS	-.31	.10	.13

276	GLASS AND GLASS PRODUCTS	1.67	1.24	2.50
277	CLAY PRODUCTS	1.12	1.02	3.72
278	CEMENT AND CONCRETE PRODUCTS	1.30	.74	2.25
279	OTHER N.M. MINERAL PRODUCTS	1.04	.60	1.64
280	BASIC IRON AND STEEL	3.19	3.36	4.22
281	NON-FERROUS METAL PRODUCTS	2.37	2.92	2.84
282	FABRICATED STRUCTURAL METAL PRODUCTS	1.28	.91	2.72
283	METAL CONTAINERS ,SHEET METAL PRODUCTS	.87	.77	1.31
284	CUTLERY AND HAND TOOLS	1.90	1.55	2.89
285	MOTOR VEHICLES AND PARTS	.74	.80	2.33
286	OTHER TRANSPORT EQUIPMENT	.82	.87	1.58
287	APPLIANCES AND ELECTRONIC EQUIPMENT	9.48	12.19	10.64
288	ELECTRICAL MACHINERY AND EQUIPMENT	11.10	10.01	10.74
289	AGRICULTURAL MACHINERY AND EQUIPMENT	6.95	7.87	8.23
290	OTHER INDUSTRIAL MACHINERY	11.98	11.15	13.31
291	LEATHER PRODUCTS	.58	.83	.74
292	RUBBER PRODUCTS	1.48	1.99	2.79
293	PLASTIC AND RELATED PRODUCTS	1.44	1.58	1.63
294	OTHER MANUFACTURING	.59	.82	2.48
295	TOTAL MANUFACTURING	2.03	2.12	2.73

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

SUMMARY TABLE B1 INTERNATIONAL AGGREGATES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	3	5
4440	TOTAL WORLD GDP 1970 $ BILLION	.34	[illegible]	[illegible]
4542	WORLD MANUFACTURING TRADE PRICE INDEX (YEAR 0 EQUALS 100.0)	0.00	.00	-.00
2825	WEIGHTED AVERAGE EXCHANGE RATE	0.00	0.00	0.00
4543	WEIGHTED AVERAGE TARIFF RATE - PERCENTAGE POINT	.07	.03	.06
4544	INDEX OF COMPETITIVENESS (YEAR 0 EQUALS 100.0)	-.20	.58	1.27
3743	TERMS OF TRADE	.00	-.00	-.00

SUMMARY TABLE B: MACRO ECONOMIC AGGREGATES - 1966-67$M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	3	5
421	TOTAL PRIVATE CONSUMPTION EXPENDITURE	[illegible]	[illegible]	[illegible]
438	TOTAL GOVERNMENT CONSUMPTION EXPENDITURE	0.00	0.00	0.00
442	PRIVATE HOUSING EXPENDITURE	6.60	13.21	11.59
2037	TOTAL PRIVATE INVESTMENT	68.40	-2.20	199.88
2038	TOTAL PUBLIC INVESTMENT	12.14	24.31	25.08
440	NON-FARM STOCKS	44.42	85.72	40.26
447	IMPORTS OF GOODS AND SERVICES	-143.58	-111.67	-114.27
446	EXPORTS OF GOODS AND SERVICES	1.81	7.09	9.16
450	GROSS DOMESTIC PRODUCT	341.26	352.26	614.91
443	FARM PRODUCT	-.00	-.03	2.60
449	GROSS NON-FARM PRODUCT	341.26	352.28	612.31
1896	GROSS DOMESTIC PRODUCT - COMPOSITE	290.50	361.96	603.64

SUMMARY TABLE 83 INCOME FORMATION AND CAPITAL ACCOUNT

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4423	WAGES AND SALARIES : SHARE IN GDP AT FACTOR COST - (P.P.)	-.12	[illegible]	-.42
4424	COMPANY SURPLUS : SHARE IN GDP AT FACTOR COST - (P.P.)	.17	.30	.20
4425	UNINCORPORATED ENTERPRISE: SHARE IN GDP AT FACTOR COST - (P.P.)	-.02	.14	.16
4426	DWELLING SURPLUS : SHARE IN GDP AT FACTOR COST - (P.P.)	-.04	.08	.07
4460	PUBLIC UTILITIES : SHARE IN GDP AT FACTOR COST - (P.P.)	-.03	-.06	-.02
4580	PRIVATE SECTOR SAVING MINUS PRIVATE SECTOR INVESTMENT	416.58	88.90	-78.73
4581	GOVT SAVING LESS INVESTMENT	54.26	286.81	608.77
4582	FOREIGN SAVING	-470.80	-376.30	-833.03
4583	PRIVATE SECTOR SAVING OUT OF INCOME	-.14	-.68	-.02
4418	CORPORATE SECTOR INTERNAL FUNDING RATIO - (P.P.)	.62	[illegible]	-1.23
4559	REAL HOUSEHOLD RECEIPTS - 1979.80 $M	501.52	783.37	1150.64
2078	HOUSEHOLD SAVING RATIO - (P.P.)	.14	.22	.18
4560	REAL HOUSEHOLD DISPOSABLE INCOME - (1979.80 $M)	384.28	631.05	919.37
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SUMMARY TABLE 84 SELECTED INDICATORS

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	5
4546	IMPLICIT CONSUMPTION DEFLATOR (YEAR 0 EQUALS 100.0)	.08	-.08	-.90
1559	NOMINAL WAGE RATE PER MALE UNIT PER WEEK - DOLLARS	.92	.66	-1.61
3711	REAL WAGE RATE (YEAR 0 CONSTANT DOLLARS)	.73	.78	.80
2054	AGGREGATE PRODUCTIVITY (EMPLOYMENT BASED) (YEAR 0 EQUALS 100.0)	.54	.66	.95

SUMMARY TABLE 85 GOVERNMENT SECTOR - 1979.80 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

DECREASE IN IMPORTS - ABSOLUTE CHANGE

Absolute Difference between Control and Disturbed Solution

NO TITLE	YEAR 1	2	3
H"HOLD INCOME TAX RATE-PERCENT OF H"HOLD RECEIPTS LESS CASH BENEFITS	-.29	[illegible]	[illegible]
COMPANY TAX RATE - RATIO	0.00	[illegible]	0.00
INDIRECT TAX RATE PERCENT OF GDP	-.13	-.09	-.09
INDIRECT TAX REVENUE $M	10.50	9.2[illegible]	26.22
DIRECT TAX REVENUE	118.60	300.54	362.22
COMPANY TAX AS PERCENT OF COMPANY G.O.S	.51	.95	.17
NET INTEREST PAID $M	-3.89	-17.30	-128.05
TRANSFERS TO PERSONS	-60.14	-11.54	-52.24
CURRENT GOVERNMENT EXPENDITURE	0.00	0.00	0.00
TOTAL INVESTMENT OUTLAY $M	38.47	77.04	79.47
PUBLIC SECTOR BORROWING REQUIREMENTS $M	-48.37	-274.58	-570.51
PUBLIC SECTOR BORROWING REQUIREMENTS : PER CENT OF GDP	-.07	-.27	-.50
TOTAL HOLDINGS OF GOVT DEBT - 1979.80 $M	-103.42	-193.61	-1135.03
DOMESTIC HOLDINGS OF GOVT DEBT AS PERCENT G.D.P	.04	.14	.03

SUMMARY TABLE B6 INDUSTRY OUTPUT 1966.67 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

DECREASE IN IMPORTS - ABSOLUTE CHANGE

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	2	8
	AGRICULTURE	- 1966.67 $M	1.32	[illegible]	[illegible]
	MINING	- 1966.67 $M	8.78	10.15	14.70
	MANUFACTURING	- 1966.67 $M	186.46	[illegible].35	281.51
	UTILITIES/CONSTRUCTION		35.29	[illegible].97	63.76
	DISTRIBUTION		153.75	[illegible]	351.18
	SERVICES		43.18	47.56	104.81
	OWNERSHIP OF DWELLINGS	- 1966.67 $M	-.03	.32	3.55
	TOTAL INDUSTRY PRODUCT		428.77	445.85	821.93

SUMMARY TABLE B7 LABOUR MARKET

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

DECREASE IN IMPORTS - ABSOLUTE CHANGE

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	2	8
	TOTAL LABOUR FORCE	- HUNDREDS	0.00	110.89	[illegible]
	TOTAL EMPLOYMENT	- HUNDREDS	210.31	157.72	348.87
	UNEMPLOYMENT (ACTUAL)	- HUNDREDS	-210.31	-46.83	-191.40
	UNEMPLOYMENT RATE (ACTUAL)	- PERCENTAGE POINT	-.31	-.08	-.28
	UNEMPLOYMENT (POTENTIAL)	- HUNDREDS	-210.31	-157.72	-348.87

SUMMARY TABLE B8 FOREIGN ACCOUNT - 1979.80 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	2	5
	BALANCE OF TRADE	- $M	452.73	[illegible]	428.77
	NET OFFICIAL MONETARY MOVEMENT	- $M	0.00	0.00	0.00
	BALANCE OF CURRENT ACCOUNT	- $M	383.87	293.02	378.01
	PROPERTY INCOME TO OVERSEAS	- $M	27.01	37.06	-68.00
	FOREIGN INVESTMENT : GOVERNMENT SECTOR	- $M	-514.26	-210.20	-561.61
	NET PRIVATE INVESTMENT	- $M	83.96	-17.10	83.53
	NET APPARENT CAPITAL INFLOW : PERCENT OF GDP		-.36	-.28	-.36
	TOTAL OVERSEAS BORROWINGS.	-$M	0.00	0.00	0.00
	TOTAL OVERSEAS BORROWING AS A PERCENT OF GDP		-.01	-.01	-.02

SUMMARY TABLE B9 EMPLOYMENT BY INDUSTRY GROUP HUNDREDS

DECREASE IN IMPORTS - ABSOLUTE CHANGE

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	2	5
	PRIMARY	HUNDREDS	.10	.19	.98
	MINING	HUNDREDS	3.80	4.38	7.80
	MANUFACTURING	HUNDREDS	176.84	79.92	106.64
	UTILITIES/CONSTRUCTION	HUNDREDS	39.44	14.22	73.09
	DISTRIBUTION		34.35	13.36	65.43
	SERVICES		-43.74	45.09	94.49

SUMMARY TABLE 8(D)? OCCUPATIONAL DEMAND FOR LABOUR — ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE		YEAR 1	2	3
	PROFESSIONAL AND TECHNICAL	- HUNDREDS	[illegible]	[illegible]	[illegible]
	ADMIN.MANAGERIAL.CLERICAL	- HUNDREDS	17.03	31.78	54.32
	FARMER.FISHERY.FORESTRY	- HUNDREDS	.96	.83	3.23
	MINERS	- HUNDREDS	1.73	1.86	3.80
	TRANSPORT AND COMMUNICATION WORKERS	- HUNDREDS	10.07	8.46	16.71
	TRADES AND PRODUCTION WORKERS	- HUNDREDS	141.26	65.73	148.25
	SERVICES.SPORTS AND RECREATION	- HUNDREDS	2.15	8.87	24.43
	UNALLOCATED	- HUNDREDS	28.33	15.14	23.86

SUMMARY TABLE [illegible] FINANCIAL AGGREGATES - 1979.80 $M — ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

DECREASE IN IMPORTS - ABSOLUTE CHANGE

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	2	3
SHORT TERM (2 YEAR) BOND RATE - PERCENTAGE POINT	[illegible]	[illegible]	[illegible]
LONG TERM (10 YEAR) BOND RATE - PERCENTAGE POINT	.00	-.00	-.00
REAL LONG TERM INTEREST RATE (POST-TAX)	-.06	.13	.19
DEMAND FOR MONEY (M2) $M	286.42	292.14	469.88
NON CENTRAL BANK HOLDING OF GOVT SECURITIES $M	253.72	163.97	435.75
CENTRAL BANK HOLDING OF GOVT SECURITIES $M	163.46	442.64	558.05
SRD RATIO	.82	1.31	.88

SUMMARY TABLE B12 COMMODITY ACTIVITY

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	5	9
CRUDE OIL IMPORTS 1000" KILOLITRES	[illegible]	[illegible]	32.85
BLACK COAL EXPORTS 1000" TONNES	0.00	0.00	-38.53
ALUMINA PRODUCTION 1000" TONNES	0.00	0.00	[illegible]
ALUMINIUM PRODUCTION 1000" TONNES	0.00	0.00	-3.17
IRON ORE PRODUCTION 1000" TONNES	0.00	.02	.15
URANIUM EXPORTS 1000" TONNES	0.00	0.00	[illegible]
CONCENTRATE MINING EXPORTS 1974.75 $M	-.33	.06	.12
PROCESSED MINING EXPORTS 1974.75 $M	-2.12	-1.58	-7.11
LNG EXPORTS - MILLION THERMS	0.00	0.00	0.00

SUMMARY TABLE B13 PRIVATE INVESTMENT BY INDUSTRY

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	5	9
AGRICULTURE - 1979.80 $M	[illegible]	[illegible]	[illegible]
MINING - 1979.80 $M	1.53	15.53	77.25
MANUFACTURING - 1979.80 $M	200.24	-90.53	412.13
TERTIARY SECTOR - 1979.80 $M	16.14	55.00	94.50
TOTAL PRIVATE INVESTMENT - 1979.80 $M	210.46	-6.76	615.03

SUMMARY TABLE B14 INDUSTRY OUTPUT - (GROSS OUTPUT) - 1966.67 $M

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

DECREASE IN IMPORTS - ABSOLUTE CHANGE

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	3
251	MEAT PRODUCTS	[illegible]	[illegible]	[illegible]
252	MILK PRODUCTS	0.00	0.00	0.00
253	FRUIT AND VEGETABLES	0.00	.38	2.37
254	MARGARINE	.56	.83	1.09
255	FLOUR MILL	.89	.66	1.06
256	BREAD,CAKES	.83	1.36	1.83
257	BEVERAGES	2.46	3.89	7.84
258	TOBACCO	.20	.48	1.29
259	PREPARED FIBRES	0.00	[illegible]	.00
260	MAN-MADE YARNS AND FIBRES	3.98	5.36	8.41
261	TEXTILE FINISHING	.48	.44	.97
262	TEXTILE FLOOR COVERING	1.91	2.54	4.02
263	KNITTING MILLS	1.25	1.65	2.09
264	CLOTHING	2.86	3.65	4.77
265	FOOTWEAR	1.76	1.82	2.46
266	SAWMILL PRODUCTS	4.12	3.76	8.18
267	JOINERY AND WOOD PRODUCTS	2.79	2.19	5.69
268	FURNITURE	2.37	2.67	3.67
269	PULP,PAPER AND PAPERBOARD	7.69	8.40	11.19
270	PRINTED MATTER	10.95	11.74	24.46
271	INDUSTRIAL CHEMICALS	14.71	13.17	22.82
272	PAINTS	2.75	2.67	4.38
273	SOAP	.77	.99	2.10
274	OTHER CHEMICALS	4.20	4.21	10.50

275	PETROLEUM AND COAL PRODUCTS	-2.26	.79	.90
276	GLASS AND GLASS PRODUCTS	2.67	1.79	3.14
277	CLAY PRODUCTS	1.97	1.67	4.45
278	CEMENT AND CONCRETE PRODUCTS	7.44	4.08	15.93
279	OTHER N.M. MINERAL PRODUCTS	1.17	.66	2.21
280	BASIC IRON AND STEEL	57.73	58.29	89.26
281	NON-FERROUS METAL PRODUCTS	49.44	52.95	74.68
282	FABRICATED STRUCTURAL METAL PRODUCTS	7.01	4.84	16.50
283	METAL CONTAINERS ,SHEET METAL PRODUCTS	4.98	4.21	8.22
284	CUTLERY AND HAND TOOLS	14.37	11.20	24.79
285	MOTOR VEHICLES AND PARTS	14.54	[illegible]	47.83
286	OTHER TRANSPORT EQUIPMENT	3.72	[illegible]	7.16
287	APPLIANCES AND ELECTRONIC EQUIPMENT	105.64	134.41	138.04
288	ELECTRICAL MACHINERY AND EQUIPMENT	63.64	51.24	67.95
289	AGRICULTURAL MACHINERY AND EQUIPMENT	16.40	18.08	21.88
290	OTHER INDUSTRIAL MACHINERY	100.56	81.19	126.75
291	LEATHER PRODUCTS	.52	.61	.66
292	RUBBER PRODUCTS	3.73	5.22	9.81
293	PLASTIC AND RELATED PRODUCTS	10.54	11.66	14.43
294	OTHER MANUFACTURING	1.16	1.61	5.51
295	TOTAL MANUFACTURING	532.13	544.95	805.16

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

TABLE C1 EMPLOYMENT BY AGE GROUP

Absolute Difference between Control and Disturbed Solution

	0-19	20-24	25-29	30-34	35-39	40-44	45-49
1	1952.9	2551.7	2229.1	2253.3	1907.8	1693.7	1465.9
2	1677.9	2601.5	2349.7	2288.6	1906.2	1635.1	1378.9
3	2268.9	3530.2	3229.5	3156.9	2658.2	2292.9	1930.1
4	3005.4	4668.3	4255.3	4155.6	3498.7	3026.3	2562.5
5	3563.6	5519.5	5004.7	4886.6	4111.5	3552.2	2996.5
6	3246.4	5141.2	4654.0	4529.9	3805.5	3263.0	2741.2
7	3757.9	5805.0	5233.4	5117.6	4314.6	3720.2	3135.4

	50-54	55-59	60-64	65 +
1	1407.1	1160.3	537.1	142.7
2	1323.1	1065.6	486.8	157.9
3	1821.9	1449.4	662.6	232.1
4	2405.2	1916.8	877.8	306.1
5	2830.0	2256.2	1035.2	364.4
6	2596.6	2058.9	944.9	351.1
7	2966.2	2356.9	1084.8	396.9

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

TABLE C2 EMPLOYMENT BY SEX

Absolute Difference between Control and Disturbed Solution

	MALES	FEMALES
1	15008.9	2300.3
2	12435.0	4443.8
3	16310.3	6932.3
4	21629.4	9051.8
5	25300.5	10835.6
6	22217.7	11129.7
7	25750.6	12154.9

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

TABLE C3 EMPLOYMENT BY QUALIFICATION

Absolute Difference between Control and Disturbed Solution

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFIC-ATE	OTHER CERTIFIC-ATE	NOT CLASSIFIED BY LEVEL	INADEQUATE DESCRIP-TION	NO QUALIFIC-ATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE
1981	35.3	27.7	230.8	220.4	5332.8	936.8	25.3	.1	9411.2	70.4	1011.5
1982	122.3	169.5	695.6	733.0	3769.0	1491.0	40.0	.1	8923.5	61.0	867.3
1983	195.0	315.8	1061.3	1243.9	4746.5	2193.6	53.3	.1	12132.1	112.6	1179.0
1984	250.6	406.2	1385.9	1595.6	6398.5	2899.9	69.1	.1	15951.7	142.3	1568.7
1985	287.7	455.3	1635.0	1810.8	7448.7	3478.2	83.6	.1	18910.1	168.3	1843.5
1986	283.5	437.1	1658.2	1755.6	6131.2	3470.3	86.5	.1	17695.2	162.4	1654.0
1987	299.3	467.0	1764.0	1871.0	7356.5	3828.4	92.8	.2	20107.1	190.8	1913.5

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

TABLE C4 EMPLOYMENT BY INDUSTRY

	PRIMARY	MINING	MEAT	MILK	FRUIT	MARGARINE, OILS	FLOUR	BREAD, SUGAR CAKES	BEVERAGES	TOBACCO PRODUCTS
1	.1	3.8	-43.3	15.5	-.6	-1.5	2.0	4.6	22.9	12.0
2	.2	4.4	145.0	-2.2	-2.4	4.0	-7.4	-34.6	72.5	-16.7
3	.4	6.1	169.7	-44.5	19.4	3.7	5.3	-20.2	127.1	-42.6
4	.7	7.0	-51.7	-109.1	50.3	-4.2	26.7	59.9	199.6	-61.8
5	1.0	7.8	-416.4	-180.5	80.4	-18.3	43.2	168.6	265.5	-70.6
6	1.3	7.7	-725.0	-244.1	102.5	-33.1	49.6	245.1	275.5	-60.4
7	1.7	7.7	-519.6	-240.1	76.6	-33.3	61.7	272.2	291.3	-30.0

	PREPARED FIBRES	YARNS	TEXTILE FINISHING	FLOOR COVERINGS	KNITTING MILLS	CLOTHING	FOOTWEAR	SAWMILLS	WOOD, JOINERY	FURNITURE
1	0.0	11.0	25.4	32.7	63.9	14.0	63.4	335.1	38.2	110.6
2	.0	71.8	17.1	41.3	35.6	-152.0	76.0	51.7	-50.1	-47.6
3	.0	89.9	4.1	37.2	-15.0	-159.3	73.7	-84.1	-68.5	-192.0
4	.0	105.5	7.2	54.5	-37.0	16.5	100.0	-42.4	-98.3	-226.7
5	.0	136.1	.7	73.0	-55.4	202.6	111.3	14.4	-130.6	-241.4
6	.0	158.4	-12.9	67.8	-74.8	339.9	92.4	81.4	-134.6	-242.2
7	-.0	148.1	.5	76.7	-39.2	378.7	114.2	201.4	-52.7	-136.4

	PAPER	PRINTING	INDUSTRIAL CHEMICALS	PAINTS	SOAP	OTHER CHEMICALS	PETROLEUM	GLASS + PRODUCTS	CLAY PRODUCTS	CEMENT
1	197.3	423.5	79.1	47.2	10.8	104.9	-9.9	139.0	85.8	44.3
2	37.0	238.9	8.0	8.3	-5.8	34.1	2.6	119.3	10.8	95.7
3	-29.9	247.6	33.5	-17.4	-3.1	26.3	2.9	164.7	18.9	158.4
4	49.6	362.1	88.7	-25.3	14.8	81.3	5.1	201.0	78.6	211.7
5	164.8	416.7	124.4	-45.6	38.6	133.2	9.1	196.9	158.2	281.3
6	228.5	303.9	101.7	-74.8	58.2	148.8	13.8	162.6	276.1	273.7
7	302.0	477.1	141.3	-65.6	70.3	197.5	11.1	197.8	-120.3	236.5

	OTHER NON-METALLIC MIN. PRODS.	IRON AND STEEL	NON-FERROUS METAL PRODUCTS	FABRICATED STRUCTURAL METAL PRODS.	SHEET METAL PRODUCTS	OTHER STEEL PRODUCTS	MOTOR VEHICLES	OTHER TRANSPORT EQUIPMENT	APPLIANCES	ELECTRICAL MACHINERY
1	8.2	929.8	425.3	284.1	114.8	666.9	664.3	268.4	4578.3	1603.3
2	-16.6	1780.4	369.8	-150.5	184.7	201.1	513.4	165.1	3812.7	2747.4
3	-13.9	1929.0	232.8	-126.7	222.6	232.6	1082.8	184.2	895.9	2563.8
4	-16.6	2195.2	350.2	24.7	308.3	290.7	1702.0	218.6	-7.9	2714.7
5	-16.1	2449.6	547.5	88.3	325.5	237.3	1932.1	110.4	471.6	2990.7
6	-.3	2307.3	416.6	96.9	203.1	23.3	1634.3	-80.6	318.1	2960.2
7	28.2	2220.8	481.0	195.8	140.7	183.3	1840.6	156.5	809.8	3034.1

TABLE C4 (cont) EMPLOYMENT BY INDUSTRY

Absolute Difference between Control and Disturbed Solution

	AGRICULTURAL MACHINERY	OTHER INDUSTRIAL MACHINERY	LEATHER+ LEATHER GOODS	RUBBER GOODS	PLASTIC+ PLASTIC GOODS	OTHER MANUFACTUR-ING	ELECTRICITY GAS + WATER	CONSTRUCT-ION	WHOLESALE + RETAIL TRADE	TRANSPORT + STORAGE
1	-75.7	2415.9	17.5	-53.8	396.2	34.0	.2	38.7	18.3	13.3
2	-508.5	284.6	-12.8	-118.9	255.2	80.0	.5	16.2	1.6	10.8
3	-385.2	612.1	-32.0	-119.2	109.7	114.5	.9	45.0	31.0	11.5
4	50.3	1519.1	-.6	-74.8	86.0	160.2	1.2	67.1	36.4	12.2
5	444.6	2289.8	13.2	-10.1	43.5	204.7	1.4	60.6	40.2	12.2
6	499.4	2283.2	24.1	87.9	-117.6	219.1	1.5	40.7	34.5	10.1
7	555.0	2893.4	23.8	164.1	-4.8	225.8	1.5	58.6	47.8	9.8

	COMMUNIC-ATION	FINANCE+ PROPERTY+ BUSINESS	PUBLIC ADMINISTR-ATION	DEFENCE	COMMUNITY SERVICES	ENTERTAIN-MENT RECREATION
1	2.0	-45.4	0.0	0.0	10.7	1.1
2	4.1	-2.0	0.0	0.0	30.4	-.9
3	6.4	-14.8	0.0	0.0	65.4	.6
4	8.7	-19.4	0.0	0.0	87.1	.1
5	11.0	-16.2	0.0	0.0	98.6	.2
6	12.1	8.7	0.0	0.0	93.6	.9
7	13.0	-7.5	0.0	0.0	102.7	2.0

TABLE C5 - EMPLOYMENT BY OCCUPATION

Absolute Difference between Control and Disturbed Solution

	ARCHITECTS ENGINEERS SURVEYORS	CHEMISTS PHYSICISTS GEOLOGISTS	BIOLOGISTS VETS AGRONOMISTS	MEDICAL PRACS. DENTISTS	NURSES	PROF. MEDICAL WORKERS NEC	TEACHERS	CLERGY RELIGIOUS ORDERS	LAW PROFESSION-ALS	ARTISTS ENTERTAINER WRITERS
1	186.7	27.4	1.3	-.8	7.0	18.4	7.4	1.2	-123.4	16.2
2	252.6	47.9	30.2	129.5	551.9	71.7	685.2	37.9	-2.6	47.4
3	229.2	65.9	63.8	270.7	1152.2	165.7	1449.1	88.3	-36.7	59.2
4	293.9	85.9	86.9	369.2	1571.2	220.8	1817.8	121.9	-47.9	80.0
5	372.8	100.9	100.6	436.6	1855.7	258.7	1932.1	135.4	-38.4	106.2
6	388.7	96.7	97.1	443.7	1877.6	256.5	1745.0	111.5	-29.8	130.3
7	396.1	104.6	108.1	491.4	2082.5	290.9	1841.0	125.9	-14.2	141.8

	DRAFTSMEN TECHNICIANS+ OTHER PROF-ESSIONAL + TECHNICAL	GOVT. ADMINIST-RATORS + EXECUTIVES	NON-GOVT. ADMINIST-RATORS + EXECUTIVES	BOOK-KEEPERS, CASHIERS, BANKTELLERS SHOPKEEPERS	STENO-GRAPHERS + TYPISTS	OTHER CLERICAL WORKERS	INSURANCE-REAL ESTATE SALESMEN-AUCTIONEERS, VALUERS	COMMERCIAL TRAVELLERS, MANUFACT-URING AGENTS	SHOP ASSISTANTS, RETAIL+ WHOLESALE SALESMEN	FARMERS + FARM MANAGERS
1	345.6	-60.9	3.8	820.8	70.8	-14.3	346.9	-290.2	155.7	922.7
2	474.0	259.6	10.5	684.8	161.6	196.7	1698.7	-9.9	86.8	283.8
3	528.2	283.0	19.3	905.7	200.4	224.3	1969.3	-81.7	139.4	1270.4
4	690.0	366.4	25.5	1165.4	250.6	292.1	2543.3	-107.8	176.5	1511.7
5	845.3	470.7	28.3	1422.1	323.6	373.3	3227.1	-85.0	212.3	1711.0
6	842.0	581.9	25.6	1390.5	386.5	451.2	3796.4	76.0	194.4	1496.9
7	902.2	547.1	27.8	1598.2	398.8	438.1	3767.0	-25.1	247.4	2061.1

	FARM WORKERS INCLUDING FOREMEN	WOOL CLASSERS	HUNTERS + TRAPPERS	FISHERMEN + FISHING WORKERS	TIMBER + FORESTRY WORKERS	MINERS, QUARRYMEN, MINERAL PROSPECTORS	OIL + WATER WELL DRILLERS	ORE+MINERAL TREATMENT OPERATORS	CIVILIAN DECK+ENGIN-EER SHIP OFFICERS	CIVILIAN DECK + ENGINEROOM HANDS
1	25.0	43.6	.7	-.0	.9	9.1	133.7	6.2	19.3	11.0
2	21.5	46.7	.4	.0	.8	2.2	158.6	6.4	26.1	9.6
3	52.7	109.1	1.5	.1	2.0	.4	215.9	9.8	30.4	11.1
4	80.5	143.9	1.9	.1	2.8	1.6	248.2	12.3	35.5	12.7
5	104.2	162.4	2.2	.1	3.4	2.6	276.9	13.6	40.8	13.3
6	114.8	147.5	2.0	.1	3.7	3.1	271.2	12.2	38.7	11.3
7	147.1	178.6	2.5	.2	5.0	7.9	271.7	12.7	38.4	11.4

TABLE C9 (cont) EMPLOYMENT BY OCCUPATION

Absolute Difference between Control and Disturbed Solution

	CIVILIAN AIR-PILOTS, FLIGHT NAVIGATORS	RAILWAY DRIVERS + FIREMEN	ROAD TRANSPORT DRIVERS	RAILWAY GUARDS + CONDUCTORS	INSPECTORS SUPERVISORS DESPATCHES TRAFFIC CONTROLLERS	TELEPHONISTS TELEGRAPHISTS RADIO + TV STATION OPERATORS	POST-MASTERS, POSTMEN, MESSENGERS	OTHER TRANSPORT WORKERS	SPINNERS, WEAVERS, KNITTERS, DYERS	TAILORS, CUTTERS, FURRIERS
1	19.9	15.0	47.9	595.3	18.1	90.5	47.2	44.7	36.1	28.8
2	16.5	12.9	41.8	467.9	14.8	78.0	70.5	94.1	30.3	37.4
3	19.3	14.2	46.1	624.2	16.0	84.8	97.7	133.0	35.3	36.6
4	22.2	15.6	51.1	737.5	17.4	94.2	128.9	178.2	40.4	54.4
5	23.1	15.9	51.8	785.4	17.5	97.6	159.8	225.7	41.4	73.6
6	19.2	13.7	42.7	665.2	14.5	83.1	169.4	252.0	34.3	77.1
7	19.5	13.6	43.5	719.5	14.2	83.3	183.5	266.6	35.2	85.4

	BOOT+SHOE, LEATHER GDS, CUTTERS, LASTERS, SEWERS	METAL WORKERS (FURNACEMEN, ROLLERS, ETC.)	PRECISION INSTRUMENT MAKERS, JEWELLERS WATCHMAKERS	TOOLMAKERS, METAL MACHINISTS, MECHANICS, PLUMBERS	ELECTRICIAN ELECTRONICS WORKERS	METAL WORKERS, ELECT.PROD. PROCESS WORKERS	CARPENTERS, WOODWORK MACHINISTS + RELATED WORKERS	PAINTERS + DECORATORS	BRICKLAYERS PLASTERERS + CONSTRUCTION WORKERS NEC	COMPOSITORS PRINTING MACHINISTS, BOOKBINDERS ETC.
1	117.3	22.4	199.1	116.5	3750.3	956.4	1738.3	681.7	1323.9	696.9
2	22.9	-2.6	227.1	102.0	2672.6	781.1	1319.0	223.6	595.1	326.9
3	30.2	-8.0	217.3	116.9	2755.9	903.6	1019.4	346.9	1505.8	808.5
4	103.5	15.1	264.6	146.3	3589.7	1183.8	1286.3	563.9	2226.2	1192.2
5	163.3	34.3	317.3	182.6	4313.5	1424.8	1655.3	615.8	2330.3	1256.7
6	172.7	43.6	285.4	175.1	3672.3	1266.4	1496.7	387.1	1419.0	794.4
7	236.0	54.4	302.4	204.8	4410.7	1450.8	1779.9	658.0	1801.0	964.2

	CLAY + GLASS POTTERS, KILNSMEN	MILLERS, BAKERS, BUTCHERS, BREWERS + ETC.	CHEMICAL, SUGAR WORKERS - PAPER PRODUCTION	TOBACCO PREPARERS + PRODUCTION WORKERS	PAPER, RUBBER PLASTIC + PRODUCTION PROCESS WORKERS	PACKERS, WRAPPERS, LABELLERS	STATIONARY ENGINE, EXCAVATING, LIFTING EQUP OPERATORS	STOREMEN + FREIGHT HANDLERS	RAIL + TRAMWAY REPAIRMEN, LABOURERS NEC	APPRENTICES FOREMEN, MACHINISTS, FACTORY WORK-ERS NEC
1	232.8	45.7	55.8	77.6	.2	268.4	75.8	386.1	532.9	1161.9
2	121.8	33.5	61.0	34.9	1.6	158.9	48.4	315.4	361.7	898.5
3	96.7	49.4	158.6	35.2	2.2	109.7	63.5	424.1	447.4	1112.8
4	165.1	69.7	138.5	66.6	1.2	165.9	79.0	565.3	558.6	1498.6
5	228.1	89.9	68.1	91.4	-1.1	225.1	88.2	636.9	662.7	1744.7
6	211.0	98.7	-30.1	84.5	-3.6	201.3	69.3	513.4	586.6	1461.1
7	295.6	55.0	75.9	110.9	-1.4	284.3	100.8	571.7	719.6	1648.1

TABLE C8 (cont.) EMPLOYMENT BY OCCUPATION

	FIRE BRIGADES + POLICE	HOUSEKEEPERS COOKS, MAIDS	WAITERS, BARTENDERS	CARETAKERS, CLEANERS (BUILDINGS)	BARBERS, HAIRDRESSER BEAUTICIAN	LAUNDERERS, DRY CLEANERS, PRESSERS	ATHLETES, SPORTSMEN	PHOTOGRAPHER + CAMERA OPERATORS	UNDERTAKERS CREMATORIUM WORKERS	SERVICE, SPORT, RECREATION WORKERS NEC
1	1045.2	11.0	75.8	26.9	-110.5	12.9	6.4	2.7	20.3	.4
2	754.3	156.3	290.4	-8.1	177.5	-6.5	15.6	-.2	15.3	-.2
3	678.3	313.6	602.9	32.4	234.5	12.7	37.5	5.3	13.0	.5
4	940.3	429.0	791.4	27.9	301.4	9.6	53.8	5.3	16.0	.5
5	1202.8	482.2	922.4	33.7	374.5	12.1	67.2	6.2	21.9	.6
6	1102.0	415.1	920.3	44.0	472.6	17.6	71.3	7.2	22.9	.9
7	1325.8	455.2	1029.8	67.9	443.9	29.7	82.6	10.0	27.8	1.3

	MEMBERS OF ARMED SERVICES	INADEQUATELY DESCRIBED	HOUSEWIFE, PENSIONER, F.T.STUDENT UNEMPLOYED	TOTAL
1	3.9	0.0	140.3	17310.5
2	228.1	0.0	118.7	16880.3
3	472.1	0.0	150.0	23244.6
4	639.4	0.0	195.9	30683.7
5	754.9	0.0	232.2	36139.1
6	767.0	0.0	210.4	33350.2
7	847.9	0.0	244.4	37908.8

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

TABLE C.6A EMPLOYMENT BY OCCUPATION AND QUALIFICATION, MALES AND FEMALES 15-19 YEARS OLD 1985

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFICATE	OTHER CERTIFICATE	NOT CLASSIFIED BY LEVEL	INADEQUATELY DESCRIBED	NO QUALIFICATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE	TOTAL
PROFESSIONAL TECHNICAL + RELATED WORKERS	0.0	0.0	0.0	0.0	.2	2.2	0.0	0.0	33.8	.4	2.8	39.5
	0.0	0.0	0.0	.9	.9	23.4	0.0	0.0	152.8	1.3	11.8	191.1
ADMINISTRATIVE EXECUTIVE + MANAGERIAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	.1	2.8
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	0.0	0.0	.9
CLERICAL WORKERS	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	81.2	1.6	4.7	87.9
	0.0	0.0	0.0	2.7	.4	43.9	2.7	0.0	301.0	14.9	22.8	388.5
SALES WORKERS	0.0	0.0	0.0	0.0	.4	.4	0.0	0.0	73.9	24.1	6.4	105.1
	0.0	0.0	0.0	.2	.6	3.5	.2	0.0	179.8	41.4	14.9	240.4
FARMERS, FISHERMEN, ETC.	0.0	0.0	0.0	0.0	.2	.3	.0	0.0	15.0	.5	1.0	17.0
	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	2.1	.2	.1	2.5
MINERS, QUARRYMEN, ETC.	0.0	0.0	0.0	0.0	.4	.2	0.0	0.0	13.1	.1	.6	14.2
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	.3
TRANSPORT + COMMUNICATION WORKERS	0.0	0.0	0.0	.0	.3	.1	.1	0.0	31.9	1.9	2.0	36.3
	0.0	0.0	0.0	.0	0.0	.9	.1	0.0	13.1	.3	1.0	15.5
PRODUCTION PROCESS + LABOURERS NEC	0.0	0.0	0.0	0.0	179.9	7.0	0.0	0.0	1611.1	23.4	168.7	1990.1
	0.0	0.0	0.0	0.0	2.1	2.3	0.0	0.0	133.7	2.0	8.8	148.9
SERVICE, SPORT + RECREATION WORKERS	0.0	0.0	0.0	0.0	3.1	1.6	0.0	0.0	62.6	10.6	5.6	83.4
	0.0	0.0	0.0	.2	10.1	6.6	.4	0.0	111.3	11.2	10.0	149.8
ARMED SERVICES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INADEQUATELY DESCRIBED + OTHERS	0.0	0.0	0.0	0.0	.3	.0	0.0	0.0	7.3	4.7	4.1	16.5
	0.0	0.0	0.0	0.0	.0	.3	.0	0.0	6.3	4.6	3.4	14.7
TOTAL	0.0	0.0	0.0	.0	184.8	12.2	.1	0.0	1932.5	67.3	196.0	2392.9
	0.0	0.0	0.0	4.1	14.1	80.9	3.4	0.0	901.3	75.9	72.8	1152.5

ONCE OFF 5 PERCENTAGE POINT DECREASE IN IMPORT SHARE IN MACHINERY PRODUCING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

TABLE C66 EMPLOYMENT BY OCCUPATION AND QUALIFICATION, MALES AND FEMALES 20-24 YEARS OLD ~~1986~~

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFIC-ATE	OTHER CERTIFIC-ATE	NOT CLASSIFIED BY LEVEL	INADEQU-ATELY DESCRIBED	NO QUALIFIC-ATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE	TOTAL
PROFESSIONAL TECHNICAL + RELATED WORKERS	.9	12.9	99.6	48.7	8.9	43.3	.6	0.0	76.4	.4	6.0	297.8
	.6	30.2	92.1	164.5	4.0	298.6	1.1	0.0	156.7	.7	16.6	765.1
ADMINISTRAT-IVE EXECUTIVE + MANAGERIAL	0.0	0.0	1.6	.9	3.9	2.5	0.0	0.0	19.3	0.0	.9	29.0
	0.0	0.0	.4	.3	.3	1.0	0.0	0.0	5.5	0.0	.3	7.8
CLERICAL WORKERS	0.0	.4	13.3	2.0	3.1	5.9	0.0	0.0	177.0	.4	7.5	209.5
	0.0	1.2	14.1	12.6	2.4	78.5	4.7	0.0	452.8	.4	23.9	590.6
SALES WORKERS	0.0	0.0	3.1	1.3	7.5	4.4	0.0	0.0	87.7	.4	4.2	108.6
	0.0	.2	2.2	1.7	1.8	6.6	.2	0.0	110.7	.4	5.9	129.6
FARMERS, FISHERMEN, ETC.	0.0	.0	.3	.4	2.1	1.3	.0	0.0	17.0	.0	.9	22.0
	0.0	0.0	.1	.1	.1	.5	0.0	0.0	2.9	0.0	.1	3.8
MINERS, QUARRYMEN, ETC.	0.0	.0	.7	.3	7.3	1.1	.0	0.0	34.9	0.0	1.6	45.9
	0.0	0.0	.0	0.0	0.0	.1	0.0	0.0	1.0	0.0	.0	1.2
TRANSPORT + COMMUNIC-ATION WORKERS	0.0	0.0	.7	.3	14.5	2.1	.3	0.0	99.7	.0	5.2	122.8
	0.0	.0	.2	.3	.4	2.4	.1	0.0	30.2	0.0	1.4	35.1
PRODUCTION PROCESS + LABOURERS NEC	0.0	0.0	7.8	5.7	1189.0	88.4	.2	0.0	1134.7	2.8	106.4	2535.0
	0.0	0.0	.5	.8	6.8	8.0	.1	0.0	170.8	.2	8.8	196.0
SERVICE, SPORT + RECREATION WORKERS	0.0	.0	3.3	1.3	23.2	10.4	.7	0.0	103.8	.7	6.7	150.0
	0.0	.2	4.2	4.8	27.8	32.1	1.0	0.0	136.2	.5	8.9	215.7
ARMED SERVICES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INADEQUATELY DESCRIBED + OTHERS	0.0	0.0	.4	.1	1.6	.2	0.0	0.0	6.0	.1	5.2	13.7
	0.0	.0	.3	.3	.2	.9	.0	0.0	7.8	.1	3.8	13.4
TOTAL	.9	13.4	130.8	60.9	1261.2	159.5	1.8	0.0	1756.4	4.8	144.5	3534.3
	.6	31.9	114.1	185.4	43.8	428.6	7.2	0.0	1074.6	2.2	69.8	1958.2

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

TABLE C.6C EMPLOYMENT BY OCCUPATION AND QUALIFICATION, MALES AND FEMALES 25-44 YEARS OLD 1985

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFIC-ATE	OTHER CERTIFIC-ATE	NOT CLASSIFIED BY LEVEL	INADEQU-ATELY DESCRIBED	NO QUALIFIC-ATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE	TOTAL
PROFESSIONAL TECHNICAL + RELATED WORKERS	134.5	154.0	619.0	385.6	73.9	284.2	4.0	0.0	197.7	0.0	19.3	1872.2
	33.0	130.1	257.9	500.9	6.9	741.2	2.4	0.0	230.6	0.0	36.0	1939.0
ADMINISTRAT-IVE EXECUTIVE + MANAGERIAL	13.1	5.7	59.0	43.8	124.0	84.8	2.3	0.0	352.4	0.0	19.3	704.4
	.7	1.3	5.9	6.5	2.9	12.6	.6	0.0	71.8	0.0	4.2	106.3
CLERICAL WORKERS	3.1	2.4	35.7	17.3	27.1	46.3	1.2	0.0	444.6	0.0	12.9	590.6
	2.0	6.3	29.8	41.2	13.3	156.2	9.8	0.0	928.8	0.0	52.2	1239.6
SALES WORKERS	.4	.7	9.2	11.9	64.7	43.4	.9	0.0	295.6	0.0	14.2	441.0
	0.0	.9	3.1	8.8	8.5	24.3	.9	0.0	285.1	0.0	17.6	349.3
FARMERS, FISHERMEN, ETC.	.1	.1	1.1	1.8	6.6	5.1	.2	0.0	63.9	.0	3.4	82.2
	0.0	.2	.4	2.2	.5	3.7	.1	0.0	25.4	0.0	1.3	33.6
MINERS, QUARRYMEN, ETC.	0.0	.1	1.4	1.1	31.6	8.1	.2	0.0	130.2	0.0	9.2	181.8
	0.0	0.0	0.0	.0	.0	.1	0.0	0.0	2.1	0.0	0.0	2.3
TRANSPORT + COMMUNIC-ATION WORKERS	.1	.2	3.3	3.5	87.1	16.7	2.0	0.0	479.9	.0	28.3	621.2
	0.0	.0	.7	1.3	1.4	6.5	.3	0.0	108.5	0.0	6.1	124.8
PRODUCTION PROCESS + LABOURERS NEC	1.0	.4	31.0	38.3	3331.6	440.4	4.0	0.0	2951.2	1.9	343.6	7143.3
	0.0	0.0	1.0	3.7	19.4	17.9	.1	0.0	611.4	.6	45.1	699.2
SERVICE, SPORT + RECREATION WORKERS	0.0	1.1	5.7	5.2	107.2	38.5	2.8	0.0	338.8	.1	21.1	520.6
	0.0	1.0	4.2	11.6	41.0	59.7	2.2	0.0	532.2	.3	40.7	692.9
ARMED SERVICES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INADEQUATELY DESCRIBED + OTHERS	.2	.0	.8	.4	4.1	.9	0.0	0.0	13.7	0.0	23.7	43.8
	.1	.2	.6	1.6	1.0	3.7	.2	0.0	32.8	.1	15.5	55.8
TOTAL	152.4	164.5	766.3	508.9	3857.9	968.5	17.7	0.0	5268.0	2.0	495.0	12201.1
	35.8	140.1	303.7	577.9	95.0	1025.8	16.6	0.0	2828.4	1.0	218.7	5242.9

ONCE OFF INCREASE IN DOMESTIC OUTPUT FOR FOUR HEAVY ENGINEERING INDUSTRIES

Absolute Difference between Control and Disturbed Solution

TABLE C6D EMPLOYMENT BY OCCUPATION AND QUALIFICATION, MALES AND FEMALES 45 + YEARS OLD 1985

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFIC-ATE	OTHER CERTIFIC-ATE	NOT CLASSIFIED BY LEVEL	INADEQU-ATELY DESCRIBED	NO QUALIFIC-ATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE	TOTAL
PROFESSIONAL	63.7	56.6	196.0	193.1	49.3	110.7	2.1	0.0	95.5	0.0	13.6	780.5
TECHNICAL +	12.0	22.8	52.2	149.8	2.1	261.2	.8	0.0	107.6	0.0	24.6	633.2
RELATED WORKERS												
ADMINISTRAT-	5.8	3.8	25.4	39.3	87.6	53.8	1.9	0.0	276.4	0.0	20.7	514.7
IVE	.1	.1	1.6	2.6	1.5	7.3	0.0	0.0	54.0	0.0	4.8	71.9
EXECUTIVE + MANAGERIAL												
CLERICAL	.4	0.0	6.3	11.4	24.3	20.0	0.0	0.0	218.2	0.0	10.6	291.2
WORKERS	0.0	.4	4.3	11.0	5.1	57.3	4.7	0.0	377.1	0.0	31.0	490.9
SALES	0.0	0.0	1.8	6.4	34.2	20.4	.4	0.0	177.8	0.0	13.2	254.2
WORKERS	0.0	0.0	.4	2.4	4.0	9.6	.4	0.0	163.1	0.0	14.5	194.3
FARMERS,	.1	.0	.5	1.0	4.1	2.2	.0	0.0	68.0	.0	5.0	80.9
FISHERMEN,	0.0	0.0	.2	1.0	.2	1.9	0.0	0.0	25.4	0.0	1.6	30.3
ETC.												
MINERS,	0.0	0.0	0.0	.2	7.0	3.3	.1	0.0	[illegible]	0.0	6.4	83.1
QUARRYMEN,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	0.0	0.0	.6
ETC.												
TRANSPORT +	.0	0.0	.6	1.8	39.6	7.6	.4	0.0	322.8	0.0	27.3	400.2
COMMUNIC-	0.0	0.0	.0	.5	.6	2.4	.0	0.0	56.0	0.0	5.3	64.9
ATION WORKERS												
PRODUCTION	0.0	0.0	2.3	14.7	1615.4	171.8	.7	0.0	2085.0	0.0	321.9	4212.0
PROCESS +	0.0	0.0	.0	.6	11.2	4.6	.0	0.0	312.4	0.0	26.2	355.1
LABOURERS NEC												
SERVICE,	0.0	.2	.4	2.1	57.4	13.9	.8	0.0	265.3	0.0	25.7	365.8
SPORT +	0.0	0.0	.4	3.2	12.6	19.4	.6	0.0	399.1	0.0	39.7	475.2
RECREATION WORKERS												
ARMED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SERVICES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INADEQUATELY	0.0	0.0	.2	.3	3.2	.7	0.0	0.0	16.1	0.0	12.5	33.1
DESCRIBED	0.0	0.0	.1	.5	.5	1.6	.1	0.0	27.8	0.0	8.2	38.8
+ OTHERS												
TOTAL	69.9	60.6	233.4	270.4	1922.2	404.5	6.4	0.0	3591.2	.0	457.1	7015.8
	12.1	23.4	59.2	171.5	37.8	365.3	6.7	0.0	1523.0	0.0	156.1	2355.1

SUMMARY TABLE D1 INTERNATIONAL AGGREGATES

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	[illegible]	[illegible]
	TOTAL WORLD GDP 1970 $ BILLION	.00	[illegible]	.00
	WORLD MANUFACTURING TRADE PRICE INDEX (YEAR 0 EQUALS 100.0)	0.00	.00	.00
	WEIGHTED AVERAGE EXCHANGE RATE	0.00	0.00	0.00
	WEIGHTED AVERAGE TARIFF RATE - PERCENTAGE POINT	.00	-.00	.00
	INDEX OF COMPETITIVENESS (YEAR 0 EQUALS 100.0)	.01	.05	.13
	TERMS OF TRADE	.00	.00	-.00

SUMMARY TABLE D2 MACRO ECONOMIC AGGREGATES - 1966.67$M

$100 million increase in public authority investment expenditure (1979-80 prices)

PUBLIC AUTHORITY EXPENDITURE

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	2	5
TOTAL PRIVATE CONSUMPTION EXPENDITURE	12.07	[illegible]	31.25
TOTAL GOVERNMENT CONSUMPTION EXPENDITURE	0.00	0.00	0.00
PRIVATE HOUSING EXPENDITURE	1.25	2.48	1.97
TOTAL PRIVATE INVESTMENT	9.77	2.68	19.97
TOTAL PUBLIC INVESTMENT	38.88	38.69	38.93
NON-FARM STOCKS	4.29	7.51	3.07
IMPORTS OF GOODS AND SERVICES	13.60	14.84	15.12
EXPORTS OF GOODS AND SERVICES	-.28	-.03	.77
GROSS DOMESTIC PRODUCT	52.22	55.94	79.60
FARM PRODUCT	-.00	.00	.42
GROSS NON-FARM PRODUCT	52.22	55.93	79.18
GROSS DOMESTIC PRODUCT - COMPOSITE	48.43	55.89	79.20

SUMMARY TABLE D3 INCOME FORMATION AND CAPITAL ACCOUNT

$100 million increase in public authority investment expenditure (1979-80 prices)

PUBLIC AUTHORITY EXPENDITURE

SERIES NO	TITLE		YEAR	1	2	3
				Absolute Difference between Control and Disturbed Solution		
	WAGES AND SALARIES	: SHARE IN GDP AT FACTOR COST	- (P.P.)	-.00	-.03	-.03
	COMPANY SURPLUS	: SHARE IN GDP AT FACTOR COST	- (P.P.)	.01	.01	.01
	UNINCORPORATED ENTERPRISE	: SHARE IN GDP AT FACTOR COST	- (P.P.)	-.00	.01	.01
	DWELLING SURPLUS	: SHARE IN GDP AT FACTOR COST	- (P.P.)	-.00	.00	.01
	PUBLIC UTILITIES	: SHARE IN GDP AT FACTOR COST	- (P.P.)	-.00	-.00	-.00
	PRIVATE SECTOR SAVING MINUS PRIVATE SECTOR INVESTMENT			54.02	25[illegible]	-12.70
	GOVT SAVING LESS INVESTMENT			-95.73	-79.70	-78.62
	FOREIGN SAVING			41.71	54.50	91.32
	PRIVATE SECTOR SAVING OUT OF INCOME			-.03	-.07	-.00
	CORPORATE SECTOR INTERNAL FUNDING RATIO		- (P.P.)	.04	.07	-.12
	REAL HOUSEHOLD RECEIPTS - 1979.80 $M			99.44	128.63	160.46
	HOUSEHOLD SAVING RATIO		- (P.P.)	.03	.04	.01
	REAL HOUSEHOLD DISPOSABLE INCOME - (1979.80 $M)			77.97	102.69	125.71
	HOUSEHOLD LIABILITY - CURRENT RATIO			-.00	-.00	-.00

SUMMARY TABLE D4 SELECTED INDICATORS

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	[illegible]	[illegible]
4546	IMPLICIT CONSUMPTION DEFLATOR (YEAR 0 EQUALS 100.0)	[illegible]	[illegible]	-.11
1559	NOMINAL WAGE RATE PER MALE UNIT PER WEEK - DOLLARS	.14	.04	-.23
3711	REAL WAGE RATE (YEAR 0 CONSTANT DOLLARS)	.18	[illegible]	.04
2054	AGGREGATE PRODUCTIVITY (EMPLOYMENT BASED) (YEAR 0 EQUALS 100.0)	.08	.08	.09

SUMMARY TABLE D5 GOVERNMENT SECTOR - 1979.80 $M

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

SERIES NO	TITLE	YEAR 1	2	3
	H"HOLD INCOME TAX RATE-PERCENT OF H"HOLD RECEIPTS LESS CASH BENEFITS	-.04	-.0[illegible]	-.11
	COMPANY TAX RATE - RATIO	0.00	0.00	0.00
	INDIRECT TAX RATE PERCENT OF GDP	-.01	-.01	-.00
	INDIRECT TAX REVENUE $M	5.97	5.99	6.63
	DIRECT TAX REVENUE	21.68	38.[illegible]	45.28
	COMPANY TAX AS PERCENT OF COMPANY G.O.S	.04	.09	.00
	NET INTEREST PAID $M	5.41	11.88	36.16
	TRANSFERS TO PERSONS	-10.07	-5.69	-9.04
	CURRENT GOVERNMENT EXPENDITURE	0.00	0.00	0.00
	TOTAL INVESTMENT OUTLAY $M	123.21	122.62	122.11
	PUBLIC SECTOR BORROWING REQUIREMENTS $M	96.20	82.38	83.44
	PUBLIC SECTOR BORROWING REQUIREMENTS : PER CENT OF GDP	.07	.06	.05
	TOTAL HOLDINGS OF GOVT DEBT - 1979.80 $M	99.10	189.26	427.22
	DOMESTIC HOLDINGS OF GOVT DEBT AS PERCENT G.D.P	.00	.02	.01

SUMMARY TABLE: 36 INDUSTRY OUTPUT 1966.67 $M

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

SERIES NO	TITLE		YEAR 1	[illegible]	9
			Absolute Difference between Control and Disturbed Solution		
	AGRICULTURE	- 1966.67 $M	.32	[illegible]	[illegible]
	MINING	- 1966.67 $M	1.44	1.90	2.18
	MANUFACTURING	- 1966.67 $M	19.49	21.71	28.22
	UTILITIES/CONSTRUCTION		19.89	18.35	22.88
	DISTRIBUTION		28.36	31.54	49.17
	SERVICES		6.66	[illegible]	14.44
	OWNERSHIP OF DWELLINGS	- 1966.67 $M	-.02	[illegible]	.04
	TOTAL INDUSTRY PRODUCT		76.57	81.81	117.07

SUMMARY TABLE D7 LABOUR MARKET

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

TITLE		YEAR	1	2	5
			Absolute Difference between Control and Disturbed Solution		
TOTAL LABOUR FORCE	- HUNDREDS		0.00	10.73	32.31
TOTAL EMPLOYMENT	- HUNDREDS		35.50	30.84	64.54
UNEMPLOYMENT (ACTUAL)	- HUNDREDS		-35.50	-20.31	-32.23
UNEMPLOYMENT RATE (ACTUAL)	- PERCENTAGE POINT		-.05	-.03	-.05
UNEMPLOYMENT (POTENTIAL)	- HUNDREDS		-35.50	-30.84	-64.54

SUMMARY TABLE D8 FOREIGN ACCOUNT - 1979.80 $M

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

TITLE		YEAR	1	2	5
			Absolute Difference between Control and Disturbed Solution		
BALANCE OF TRADE	- $M		-37.17	-41.87	-47.64
NET OFFICIAL MONETARY MOVEMENT	- $M		0.00	0.00	0.00
BALANCE OF CURRENT ACCOUNT	- $M		-40.39	-52.19	-69.03
PROPERTY INCOME TO OVERSEAS	- $M		6.87	17.22	40.48
FOREIGN INVESTMENT : GOVERNMENT SECTOR	- $M		38.39	59.96	82.22
NET PRIVATE INVESTMENT	- $M		6.56	.47	8.15
NET APPARENT CAPITAL INFLOW : PERCENT OF GDP			.03	.05	.07
TOTAL OVERSEAS BORROWINGS.	-$M		0.00	0.00	0.00
TOTAL OVERSEAS BORROWING AS A PERCENT OF GDP			.00	.00	.00

SUMMARY TABLE D9 EMPLOYMENT BY INDUSTRY GROUP HUNDREDS

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

TITLE		YEAR 1	2	5
		Absolute Difference between Control and Disturbed Solution		
PRIMARY	HUNDREDS	.08	[illegible]	.17
MINING	HUNDREDS	.50	.01	1.37
MANUFACTURING	HUNDREDS	11.60	9.63	14.05
UTILITIES/CONSTRUCTION	HUNDREDS	21.71	21.19	27.79
DISTRIBUTION		5.45	2.44	8.08
SERVICES		-3.78	4.91	13.03

SUMMARY TABLE D10 OCCUPATIONAL DEMAND FOR LABOUR

$100 million increase in public authority investment expenditure (1979-80 prices)

PUBLIC AUTHORITY EXPENDITURE

TITLE		YEAR 1	2	5
		Absolute Difference between Control and Disturbed Solution		
PROFESSIONAL AND TECHNICAL	- HUNDREDS	3.21	6.09	11.07
ADMIN.MANAGERIAL.CLERICAL	- HUNDREDS	1.63	3.19	8.83
FARMER.FISHERY.FORESTRY	- HUNDREDS	.33	.36	.67
MINERS	- HUNDREDS	.24	.37	.59
TRANSPORT AND COMMUNICATION WORKERS	- HUNDREDS	1.92	2.11	2.97
TRADES AND PRODUCTION WORKERS	- HUNDREDS	24.01	22.78	32.32
SERVICES.SPORTS AND RECREATION	- HUNDREDS	1.02	1.96	3.96
UNALLOCATED	- HUNDREDS	3.11	2.36	4.16

SUMMARY TABLE D11 FINANCIAL AGGREGATES - 1979.80 $M

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

SERIES NO	TITLE	YEAR 1	2	5
		Absolute Difference between Control and Disturbed Solution		
	SHORT TERM (2 YEAR) BOND RATE - PERCENTAGE POINT	0.00	0.00	0.00
	LONG TERM (10 YEAR) BOND RATE - PERCENTAGE POINT	-.00	-.00	-.00
	REAL LONG TERM INTEREST RATE (POST-TAX)	.01	.02	.02
	DEMAND FOR MONEY (M2) $M	44.18	46.28	60.82
	NON CENTRAL BANK HOLDING OF GOVT SECURITIES $M	39.29	35.97	58.31
	CENTRAL BANK HOLDING OF GOVT SECURITIES $M	21.15	54.93	72.97
	SRD RATIO	.06	.15	.11

SUMMARY TABLE D12 COMMODITY ACTIVITY

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

SERIES NO	TITLE	YEAR 1	2	5
		Absolute Difference between Control and Disturbed Solution		
	CRUDE OIL IMPORTS 1000" KILOLITRES	-5.09	12.62	19.67
	BLACK COAL EXPORTS 1000" TONNES	0.00	0.00	1.07
	ALUMINA PRODUCTION 1000" TONNES	0.00	0.00	.18
	ALUMINIUM PRODUCTION 1000" TONNES	0.00	0.00	.09
	IRON ORE PRODUCTION 1000" TONNES	0.00	.01	.01
	URANIUM EXPORTS 1000" TONNES	0.00	0.00	.00
	CONCENTRATE MINING EXPORTS 1974.75 $M	-.02	-.01	.01
	PROCESSED MINING EXPORTS 1974.75 $M	-.77	-.73	-.95
	LNG EXPORTS - MILLION THERMS	0.00	0.00	0.00

SUMMARY TABLE D13 PRIVATE INVESTMENT BY INDUSTRY

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

TITLE	YEAR 1	2	5
	Absolute Difference between Control and Disturbed Solution		
AGRICULTURE - 1979.80 $M	1.38	1.84	3.39
MINING - 1979.80 $M	.67	3.04	8.40
MANUFACTURING - 1979.80 $M	18.38	-8.57	34.50
TERTIARY SECTOR - 1979.80 $M	9.70	11.96	12.38
TOTAL PRIVATE INVESTMENT - 1979.80 $M	30.06	8.26	58.67

SUMMARY TABLE D14 INDUSTRY OUTPUT - (GROSS OUTPUT) - 1966.67 $M

PUBLIC AUTHORITY EXPENDITURE

$100 million increase in public authority investment expenditure (1979-80 prices)

SERIES NO	TITLE	YEAR 1	2	5
		Absolute Difference between Control and Disturbed Solution		
	MEAT PRODUCTS	-.08	-.11	-.27
	MILK PRODUCTS	0.00	0.00	0.00
	FRUIT AND VEGETABLES	0.00	.06	.36
	MARGARINE	.09	.11	.15
	FLOUR MILL	.16	.12	.13
	BREAD,CAKES	.15	.22	.25
	BEVERAGES	.43	.67	1.08
	TOBACCO	.06	[illegible]	.17
	PREPARED FIBRES	0.00	.06	.08
	MAN-MADE YARNS AND FIBRES	.62	.79	.96
	TEXTILE FINISHING	.09	.07	.07
	TEXTILE FLOOR COVERING	.32	.42	.48
	KNITTING MILLS	.23	.27	.26
	CLOTHING	.52	.58	.61
	FOOTWEAR	.22	.26	.32
	SAWMILL PRODUCTS	1.33	1.25	1.60
	JOINERY AND WOOD PRODUCTS	1.34	1.20	1.53
	FURNITURE	.37	.34	.32
	PULP,PAPER AND PAPERBOARD	1.10	1.16	1.35
	PRINTED MATTER	1.65	1.90	3.18
	INDUSTRIAL CHEMICALS	1.71	1.68	2.45

TABLE D.14 (cont.)

	PAINTS	.65	.65	.76
	SOAP	.13	.17	.29
	OTHER CHEMICALS	.86	1.00	1.72
	PETROLEUM AND COAL PRODUCTS	-.15	.37	.58
	GLASS AND GLASS PRODUCTS	.51	.35	.46
	CLAY PRODUCTS	.60	.59	1.03
	CEMENT AND CONCRETE PRODUCTS	5.11	4.96	5.81
	OTHER N.M. MINERAL PRODUCTS	.48	.38	.62
	BASIC IRON AND STEEL	6.36	7.10	9.05
	NON-FERROUS METAL PRODUCTS	6.22	8.36	8.54
	FABRICATED STRUCTURAL METAL PRODUCTS	3.07	3.03	3.80
	METAL CONTAINERS ,SHEET METAL PRODUCTS	1.22	.94	1.17
	CUTLERY AND HAND TOOLS	2.35	2.25	3.39
	MOTOR VEHICLES AND PARTS	2.82	3.13	5.41
	OTHER TRANSPORT EQUIPMENT	1.03	.92	1.12
	APPLIANCES AND ELECTRONIC EQUIPMENT	1.98	2.74	4.57
	ELECTRICAL MACHINERY AND EQUIPMENT	2.68	2.35	3.15
	AGRICULTURAL MACHINERY AND EQUIPMENT	.13	.17	.20
	OTHER INDUSTRIAL MACHINERY	2.68	2.99	5.61
	LEATHER PRODUCTS	.10	.15	.02
	RUBBER PRODUCTS	.41	.61	1.01
293	PLASTIC AND RELATED PRODUCTS	1.85	1.92	1.99
294	OTHER MANUFACTURING	.21	.30	.60
295	TOTAL MANUFACTURING	51.65	56.52	75.99

$100 million increase in public authority investment expenditure (1979-80 prices)

TABLE E1 EMPLOYMENT BY AGE GROUP

Absolute Difference between Control and Disturbed Solution

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 +
1	330.2	416.4	363.5	370.8	316.2	290.4	256.6	238.6	199.9	92.5	22.1
2	373.0	583.1	535.3	519.9	435.7	384.7	328.4	304.7	247.7	112.7	33.6
3	492.6	760.4	697.9	681.7	574.5	506.2	431.2	399.7	322.4	147.0	46.8
4	573.6	891.5	815.7	795.5	669.9	588.6	500.9	465.0	374.5	171.0	55.7
5	618.2	962.5	878.1	856.3	721.3	632.5	537.9	500.0	401.9	183.8	61.2
6	597.5	938.6	855.4	833.5	702.0	613.9	521.2	485.0	388.9	178.0	60.9
7	602.9	944.7	859.3	837.7	706.2	617.5	524.1	487.6	390.6	179.0	62.2

TABLE E2 EMPLOYMENT BY SEX

	MALES	FEMALES
1	2729.6	169.5
2	3051.3	809.2
3	3841.6	1201.0
4	4426.9	1477.3
5	4687.2	1669.2
6	4458.3	1719.1
7	4443.5	1770.7

TABLE E3 EMPLOYMENT BY QUALIFICATION

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFICATE	OTHER CERTIFICATE	NOT CLASSIFIED BY LEVEL	INADEQUATE DESCRIPTION	NO QUALIFICATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE
1	1.0	1.4	4.1	14.7	1059.6	97.3	2.3	.0	1517.9	9.1	185.3
2	23.4	43.1	104.3	105.5	1540.9	290.6	6.5	.0	1890.6	9.3	212.6
3	36.3	47.3	149.1	253.4	1273.1	407.7	9.0	.0	2520.7	17.6	274.6
4	45.3	78.3	240.5	297.3	1417.6	496.2	11.1	.0	2967.0	20.8	317.2
5	49.0	83.3	255.2	315.5	1496.6	551.7	12.6	.0	3213.0	23.4	339.1
6	48.8	82.9	270.5	315.0	1390.4	556.5	13.0	.0	3146.6	23.5	325.9
7	49.1	92.5	274.7	316.9	1343.0	572.5	13.2	.0	3167.4	24.6	327.0

$100 million increase in public authority investment expenditure (1979-80 prices)

TABLE E4 EMPLOYMENT BY INDUSTRY

Absolute Difference between Control and Disturbed Solution

	PRIMARY	MINING	MEAT	MILK	FRUIT	MARGARINE, OILS	FLOUR	BREAD, CAKES	BEVERAGES	TOBACCO PRODUCTS
1	.0	.5	15.1	-2.4	.1	.3	.9	2.3	10.5	-1.9
2	.0	.8	6.2	-6.0	3.7	-.6	.8	1.4	14.3	-3.7
3	.1	1.3	-10.8	-12.4	6.6	-1.3	2.2	4.0	20.0	-5.6
4	.1	1.3	-43.0	-20.2	8.4	-2.0	4.1	10.4	27.3	-6.0
5	.2	1.4	-62.6	-28.1	8.5	-2.1	4.9	16.8	34.7	-5.5
6	.2	1.3	-59.4	-33.4	6.9	-2.0	4.0	20.3	35.0	-2.9
7	.3	1.2	-35.1	-38.6	3.6	-1.1	3.9	23.5	35.8	-1.2

	PREPARED FIBRES	YARNS	TEXTILE FINISHING	FLOOR COVERINGS	KNITTING MILLS	CLOTHING	FOOTWEAR	SAWMILLS	WOOD, JOINERY	FURNITURE
1	0.0	1.6	3.5	5.6	5.8	-2.1	11.3	65.1	11.7	-1.3
2	.0	10.8	1.7	7.0	2.8	-13.3	11.3	15.9	-19.7	-18.6
3	.0	12.3	1.3	6.2	-1.2	-7.2	11.8	7.8	-23.8	-30.1
4	.0	14.4	1.3	7.9	-3.0	12.1	14.2	15.4	-20.2	-28.7
5	.0	17.2	.9	9.6	-3.9	27.8	14.9	21.0	-16.8	-26.7
6	-.0	18.4	-.2	9.2	-3.7	31.4	13.4	24.1	-15.6	-23.2
7	-.0	17.5	.7	9.5	-.9	35.0	14.2	28.6	-8.9	-14.0

	PAPER	PRINTING	INDUSTRIAL CHEMICALS	PAINTS	SOAP	OTHER CHEMICALS	PETROLEUM	GLASS, PRODUCTS	CLAY PRODUCTS	CEMENT
1	13.3	55.7	9.3	11.1	.0	14.3	-.5	24.4	21.0	30.6
2	5.2	35.7	1.5	1.9	-.3	11.4	1.3	18.7	5.9	75.7
3	6.5	39.6	4.0	-5.1	1.2	12.0	1.3	30.6	8.4	114.8
4	18.3	53.3	10.1	-7.9	4.2	19.6	1.7	39.1	23.4	118.5
5	27.1	59.9	14.2	-10.9	7.0	24.5	2.2	38.3	44.6	121.5
6	29.9	55.4	13.1	-13.3	4.4	25.7	2.5	32.2	73.1	117.8
7	33.9	64.5	15.4	-13.2	9.9	28.8	2.4	27.9	-20.8	111.1

	OTHER NON-METALLIC MIN. PRODS.	IRON AND STEEL	NON-FERROUS METAL PRODUCTS	FABRICATED STRUCTURAL METAL PRODS.	SHEET METAL PRODUCTS	OTHER STEEL PRODUCTS	MOTOR VEHICLES	OTHER TRANSPORT EQUIPMENT	APPLIANCES	ELECTRICAL MACHINERY
1	1.5	103.9	50.7	72.4	27.8	94.4	136.0	64.7	57.6	62.3
2	-4.2	207.0	48.5	2.4	44.1	45.3	119.4	35.4	39.7	111.1
3	-1.1	226.1	32.4	-20.3	45.2	38.4	147.8	42.3	-4.7	111.1
4	3.3	247.9	43.8	5.9	51.7	47.0	221.8	58.0	-13.7	123.8
5	7.8	260.5	63.7	21.5	47.3	39.7	217.0	63.4	-16.3	133.0
6	10.1	242.2	54.3	15.0	34.9	28.8	166.6	55.4	-17.3	122.8
7	13.3	216.5	53.4	12.3	27.9	27.3	146.1	70.7	1.2	115.7

$100 million increase in public authority investment expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

TABLE E4(cont) EMPLOYMENT BY INDUSTRY

	AGRICULTURAL MACHINERY	OTHER INDUSTRIAL MACHINERY	LEATHER, LEATHER GOODS	RUBBER GOODS	PLASTIC, PLASTIC GOODS	OTHER MANUFACTUR-ING	ELECTRICITY GAS + WATER	CONSTRUCT-ION	WHOLESALE + RETAIL TRADE	TRANSPORT + STORAGE
1981	-4.0	64.2	.2	-6.0	56.1	6.3	.0	21.7	3.2	1.9
2	-8.4	31.4	-.6	-13.5	36.0	14.6	.1	21.1	-.2	2.1
3	-7.5	36.5	-4.4	-14.1	23.7	20.0	.1	25.3	3.8	2.3
4	-1.5	85.8	2.9	-8.7	22.9	25.8	.2	27.3	3.9	2.2
5	3.6	78.0	3.7	1.3	18.0	30.3	.2	27.6	4.6	2.0
6	6.3	108.6	3.7	12.9	5.2	31.7	.2	25.0	4.1	1.7
7	8.6	110.9	2.3	22.3	13.5	31.7	.2	24.6	4.7	1.6

	COMMUNIC-ATION	FINANCE, PROPERTY, BUSINESS	PUBLIC ADMINISTR-ATION	DEFENCE	COMMUNITY SERVICES	ENTERTAIN-MENT RECREATION
1	.3	-9.7	0.0	0.0	5.8	.1
2	.7	-6.9	0.0	0.0	10.1	-.3
3	1.1	-6.8	0.0	0.0	14.4	-.0
4	1.5	-6.3	0.0	0.0	17.0	-.0
5	1.7	-5.2	0.0	0.0	18.2	.0
6	1.8	-3.2	0.0	0.0	17.9	.1
7	1.9	-3.0	0.0	0.0	18.3	.3

Absolute Difference between Control and Disturbed Solution

TABLE E5 - EMPLOYMENT BY OCCUPATION $100 million increase in public authority investment expenditure (1979-80 prices)

	ARCHITECTS ENGINEERS SURVEYORS	CHEMISTS PHYSICISTS GEOLOGISTS	BIOLOGISTS VETS AGRONOMISTS	MEDICAL PRACS. DENTISTS	NURSES	PROF. MEDICAL WORKERS NEC	TEACHERS	CLERGY RELIGIOUS ORDERS	LAW PROFESSION-ALS	ARTISTS ENTERTAINER WRITERS
1	14.7	2.7	.2	-.3	.1	2.5	1.0	.0	-26.7	-4.4
2	31.6	8.6	9.4	38.5	164.3	20.1	251.2	13.4	-13.0	3.4
3	35.3	11.4	13.6	57.3	244.0	32.7	336.2	19.3	-18.1	6.2
4	44.1	13.9	16.4	69.9	297.4	39.3	377.7	22.8	-16.6	10.2
5	50.0	15.2	17.9	77.8	330.3	43.6	388.1	23.9	-13.4	13.7
6	51.6	15.1	17.9	79.7	337.7	44.2	370.6	21.8	-9.0	16.1
7	50.5	15.0	18.4	82.9	351.1	46.2	347.4	21.7	-7.5	17.9

	DRAFTSMEN TECHNICIANS, OTHER PROF-ESSIONAL + TECHNICAL	GOVT. ADMINIST-RATORS + EXECUTIVES	NON-GOVT. ADMINIST-RATORS + EXECUTIVES	BOOK-KEEPERS, CASHIERS, BANKTELLERS SHOPKEEPERS	STENO-GRAPHERS + TYPISTS	OTHER CLERICAL WORKERS	INSURANCE, REAL ESTATE SALESMEN, AUCTIONEERS, VALUERS	COMMERCIAL TRAVELLERS, MANUFACT-URING AGENTS	SHOP ASSISTANTS, RETAIL+ WHOLESALE SALESMEN	FARMERS + FARM MANAGERS
1	27.0	-40.9	1.6	183.9	-5.1	-23.4	-67.9	-62.0	17.2	133.6
2	70.7	18.9	3.8	101.9	8.0	18.0	186.3	-31.2	7.8	16.0
3	87.4	24.7	4.9	152.8	17.6	24.3	251.9	-42.0	17.5	157.6
4	107.6	40.0	5.6	184.3	26.2	36.3	350.1	-38.5	21.2	169.2
5	119.5	52.8	5.9	207.5	35.1	46.0	431.6	-30.9	24.3	189.1
6	120.4	62.5	5.7	208.9	41.3	53.0	484.2	-17.9	24.1	179.4
7	120.1	63.7	5.8	213.9	43.8	56.6	496.0	-16.6	25.5	201.0

	FARM WORKERS INCLUDING FOREMEN	WOOL CLASSERS	HUNTERS + TRAPPERS	FISHERMEN + FISHING WORKERS	TIMBER + FORESTRY WORKERS	MINERS, QUARRYMEN, MINERAL PROSPECTORS	OIL + WATER WELL DRILLERS	ORE+MINERAL TREATMENT OPERATORS	CIVILIAN DECK+ENGIN-EER SHIP OFFICERS	CIVILIAN DECK + ENGINEROOM HANDS
1	9.3	14.0	.1	-.0	.2	1.6	18.6	1.8	2.5	1.8
2	10.0	19.5	.1	-.0	.2	.5	29.2	2.2	3.9	2.1
3	14.9	28.2	.2	-.0	.4	.5	44.3	2.9	5.1	2.3
4	18.6	32.8	.3	.0	.5	.8	47.3	3.2	5.6	2.4
5	22.2	34.5	.3	.0	.6	1.1	48.5	3.2	5.9	2.3
6	24.6	34.2	.3	.0	.7	1.2	47.8	3.1	5.7	2.1
7	26.1	36.0	.3	.0	.8	1.5	44.7	3.0	5.2	1.9

$100 million increase in public authority investment expenditure (1979-80 prices)

TABLE E5 EMPLOYMENT BY OCCUPATION

Absolute Difference between Control and Disturbed Solution

	CIVILIAN AIR-PILOTS, FLIGHT NAVIGATORS	RAILWAY DRIVERS + FIREMEN	ROAD TRANSPORT DRIVERS	RAILWAY GUARDS + CONDUCTORS	INSPECTORS SUPERVISORS DESPATCHES TRAFFIC CONTROLLERS	TELEPHONISTS TELEGRAPHSTS RADIO + TV STATION OPERATORS	POST-MASTERS, POSTMEN, MESSENGERS	OTHER TRANSPORT WORKERS	SPINNERS, WEAVERS, KNITTERS, DYERS	TAILORS, CUTTERS, FURRIERS
1	3.4	2.1	7.3	105.0	2.7	13.1	5.1	5.4	5.6	4.2
2	3.8	2.5	8.1	109.1	3.0	14.7	11.3	15.0	6.4	6.0
3	4.3	2.4	8.9	136.8	3.2	16.2	16.4	22.2	7.2	6.4
4	4.4	2.8	8.9	145.0	3.2	16.4	20.6	28.7	7.3	8.4
5	4.2	2.5	8.3	144.6	2.9	15.3	23.6	33.7	6.8	10.1
6	3.8	2.3	7.3	135.6	2.6	13.8	24.8	36.5	6.1	10.1
7	3.5	2.1	6.7	125.5	2.3	12.4	25.3	37.1	5.5	10.4

	BOOT+SHOE, LEATHER GDS, CUTTERS, LASTERS, SEWERS	METAL WORKERS (FURNACEMEN, ROLLERS, ETC.)	PRECISION INSTRUMENT MAKERS, JEWELLERS WATCHMAKERS	TOOLMAKERS, METAL MACHINISTS, MECHANICS, PLUMBERS	ELECTRICIAN ELECTRONICS WORKERS	METAL WORKERS, ELECT.PROD. PROCESS WORKERS	CARPENTERS, WOODWORK MACHINISTS + RELATED WORKERS	PAINTERS + DECORATORS	BRICKLAYERS PLASTERERS + CONSTRUCTION WORKERS NEC	COMPOSITORS PRINTING MACHINISTS, BOOKBINDERS ETC.
1	22.9	2.1	19.0	6.9	443.0	155.4	103.7	231.3	683.9	359.0
2	13.0	.3	25.1	9.9	396.9	167.5	96.3	181.4	664.9	351.3
3	17.8	.3	25.8	15.2	476.8	208.8	98.8	210.3	800.5	424.7
4	26.3	3.6	30.1	18.3	555.2	237.5	124.3	236.9	864.4	460.5
5	32.0	5.1	32.9	20.2	577.9	250.0	129.7	246.3	874.8	468.5
6	31.3	5.3	29.9	20.2	527.4	238.6	118.7	226.6	792.6	427.7
7	34.7	5.7	28.0	21.0	523.5	237.8	119.1	233.1	782.4	415.5

	CLAY + GLASS POTTERS, KILNSMEN	MILLERS, BAKERS, BUTCHERS, BREWERS + ETC.	CHEMICAL + SUGAR WORKERS = PAPER PRODUCTION	TOBACCO PREPARERS + PRODUCTION WORKERS	PAPER,RUBBER PLASTIC + PRODUCTION PROCESS WORKERS	PACKERS, WRAPPERS, LABELLERS	STATIONARY ENGINE, EXCAVATING, LIFTING EQUP OPERATORS	STOREMEN + FREIGHT HANDLERS	RAIL + TRAMWAY REPAIRMEN, LABOURERS NEC	APPRENTICES FOREMEN, MACHINISTS, FACTORY WORKERS NEC
1	23.9	10.8	17.0	10.9	.3	27.0	9.1	100.3	55.3	239.9
2	15.1	12.9	5.5	7.1	.2	21.5	5.2	104.1	42.6	242.2
3	17.9	20.3	11.8	7.8	.0	22.7	7.8	124.9	63.5	290.3
4	27.0	24.4	4.5	11.5	-.2	31.0	9.0	139.0	72.9	330.3
5	32.5	28.0	1.8	14.1	-.3	35.8	9.9	144.8	77.2	347.8
6	32.0	30.5	1.6	14.1	-.3	36.4	9.4	134.9	72.4	324.8
7	35.3	17.3	10.5	14.5	-.1	38.1	10.8	128.0	74.5	308.1

$100 million increase in public authority investment expenditure (1979-80 prices)

TABLE E5 (cw) EMPLOYMENT BY OCCUPATION

Absolute Difference between Control and Disturbed Solution

	FIRE BRIGADES + POLICE	HOUSEKEEPERS COOKS, MAIDS	WAITERS, BARTENDERS	CARETAKERS, CLEANERS (BUILDINGS)	BARBERS, HAIRDRESSER BEAUTICIAN	LAUNDERERS, DRY CLEANERS, PRESSERS	ATHLETES, SPORTSMEN	PHOTOGRAPHER + CAMERA OPERATORS	UNDERTAKERS CREMATORIUM WORKERS	SERVICE, SPORT, RECREATION WORKERS NEC
1	105.1	-1.1	5.4	3.2	-35.7	1.5	.6	.3	.6	.0
2	93.1	45.2	75.5	-3.3	19.9	-2.3	4.7	-.0	.7	-.1
3	107.4	63.8	118.1	3.4	27.5	1.0	8.0	.8	1.1	.1
4	135.4	76.3	141.7	3.3	40.3	.8	10.0	.9	1.5	.1
5	149.5	80.6	156.7	5.0	50.9	1.6	11.6	1.1	1.9	.1
6	142.5	74.9	159.1	6.7	59.6	2.5	12.1	1.3	2.1	.2
7	142.6	74.4	165.8	9.1	61.7	3.7	13.0	1.5	2.3	.2
PERCENTAGE CHANGES										
2	-11.49	*******	1293.46	-204.04	-155.60	-257.11	744.78	-113.61	8.70	-216.83
3	15.41	41.10	56.40	-202.92	38.38	-141.22	71.22	*******	61.88	-240.25
4	26.05	19.59	19.96	-3.57	46.45	-16.76	26.14	7.15	38.51	12.09
5	10.45	5.62	10.58	49.97	26.33	101.27	15.53	24.11	21.11	47.99
6	-4.68	-7.02	1.59	34.29	17.07	55.44	4.32	16.32	10.69	34.98
7	.09	-.72	4.19	36.35	3.62	50.40	7.26	21.49	12.94	19.98

TABLE E5 EMPLOYMENT BY OCCUPATION

	MEMBERS OF ARMED SERVICES	INADEQUATELY DESCRIBED	HOUSEWIFE, PENSIONER, F.T.STUDENT UNEMPLOYED
1	-.7	0.0	28.2
2	65.7	0.0	22.6
3	98.3	0.0	29.6
4	119.8	0.0	34.5
5	133.3	0.0	37.1
6	136.6	0.0	35.8
7	142.0	0.0	35.9

SUMMARY TABLE F1 INTERNATIONAL AGGREGATES

$100 million increase in government public administration current expenditure (1979-80 prices)

TITLE	YEAR 1	2	5
	Absolute Difference between Control and Disturbed Solution		
TOTAL WORLD GDP 1978 $ BILLION	.05	.06	.09
WORLD MANUFACTURING TRADE PRICE INDEX (YEAR 0 EQUALS 100.0)	0.00	.00	.00
WEIGHTED AVERAGE EXCHANGE RATE	0.03	0.00	0.00
WEIGHTED AVERAGE TARIFF RATE - PERCENTAGE POINT	-.00	-.00	.00
INDEX OF COMPETITIVENESS (YEAR 0 EQUALS 100.0)	.02	.05	.13
TERMS OF TRADE	.00	.00	-.00

SUMMARY TABLE F2 MACRO ECONOMIC AGGREGATES - 1966.67$M

$100 million increase in government public administration current expenditure (1979-80 prices)

TITLE	YEAR 1	2	5
	Absolute Difference between Control and Disturbed Solution		
TOTAL PRIVATE CONSUMPTION EXPENDITURE	26.24	26.28	45.27
TOTAL GOVERNMENT CONSUMPTION EXPENDITURE	31.40	31.40	31.40
PRIVATE HOUSING EXPENDITURE	1.77	3.65	2.71
TOTAL PRIVATE INVESTMENT	6.01	3.76	16.94
TOTAL PUBLIC INVESTMENT	3.32	3.46	3.35
NON-FARM STOCKS	3.44	5.76	3.28
IMPORTS OF GOODS AND SERVICES	12.08	14.39	15.41
EXPORTS OF GOODS AND SERVICES	.06	.19	.86
GROSS DOMESTIC PRODUCT	54.19	63.09	88.51
FARM PRODUCT	-.00	.02	.49
GROSS NON-FARM PRODUCT	54.19	63.07	88.82
GROSS DOMESTIC PRODUCT - COMPOSITE	51.76	64.00	88.86

$100 million increase in government public administration current expenditure (1979-80 prices)

SUMMARY TABLE F3 INCOME FORMATION AND CAPITAL ACCOUNT

TITLE	YEAR	1	2	[illegible]
		Absolute Difference between Control and Disturbed Solution		
WAGES AND SALARIES : SHARE IN GDP AT FACTOR COST - (P.P.)		.02	-.00	.00
COMPANY SURPLUS : SHARE IN GDP AT FACTOR COST - (P.P.)		-.01	.00	-.00
UNINCORPORATED ENTERPRISE: SHARE IN GDP AT FACTOR COST - (P.P.)		-.01	.00	.00
DWELLING SURPLUS : SHARE IN GDP AT FACTOR COST - (P.P.)		-.01	-.00	-.00
PUBLIC UTILITIES : SHARE IN GDP AT FACTOR COST - (P.P.)		-.00	-.00	-.00
PRIVATE SECTOR SAVING MINUS PRIVATE SECTOR INVESTMENT		74.72	38.62	.97
GOVT SAVING LESS INVESTMENT		-111.29	-93.30	-92.01
FOREIGN SAVING		36.56	54.68	91.04
PRIVATE SECTOR SAVING OUT OF INCOME		-.06	-.08	-.01
CORPORATE SECTOR INTERNAL FUNDING RATIO - (P.P.)		.01	.05	-.15
REAL HOUSEHOLD RECEIPTS - 1979.80 $M		157.03	200.49	235.03
HOUSEHOLD SAVING RATIO - (P.P.)		.05	.09	.02
REAL HOUSEHOLD DISPOSABLE INCOME - (1979.80 $M)		132.13	159.47	184.54
HOUSEHOLD LIABILITY - CURRENT RATIO		-.00	-.00	-.00

SUMMARY TABLE F4 SELECTED INDICATORS

$100 million increase in government public administration current expenditure (1979-80 prices)

TITLE	YEAR	1	2	3
		Absolute Difference between Control and Disturbed Solution		
IMPLICIT CONSUMPTION DEFLATOR (YEAR 0 EQUALS 100.0)		-.03	-.04	-.12
NOMINAL WAGE RATE PER MALE UNIT PER WEEK - DOLLARS		.14	.02	-.28
REAL WAGE RATE (YEAR 0 CONSTANT DOLLARS)		.23	.12	.06
AGGREGATE PRODUCTIVITY (EMPLOYMENT BASED) (YEAR 0 EQUALS 100.0)		.04	.05	.06

SUMMARY TABLE F5 GOVERNMENT SECTOR - 1979.80 $M

$100 million increase in government public administration current expenditure (1979-80 prices)

TITLE	YEAR 1	2	5
	Absolute Difference between Control and Disturbed Solution		
H"HOLD INCOME TAX RATE-PERCENT OF H"HOLD RECEIPTS LESS CASH BENEFITS	-.05	-.09	-.15
COMPANY TAX RATE - RATIO	0.00	0.00	0.00
INDIRECT TAX RATE PERCENT OF GDP	-.01	-.01	-.01
INDIRECT TAX REVENUE $M	1.74	2.36	3.46
DIRECT TAX REVENUE	33.69	40.46	54.48
COMPANY TAX AS PERCENT OF COMPANY G.O.S	.02	.07	-.02
NET INTEREST PAID $M	5.99	13.84	40.32
TRANSFERS TO PERSONS	-17.30	-19.41	-13.82
CURRENT GOVERNMENT EXPENDITURE	119.01	119.01	119.01
TOTAL INVESTMENT OUTLAY $M	10.51	10.96	10.63
PUBLIC SECTOR BORROWING REQUIREMENTS $M	111.40	97.07	97.73
PUBLIC SECTOR BORROWING REQUIREMENTS : PER CENT OF GDP	.08	.07	.06
TOTAL HOLDINGS OF GOVT DEBT - 1979.80 $M	103.81	209.04	404.12
DOMESTIC HOLDINGS OF GOVT DEBT AS PERCENT G.D.P	.01	.03	.04

SUMMARY TABLE F6 INDUSTRY OUTPUT 1966.67 $M

$100 million increase in government public administration current expenditure (1979-80 prices)

TITLE		YEAR 1	2	5
		Absolute Difference between Control and Disturbed Solution		
AGRICULTURE	- 1966.67 $M	.23	.29	.96
MINING	- 1966.67 $M	.65	.90	1.34
MANUFACTURING	- 1966.67 $M	12.19	15.49	22.61
UTILITIES/CONSTRUCTION		6.80	7.23	9.68
DISTRIBUTION		28.38	35.35	54.61
SERVICES		27.97	30.41	37.97
OWNERSHIP OF DWELLINGS	- 1966.67 $M	-.05	.09	.95
TOTAL INDUSTRY PRODUCT		76.22	89.67	127.17

$100 million increase in government public administration current expenditure
(1979-80 prices)

SUMMARY TABLE F7 LABOUR MARKET

Absolute Difference between Control and Disturbed Solution

TITLE		YEAR 1	2	5
TOTAL LABOUR FORCE	- HUNDREDS	0.00	32.41	50.19
TOTAL EMPLOYMENT	- HUNDREDS	61.45	69.02	98.96
UNEMPLOYMENT (ACTUAL)	- HUNDREDS	-61.45	-36.61	-48.77
UNEMPLOYMENT RATE (ACTUAL)	- PERCENTAGE POINT	-.09	-.06	-.07
UNEMPLOYMENT (POTENTIAL)	- HUNDREDS	-61.45	-69.02	-98.96

SUMMARY TABLE F8 FOREIGN ACCOUNT - 1979.80 $M

TITLE		YEAR 1	2	5
BALANCE OF TRADE	- $M	-33.63	-44.15	-50.98
NET OFFICIAL MONETARY MOVEMENT	- $M	0.00	0.00	0.00
BALANCE OF CURRENT ACCOUNT	- $M	-35.01	-54.09	-69.44
PROPERTY INCOME TO OVERSEAS	- $M	3.93	15.80	37.01
FOREIGN INVESTMENT + GOVERNMENT SECTOR	- $M	34.42	68.43	83.17
NET PRIVATE INVESTMENT	- $M	3.98	1.91	7.99
NET APPARENT CAPITAL INFLOW % PERCENT OF GDP		.03	.05	.07
TOTAL OVERSEAS BORROWINGS.	-$M	0.00	0.00	0.00
TOTAL OVERSEAS BORROWING AS A PERCENT OF GDP		.00	.00	.00

$100 million increase in government public administration current expenditure
(1979-80 prices)

SUMMARY TABLE F9 EMPLOYMENT BY INDUSTRY GROUP HUNDREDS

Absolute Difference between Control and Disturbed Solution

TITLE		YEAR 1	2	5
PRIMARY	HUNDREDS	[illegible]	[illegible]	.16
MINING	HUNDREDS	.21	.43	.87
MANUFACTURING	HUNDREDS	7.57	7.29	11.52
UTILITIES/CONSTRUCTION	HUNDREDS	6.24	4.41	8.90
DISTRIBUTION		5.21	4.36	7.40
SERVICES		36.54	51.50	64.37

$100 million increase in government public administration current expenditure
(1979-80 prices)

SUMMARY TABLE F10 OCCUPATIONAL DEMAND FOR LABOUR

Absolute Difference between Control and Disturbed Solution

TITLE		YEAR 1	2	5
PROFESSIONAL AND TECHNICAL	- HUNDREDS	6.92	11.16	18.35
ADMIN, MANAGERIAL, CLERICAL	- HUNDREDS	28.68	24.09	31.71
FARMER, FISHERY, FORESTRY	- HUNDREDS	1.39	1.39	1.76
MINERS	- HUNDREDS	.12	.28	.38
TRANSPORT AND COMMUNICATION WORKERS	- HUNDREDS	2.97	3.21	4.24
TRADES AND PRODUCTION WORKERS	- HUNDREDS	16.37	14.39	22.95
SERVICES, SPORTS AND RECREATION	- HUNDREDS	2.94	4.30	7.26
UNALLOCATED	- HUNDREDS	10.12	10.26	12.28

SUMMARY TABLE FM FINANCIAL AGGREGATES - 1979.86 $M

$100 million increase in government public administration current expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	2	3
SHORT TERM (2 YEAR) BOND RATE - PERCENTAGE POINT	0.00	0.00	0.00
LONG TERM (10 YEAR) BOND RATE - PERCENTAGE POINT	.00	-.00	-.00
REAL LONG TERM INTEREST RATE (POST-TAX)	.03	.01	.01
DEMAND FOR MONEY (M2) $M	45.58	52.38	67.45
NON CENTRAL BANK HOLDING OF GOVT SECURITIES $M	43.24	43.18	68.02
CENTRAL BANK HOLDING OF GOVT SECURITIES $M	27.03	71.94	118.66
SRD RATIO	.09	.21	.25

SUMMARY TABLE F2 COMMODITY ACTIVITY

$100 million increase in government public administration current expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	2	3
CRUDE OIL IMPORTS 1000" KILOLITRES	9.32	[illegible]	42.18
BLACK COAL EXPORTS 1000" TONNES	0.00	0.00	1.00
ALUMINA PRODUCTION 1000" TONNES	0.00	0.00	.17
ALUMINIUM PRODUCTION 1000" TONNES	0.00	0.00	.08
IRON ORE PRODUCTION 1000" TONNES	0.00	.01	.02
URANIUM EXPORTS 1000" TONNES	0.00	0.00	.00
CONCENTRATE MINING EXPORTS 1974.75 $M	-.00	.01	.05
PROCESSED MINING EXPORTS 1974.75 $M	-.29	-.29	-.45
LNG EXPORTS - MILLION THERMS	0.00	0.00	0.00

$100 million increase in government public administration current expenditure
(1979-80 prices)

SUMMARY TABLE F5 PRIVATE INVESTMENT BY INDUSTRY

INCREASE IN PUBLIC ADMIN EXPENDITURE

TITLE	YEAR	1	2	5
		Absolute Difference between Control and Disturbed Solution		
AGRICULTURE - 1979.80 $M		1.43	[illegible]	[illegible]
MINING - 1979.80 $M		.59	1.89	7.42
MANUFACTURING - 1979.80 $M		9.66	-1.30	31.61
TERTIARY SECTOR - 1979.80 $M		6.81	9.13	9.52
TOTAL PRIVATE INVESTMENT - 1979.80 $M		18.49	11.57	52.11

SUMMARY TABLE FOR INDUSTRY OUTPUT - (GROSS OUTPUT) - 1966.67 $M

INCREASE IN PUBLIC ADMIN EXPENDITURE

$100 million increase in government public administration current expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

TITLE	YEAR 1	2	3
MEAT PRODUCTS	-.00	-.10	-.2[illegible]
MILK PRODUCTS	0.00	0.00	0.00
FRUIT AND VEGETABLES	0.00	.06	.39
MARGARINE	.07	.10	.15
FLOUR MILL	.16	.19	.18
BREAD,CAKES	.24	.35	.43
BEVERAGES	.57	.95	1.45
TOBACCO	.05	.16	.24
PREPARED FIBRES	0.00	.00	-.00
MAN-MADE YARNS AND FIBRES	.77	1.01	1.14
TEXTILE FINISHING	.11	.08	.09
TEXTILE FLOOR COVERING	.34	.48	.52
KNITTING MILLS	.33	.38	.35
CLOTHING	.76	.82	.80
FOOTWEAR	.30	.34	.39
SAWMILL PRODUCTS	.72	.92	1.15
JOINERY AND WOOD PRODUCTS	.55	.64	.84
FURNITURE	.62	.53	.51
PULP,PAPER AND PAPERBOARD	1.35	1.52	1.72
PRINTED MATTER	2.73	3.21	4.64
INDUSTRIAL CHEMICALS	1.20	1.43	2.20
PAINTS	.26	.32	.43

FA cont.

SOAP	.35	.42	.56
OTHER CHEMICALS	.69	1.08	1.77
PETROLEUM AND COAL PRODUCTS	.64	.91	1.24
GLASS AND GLASS PRODUCTS	.26	.25	.42
CLAY PRODUCTS	.27	.35	.59
CEMENT AND CONCRETE PRODUCTS	1.46	1.56	2.23
OTHER N.M. MINERAL PRODUCTS	.18	.18	.31
BASIC IRON AND STEEL	2.69	3.44	5.65
NON-FERROUS METAL PRODUCTS	2.44	3.66	4.95
FABRICATED STRUCTURAL METAL PRODUCTS	.95	.98	1.75
METAL CONTAINERS ,SHEET METAL PRODUCTS	.64	.63	.81
CUTLERY AND HAND TOOLS	1.28	1.42	2.37
MOTOR VEHICLES AND PARTS	2.77	3.78	5.94
OTHER TRANSPORT EQUIPMENT	.53	.57	.77
APPLIANCES AND ELECTRONIC EQUIPMENT	1.81	2.98	4.90
ELECTRICAL MACHINERY AND EQUIPMENT	1.44	1.53	2.36
AGRICULTURAL MACHINERY AND EQUIPMENT	.12	.14	.19
OTHER INDUSTRIAL MACHINERY	1.29	1.77	4.39
LEATHER PRODUCTS	.15	.22	.82
RUBBER PRODUCTS	.47	.75	1.16
PLASTIC AND RELATED PRODUCTS	1.23	1.44	1.52
OTHER MANUFACTURING	.23	.38	.73
TOTAL MANUFACTURING	32.59	41.73	62.88

$100 million increase in government public administration current expenditure (1979-80 prices)

TABLE G1 EMPLOYMENT BY AGE GROUP

Absolute Difference between Control and Disturbed Solution

year	0-19	20-24	25-29	30-34	35-39	40-44	45-49
1	534.4	872.6	772.6	758.1	630.2	532.0	454.5
2	563.7	1008.5	904.6	870.2	714.9	594.5	501.5
3	707.9	1230.3	1109.8	1072.9	889.3	745.3	627.5
4	789.1	1370.7	1238.4	1196.1	992.7	833.5	701.1
5	843.8	1462.0	1320.8	1276.3	1060.8	891.5	749.5
6	832.8	1457.1	1316.8	1270.8	1056.2	885.3	742.8
7	852.6	1489.4	1345.9	1299.8	1080.6	906.2	[illegible]

	50-54	55-59	60-64	65 +
1	438.3	352.2	165.0	64.2
2	484.0	386.2	179.0	73.0
3	600.5	476.4	220.6	90.2
4	669.5	530.5	245.4	100.1
5	714.9	565.6	261.6	107.3
6	709.1	559.4	258.8	108.4
7	725.1	571.5	264.5	111.5

	MALES	FEMALES
1	3682.5	1894.1
2	3872.5	2410.6
3	4783.7	2990.5
4	5326.5	3344.5
5	5647.1	3611.3
6	5479.4	3721.4
7	5574.4	3836.8

	HIGHER DEGREE	GRADUATE DIPLOMA	BACHELOR DEGREE	DIPLOMA	TRADE CERTIFICATE	OTHER CERTIFICATE	NOT CLASSIFIED BY LEVEL	INADEQUATE DESCRIPTION	NO QUALIFICATIONS	STILL AT SCHOOL	NOT STATED/ APPLICABLE
1	33.1	31.3	219.0	189.4	747.7	441.7	19.9	.0	3569.6	19.7	282.9
2	51.5	57.0	326.0	291.9	721.4	599.5	24.6	.0	3891.1	16.9	300.3
3	66.8	85.2	407.2	395.3	952.4	764.7	28.2	.0	4670.2	28.4	372.5
4	76.4	100.7	462.9	454.8	1087.2	872.1	30.8	.0	5135.3	32.2	415.1
5	82.5	110.4	500.5	492.3	1151.3	947.6	32.6	.0	5459.2	35.8	442.4
6	84.6	113.5	515.7	503.8	1056.3	972.8	33.3	.0	5446.4	36.4	434.2
7	86.9	117.8	510.9	519.3	1075.3	1007.4	34.0	.0	5553.9	38.3	443.3

$100 million increase in government public administration current expenditure (1979-80 prices)

TABLE G4(a) EMPLOYMENT BY INDUSTRY — Absolute Difference between Control and Disturbed Solution

	PRIMARY	MINING	MEAT	MILK	FRUIT	MARGARINE, OILS	FLOUR	BREAD+SUGAR CAKES	BEVERAGES	TOBACCO PRODUCTS
1	.0	.2	13.2	-2.9	-1.0	-.1	1.1	-.1	12.9	-2.4
2	.0	.4	-1.0	-6.6	3.0	-.7	1.1	-.2	17.4	-4.1
3	.1	.7	-14.8	-13.1	6.2	-1.2	1.9	-.4	23.1	-5.7
4	.1	.8	-32.8	-21.2	7.9	-1.4	3.5	4.7	31.7	-5.8
5	.2	.9	-37.8	-29.4	7.8	-1.1	4.5	11.1	41.3	-4.4
6	.2	.9	-24.1	-35.7	5.5	-.5	3.3	14.7	43.6	-1.7
7	.3	.9	.8	-41.9	2.2	.2	3.1	18.4	46.5	-.1

	PREPARED FIBRES	YARNS	TEXTILE FINISHING	FLOOR COVERINGS	KNITTING MILLS	CLOTHING	FOOTWEAR	SAWMILLS	WOOD, JOINERY	FURNITURE
1	0.0	1.9	4.3	5.9	8.6	-1.7	15.2	31.1	3.1	4.6
2	.0	13.4	2.4	8.2	4.8	-19.9	15.2	22.7	-8.1	-10.5
3	.0	15.1	1.6	7.5	-.2	-16.4	15.1	11.2	-13.4	-20.3
4	.0	16.3	1.8	9.3	-1.9	4.1	17.4	14.8	-13.0	-8.8
5	-.0	18.6	1.7	11.0	-1.6	21.2	18.3	20.2	-11.9	3.4
6	-.0	20.1	.7	10.7	-1.1	21.6	17.3	21.4	-9.7	3.5
7	-.0	19.4	1.2	11.1	1.5	24.7	18.3	28.9	-3.2	8.2

	PAPER	PRINTING	INDUSTRIAL CHEMICALS	PAINTS	SOAP	OTHER CHEMICALS	PETROLEUM	GLASS + PRODUCTS	CLAY PRODUCTS	CEMENT
1	15.0	93.8	6.5	4.5	1.3	10.7	.8	10.2	7.9	8.8
2	8.2	70.6	2.3	1.7	.6	13.7	2.8	9.3	4.6	22.4
3	9.7	70.4	3.2	-1.5	4.4	14.6	3.0	16.2	4.8	35.6
4	22.9	89.2	7.9	-3.3	11.0	21.0	3.4	27.0	13.6	40.1
5	34.1	103.1	11.6	-5.5	16.7	25.4	4.0	32.0	29.2	43.6
6	36.0	101.7	11.4	-7.7	18.4	26.4	4.4	30.6	48.9	41.6
7	40.5	112.4	13.8	-7.3	19.4	30.2	4.3	29.7	-22.1	36.8

$300 million increase in government public administration current expenditure (1979-80 prices)

TABLE G4(a) EMPLOYMENT BY INDUSTRY

Absolute Difference between Control and Disturbed Solution

	OTHER NON-METALLIC MIN. PRODS.	IRON AND STEEL	NON-FERROUS METAL PRODUCTS	FABRICATED STRUCTURAL METAL PRODS.	SHEET METAL PRODUCTS	OTHER STEEL PRODUCTS	MOTOR VEHICLES	OTHER TRANSPORT EQUIPMENT	APPLIANCES	ELECTRICAL MACHINERY
1	-.5	43.6	19.8	16.5	14.6	48.3	135.2	29.6	46.2	33.4
2	-2.6	95.2	21.4	.2	26.4	30.0	156.4	17.3	49.4	66.8
3	-2.4	116.8	17.2	-.1	30.5	26.0	181.0	17.5	11.5	74.7
4	-.9	143.1	23.8	12.0	35.7	33.8	202.2	27.8	-.1	88.5
5	1.2	160.2	31.5	12.5	34.6	29.4	195.4	30.8	2.6	98.8
6	3.5	147.5	23.9	3.2	22.8	19.5	149.0	27.5	4.1	91.9
7	6.1	132.1	25.7	7.2	14.9	23.2	153.1	43.3	24.3	88.7

	AGRICULTURAL MACHINERY	OTHER INDUSTRIAL MACHINERY	LEATHER, LEATHER GOODS	RUBBER GOODS	PLASTIC, PLASTIC GOODS	OTHER MANUFACTURING	ELECTRICITY GAS + WATER	CONSTRUCTION	WHOLESALE + RETAIL TRADE	TRANSPORT + STORAGE
1	-3.0	30.0	1.0	-6.8	34.7	6.9	.0	6.2	2.8	1.8
2	-5.3	25.0	.1	-16.1	27.3	17.6	.1	4.3	-3.7	2.1
3	-4.2	28.8	-5.5	-17.3	17.4	25.0	.2	7.6	1.9	2.4
4	-.1	58.8	4.6	-9.6	17.1	31.5	.2	8.7	2.1	2.4
5	3.4	53.6	5.0	3.3	13.4	36.7	.3	8.7	2.9	2.2
6	5.1	66.7	4.3	15.3	3.8	39.1	.3	6.2	2.7	1.9
7	8.0	85.6	2.1	23.0	9.5	40.2	.3	5.8	3.6	1.8

	COMMUNICATION	FINANCE, PROPERTY, BUSINESS	PUBLIC ADMINISTRATION	DEFENCE	COMMUNITY SERVICES	ENTERTAINMENT RECREATION
1	.5	-19.8	56.7	0.0	-.5	.1
2	1.2	-9.7	56.7	0.0	5.2	-.7
3	1.7	-11.4	56.7	0.0	11.5	-.2
4	2.1	-10.4	56.7	0.0	15.1	-.3
5	2.3	-9.4	56.7	0.0	17.3	-.2
6	2.5	-7.5	56.7	0.0	17.9	-.1
7	2.6	-7.5	56.7	0.0	19.1	.0

$100 million increase in government public administration current expenditure (1979-80 prices)

Absolute Difference between Control and Disturbed Solution

TABLE G5 - EMPLOYMENT BY OCCUPATION

	ARCHITECTS ENGINEERS SURVEYORS	CHEMISTS PHYSICISTS GEOLOGISTS	BIOLOGISTS VETS AGRONOMISTS	MEDICAL PRACS. DENTISTS	NURSES	PROF. MEDICAL WORKERS NEC	TEACHERS	CLERGY RELIGIOUS ORDERS	LAW PROFESSION-ALS	ARTISTS ENTERTAINER WRITERS
1	100.3	15.6	44.9	10.3	33.8	8.3	53.8	.4	-12.2	14.3
2	130.2	20.7	50.2	34.6	135.4	15.9	155.4	6.3	15.9	22.7
3	133.9	24.2	56.3	62.0	251.5	34.2	291.8	14.1	11.2	28.0
4	143.3	27.3	60.0	78.8	322.4	42.9	356.0	18.3	14.3	33.7
5	149.1	29.3	62.5	90.8	372.8	49.6	390.8	20.2	17.2	38.5
6	150.8	29.7	63.3	96.7	397.1	52.4	396.9	19.2	22.3	41.5
7	151.1	30.3	64.6	103.5	425.8	56.4	412.5	19.9	22.3	43.7

	DRAFTSMEN TECHNICIANS, OTHER PROF-ESSIONAL + TECHNICAL	GOVT. ADMINIST-RATORS + EXECUTIVES	NON-GOVT. ADMINIST-RATORS + EXECUTIVES	BOOK-KEEPERS, CASHIERS, BANKTELLERS SHOPKEEPERS	STENO-GRAPHERS + TYPISTS	OTHER CLERICAL WORKERS	INSURANCE, REAL ESTATE SALESMEN, AUCTIONEERS, VALUERS	COMMERCIAL TRAVELLERS, MANUFACT-URING AGENTS	SHOP ASSISTANTS, RETAIL, WHOLESALE SALESMEN	FARMERS + FARM MANAGERS
1	149.2	142.3	332.6	-9.7	-31.4	236.9	1662.5	-110.2	6.6	107.2
2	197.7	220.0	334.1	-1.1	-4.6	291.1	2039.4	-45.7	-6.1	-113.8
3	220.0	233.5	335.6	67.2	11.3	303.7	2161.1	-55.0	7.8	85.2
4	243.1	254.9	336.5	100.5	22.3	320.2	2277.3	-47.7	11.9	98.3
5	257.6	270.2	337.0	128.2	32.3	332.1	2372.2	-40.8	16.5	130.5
6	261.5	282.1	337.0	131.4	38.8	340.7	2433.7	-28.7	16.9	127.1
7	265.6	285.7	337.1	142.8	42.3	344.3	2469.1	-28.5	19.1	156.3

	FARM WORKERS INCLUDING FOREMEN	WOOL CLASSERS	HUNTERS + TRAPPERS	FISHERMEN + FISHING WORKERS	TIMBER + FORESTRY WORKERS	MINERS, QUARRYMEN, MINERAL PROSPECTORS	OIL + WATER WELL DRILLERS	ORE+MINERAL TREATMENT OPERATORS	CIVILIAN DECK+ENGIN-EER SHIP OFFICERS	CIVILIAN DECK + ENGINEROOM HANDS
1	4.7	142.8	.2	.3	.6	3.7	9.3	.8	1.4	3.2
2	3.9	141.6	.0	.3	.5	3.2	16.9	1.2	2.3	3.4
3	9.0	152.6	.2	.3	.7	3.2	24.9	1.6	3.0	3.8
4	12.6	156.3	.3	.3	.8	3.5	29.5	1.9	3.6	3.8
5	16.4	160.5	.3	.3	.9	3.9	32.3	2.0	4.0	3.8
6	19.3	161.1	.3	.3	1.1	4.0	32.5	1.9	3.9	3.6
7	23.2	163.7	.4	.3	1.2	4.3	31.8	1.9	3.7	3.5

TABLE G5(cont) EMPLOYMENT BY OCCUPATION

	BOOT+SHOE, LEATHER GDS. CUTTERS, LASTERS, SEWERS	METAL WORKERS (FURNACEMEN, ROLLERS, ETC.)	PRECISION INSTRUMENT MAKERS, JEWELLERS WATCHMAKERS	TOOLMAKERS, METAL MACHINISTS, MECHANICS, PLUMBERS	ELECTRICIAN ELECTRONICS WORKERS	METAL WORKERS, ELECT.PROD. PROCESS WORKERS	CARPENTERS, WOODWORK MACHINISTS + RELATED WORKERS	PAINTERS + DECORATORS	BRICKLAYERS PLASTERERS + CONSTRUCTION WORKERS NEC	COMPOSITORS PRINTING MACHINISTS, BOOKBINDERS ETC.
1	16.1	2.8	10.6	6.8	319.7	91.1	64.2	123.1	221.5	154.0
2	5.1	-.1	14.7	6.4	283.0	100.5	72.4	91.3	161.4	125.6
3	9.4	-.6	16.6	14.1	372.1	142.9	77.3	111.5	267.6	182.4
4	17.9	3.4	20.4	17.6	430.8	168.4	95.2	132.3	305.7	204.7
5	25.0	5.2	22.5	20.3	452.8	182.2	99.5	143.8	308.7	208.8
6	23.7	5.0	20.1	20.9	407.0	172.8	88.5	122.8	228.3	168.8
7	27.3	5.3	19.6	22.7	422.4	176.7	96.0	130.0	219.2	159.2

	CIVILIAN AIR-PILOTS, FLIGHT NAVIGATORS	RAILWAY DRIVERS + FIREMEN	ROAD TRANSPORT DRIVERS	RAILWAY GUARDS + CONDUCTORS	INSPECTORS SUPERVISORS DESPATCHES TRAFFIC CONTROLLERS	TELEPHONISTS TELEGRAPHISTS RADIO + TV STATION OPERATORS	POST-MASTERS, POSTMEN, MESSENGERS	OTHER TRANSPORT WORKERS	SPINNERS, WEAVERS, KNITTERS, DYERS	TAILORS, CUTTERS, FURRIERS
1	4.7	2.3	6.5	295.3	2.6	20.0	15.3	9.9	27.3	4.8
2	5.0	2.7	7.6	293.2	3.0	22.1	23.1	24.9	28.2	7.1
3	5.6	3.2	8.7	325.9	3.4	24.4	30.2	34.8	29.3	7.4
4	5.7	3.2	8.8	334.7	3.4	24.7	35.3	42.7	29.4	9.2
5	5.6	3.0	8.3	338.1	3.1	23.9	39.0	48.5	29.1	11.0
6	5.2	2.8	7.4	330.8	2.8	22.4	40.8	52.1	28.3	11.0
7	5.0	2.7	7.0	325.9	2.6	21.6	42.1	53.8	28.0	11.4

	CLAY + GLASS POTTERS, KILNSMEN	MILLERS, BAKERS, BUTCHERS, BREWERS + ETC.	CHEMICAL + SUGAR WORKERS - PAPER PRODUCTION	TOBACCO PREPARERS + PRODUCTION WORKERS	PAPER,RUBBER PLASTIC + PRODUCTION PROCESS WORKERS	PACKERS, WRAPPERS, LABELLERS	STATIONARY ENGINE, EXCAVATING, LIFTING EQUP OPERATORS	STOREMEN + FREIGHT HANDLERS	RAIL + TRAMWAY REPAIRMEN, LABOURERS NEC	APPRENTICES FOREMEN, MACHINISTS, FACTORY WORKERS NEC
1	46.3	4.1	17.4	5.8	.3	17.5	7.2	131.5	72.5	585.0
2	39.1	4.5	-4.3	7.3	.1	12.7	1.7	131.6	58.7	578.9
3	40.2	7.7	6.4	8.5	-.0	13.7	5.6	148.2	79.4	622.8
4	51.4	11.1	4.0	12.9	-.1	23.2	7.3	159.7	88.3	655.8
5	60.1	14.4	8.0	16.4	-.0	30.1	9.4	165.6	95.2	672.7
6	60.3	14.7	12.0	16.7	.1	31.6	9.6	156.6	91.9	651.9
7	65.5	7.5	18.3	17.8	.2	34.1	11.1	153.0	97.0	644.4

TABLE G5(4) EMPLOYMENT BY OCCUPATION

Absolyte Difference between Control and Disturbed Solution

	FIRE BRIGADES + POLICE	HOUSEKEEPERS COOKS, MAIDS	WAITERS, BARTENDERS	CARETAKERS, CLEANERS (BUILDINGS)	BARBERS, HAIRDRESSER BEAUTICIAN	LAUNDERERS, DRY CLEANERS, PRESSERS	ATHLETES, SPORTSMEN	PHOTOGRAPHER CAMERA OPERATORS	UNDERTAKERS CREMATORIUM WORKERS	SERVICE, SPORT, RECREATION WORKERS NEC
1	134.2	53.0	100.5	5.4	1.6	1.4	1.1	1.9	3.3	.2
2	125.8	79.8	134.6	-9.3	66.7	-6.4	2.1	.5	3.1	-.0
3	139.7	104.8	197.5	1.2	83.0	-1.3	6.9	1.8	3.8	.1
4	165.7	119.9	228.9	1.4	101.9	-1.3	9.6	2.0	4.3	.2
5	182.6	126.8	251.9	3.5	115.7	-.4	11.8	3.2	4.8	.2
6	176.6	124.5	261.7	5.1	127.2	.5	12.7	2.4	5.0	.3
7	181.9	126.3	274.9	7.4	131.6	1.6	14.0	2.7	5.3	.3

	MEMBERS OF ARMED SERVICES	INADEQUATELY DESCRIBED	HOUSEWIFE, PENSIONER, F.T.STUDENT UNEMPLOYED
1	35.2	0.0	37.8
2	76.4	0.0	33.8
3	124.1	0.0	47.2
4	152.7	0.0	52.2
5	173.2	0.0	55.6
6	183.2	0.0	54.8
7	194.6	0.0	56.0