# FORECASTING THE ECONOMY IN THE EIGHTIES

Eric Haywood

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## ACKNOWLEDGEMENTS

I would like to express my gratitude to the many individuals who over the months have encouraged and pointed out the weaknesses as well as strengths of the study as it went through its stages of development.

In particular I would like to thank Professor Philpott of Victoria University for his comments and those given by Murry Horne from the Treasury.

The improved readability of the final report owes much to Margaret Bell from the Planning Council Secretariat whose insistence that the study be written largely in the first person makes the assumptions and value judgements adopted much clearer to the reader than they would have been otherwise. Final thanks are given to Sue and Carol for their excellent effort in the presentation of the report.

All that remains to be said is that the views expressed in the paper are those of the author and do not purport to represent those of the Planning Council.

## FOREWORD

In an uncertain world, the task of forecasting is full of difficulties. Nevertheless in planning and making decisions for the future, judgement must be made on the best information available at the time.

Dr Eric Haywood, of the Planning Council Secretariat, was asked to review the assumptions and judgements made by the Council in one of its earliest publications, Planning Perspectives, about such things as New Zealand's capacity to export and grow. He has been able to build on the work done by others since then, incorporate information on recent economic trends and investment decisions, and engage in rather more sophisticated analysis than was possible in Planning Perspectives.

I believe Dr Haywood's scenarios emphasise the importance of pursuing the kinds of policies which the Council set out in Economic Strategy 1979 and especially of sustaining incentives to export and to find domestic substitutes for imports to relieve the major constraints on growth. They also point to the benefits of policies which would produce a more stable rate of expansion than we have achieved in the past. They put the big energy and energy-related projects in perspective, and indicate that New Zealand needs balanced development in agriculture, industry and services if adequate growth is to be sustained. I believe the essential message from the work is an optimistic one - we can restore full employment and improve our living standards in the 1980s if we adopt the right policies.

As his text makes plain, many of the assumptions Dr Haywood has made are inevitably uncertain and the conclusions must be reviewed from time to time. The Council issues Dr Haywood's results, therefore, as a basis for professional and public discussion which it trusts will lead to further improvement in analysis and forecasting in the future.

Frank Holmes
Chairman

Naturally, as with any study of this type, as work
progressed additional data became available. But
if the study was ever to be finalised for publication
I had to make a cut-off point. I have therefore
included little of the data that became available
after July 1980. However, since the paper is
concerned with developments in the medium not the
short term and with trend rather than trend-cycle
movements in time series, the inclusion of one year's
additional information would not affect in any
significant manner the basic results derived.

Eric Haywood
October, 1980

## INTRODUCTION

The aim of this study was to develop a small macro-economic
model of the New Zealand economy for two purposes. First, to
generate forecasts of the main economic variables - employment,
productivity, output, and the current account balance - up to
1990. Second, to examine the effect of certain assumptions
about export growth and large-scale investment in energy and
related projects on the balance of payments and medium-term
economic growth.

There are numerous ways by which an assessment of the nation's
medium-term future can be conducted. It will become evident quite
quickly that the forecasts/projections of this paper were based
on the following general premises:

(a)  A nation's medium-term growth rate is constrained by the
     growth of its balance of payments. However, while I
     believe that it is the balance of payments that determines
     the medium-term growth rate the influence of this factor
     can be modified at times by the desire to achieve other
     national objectives; for instance particularly employment
     in the case of New Zealand.

(b)  I share the now widely accepted view that when looking some
     10 years ahead the use of complex econometric techniques
     is of limited value. It is of more importance to focus on
     the expected changes likely to occur. In an assessment of
     approaches most suitable to medium-term forecasting Brown
     and Sheriff (1978) commented "...we remain sceptical about
     the use of relatively sophisticated econometric techniques
     in exercises with a time horizon (about 10-15 years) ...
     Over such a period, the expectation must be that some
     existing relationships will change and we do not feel that,
     given the present state of the art, the use of such
     techniques can reduce uncertainty to a sufficient extent
     to justify their use"[1]

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1. Brown and Sheriff (1978) p.61

(c)   Accepting that it is impossible to provide a precise
      estimate of the path of the economy over the next
      decade, it seemed sensible to me that a set of
      scenarios should be presented.  Given that the
      basic model adopted was one of balance-of-payments
      constraint, different export and import substitution
      possibilities were examined.  Such an approach
      assists in taking into account the importance of
      uncertainty and encourages discussion of the main
      assumptions.  However, for many people the presen-
      tation of a number of scenarios is of limited value;
      after all in the final analysis, you can only walk
      in one direction at once.  Consequently, in the
      conclusion to the study I have given my own personal
      view regarding the most likely scenario for the next
      decade.

Overall the results of the study suggest that New Zealand's
economic activity will continue to be significantly restrained
by our external deficit until the mid 1980s.  If this is so there
will be limited growth in the economy and employment over the
next 5 years.  The forecasts show that over the 5 years ended
March 1985 the economic growth rate should average just under
2.0 percent per annum compared with estimated average annual
growth rates of 0.7 percent and 2.6 percent for the 5 and 10
year periods ended March 1980.  During the second half of the
decade the growth rate is expected to increase primarily because
of an improving trade balance which will result from export
growth and benefits in the form of both import savings and exports
when the large-scale projects come on stream.  If export
growth averages about the same as over the last decade (i.e.
2.5 percent per annum) then New Zealand is likely to attain an
average annual growth rate of 3.5 percent during the second half
of the 1980s.  However, some unemployment is likely to remain.
But if the export growth rate doubles, the average growth rate
during 1985-1990 is likely to be about 4.5 percent per annum
which should see registered unemployment largely eliminated.
It is estimated that the total contribution of the large-scale

projects to the level of economic activity in the second half
of the decade will be in the order of 6 percent.  However,
their contribution to the growth rate will have ended by 1988.
Unless additional projects or new sources of export growth and
import substitution are found the growth rate will fall back
to its recent historical average of 2.5-3.5 percent per annum
after this date.

## UNDERLYING CONCEPTS BEHIND THE PROJECTIONS

Projecting trends in the economy up to 10 years ahead is a
chancy business - so many uncertainties exist. Even the highly
sophisticated econometric models of the 1960s failed to forecast
the developments of the 1970s. I claim no special powers to fore-
see the forces at work over the next few years. I have attempted
to make some reasonable assumptions about changes in the main
economic variables, policies regarding unemployment, and the
balance of payments; and examined their impact on New Zealand's
economy. These projections, however, should not be regarded as
precise forecasts. They are based on trend values, and no doubt
significant cyclical and random fluctuations will occur as the
decade develops.

For exports two possible trend projections of the future
growth in this important economic series are presented. Adopting
two projections for this variable highlights first, the uncertain-
ty that surrounds the likely future growth of exports, and second,
the fact that export growth is not automatically predetermined -
New Zealand has an element of choice about the final outcome. I
believe that the upper trend values outlined in the paper are
well within the resources and capabilities of the community and
should not be regarded as unachievable.

Growth is often measured as an increase in Real Gross Domestic
Product (GDP) per capita. It is generally accepted that growth
in GDP is desirable because it increases the options available to
the community. Unemployment, for obvious social and economic
reasons, is generally regarded as undesirable.

Attaining the twin objectives of growth with full employment
has been frustrated in recent years by a continuing balance of
payments deficit. Ideally, (see Figure 1) given the available
resources, full employment is achieved at a position of sustain-
able balance of payments with community satisfaction increasing
at its highest rate.

## FIGURE 1

### MAJOR POLICY OBJECTIVES



Desirable
improving per capita income

Actual
improving per capita income
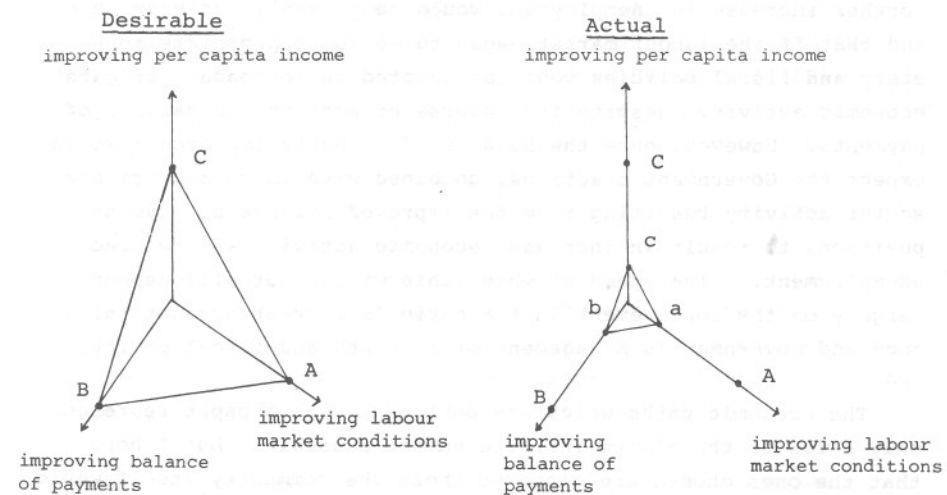
Unfortunately, over recent years the economy has been well
removed from this desired position; the attainment of all objec-
tives - full employment, a sustainable balance of payments, and
maximum desirable growth - is now well below that desired by the
community. It should be the objective of all interested parties
- producers, the Government, trade unions, and the general pub-
lic - to assist in developing policies and strategies that will
help shift the "actual" closer to what is regarded as "desirable".
It is anticipated that this "structural shift" will occur gradually
through increased production of agricultural exports, an ever-
increasing orientation of the manufacturing industry to the ex-
port sector, and import substitution resulting from the large-
scale energy developments proposed for the next 5-7 years. These
developments should gradually reduce the balance of payments
constraint which hopefully should see the attainment of the ob-
jectives of full employment, improving living standards, and a
sustainable balance of payments.

The triangle abc figure 1 illustrates our present economic position. Although appropriate macro-economic policies could reduce unemployment and increase growth this would create an even greater balance of payments deficit. I believe that any further increase in unemployment would be generally unacceptable and that if the labour market began to weaken appropriate monetary and fiscal policies would be adopted to increase aggregate economic activity, despite its adverse effects on the balance of payments. However, once the balance of payments improves I would expect the Government's actions, combined with increased private sector activity resulting from the improved balance of payments position, to result in increased economic activity and reduced unemployment. The speed at which this will occur will depend largely on the improvement in the nation's current account balance and Government's management of monetary and fiscal policy.

The economic paths which are outlined in this paper represent only a few of the almost infinite number possible. But I hope that the ones chosen are close to those the community itself would select, given the constraints and society's goals.

By now it should be evident that I believe that the balance of payments deficit is the prime constraint on our economic growth. This hypothesis, that growth in the external account is the major determinant of the growth rate a nation can achieve in the medium term, has been supported by many others. (See for example, Wilson (1930); Simkin (1951); Weststrate (1966); Monetary and Economic Council Report No. 2 (1962); New Zealand at the Turning Point (1976); Campbell and Haywood (1978); Proctor (1979); Lloyd et.al. (1980).

The external constraint is well recognised during recessionary periods such as at present and that which occurred during 1966-67, for example, when the current account deficit resulted in significantly higher unemployment and lower growth than is generally desired by the community. Not so widely recognised is that it has been what might be called a "foreign exchange ceiling" rather than other supply constraint (such as full employment) that has restricted continued economic growth during higher growth periods. This is not generally recognised by the community because of the higher growth rates achieved during these periods. Of course it is quite possible and probable during the short term (2-5 years) for other factors such as overseas borrowing and counter-cyclical monetary and fiscal policies to cause the domestic economy to move counter to the external position. However, eventually the nation's long-term growth rate must be tied to the growth in the nation's external account, reflecting changes in export growth and/or import substitution.[1] Figure 2 shows the close relationship that has existed between changes in economic activity in New Zealand and its major trading partners.

Currently the nation is faced with the highest unemployment level experienced since the great depression. I personally believe it is desirable for social reasons alone that the level of unemployment does not increase any further. As a consequence the first section of this paper is concerned with estimating the necessary growth required to maintain at a minimum the estimated 1979-80 employment position even though it is likely to have an adverse effect on the current account.

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1. In a recent study Thirlwall (1979) reasoned theoretically and demonstrated empirically that the growth of several developed countries in the post-war period was closely related to their rate of growth of exports divided by their input elasticity of demand for imports. This ratio is regarded by Thirlwall as an approximate measure of a nation's balance of payments equilibrium growth rate.

The remaining sections of the paper are concerned with examining a sustainable balance of payments and the pattern the terms of trade and various components of the balance of payments are likely to display in the medium term. The paper also examines, under the assumptions adopted, if the changes in balance of payments are initially sustainable and secondly if they will eventually allow an increase in growth.

FIGURE 2

DOMESTIC AND EXTERNAL GROWTH CYCLES
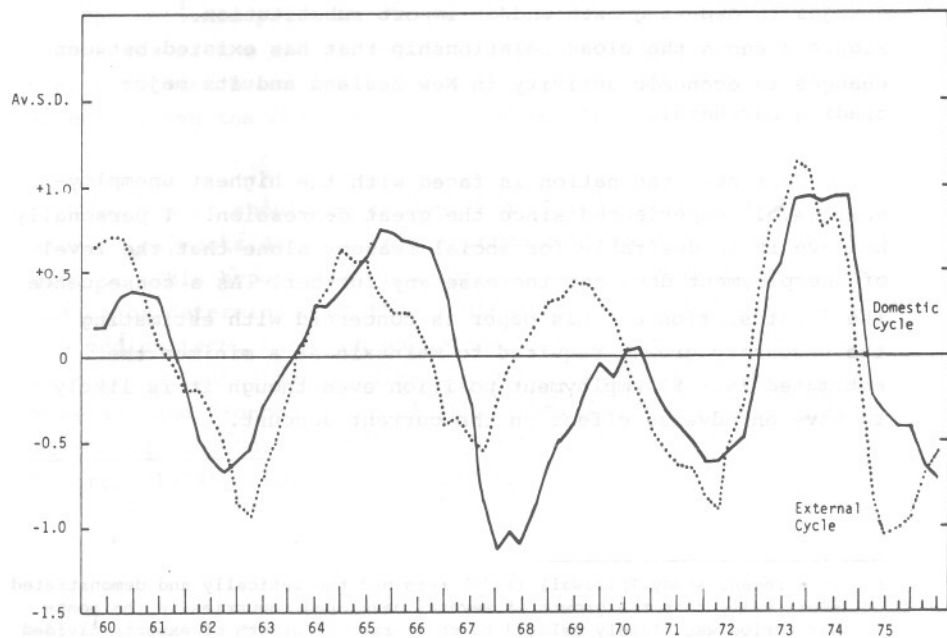


Source:    Haywood and Morgan (1976)

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## ESTIMATES OF REAL GROSS DOMESTIC PRODUCT NECESSARY TO MAINTAIN THE 1979-80 EMPLOYMENT POSITION

The current unemployment position is clearly unsatisfactory both economically and socially. However, owing to the continued deterioration of the external account over recent years a degree of downward internal adjustment has of necessity occurred. By adopting certain demographic and productivity assumptions it is possible to estimate the necessary changes in real gross domestic product required to maintain the present employment participation rate through the decade. Certainly the fine-tuning policy adopted by the Government to maintain aggregate demand to sustain approximately the employment position that has existed over the last year or so tends to support my belief that any marked increase in the registered unemployed would be unacceptable and would be counterbalanced by appropriate monetary or fiscal policies.

(a)    Employment

Over the 3 years ended March 1978 the Department of Statistics estimates that domestic output displayed an average annual growth rate of -0.3 percent. The NZIER has estimated that for the 2-year period ended March 1980 the country experienced an average annual increase in its domestic output of 2.3 percent. These values are well below the average of 3.4 percent per annum recorded over the 23-year period ended March 1978. The recent low growth rate in the nation's output has been associated with little increase in employment. The figures published by the Department of Statistics indicate that between 1974-75 and 1977-78 employment grew at an average annual rate of only 0.4 percent compared with 1.9 percent recorded over the period 1954-78. Although not directly comparable, the Department of Labour's survey of employment suggests that the number in the work force has remained virtually static since 1978. The available data, direct and indirect, would suggest that since 1976 limited growth in employment has occurred. In this paper I have assumed that the average participation rate during the decade ended March 1999 would, as an absolute minimum, remain at the estimated 1979-1980 level; and that

appropriate monetary and fiscal action would be taken, if
necessary, to maintain this.  Of course, if economic
activity rises above the minimum growth rate estimated
then employment, and the average employment rate, will
increase automatically.  Other assumptions underlying the
calculation of the estimates required to maintain the
1979-80 employment position for the 10 years ended March
1990 are:

o  Department of Statistics medium fertility estimate
   adopted;

o  mortality to remain constant over the projection period
   at the level implied by the 1970-72 New Zealand Life
   Tables;

o  Department of Statistics low migration estimate adopted.
   (This assumes an annual immigration of -19,000 (1981),
   -10,000 (1982), -5000 (1983), zero (1984), and 5000
   (1985) onward.)

(b)  Productivity

Conceptual and methodological problems associated with
defining and measuring productivity are well known.[1]  In the
absence of anything better, I have assumed that productivity
can be reasonably measured by total output per person employed.
Problems arising from this measure for the purposes of this
study are minimised if it is found that there has been and is
expected to remain, a stable relationship between changes in
employment and changes in output.

In the long term, productivity is generally regarded as
being determined by the growth and application of capital, tech-
nological advance and its application, managerial skills, the
education of the workforce and its motivation.  In the short
run changes in productivity are largely the direct result of
changes in demand.  This point is illustrated in Figure 3.

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1.  See for example, New Zealand at the Turning Point (1976). p.265-266

FIGURE 3



CHANGES IN REAL GROSS DOMESTIC PRODUCT PER PERSON EMPLOYED

Shaded areas represent periods of economic slowdown or contraction as
denoted in Haywood and Campbell (1976).

P = Peak     T = Trough

which shows that the nation's real gross domestic product per
person employed increases rapidly during periods of expansion
but declines during periods of recession. Blyth and Hamer
(1963) commented in their empirical study of output,
employment, and productivity in New Zealand's manufacturing
industry - "the year by year changes in productivity growth in
most industries are closely connected with changes in gross
output, that is with changes in the volume of production. The
bigger the increase in the volume of production in a year, the
bigger is the increase in productivity that year, due partly to
economy of scale and partly to the existence of under utilised
labour. When production declines productivity declines because
of diseconomies of scale and labour".[1]

Figure 3, and the above quotation suggests that productivity
increases relatively more during times of higher growth, and
decreases relatively more during times of lower growth. This
shows up very clearly in Figure 4: the output and employment
increases in the post-war period are scattered within a narrow
positive band. The regression line for 1964-78 suggests that
above a growth rate of approximately 0.5 percent marginal
productivity is increasing, and below this value marginal
productivity is declining and reaches a negative value at a
growth rate of about 0.5 percent. Expressed in simpler terms
the higher the growth rate, the lower the relative increase in
employment required to produce the increased output.

$$\% \ EMP = \ .339 + .475 \ \% \ RGDP \quad r^2 = .85$$
$$(7.88)$$

Period 1965-78

"t" statistics in parenthesis

D.W. = 1.78

F statistic = 62.07

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1. Blyth and Hamer (1963) p.7. The view that productivity
   moves positively with general economic activity is also
   shared by Dornbusch and Fischer (1978) pp.348-50.

## FIGURE 4

### CHANGES IN DOMESTIC OUTPUT AND PERSONS EMPLOYED



a - regression line based on years 1965-78

b - for interest it was decided in the above figure to include
    values covering a longer period than that adopted as the
    base period used for regressions in this paper of 1965-78
    to see how stable the relationship between output and
    employment changes has been in the post-war period. An
    inspection shows that the estimated equation covering the
    23 years ended March 1978 (see below) is very close to
    that derived for the shorter period 1964-78.

$$\% \ EMP = .429 + .412\% \ RGDF \quad r^2 = .76$$
$$(8.06)$$

Period 1955-78

"t" statistic in parenthesis

D.W. = 2.17

F statistic = 65.03

The relationship between changes in output and employment displayed in figure 4 suggests that if New Zealand were able to maintain a high effective demand then it would also be able to achieve a more satisfactory growth in productivity.  If this is so then it is possible that New Zealand's low productivity is largely a symptom rather than a cause of its inability to sustain a higher growth rate.  This is the opposite of the often held view  which regards the nation's low productivity as a major cause of the nation's low growth rate.  However, it must be recognised that increasing productivity is more than just a function of demand alone.  It may well be that the established productivity pattern is significantly different from that in other countries because of such factors as work attitudes, managerial ability, a short working week, and so on.  Although this is possible, available data suggest that if New Zealand were able to sustain a reasonably high growth rate, which through increased and more efficient investment and increased use of available resources, generated increased productivity, this would eventually see New Zealand well placed in the international productivity stakes.

It is of course extremely desirable from New Zealand's point of view to move the estimated relationship in Figure 5 to the right (i.e. increase the relative growth in output per given employed person).  However as stated in New Zealand at the Turning Point:- "While it is easy to say (and so often is) that greater productivity is required, it is equally easy to overlook the fact that this implies that hard decisions will have to be made."[1]  To date the stability of the estimated relationship suggests that policies and other developments over the last few years have not been successful in shifting the relationship, although they may well have been successful in keeping it close to its historical relationship.

Future developments in output per employed person are far from clear.  It has been noted in a number of Western countries that since about 1973 (see table 1) the rate of growth of output per employed person has slowed down.

### TABLE  1

### GROWTH RATES IN REAL GDP PER EMPLOYED PERSON IN SELECTED INDUSTRIAL COUNTRIES

| | Average growth rate % | |
|---|---|---|
| | 1960-73 | 1973-77 |
| Canada | 2.4 | 0.5 |
| France | 4.6 | 2.9 |
| Italy | 5.8 | 0.2 |
| Japan | 8.8 | 2.7 |
| NEW ZEALAND | 1.9 | 1.6 |
| United Kingdom | 2.6 | 0.4 |
| United States | 2.1 | 0.3 |

Source:  Denison (1979), New Zealand Year Books, Monthly Abstract of Statistics

1. New Zealand at the Turning Point (1976) p.267

Productivity in New Zealand, as in many other countries, has been declining since 1973. But during 1973-77 the decline in New Zealand was lower than in many other countries mainly because of the Government's attempt to isolate the domestic economy from the external recession by high overseas borrowing. But by 1977 the Government was forced to recognise it could no longer maintain domestic activity at such a high level by overseas borrowing. Consequently, in 1978 the effects of the world recession were reflected in domestic activity and productivity. The latest official figures available indicate that during the year ended March 1978 output per employee displayed an absolute decline of -2.4 percent.

In a detailed analysis of the decline of productivity in the United States since 1973 Denison (1979) concluded that most of the decline could not, as was commonly believed, be attributed primarily to factors related to the slower increase in output. It seemed to result more from residual determinants classified by Denison as - "advances in knowledge and miscellaneous determinants". Denison examined a total of 17 reasons that might explain the fall in the "residual" category. These included the curtailment of expenditures on research and development, the decline in opportunities for major new advances, the increased lag in the application of knowledge due to the aging of capital, the diversion of inputs to comply with government regulations, government imposed paperwork, regulation and taxation which resulted in misallocation of resources, the reduction of work incentives, and the effect of increasing inflation for example. Denison concluded, perhaps not surprisingly, that no single hypothesis seemed to provide a total explanation of the sharp decline in productivity in the United States after 1973. He suggested that it was likely that everything went wrong at once among the determinants that affect the residual series after this date.

It is unclear whether the recent trends that have caused a reduction in productivity per employee in most western economies will continue or be reversed in the medium term. It has been suggested, for example, by a number of people that the recent development of the "silicon chip" will have a significant

influence on productivity in the medium term. However, not all people subscribe to this view: they point out that the "chip" has only limited application at this stage, that it will not be introduced overnight, and that its influence will be at the margin which means at the best it will have a very limited impact on average productivity in the medium term.

Given the current uncertainty about the likely movement in output per employed person, I decided in this preliminary study to assume that the average relationship that has existed between changes in employment and output will continue to exist through the next decade.

Combining the estimated relationships between changes in output and employment with the estimated increase in employment that would maintain, at a minimum, the current employment position the macro-economic values set out in Table 2 were obtained.

## TABLE 2

### REAL GDP GROWTH RATES NECESSARY TO MAINTAIN THE 1979-80 EMPLOYMENT POSITION DURING 1980-90

| Years ended 31 March | Percent Change | | |
| --- | --- | --- | --- |
| | Employment | Real GDP | Output per person employed |
| 1971 | 2.7 | 3.7 | 1.0 |
| 1972 | 1.2 | 2.5 | 1.3 |
| 1973 | 1.4 | 4.4 | 3.1 |
| 1974 | 3.7 | 7.2 | 3.4 |
| 1975 | 2.6 | 4.0 | 1.4 |
| 1976 | 0.8 | 1.7 | 0.8 |
| 1977 | 0.8 | 0.1 | -0.6 |
| 1978 | -0.3 | -2.7 | -2.4 |
| 1979 | 1.5$^b$ | 2.5$^a$ | 1.0$^b$ |
| 1980 | 1.3$^b$ | 2.0$^a$ | 0.7$^b$ |
| 1981 | 0.6 | 0.8 | 0.3 |
| 1982 | 1.0 | 1.5 | 0.6 |
| 1983 | 1.2 | 2.0 | 0.8 |
| 1984 | 1.5 | 2.5 | 1.0 |
| 1985 | 1.7 | 2.9 | 1.2 |
| 1986 | 1.5 | 2.5 | 1.0 |
| 1987 | 1.3 | 2.1 | 0.8 |
| 1988 | 1.3 | 2.2 | 0.9 |
| 1989 | 1.2 | 2.0 | 0.8 |
| 1990 | 1.3 | 2.1 | 0.8 |

a. NZIER Estimate - Quarterly Predictions, June 1980

b. Estimated using the relationship shown in Figure 5 based on the balues of (a).

## SUSTAINABLE BALANCE OF PAYMENTS

New Zealand's external account has, both by design and accident, in the long run recorded a deficit. This means the domestic economy has been living beyond its income and the deficit has been made up by borrowing overseas. Table 3 shows that since 1950 New Zealand's current account balance as a percentage of its money gross domestic product has averaged a deficit of -2.3 percent. There is of course no reason why policy-makers should aim to balance the external account if New Zealand can borrow under reasonable conditions from overseas and this money is used to fulfill a number of important objectives such as improving stock of capital equipment for example. Over shorter periods significant variations in the size of the deficit in relation to domestic activity have occurred. During the stable and full employment years of the 1960s and early 1970s, with the exception of the short recession of 1966-67, the external deficit in relation to domestic activity averaged -1.4 percent. But since 1974, partly due to increased oil prices, the deficit has risen substantially. It averaged -6.7 percent in the 6 years ended March 1980. In the early part of this period the Government attempted to cushion the domestic economy, and especially employment, from the full effects of the OPEC oil price rises, and the resulting downturn in the international economy that followed. However, the resulting deficits which averaged -9.4 percent during 1975-77 were regarded as too high to be sustained indefinitely. Domestic activity was therefore gradually reduced (despite its effect on employment) to being the external deficit down in relation to domestic activity. For the most recent 3-year period the deficit has averaged about -4.0 percent of domestic activity.

The above description of the pattern of New Zealand's external account in the post-war period shows clearly that there is no single figure of the current account balance to domestic activity that can, or should, be regarded as sustainable. The figure will vary from period to period and will depend on a multitude of factors, including the Government's objectives regarding employment, the desired level of domestic activity, the ability to borrow overseas, cost of borrowing,

## TABLE 3

### CURRENT ACCOUNT BALANCE AS A
### PERCENTAGE OF MONEY GROSS DOMESTIC PRODUCT

| Year Ended 31 March | Percent | Average annual percent |
|---|---|---|
| 1950 | +0.7 | |
| 51 | +4.0 | |
| 52 | -4.2 | |
| 53 | -0.6 | |
| 54 | +4.3 | |
| 55 | -3.8 | -2.3% |
| 56 | -3.0 | |
| 57 | -1.4 | |
| 58 | -4.1 | |
| 59 | -1.7 | |
| 1960 | +3.3 | |
| 61 | -4.1 | |
| 62 | -4.2 | -1.4% |
| 63 | -1.6 | |
| 64 | -0.9 | |
| 65 | -1.0 | |
| 66 | -4.6 | |
| 67 | -4.0 | |
| 68 | -2.0 | |
| 69 | +1.1 | |
| 1970 | +0.6 | -2.9% |
| 71 | -3.5 | |
| 72 | -0.2 | |
| 73 | +1.8 | |
| 74 | -1.1 | |
| 75 | -13.5 | -3.9% |
| 76 | -8.7 | |
| 77 | -5.9 | -6.7% |
| 78 | -4.7 | |
| 79 | -2.7 * | |
| 1980 | -4.7 * | |

\* Estimated

the reasons for the borrowing (i.e. whether it was primarily for consumption or investment) the expectations about the future balance of payment position, the world liquidity situation and so on.

As a consequence, the analysis of past relationships in this area provides only a rough guide to the balance of payments deficit that is likely to occur over the next 10 years - the forecasting horizon of this paper.

It is widely recognised that the Government in the intermediate period faces many problems. Already over the last few years it has adjusted the domestic economy down to reduce what is clearly believed was an unsustainable balance of payments deficit. However, an undesirable consequence has been an increase in the number of unemployed to its highest post-war level. Government action over the last 2 years has been aimed at maintaining domestic activity at about a level that will ensure the unemployment problem does not deteriorate significantly, despite the possible effects such a policy will have on the external accounts. At the same time policies have been undertaken to restructure the economy (particularly to increase exports, and to reduce the effects of previous and possible future oil price rises) by adopting a policy of large-scale import substitution. It is recognised that the large-scale projects required to reduce dependence on imported oil will lead to a significant increase in capital imports in the short-run, and consequently will worsen the balance of payments. However, it is believed that since these imports are investment for export and import substitution at a later date the increasing deficit resulting from undertaking these projects is sustainable. Clearly a different view would be obtained if the increase in the deficit had been used primarily for domestic consumption. The picture that emerges from the above discussion, and the one adopted in this paper, is that for political, social and economic reasons the Government will probably accept an increasing external deficit in the short run to maintain domestic activity and to ensure the labour market is not further weakened. It expects a deterioration

in the current account as it undertakes the large-scale import substitution programme. But the Government would probably be very unhappy if the deficit got close to the position of 1974-75 - about -13 percent of domestic activity. If this happened it seems likely that Government would once again have to undertake policies to reduce domestic activity even further. In the longer term as the current account balance improves (because of increased exports resulting from the recent restructuring policies undertaken by the Government), and as exports increase and imports reduce (with the completion of the large-scale projects) domestic expansion will be able to take place.

As already mentioned, if in the short run the deficit approaches the 1974-75 ratio it is likely the Government would regard the position as undesirable. However, I believe that a deficit of up to 6-8 percent of domestic activity would be acceptable in the short run. It is difficult to assess at what point the Government would promote or accept an expansion in economic activity to reduce unemployment. But given the amount of unemployment at present, it would probably be less than in the 1960s and early 1970s of -1.4 percent. I have assumed that if the current account deficit as a percentage of domestic activity was less than about 2.5 percent then Government would allow, it would undertake action itself to increase domestic activity.[1] This means that over the next decade the average annual current account balance as a percentage of domestic activity could be expected to be significantly greater than in the post-war period. This reflects the fact that conditions today and those expected to occur are very different from those of the past. Consequently, past values are of little use in determining expected future values.

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1. This expected policy response to the external deficit follows closely that expressed by the Planning Council in its various publications. See, for example, Planning Perspectives (1978)p.30; Economic Strategy 1979 p.11; Implications of New Energy Developments (1979)p.19.

TERMS OF TRADE

Three reports published in 1977-78 (OECD Survey of New Zealand (1977), New Zealand's Medium Term Outlook (1978), and Planning Perspectives (1978) which examined New Zealand's economi prospects in the medium term all emphasised the importance of the terms of trade in determining the final outcome of the balan of payments. This view in many ways reflected the significan movement that had been recently displayed by the series; falling from a historical high of 113 (1957=100) in 1972-73 to 72 in 1975-76. All studies (see table 4) indicated that they expected an improvement in the terms of trade in the intermediate period.

TABLE 4

TERMS OF TRADE PREDICTIONS

(1957=100)

| Year ended June | NZPC[a] | OECD[b] | NZIER[c] | Actual |
|---|---|---|---|---|
| 1976 | 72 | 72 | 72 | 72 |
| 1977 | 77 | 74.2 | 75[d] | 79 |
| 1978 | 79 | 76.4 | 78[d] | 78[f] |
| 1979 | 80 | 78.7 | 81[d] | 85 |
| 1980 | 80 | 80.9 | 84[d] | |
| 1981 | 80 | 83.1 | 87[d] | |
| 1982 | 80 | 85.3 | 87[e] | |
| 1983 | 80 | 87.5 | 87[e] | |
| 1984 | 80 | 89.8 | 87[e] | |
| 1985 | 80 | 92 | 87[e] | |

a. Planning Perspectives (1978), p.99
b. OECD Survey of New Zealand (1977), p.32
c. E. Haywood (1978), pp95-96
d. Although the effects of using three alternative terms of trade assumptions were examined the author assumed (see p.101) the most likely to occur terms of trade would be midway between the "cautious" and "optimistic" options.
e. Assumed to be the value chosen if the study's time horizon was extended to 1985.
f. Provisional

Both the OECD and the NZIER expected the terms of trade
to slowly improve over the forecast period to a level in 1984-
85 some 2-7 points below the average value displayed during
the last 20 years, but the Planning Council was somewhat less
optimistic. It believes that New Zealand would continue to
experience a significant structural change in its terms of
trade in the medium term which would fluctuate about 12
points below the historical average of 94 (i.e. the average
for the two decades ended June 1978).

The Council's most recent economic report - Economic
Strategy 1979 states that "Recent developments have been con-
sistent with the assumptions made in Planning Perspectives
that the terms of trade ... would continue to improve
moderately. They may indeed, in the coming year, rise above
the figure of 80 we suggested the Government should assume as
the average which would prevail between 1978 and 1983. Never-
theless, we would stick to this assumption for the medium term
as this stage."[1]

Available information indicates that in 1979 and 1980 New
Zealand's terms of trade reached into the mid-80s.

Although New Zealand has experienced a downward shift in
its terms of trade (caused primarily by the phenomenal increase
in the relative price of oil during the early 1970s) I do not
expect this downward shift to be as great in the medium to long
term as that suggested in Planning Perspectives (1978). At
present there seems to be two basic schools of thought on the
likely movement of oil prices in the medium term. One school
stresses the relative monopoly position of the oil producers,
and suggests that they will continue, as they have since 1973,
to take advantage of this by increasing the relative price of
oil in the short to medium term. The other school believes
that the cartel of oil producers is well aware of the dis-
ruptive effects sudden and large increases in the price of oil
has on the world economy. In addition, advocates of this
view believe that the price of oil is now almost at a level
which, when combined with countries' needs for uninterrupted
supply, could precipitate a massive switch to substitutes.

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1. Economic Strategy 1979, pp.9,11.

Consequently, they suggest that the relative real price of oil
will remain fairly static in the medium term, although there
could well be a relative shift over the next 2-3 years.

The relative shift in the price of oil over recent years has
had, and is continuing to have, a quantity effect on the composi-
tion of New Zealand's imports which by itself is likely to reduce
the relative importance future oil price increases will have on
New Zealand's terms of trade. In addition, New Zealand has
already begun to substitute locally derived fuel sources such as
coal, gas, and timber for imported oil. In the medium to long
term, this will significantly affect New Zealand's terms of
trade. However, some people believe this improvement may be
offset because in the post-war period our terms of trade have
followed a declining trend. In New Zealand at the Turning Point
(1976) the trend in New Zealand's terms of trade was estimated
by fitting a simple exponential growth model to both import and
export prices during the first quarter 1960 - fourth quarter
1975. The results indicate a quarterly compound growth rate
of 1.34 percent for import prices and 1.12 percent for export
prices, and consequently an implicit negative compound growth
of 0.23 percent a quarter for the terms of trade. However, over
the next 3½ years (i.e. to the second quarter 1979) import prices
rose by 27 percent and export prices by 53 percent. Using the
same approach and including this additional data, the following
results were obtained: a compound growth of 1.17 percent per
quarter for export prices and 1.21 percent for import prices.
This implies a negative trend in the terms of trade over the
estimated period of a mere 0.03 percent per quarter or 0.12 percent
per year. This is significantly less than the almost 1 percent per
annum decline estimated in the original study.[1]

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1. Such a result was not unexpected. If a period does not begin and end at
   the same cycle phase (e.g. peak to peak or trough to trough) or does not
   include complete cycles of unusual magnitude at either end, then, a priori,
   the results can be expected to be biased in a particular direction, but this
   is likely to be reversed with the inclusion of additional data. For example,
   in New Zealand at the Turning Point (1976) the starting date (first quarter
   1960) is about midway between the series long-term trend and a localised
   cyclical high point; and the ending date (fourth quarter 1975) corresponds
   to a cyclical trough position of unusual depth. The inclusion of additional
   data which completes the cycle results in a significant upward movement in
   the series trend. Given that it is believed that New Zealand's terms of trade

Taking all factors into account I have assumed, perhaps pessimistically, that New Zealand will experience an average terms of trade value of 82 (1957=100) over the years 1981-90.

The forecast trend value of 82 is lower than the value of 85 recorded for the last year for which data is available: year ended June 1979. However, it is generally agreed that this recent value reflects a local cyclical high in the terms of trade rather than an average value likely to occur in the medium term. In view of the higher rate of price increases in recent years, along with the expectation that these higher rates are likely to continue, I have assumed that both import and export prices will grow at an annual rate of 11 percent rather than the 8 percent adopted in Planning Perspectives (1978).

TABLE 5

| Year ended 31 March | Import Prices | Export Prices | Terms of Trade |
|---|---|---|---|
| | | (1957=100) | |
| 1981 | 471 | 386 | 82 |
| 1982 | 522 | 428 | 82 |
| 1983 | 580 | 475 | 82 |
| 1984 | 644 | 527 | 82 |
| 1985 | 715 | 585 | 82 |
| 1986 | 793 | 650 | 82 |
| 1987 | 880 | 721 | 82 |
| 1988 | 977 | 801 | 82 |
| 1989 | 1085 | 889 | 82 |
| 1990 | 1204 | 987 | 82 |

. have recently reached a cyclical high it could be expected, if one uses the same model as New Zealand at the Turning Point (1976), that over the next 2-3 years the trend in the series will once again display a gradual downward movement.

## EXPORTS

An important element of the Planning Perspectives (1978) projections was the assumption that average annual growth would be 2 percent for traditional exports (meat, wool, and dairy products) and 10 percent for non-traditional exports (forest products, manufacturing, and other primary products). It was recognised that this represented a significant shift in trend from the recent past, especially for traditional exports. However, it was believed that appropriate policies and signals would emerge which would lead to improved investment, production and in certain cases diversion from the home market to the export sector.

### TABLE 6

#### ANNUAL CHANGES IN THE VOLUME OF EXPORTS BY MAIN INDUSTRY GROUPS

| Year ended 30 June | Agricultural Production | Fisheries | Forestry | Manufacturing | All Groups[a] |
|---|---|---|---|---|---|
| | | (percent) | | | |
| 1972 | 2.4 | 2.2 | 10.1 | 11.6 | 4.8 |
| 1973 | -0.3 | -9.3 | 6.3 | 21.0 | 2.5 |
| 1974 | -14.0 | -9.3 | -4.8 | 7.8 | -11.3 |
| 1975 | -2.4 | 11.1 | -7.9 | 5.4 | -2.5 |
| 1976 | 17.5 | 10.4 | 19.6 | 23.1 | 17.8 |
| 1977 | 7.3 | 14.5 | 20.6 | 22.8 | 10.7 |
| 1978 | -6.5 | 4.4 | 3.0 | 7.9 | -3.4 |
| Annual average | | | | | |
| 1972-78 | +0.6 | +3.4 | +6.7 | +14.2 | +2.7 |

a - Also includes the fuel and power, and mineral resources industry groups.

In 1977-78 (the most recent year for which official figures are available) the volume of agricultural exports fell by 6.5 percent while manufacturing exports rose by 7.9 percent. The total volume of exports in 1977-78 declined by 3.4 percent. The NZIER has estimated that in 1978-79 the total volume of exports rose by 5.6 percent but since that time the rate of increase has been tapering off and is estimated to be 2.0 percent for the year ended June 1981.[1]

## (a)  Optimistic Export Trend Projections
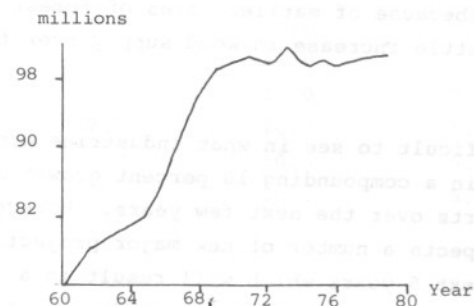
### Traditional Exports

Planning Perspectives (1978) recognised that its assumption of an annual growth rate of 2 percent in livestock numbers and traditional exports over the 8 years ended March 1985 was a major change from the pattern in the immediate past. However, it was believed that appropriate policies would be adopted to encourage higher investment in this sector, and consequently higher output. Although policies generally have been in this direction, so far they have been frustrated by other factors, particularly cost increases which have affected the sectors ability to undertake increased investment. In addition, adverse weather in recent years has markedly affected the sector's output. As a consequence of these and other factors, the expected improvement in agricultural exports has not occurred. There appears now to be general pessimism about the possibility of this sector achieving the expected average annual growth rate of 2 percent over the next 5 years.  Investment Issues  (1980) stated: "There can be no confidence that the recent level and composition of investment in pastoral agriculture will produce the 2 percent growth rate per annum in the volume of production and exports ... considered necessary for future balanced growth in the economy". A view also held by McLean (1978), and more recently L.C. Bayliss (1978) who concluded although farm production is capable of achieving 3 percent growth, it would be remarkable if the present policies achieved 1 percent growth.

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1.  Since future values in this paper are derived by applying percentage changes to a base year value the base value chosen is of critical importance. For further discussions of this aspect and its importance see Appendix A.

In this context it is perhaps worth noting that livestock units in the nation have remained stable over recent years as clearly illustrated in Figure 5. However, recent estimates suggest sheep numbers in particular have recorded a sharp increase over the last year.

### FIGURE 5

### TOTAL STOCK UNITS



millions

Source:  Land Alone Endures (1980) p.121.

To reflect the view that agricultural production will increase in the next few years I have assumed that traditional exports will grow by 1 percent in 1980-81, and will increase in a linear manner to 2 percent in 1984-85, after which they will increase at 2 percent per annum to 1990. However, to sustain this rate of increase, will I believe, require a change in existing policies to maintain the sector's disposable income to allow continued investment necessary for sustained growth to occur.

Although some may feel the increase in traditional exports adopted, averaging 1.8 percent per annum over the decade ended March 1990, is less than that which could be achieved it does represent a significant change in the trend growth displayed by the sector over the last several years, 1972-78, where the volume of agricultural exports rose at a mere 0.6 percent per annum.

## Non-traditional Exports

Although the volume of the main categories of non-traditional exports (see Table 6) increased in 1977-78, the total increase was well below the projected 10 percent adopted in _Planning Perspectives_ (1978).[1]

In recent years the two main factors contributing to high growth in non-traditional exports have been the expansion in wood-product and aluminium exports. However, it is not expected that the forest industry will display the same high growth in the medium-term as (because of earlier rates of forest establishment) there will be little increase in wood supply over the next 7-10 years.[2]

It is difficult to see in what industries growth will occur which will sustain a compounding 10 percent growth in _total_ non-traditional exports over the next few years. However, _Investment Issues_ (1980) expects a number of new major projects to be under-taken over the next 5 years which will result in a significant increase in exports of non-traditional products. Accepting this possibility I have assumed that non-traditional exports, in volume terms, will grow by 6.8 percent in 1980-81 and increase in a linear manner to 10 percent in 1984-85 after which non-traditional exports will display a constant annual increase of 10 percent per annum.

In total the volume of all exports, traditional plus non-traditional (see Table 8) by this estimate will grow at an average annual rate of 3.8 percent in the 5 years ending March 1985 and by 5.3 percent during 1985-1990, compared with an average annual increase of 2.3 percent in the most recent 5-year period for which data is available.

---

1. If this increase in non-traditional exports did occur then by 1990 non-traditional exports would be about the same as traditional exports. At present they represent approximately 30 percent of total exports.

2. For example as stated in _Investment Issues_ (1980) "In 1978-79 New Zealand produced 9.15 million cubic metres of exotic logs of which 59 percent was exported. ... Productive capacity is expected to remain at about this level throughout most of the decade". p.30.

### TABLE 7

### VOLUME OF EXPORTS TREND ESTIMATES

| Year ending 31 March | Optimistic Estimate | | | Cautious Estimate |
|---|---|---|---|---|
| | Traditional | Non-traditional | Total | Total |
| 1981 | 1.0 | 6.8 | 2.7 | 2.5 |
| 1982 | 1.3 | 7.6 | 3.3 | 2.5 |
| 1983 | 1.5 | 8.4 | 3.8 | 2.5 |
| 1984 | 1.8 | 9.2 | 4.3 | 2.5 |
| 1985 | 2.0 | 10.0 | 4.9 | 2.5 |
| 1986 | 2.0 | 10.0 | 5.0 | 2.5 |
| 1987 | 2.0 | 10.0 | 5.1 | 2.5 |
| 1988 | 2.0 | 10.0 | 5.2 | 2.5 |
| 1989 | 2.0 | 10.0 | 5.5 | 2.5 |
| 1990 | 2.0 | 10.0 | 5.6 | 2.5 |

### (b) Cautious Export Trend Projections

In this estimate I have assumed that total exports will grow at a trend growth rate close to that estimated to have occurred over the last eight years of about 2.5 percent per annum.

Although it seems to be widely believed that restructuring the economy in recent years had led to an improvement in the volume of goods exported, the recorded and available forecasts to June 1981 suggest that to date a significant increase has not occurred. Recorded and forecast figures (see Table 8) suggest that the annual increase in export volumes over the 4 years ending June 1981 will average 2.0 percent per year compared with an average annual value of 2.8 percent recorded over the 11 years ending June 1981. Consequently, a value of 2.5 percent per annum for the next decade may not be as pessimistic as widely believed. It is perhaps worth being reminded that it

is generally accepted (see Economic Outlook, OECD, July 1980)
that the world economy will experience a significant slowdown
in its rate of growth in the early 1980s making it more
difficult for New Zealand to achieve an increase in its total
export volumes over the next few years.

## TABLE 8

### PAST TRENDS IN THE VOLUME OF TOTAL EXPORTS

| Year ended 30 June | Annual Percent Change | Average Annual Percent Change |
|---|---|---|
| 1971 | +0.3 | |
| 1972 | +4.8 | |
| 1973 | +2.5 | |
| 1974 | -11.3 | +2.4 |
| 1975 | -2.5 | |
| 1976 | +17.8 | |
| 1977 | +10.7 | +2.8 |
| 1978 | -3.4 | |
| 1979 | +5.5[a][b] | |
| 1980 | +4.0[a] | +3.8 |
| 1981 | +2.0[a] | +2.0 |

a - NZIER estimate Quarterly Predictions, Sept. 1980. p.21

b - Since this section was written Official figures for the volume
of exports for the year ended June 1979 have become available
(Monthly Abstract of Statistics, Sept. 1980 p.55) indicating
that total exports over the year increased by 9.0 percent
compared to 5.5 percent as estimated by the NZIER in its
September Quarterly Predictions and a provisional value of
5.6 percent given in New Zealand Economic Survey, OECD,
March 1980.  As a consequence instead of total export
growth displaying an estimated average value of 2.0 percent for
the last 4 years ended 1981 the value should now read 2.9 percent.
Such changes as this in values, now almost two years in the
past, are not unusual and highlights the view adopted in this
report which is concerned with trend movements that one shouldn't
place undue emphasis on single annual values.  The last few
months have seen a marked change in attitude in certain quarters
about the likely growth traditional exports will display in the
medium-term to that which existed some 9-18 months ago.
However, such swings about the medium-term potential of export
growth are not uncommon and in many ways reflects the cyclical,
as opposed to the trend growth, of the series itself. For
example over the five years ended June 1978 although the series
displayed an average annual growth of 2.3 percent the period
commenced with a negative growth rate of -11 percent rising
to a positive value of +18 percent in the middle year, falling
to a negative value of -3 percent in the terminal year.  The
point is that the estimates adopted in this paper are trend
values about which at times significant variations can and
are likely to occur.  Consequently, the values presented
here should not be viewed as precise estimates of any one year
but rather as the trend likely to be occurring in the series
at about that time.

## IMPORTS

The change in import volumes over the last 3 years has been different from that originally anticipated. All the medium-term studies published in 1977-78 were in agreement that the income elasticity of demand for imports in the medium term would be lower than the historical rate, reflecting an expected increase in national income less than the historical average. The OECD in making their projections assumed an income elasticity to import of 1.1 at the 1 percent growth in GDP and 1.5 at 3 percent; Planning Perspectives (1978) adopted an elasticity of 1.0 for both 1 percent and 3 percent growth, and in the NZIER's medium-term report an elasticity of 0.9 percent at a real domestic growth rate of 2 percent was adopted. Over the 3 years ended March 1980 it is estimated that the economy grew at an annual rate of approximately half a percentage point while the volume of imports over the period displayed an average annual decline of 3.5 percent. Clearly then in the first 3 of the 8 years covered by the Planning Perspectives (1978) projections there has not been a stable positive relationship between changes in growth of the economy and changes in import volumes in the manner prescribed.

Looking back at the historical relationships that have existed between changes in imports and changes in income it now seems surprising that the reports adopted a single income elasticity of import value when this value has displayed such large short-term variations. It has been negative during periods of low growth (for example, such as those displayed recently and during the 1966-67 recession) but has become strongly positive during high growth rate periods (such as that during 1973-74). However, perhaps the rationale adopted in these reports was that over most 5-year periods, owing to the relatively short nature of New Zealand's economic cycles, the average elasticity value over the whole period has tended to be close to the value suggested in the various medium-term studies.

Previous medium-term studies related the change in import volumes to the change in real gross domestic product as a constant percentage. But adopting a constant value was the prime cause of the 1977-78 studies over-estimating import volumes during 1977-80.[1]

I decided in this paper to divide imports into two basic categories:

    (a)   capital, and

    (b)   consumer and intermediate;

and to provide separate estimates for each which would include the possibility of changes in the elasticity value. Not only does this division seem a more appropriate method conceptually to estimate or project import volumes in the medium term, but it also enables the estimates of real gross investment as outlined in Investment Issues (1980) to be incorporated so that their effects on the balance of payments in the medium term can be examined.[2]

### (a)  Capital Imports

Table 9 shows that on average about 40 percent of imports are capital related and 60 percent are consumption items and/or material used in production of consumer goods. Although the relationship between gross investment and imports of capital equipment and components has been fairly stable, there has not been a stable constant relationship between domestic real growth and changes in real gross investment (i.e. that an

---

1. In Planning Perspectives (1978) a price elasticity of demand for imports of 0.5 was assumed. However, since domestic prices are assumed to be rising at the same rate as world prices after the first year, there seemed little point in introducing a relative price factor in the calculations, as it would not operate after the first year.

2. It should not be inferred that because this paper examines the effects that the proposed large-scale energy and non-energy programmes are likely to have on future growth, the proposed programme represents the most profitable use of overseas and domestic resources. The question of the most satisfactory use of resources, particularly scarce foreign exchange resources, while extremely important for the nation, is beyond the aims of this current study. For an interesting debate on this subject in the New Zealand context see van Moeseke (1980) and McDonald (1980), (1980a), (1980b).

increase in real income will result in a fixed percentage
increase in capital investment). Investment theory suggests
that the higher the domestic growth, the greater will be the
relative percentage increase in gross capital formation.

TABLE 9

CAPITAL GOOD IMPORTS AND GROSS FIXED

CAPITAL FORMATION

| Year ended March | Capital [a] Goods Imports ($m) | Gross Fixed Capital Formation ($m) | Capital Imports as % of Total Imports | Capital Imports as % of Gross Fixed Capital Formation |
|---|---|---|---|---|
| 1975 | 1123 | 2573 | 41 | 43 |
| 1976 | 1259 | 3128 | 43 | 40 |
| 1977 | 1382 | 3448 | 39 | 40 |
| 1978 | 1248 | 3393 | 38 | 37 |
| 1979 | 1420 | 3565[b] | 37 | 40 |

a - The following weights were applied to the main groups of
goods imported to derive an estimate of imported capital
goods.

| | Proportion assumed to be capital |
|---|---|
| Finished capital goods | 1.0 |
| Components and materials for capital goods | 1.0 |
| Finished goods and components - consumption and capital | 0.5 |
| Consumer goods | 0.0 |
| Other | 0.2 |

b - NZIER estimate

FIGURE 6

CHANGES IN DOMESTIC OUTPUT
AND CAPITAL INVESTMENT

Percentage change in real gross capital investment
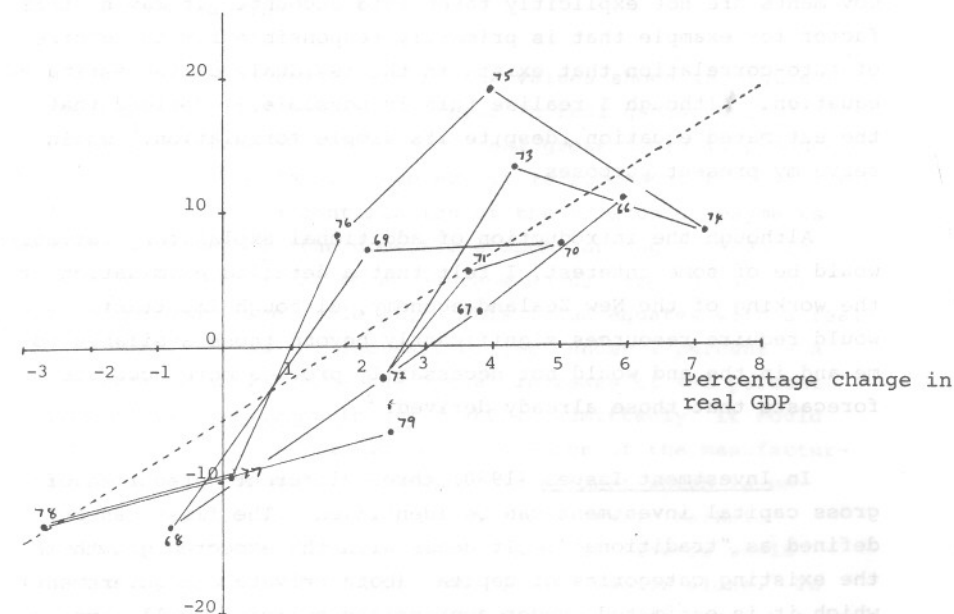


A simple regression between changes in real domestic capital
formation (RGCF) and real gross domestic product (RGDP)
portrayed in figure 6, produced the following equation.

%RGCF = -5.174 + 3.037% RGDP   $r^2$ = .65
(4.55)
Period 1965-78

"t" statistic in parenthesis

D.W. = 2.66

F statistic = 20.73

I readily admit that the estimated relationship shown in figure 6 is simplistic. For example, stocks could be expected to play a role in determining the slope of the estimated function. During the expansion phase of the cycle businessmen will tend to overstock for a variety of reasons, (such as the expectation that the prevailing high growth rate will continue) and in the downward phase the opposite pattern tends to take place. The "stock cycle" will tend to exaggerate the calculated elasticity if stock movements are not explicitly taken into account. It may be this factor for example that is primarily responsible for the degree of auto-correlation that exists in the residuals of the estimated equation. Although I realise this is possible, I decided that the estimated equation, despite its simple formulation,[1] would serve my present purposes.

Although the introduction of additional explanatory variables would be of some interest, I felt that a detailed examination of the working of the New Zealand economy, although important, would require resources significantly beyond those available to me and in the end would not necessarily provide more accurate forecasts that those already derived.[2]

In Investment Issues (1980) three different categories of gross capital investment can be identified. The first can be defined as "traditional". It deals with the expected growth in the existing categories of capital (both private and government) which it is estimated, under appropriate policies, will display

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1. Although no defense, a similar approach has been used in a number of previous New Zealand studies, see for example, Hampton (1970), Brownlie and Hool (1971), and more recently Proctor (1979). For a readable summary of previous New Zealand studies concerned with estimating annual import functions see Deane and Lumsden (1972).

2. Need the reader be reminded that the complex and very expensive econometric models developed in the 1960s completely failed to forecast the changes that occurred in the 1970s. For an interesting short article on the failure of the econometric models to forecast the 1970s see F. Tippett's article "Why Forecasters Flubbed the 70s", Time, 21 January 1980, pp.63-64.

an average annual real growth of between 4-5 percent during 1980-85 within a GDP growth rate averaging about 2 percent per annum. The second and third categories are associated with large-scale investment projects in non-energy areas (e.g. New Zealand Steel expansion, ferro-silicon plant, cement plant, etc.) and energy production (e.g. refinery extension, ammonia-urea plant, CNG conversion, LPG conversion, etc.) These, it is suggested, could add an additional $4 - 4.5 billion to investment during the 1980s.

The estimated regression of the values shown in Figure 6 suggests that a 4-5 percent increase in real gross capital formation requires an increase in real gross domestic product of between 3.0-3.3 percent. However, it is suggested that in the medium-term, given a continuation of the balance of payments restraint, growth in the domestic economy during 1980-85 is likely to be restrained to an average annual growth rate of about 2 percent (see Table 2). This value equates with a real gross capital formation increase of just under 1 percent - a value significantly below the annual increase of 4-5 percent suggested in Investment Issues (1980). Admittedly, it could be argued that increased export orientation of the manufacturing sector will necessitate greater investment which is unrelated to conditions prevailing in the domestic market. However, differences between the two sets of figures would seem too large to be accounted for by this factor alone. In addition, it needs to be recognised that the difference between the two is underestimated because the data in Figure 6 include previous large-scale, non-energy, projects while the 4-5 percent quoted in Investment Issues (1980) does not. Rather than assume "traditional" investment will grow at an annual rate of 4-5 percent I decided that the growth in this type of investment should be determined primarily by the anticipated change in domestic output.

Table 9 shows that the relationship between capital formation and capital imports has been reasonably stable with about 40 percent of the annual gross value being imported. I have assumed that the estimated annual average growth in "traditional"

investment will continue to have an average import requirement
of 40 percent.

Investment Issues (1980) lists and discusses a number of
alternative energy projects and strategies. I decided to examine
the effects of only one option - defined as Option 2A in the
Planning Council's report Implications of New Energy Develop-
ments (1979). The Planning Council believed this option to be
the one which seems most likely "at this stage, to minimise the
risk while enabling substantial progress to be made towards the
objectives of the development strategy."

However, the figures I have adopted for the large-scale
energy projects differ from those published originally by the
Council as Option 2A. I have attempted ;

   (a)  to take into account the most recent policy announce-
        ments made by the Government on energy (the major one
        being the Government's intention to go ahead with the
        Mobil process to produce synthetic petrol);

   (b)  to recognise the Council's view that the projects
        should be less bunched than originally intended;

   (c)  to allow for the fact that such projects almost invar-
        iably take significantly longer to complete, and cost
        more, than originally envisaged.

Consequently, I decided to increase the original cost estimates
by 25 percent and the estimated time taken to complete the
projects by about 50 percent. A recent study by the Rand Corpor-
ation on the differences between initial cost estimates and
final costs of large-scale energy projects in the United States
shows that - "Cost over-runs are typically 300 percent, in
constant dollars, for first of a kind energy process plant....
even after pilot plants are built the errors are large. Some
run 500 percent over initial estimates."

Investment Issues (1980) estimated that during 1980-85
about $1 billion of major non-energy capital works will be
undertaken. As with the large-scale energy project I decided
to increase the costs by 25 percent, and the time taken to
complete them by 50 percent.

It is recognised that all these projects will be
capital intensive involving substantial foreign exchange
costs and increased imports of capital goods. Consequently,
they will have an import content much higher than the histori-
cal ratio of approximately 40 percent. In Implications of New
Energy Developments (1979) yearly expenditure figures of the
energy options are broken down into local and overseas. However,
because the local expenditure figures given do not include in-
direct import content the overall overseas content is under-
estimated. I decided to apply the historical average of 40
percent import content to the local expenditure component. I
have therefore estimated that about 75 percent of the large-
scale energy projects will be imported. I have applied the same
import ratio to the large-scale non-energy projects. The profile
of capital costs, import content, import savings, and export
receipts adopted are outlined in Table 10.[1]

----

1.  It should be noted that the total large-scale investment figure used in
    this paper is less than the cost figure often quoted of about $5000 million.
    This difference reflects that only part of the $5000 million figure can be
    regarded as strictly additional, and secondly, that at the time of writing
    possible construction of a second aluminium smelter was not on the horizon.
    Supplementary model runs with large-scale investment increased, with
    corresponding increases in import savings and export growth, changes only
    marginally the main macro-economic variables.

## TABLE 10

### LARGE-SCALE CAPITAL FORMATION, IMPORT
### CONTENT AND ASSOCIATED IMPORT SAVINGS,
### AND EXPORT RECEIPTS ESTIMATES

(1979-80 prices $ million)

| Years ended 31 March | Total Cost | Import Content | Import Savings | Export Receipts |
|---|---|---|---|---|
| 1981 | 266 | 200 | | |
| 1982 | 477 | 358 | 0 | 0 |
| 1983 | 734 | 551 | 0 | 0 |
| 1984 | 986 | 740 | 0 | 0 |
| 1985 | 710 | 533 | 0 | 0 |
| 1986 | 366 | 275 | 283 | 111 |
| 1987 | 200 | 150 | 395 | 167 |
| 1988 | 44 | 33 | 597 | 191 |
| 1989 | 0 | 0 | 640 | 191 |
| 1990 | 0 | 0 | 640 | 191 |
| | 3783 | 2840 | | |

(b)  Consumer plus Intermediate Imports

It is well established that as incomes rise (fall) the
average propensity to consume by the community tends to fall
(rise) - see for example Samuelson, Hancock and Wallace (1975)
pp.249-259.  Consequently, if it is believed that imports of
consumer and intermediate goods used in the production of goods
display a reasonably fixed relationship to total consumption
then an income elasticity to import close to unity could
be expected.  However, although the community's marginal pro-
pensity to consume tends to decline (rise) with increased
(reduced) income, expenditure on durable commodities has a
tendency to rise (fall) more rapidly than expenditure.
The output of the manufacturing sector has historically
displayed greater variability in its growth than those
sectors associated with non-durable production, such as those
providing services.  As most of the imports of the category under
discussion are related to the production of manufactured goods,
it could as a consequence be expected that a non-proportionate
relationship between changes of incomes and changes in imports
of consumer and intermediate products would exist.

The estimated equation based upon data shown in Figure 7
suggests that the income elasticity for imported consumer and
intermediate goods varies considerably; it is low in periods of
low growth and high when income growth is high.

As with the equation relating changes in gross fixed capital
formation to changes in output, I once again readily admit
the equation is extremely simplistic.  It ignores other
possible determinants such as stock changes, relative prices,
import controls, financial factors, and so on.  But although
it is perhaps not accurate for individual years, it seems to
predict reasonably accurately the average change in imports for
consumer and intermediate goods over a period of time.  The
procedure in previous medium-term reports of adopting a single
income elasticity value is appropriate if it is believed that
growth in the economy in the medium term is likely to be fairly

# FIGURE 7

## CHANGES IN DOMESTIC OUTPUT
## AND
## CONSUMER PLUS INTERMEDIATE IMPORTS

% change in volume of consumer plus intermediate imports
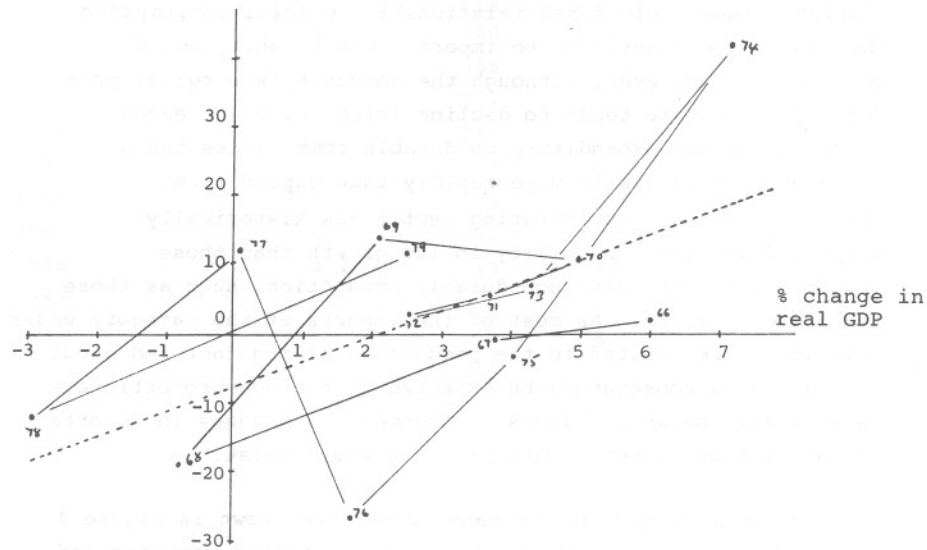


% RCIM = -8.081 +3.771% RGDP  $r^2$ = .37

Period 1965-78    (2.53)

"t" statistic in parenthesis

D.W. = 2.22

F statistic = 6.38

close to that displayed in the past. However, if the growth rate in the medium term is significantly lower (higher) than the historical rate then it is likely that this procedure will badly over (under) estimate the change in consumer and inter-mediate imports.

## STOP-GO VERSUS STEADY GROWTH - SOME TENTATIVE VIEWS

The above analysis suggests the following possible scenario of why the New Zealand economy has failed to sustain a growth rate above a trend rate of between 3-4 percent. With high domestic incomes, generally resulting from improved overseas prices, increased domestic demand (both private and Government) results in a marked increase in both production and productivity in the short run. However, as the economic growth rate rises above the historical average of approximately 3 percent increased growth in capital and consumer and intermediate imports occurs. Table 11, which combines estimates resulting from using the capital and consumer and intermediate import equations, shows that once the nation's growth rate rises above its historical average the overall import elasticity values become extremely high.

### TABLE 11

#### REAL GDP GROWTH AND VOLUME OF IMPORTS

|  | Real GDP Growth | Associated growth in real imports |
|---|---|---|
|  | % | % |
| Historical average (1964-79) | +3.0 | +2.8 |
| Assumed growth rates | +2.0 | +0.3 Estimated increase |
|  | +3.0 | +3.7 |
|  | +4.0 | +7.2 |
|  | +5.0 | +10.6 |
|  | +6.0 | +14.0 |

This may reflect the condition that the New Zealand economy has tended to operate close to its industrial capacity ceiling most of the time so that when the demand constraint on output is lifted, supply shortages appear almost immediately, which spill over into significant increases in imports. In addition, a high proportion of imports are capital related (approximately 40-50 percent). However, before this demand-induced investment

becomes fully productive demand in the economy is curtailed by the balance of payments crises caused by the rapid growth in imports, for which the increase in investment itself is partly responsible. Although there are probably numerous ways round this "stop-go" dilemma that has forced the New Zealand economy into such a narrow trend growth rate in the past, the import elasticities values suggest that a policy directed solely to increasing exports to maintain a domestic growth rate above the historical average is likely to fail owing to the extremely high increases required to sustain the increased imports that result from higher growth. On the surface it would appear a policy emphasising equally the need for export growth, import substitution and appropriate counter-cyclical government policies (as opposed to pro-cyclical policies generally adopted in the past - see Morgan and Haywood (1977) and Deane and Smith (1980)) may be the most appropriate.

Such a strategy, it is believed, would allow a steady but positive increase in investment to take place which hopefully would eventually be translated into increased productivity, higher average capacity utilisation, lower than world price increases and increased output for both domestic and overseas consumption, without the balance of payments constraint operating to curtail further investment growth.

It is recognised that the above hypothesis is a suggestion only, and certainly unproven at this stage. However, given its possible importance to the New Zealand economy, which has now experienced a low growth phase for a number of years, a detailed investigation of the hypothesis, in the New Zealand context, may well produce a number of results extremely beneficial for the future management of the nation's economy.

## SCENARIO RUNS

The consequences of adopting two possible views on export growth along with the inclusion and exclusion of the large-scale investment programme meant that four scenarios were required.

Scenario 1:   Historical export growth (i.e. 2.5 percent per annum) excluding the large-scale investment programme

Scenario 2:   Historical export growth plus the large-scale investment programme

Scenario 3:   Improving export growth (reaching 5 percent per annum in the second half of the decade) excluding the large-scale investment programme

Scenario 4:   Improving export growth plus the large-scale investment programme.

In accordance with the earlier discussion of employment and balance of payments objectives, all scenarios begin with the real gross domestic product estimates shown in Table 2. Growth rates are increased as soon as balance of payments permit to reduce unemployment and create additional real income. Naturally, raising the growth rates as well as increasing employment, and participation rates, results in an increase in imports of goods and services and a deterioration in the current account. A simple diagrammatic illustration of the linkages in the model is presented in Figure 8.

For all scenarios the balance of payments constraint continues to restrict the growth of domestic income to the minimum employment objective for the first half of the decade, and for Scenario 1 until 1988. See Table 12. Although discussed later, it is worth noting at this point that in all cases the current account deficit as a percentage of money GDP does not

FIGURE 8

MODEL FLOWS AND LINKAGES
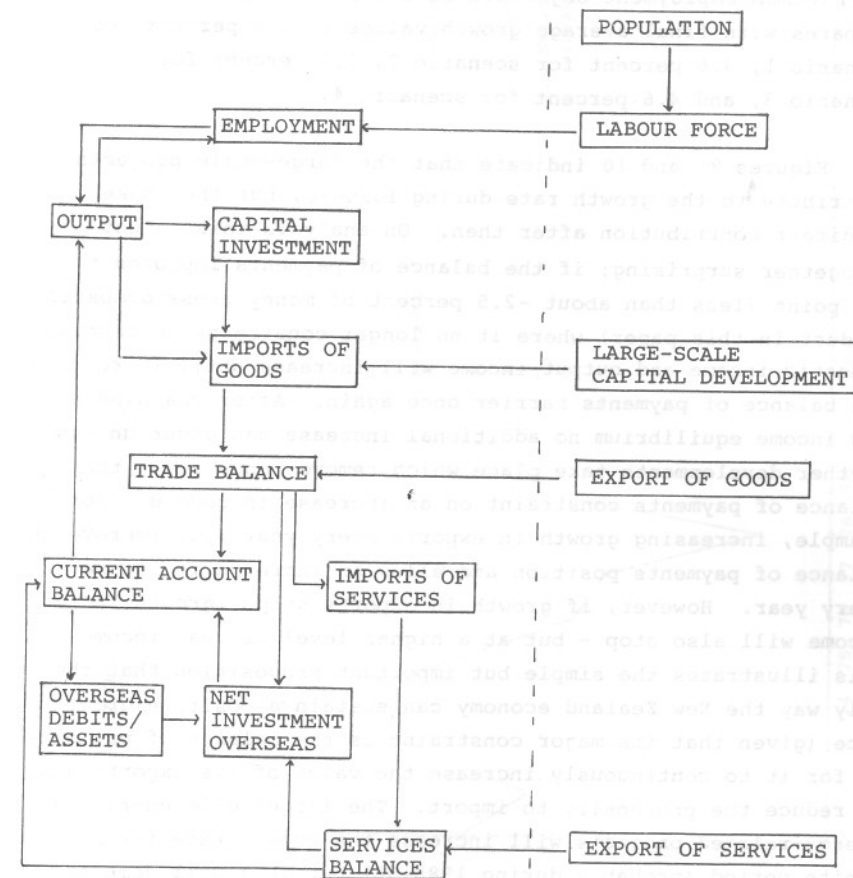
reach what can be regarded as a dangerous level in achieving
the minimum employment objective in the early part of the
decade. The path of GDP growth over the decade for the four
scenarios is illustrated in Figures 9 and 10. During 1985-
90, the average annual GDP growth rate estimated to maintain
the minimum employment objective is 2.2 percent per annum. This
compares with final average growth values of 2.6 percent for
scenario 1, 3.6 percent for scenario 2, 3.7 percent for
scenario 3, and 4.6 percent for scenario 4.

Figures 9 and 10 indicate that the large-scale projects
contribute to the growth rate during 1985-88, but they make
no direct contribution after then. On analysis this is not
altogether surprising; if the balance of payments improves to
the point (less than about -2.5 percent of money gross domestic
product in this paper) where it no longer constrains an increase
domestic income and output, income will increase until it reaches
the balance of payments barrier once again. After reaching a
new income equilibrium no additional increase can occur unless
further developments take place which remove once again the
balance of payments constraint on an increase in income. For
example, increasing growth in exports every year will improve the
balance of payments position and allow an increase in income
every year. However, if growth in exports stops, growth in
income will also stop - but at a higher level of real income.
This illustrates the simple but important proposition that the
only way the New Zealand economy can sustain a positive growth
rate (given that its major constraint is the balance of payments)
is for it to continuously increase the value of its exports and/
or reduce the propensity to import. The large-scale energy and
energy-related projects will increase the growth rate for a
finite period (probably during 1985-88) but this will come to
an end with national income in real terms at the higher level.
The total contribution of the projects to real national income
is estimated to be about 6 percent.

The above analysis is deliberately simplified but it shows
that the large-scale projects will not have a lasting effect on
the growth rate; the effect is probably of shorter duration and
less than most people believe if the results of this study are

FIGURE 9

CHANGES IN REAL GDP - HISTORICAL EXPORT GROWTH
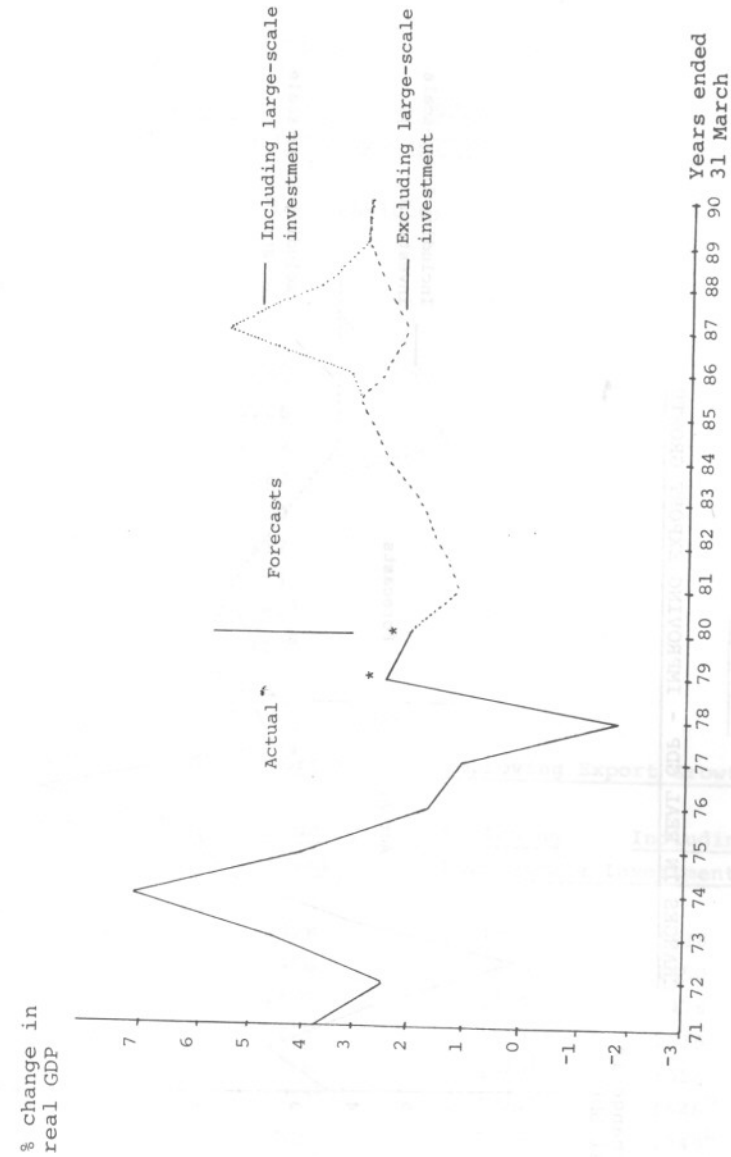


* NZIER estimates

FIGURE 10

CHANGES IN REAL GDP - IMPROVING EXPORT GROWTH
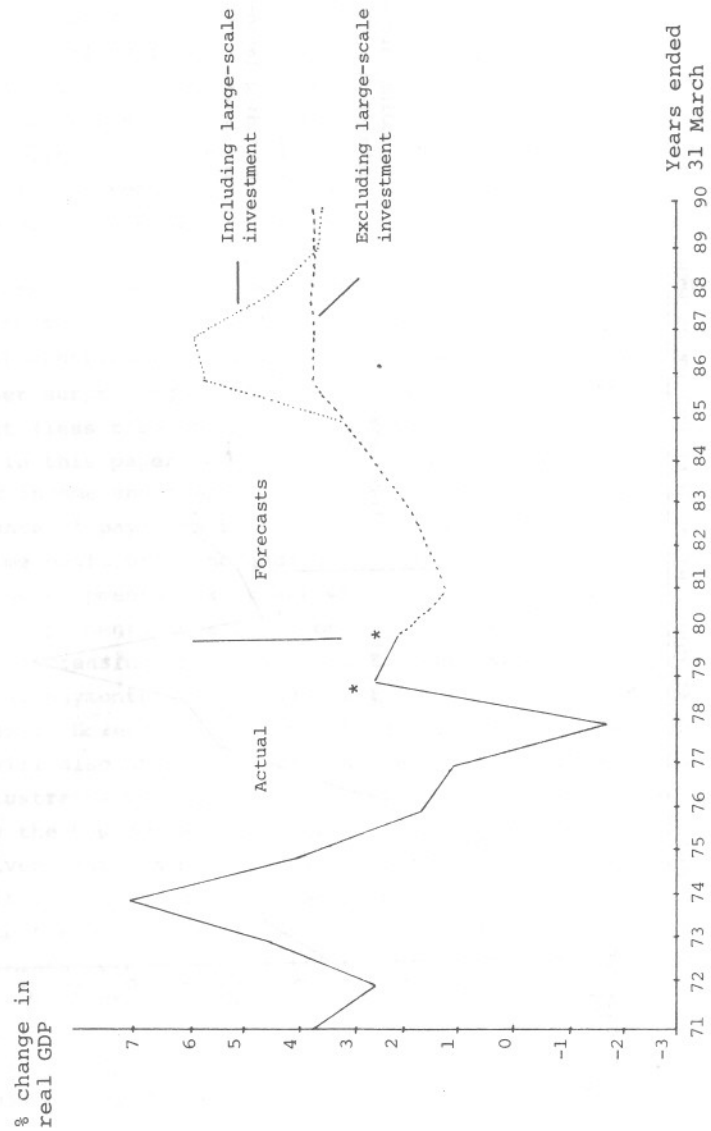


* NZIER estimates

TABLE 12

REAL GROSS DOMESTIC PRODUCT:
ACTUAL AND TREND PROJECTIONS

(Base: 1965-66=1000)

| Years ended 31 March | Actual |
|---|---|
| 1971 | 1145 |
| 1972 | 1174 |
| 1973 | 1226 |
| 1974 | 1314 |
| 1975 | 1367 |
| 1976 | 1390 |
| 1977 | 1392 |
| 1978 | 1354 |
| 1979 | 1388[a] |
| 1980 | 1416[a] |

TREND PROJECTIONS

| Years ending 31 March | Historical Export Growth | | Improving Export Growth | |
|---|---|---|---|---|
| | Excluding Large-scale Investment | Including Large-scale Investment | Excluding Large-scale Investment | Including Large-scale Investment |
| 1981 | 1428 | 1428 | 1428 | 1428 |
| 1982 | 1450 | 1450 | 1450 | 1450 |
| 1983 | 1478 | 1478 | 1478 | 1478 |
| 1984 | 1515 | 1515 | 1515 | 1515 |
| 1985 | 1558 | 1558 | 1563[b] | 1558 |
| 1986 | 1598 | 1607[b] | 1621[b] | 1648[b] |
| 1987 | 1631 | 1694[b] | 1678[b] | 1743[b] |
| 1988 | 1674[b] | 1759[b] | 1741[b] | 1819[b] |
| 1989 | 1723[b] | 1810[b] | 1804[b] | 1885[b] |
| 1990 | 1774[b] | 1861[b] | 1871[b] | 1951[b] |

a - NZIER estimates

b - Real GDP growth above that necessary to maintain 1979-80 employment position.

accepted. Second, if New Zealand is to attain the positive growth rate which is necessary to achieve and maintain full employment it must continuously seek new ways to increase exports and/or reduce its need for imports.

TABLE 13

BALANCE OF TRADE TREND ESTIMATES

($million-current prices)

| Years ended March | EXPORTS Scenario | | | | IMPORTS Scenario | | | | TRADE BALANCE Scenario | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 1981 | 5134 | | 5145 | | - 4940 | - 5162 | - 4940 | -5162 | 194 | - 28 | 205 | - 17 |
| 1982 | 5281 | | 5872 | | - 5399 | - 5840 | - 5399 | - 5840 | 422 | - 18 | 474 | 33 |
| 1983 | 6606 | | 6736 | | - 5992 | - 6754 | - 5992 | - 6745 | 614 | -139 | 744 | - 9 |
| 1984 | 7494 | | 7762 | | - 6758 | - 7880 | - 6758 | - 7880 | 736 | -386 | 1004 | -118 |
| 1985 | 8506 | 8694[a] | 8989 | 9176[a] | - 7709 | - 8129[b] | - 7779[c] | - 8129[b] | 798 | 565 | 1210 | 1047 |
| 1986 | 9664 | 9977[a] | 10430 | 10743[a] | - 8699 | - 8634[bc] | - 9102[c] | - 9328[bc] | 965 | 1343[c] | 1328[c] | 1415 |
| 1987 | 10961 | 11358[a] | 12097 | 12493[a] | - 9688 | - 9953[bc] | -10586[c] | -10941[bc] | 1274 | 1405[c] | 1511[c] | 1553[c] |
| 1988 | 12452 | 12893[a] | 14066 | 14507[a] | -10964[c] | -11374[bc] | -12397[c] | -12744[bc] | 1488[c] | 1518[c] | 1669[c] | 1762[c] |
| 1989 | 14131 | 14620[a] | 16359 | 16848[a] | -12541[c] | -12967[bc] | -14467 | -14876[bc] | 1590[c] | 1653[c] | 1892[c] | 1972[c] |
| 1990 | 16042 | 16585[a] | 19053 | 19597[a] | -14338[c] | -14797[bc] | -16926[c] | -17368[bc] | 1704[c] | 1788[c] | 2127[c] | 2229[c] |

a - includes exports resulting from large-scale investment programme

b - includes import savings resulting from large-scale investment programme

c - real GDP growth above that necessary to maintain 1979-80 employment position.

FINAL BALANCE OF PAYMENTS TREND ESTIMATES

## Trade Balance

The trend values for exports and imports listed in Table
13 were obtained by combining the various estimates of the
terms of trade, export growth and changes in import volumes
associated with the GDP growth rates as presented in Table 12.

## Export of Services

I have adopted the basic procedure, use of a log linear
trend, I used in New Zealand's Medium Term Outlook (1978) to esti-
mate this component   of the balance of payments which traced
reasonably accurately the path of this series between 1966-79.
Over the 14 years ended March 1979 the average compound increase
in the value of exports  of services has been close to 20 per-
cent.   While the annual increase in the value of export services
has averaged more than 20 percent over the last 5 years the
series has displayed a marked slow-down in its rate of growth
over the last 3 years.   Taking into account the recent slower
growth that has occurred I decided to adopt the view that export
of services will display an annual growth rate of 17 percent over
the next decade.   A rate which in conjunction with the estimated
trend increase in prices suggests that the export of services
will display a real annual increase of about 6 percent during
the decade.   In money values it is estimated (see Table 14 )
that the export of services will increase from $1308 million
in 1980-81 to $5373 million a decade later.

## TABLE 14

### EXPORT OF SERVICES: TREND ESTIMATES

| Year ending 31 March | $ million current prices |
|---|---|
| 1981 | +1308 |
| 1982 | +1529 |
| 1983 | +1789 |
| 1984 | +2092 |
| 1985 | +2448 |
| 1986 | +2867 |
| 1987 | +3352 |
| 1988 | +3925 |
| 1989 | +4592 |
| 1990 | +5373 |

## Import of Services

A high proportion of  service imports are directly
related to the costs involved in importing and exporting goods.
In New Zealand's Medium Term Outlook (1978) I estimated that
about 99 percent of the series for 1966-76 could be explained by
using total trade as the explanatory variable.  I decided to
adopt a similar procedure in this report to provide trend
estimates of imports of services for the four scenarios (see
Table 15).  Although the values given in Table 15 are self-
explanatory, it is perhaps of interest to note that the large-
scale investment programme during its construction phase (1980-
85) has only a relatively minor impact upon the estimated value
of imports of services.

## TABLE 15

### IMPORT OF SERVICES: TREND ESTIMATES

| Year ending 31 March | $ million current prices | | | |
|---|---|---|---|---|
| | Scenarios | | | |
| | 1 | 2 | 3 | 4 |
| 1981 | 1856 | 1871 | 1857 | 1872 |
| 1982 | 2119 | 2149 | 2122 | 2153 |
| 1983 | 2426 | 2480 | 2436 | 2489 |
| 1984 | 2787 | 2867 | 2806 | 2885 |
| 1985 | 3207 | 3252 | $3248^a$ | 3286 |
| 1986 | 3684 | $3703^a$ | $3771^a$ | $3810^a$ |
| 1987 | 4222 | $4272^a$ | $4374^a$ | $4427^a$ |
| 1988 | $4852^a$ | $4918^a$ | $5081^a$ | $5138^a$ |
| 1989 | $5587^a$ | $5659^a$ | $5900^a$ | $5964^a$ |
| 1990 | $6432^a$ | $6512^a$ | $6857^a$ | $6926^a$ |

a - real GDP growth rate above that necessary to maintain 1979-80 employment position

## Balance of Services

The balance of services (i.e. export of services minus import of services) for the four scenarios is given in Table 16.

As expected the table shows that the balance of services deficit increases more rapidly when the large-scale projects are included, but the differences are relatively minor. More important are the differences between Scenarios 1 and 2, and Scenarios 3 and 4 in export growth and GDP growth rates that take place in the second half of the decade. Although the various deficits all display a steady increase over the decade it is estimated that in all cases the deficit at the end of the decade is less in real terms than that re-corded in 1979-80.

## TABLE 16

### BALANCE OF SERVICES: TREND ESTIMATES

| Years ending 31 March | ($million - current prices) | | | |
|---|---|---|---|---|
| | Scenarios | | | |
| | 1 | 2 | 3 | 4 |
| 1981 | -547 | -563 | -548 | -563 |
| 1982 | -590 | -620 | -593 | -624 |
| 1983 | -638 | -691 | -647 | -700 |
| 1984 | -694 | -775 | -714 | -793 |
| 1985 | -759 | -804 | $-800^a$ | -838 |
| 1986 | -818 | $-837^a$ | $-904^a$ | $-943^a$ |
| 1987 | -870 | $-920^a$ | $-1022^a$ | $-1076^a$ |
| 1988 | $-927^a$ | $-993^a$ | $-1156^a$ | $-1213^a$ |
| 1989 | $-995^a$ | $-1067^a$ | $-1309^a$ | $-1373^a$ |
| 1990 | $-1059^a$ | $-1139^a$ | $-1483^a$ | $-1553^a$ |

a - real GDP growth above that necessary to maintain 1979 employment position

## Net Income from Overseas Investments

The approach I adopted in New Zealand's Medium Term Outlook (1978) despite certain simplistic assumptions, has been reason-ably accurate in forecasting this component of New Zealand's balance of payments over recent years. I have adopted a similar approach here. The major assumptions in estimating net income from overseas investment by this approach are: that official reserves are maintained in real terms at the 1979-80 level; and that Government and private borrowing is determined by the current deficit, on which it is assumed an interest rate of 11 percent is paid. The interest rate adopted in New Zealand's Medium Term Outlook (1978) was 8 percent. However, this figure has turned out to be somewhat too low. This reflects the failure of the world economies (as was believed possible when the report was written) to check their inflation rates in the medium-term; and second, an unexpected general decline in New

Zealand's exchange rate. As a consequence, I decided to adopt an interest rate of 11 percent here. The projected path of net income from overseas investment using the above assumptions over the forecast period for the four scenarios is given in Table 17. Figure 11 (a visual presentation of the values shown in Table 17 along with past values) illustrates very vividly the increasing importance this component of the current account has had over recent years and will continue to have in the medium term.

## TABLE 17

### NET INCOME FROM OVERSEAS INVESTMENT: TREND ESTIMATES

($million - current prices)

| Years ending 31 March | Scenarios | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1981 | -902 | -902 | -902 | -902 |
| 1982 | -1004 | -1030 | -1003 | -1029 |
| 1983 | -1090 | -1145 | -1085 | -1140 |
| 1984 | -1190 | -1285 | -1176 | -1271 |
| 1985 | -1311 | -1454 | -1282[a] | -1425 |
| 1986 | -1455 | -1501[a] | -1411[a] | -1449[a] |
| 1987 | -1603 | -1569[a] | -1568[a] | -1567[a] |
| 1988 | -1752[a] | -1740[a] | -1739[a] | -1740[a] |
| 1989 | -1930[a] | -1932[a] | -1933[a] | -1929[a] |
| 1990 | -2143[a] | -2144[a] | -2145[a] | -2143[a] |

a - real GDP growth above that necessary to maintain 1979-80 employment position

FIGURE 11

NET INCOME FROM OVERSEAS INVESTMENT
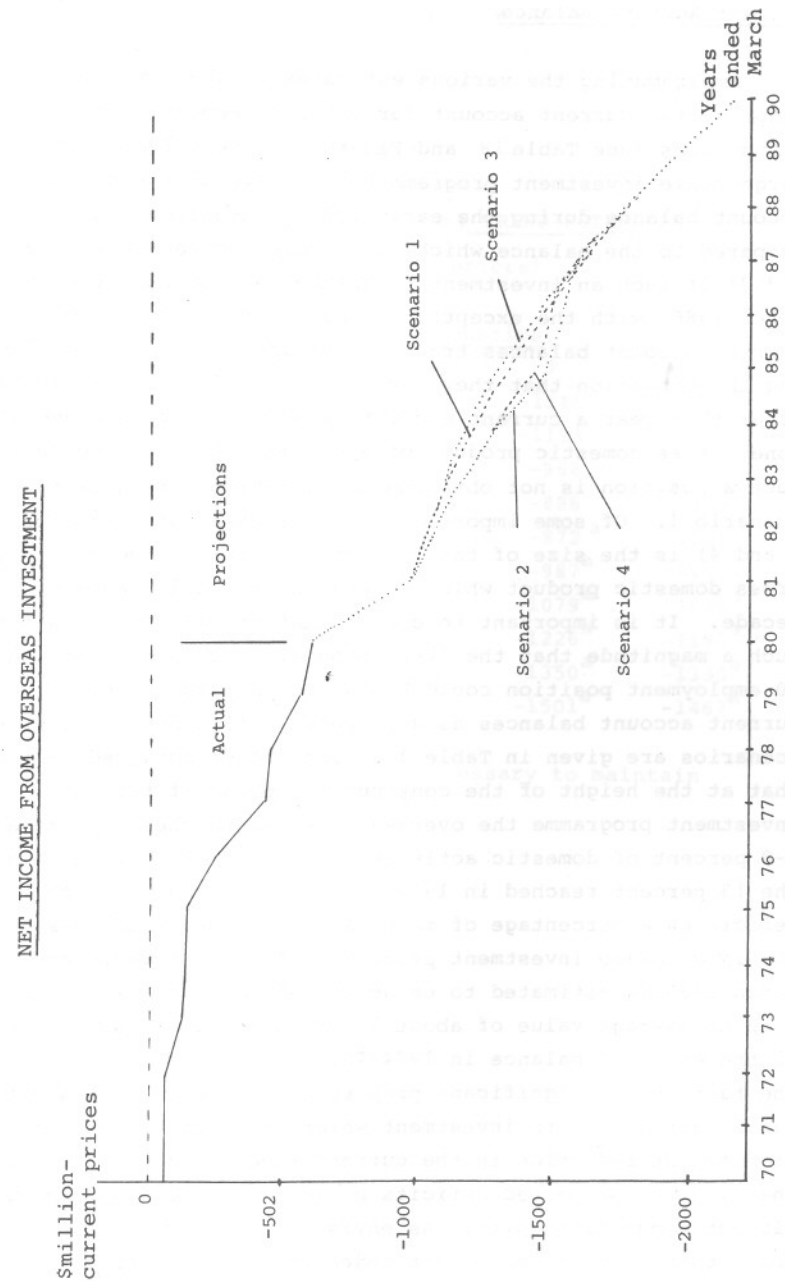
## Current Account Balance

Amalgamating the various estimates of the components that comprise the current account for the four scenarios vividly illustrates (see Table 18 and Figure 12) the effect that the large-scale investment programmes will have on the current account balance during the early 1980s (Scenarios 2 and 4) compared to the balance which would have occured (Scenarios 1 and 3) if such an investment programme had not been undertaken. After 1986, with the exception of Scenario 1, the various current account balances track almost identical paths reflecting the condition that they have reached and are maintaining after this year a current account balance as a percentage of money gross domestic product of approximately -2.5 percent. Such a position is not obtained until 1988 in the case of Scenario 1. Of some importance (in the cases of scenarios 2 and 4) is the size of the deficit as a percentage of money gross domestic product which occurs in the early years of the decade. It is important to ensure that the deficit does not reach such a magnitude that the likelihood even of maintaining the 1979-80 employment position could be put in jeopardy. The calculated current account balances as a percentage of money GDP for the four scenarios are given in Table 19. The values obtained indicate that at the height of the construction phase of the large-scale investment programme the overseas deficit reaches approximately 7-8 percent of domestic activity, a value significantly less than the 13 percent reached in 1974-75. The average value of the deficit as a percentage of money GDP for those scenarios, including the large-scale investment programme, for the five years ended March 1985 is estimated to be about 6-7 percent. This compares with an average value of about 7 percent recorded since the collapse of the external balance in 1974-75. In view of such values, and the fact that a significant proportion of the estimated deficits can be attributed to investment which in later years leads to a significant reduction in the current account balance, it is believed that all the projected deficits could be financed and serviced without undue difficulty. As envisaged earlier in the paper, in order that certain employment objectives may be achieved, New Zealand

will be required to accept a higher average external deficit in proportion to domestic activity than it has experienced historically.

### TABLE 18

#### CURRENT ACCOUNT BALANCE: TREND ESTIMATES

($million-current prices)

| Year ending 31 March | Scenarios | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1981 | -1256 | -1492 | -1246 | -1482 |
| 1982 | -1172 | -1669 | -1123 | -1620 |
| 1983 | -1114 | -1975 | -988 | -1849 |
| 1984 | -1148 | -2445 | -886 | -2182 |
| 1985 | -1272 | -1693 | -872 [a] | -1216 |
| 1986 | -1307 | -994 [a] | -987 [a] | -977 [a] |
| 1987 | -1200 | -1084 [a] | -1079 [a] | -1090 [a] |
| 1988 | -1192 [a] | -1215 [a] | -1226 [a] | -1191 [a] |
| 1989 | -1334 [a] | -1346 [a] | -1350 [a] | -1330 [a] |
| 1990 | -1498 [a] | -1495 [a] | -1501 [a] | -1467 [a] |

a – real GDP growth above that necessary to maintain 1979-80 employment position.

FIGURE 12

CURRENT ACCOUNT BALANCE - TREND ESTIMATES
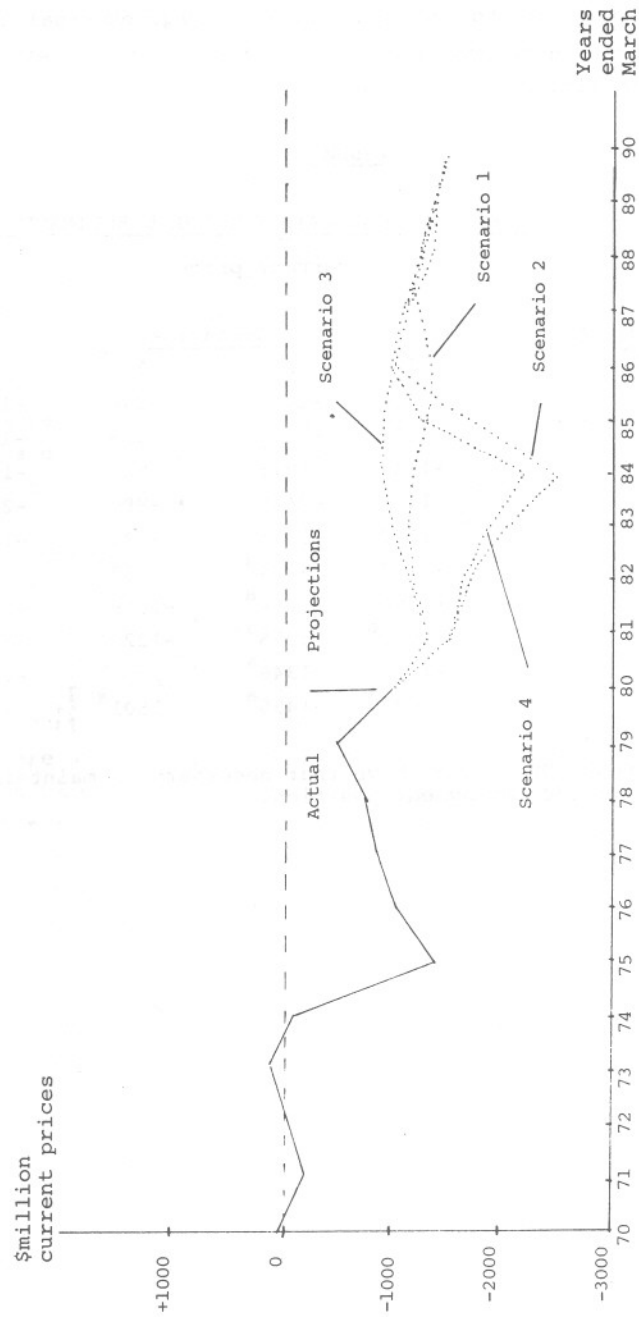
## TABLE 19

### CURRENT ACCOUNT BALANCE AS A PERCENTAGE OF
### MONEY GROSS DOMESTIC PRODUCT

| Years ending 31 March | Scenarios | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | % |
| 1981 | -5.5 | -6.6 | -5.4 | -6.5 | |
| 1982 | -4.6 | -6.6 | -4.4 | -6.4 | |
| 1983 | -3.9 | -7.0 | -3.5 | -6.5 | |
| 1984 | -3.7 | -7.8 | -2.8 | -7.0 | |
| 1985 | -3.7 | -4.9 | -2.5[a] | -3.5 | |
| 1986 | -3.4 | -2.5[a] | -2.5[a] | -2.5[a] | |
| 1987 | -2.8 | -2.5[a] | -2.5[a] | -2.5[a] | |
| 1988 | -2.5[a] | -2.5[a] | -2.5[a] | -2.5[a] | |
| 1989 | -2.5[a] | -2.5[a] | -2.5[a] | -2.5[a] | |
| 1990 | -2.5[a] | -2.5[a] | -2.5[a] | -2.5[a] | |

Average

| 1980-90 | -3.5 | -4.5 | -3.1 | -4.3 | |
|---|---|---|---|---|---|

a - real GDP growth above that necessary to maintain
    1979-80 employment position

# EMPLOYMENT AND LABOUR FORCE TREND PROJECTIONS:  A COMPARISON

In order to avoid any confusion it is of some importance that the difference in meaning between "employment" and "labour force" is clearly understood.  In this study I have defined them as follows:

> employment - the number of persons actively engaged in the work force including special Government workers;

> labour force - those actively engaged in the work force (that is numbers employed) plus those who regard themselves as unemployed as defined in the Census questionnaire (i.e. those who state that they ordinarily work more than 20 hours per week).  This is the Department of Statistics definition of the labour force.

The Department of Statistics publishes forward trend projections of New Zealand's labour force.  The Department derives its labour force projections from population projections by multiplying the projected numbers of individuals in each age-sex cohort by the proportion with it likely to be members of the labour force and then sums the results.  These proportions are known as "age-sex specific labour force participation rates".  The official projections assume a continuation in the future (up to 1986) of previous age-sex participation rates; i.e. they assume socio-economic developments will continue at the same average rate as in the past.  However, by 1986 it is assumed that socio-economic development causing changes in participation rates will have gone as far as possible, and that they will have no influence in changing participation rates after this date.

The Department's most recent labour force projections along with the studies trend projections employment for the period 1981-1990 are given in Table 20.

TABLE 20

DEPARTMENT OF STATISTICS LABOUR FORCE AND THIS STUDY'S EMPLOYMENT PROJECTIONS

| Year ending 31 March | Dept. of Stats Labour Force Projections a | Employment Estimates Scenario (thousands) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | Diffc | 2 | Diffc | 3 | Diffc | 4 | Diffc |
| 1981 | 1336 | 1296 | -40 | 1296 | -40 | 1296 | -40 | 1296 | -40 |
| 1982 | 1354 | 1310 | -45 | 1310 | -45 | 1310 | -45 | 1310 | -45 |
| 1983 | 1375 | 1326 | -50 | 1326 | -50 | 1326 | -50 | 1326 | -50 |
| 1984 | 1399 | 1347 | -50 | 1347 | -50 | 1347 | -50 | 1347 | -50 |
| 1985 | 1427 | 1370 | -60 | 1370 | -60 | 1372 | -55 | 1370 | -50 |
| 1986 | 1454 | 1391 | -60 | 1395 | -60 | 1401 | -55 | 1412 | -60 |
| 1987 | 1477b | 1410 | -70 | 1436 | -40 | 1429 | -55 | 1456 | -40 |
| 1988 | 1499b | 1432 | -70 | 1467 | -30 | 1459 | -50 | 1491 | -20 |
| 1989 | 1522b | 1457 | -65 | 1492 | -30 | 1490 | -40 | 1522 | -10 |
| 1990 | 1544b | 1482 | -60 | 1517 | -30 | 1521 | -30 | 1552 | 0 |
| | | | | | | | -20 | | +10 |

a - Assuming 'changing' age-specific labour force participation rate and 'low' net immigration variant.

b - interpolated.

c - Differences rounded to nearest 5,000 in order to indicate that the figures should not be regarded as precise values but merely used to indicate differences in overall movements between the two sets of data.

It is recognised that forecasting employment and labour force values is extremely difficult. This is particularly true in New Zealand because the last labour force statistic is now almost five years old and significant changes have occurred in the labour market. Consequently the figures shown in Table 20 can only be used to provide a rough indication of the likely changing state of the labour market rather than providing precise figures of likely employment and unemployment which will occur over the next decade. It is noted from an examination of the table that in all cases the difference between the labour force estimates and employment figures increases from 40 000 in 1981 to a maximum difference of between 60 000 - 70 000 some 5-6 years later. Naturally, most of the difference between the two sets of data is accounted for by different views on participation rates and numbers of people likely to regard themselves as unemployed, particularly during the first 5 years of the forecast period underlying the calculation of the two sets of data.

Differences in the participation rates adopted are due largely to differences in expected real growth domestic growth rates underlying the two approaches. According to the estimated relationship between changes in employment and output as estimated in data portrayed in Figure 5 the average growth rate required to accommodate the Department of Statistics labour force projections over the 5 years ended March 1986 is 2.6 percent. Conversely, the annual average growth rate underlying the study's employment figures over this period range between 1.9 and 2.0 percent - values significantly below those implicitly assumed by the department's projections. If New Zealand experiences a growth rate significantly less than the average historical rate, which implies reduced employment opportunities, then it could not be expected that the trend of increasing participation rates which occurred during the 1960s and early 1970s, caused primarily by the high increase in female participation

rates will take place. In addition, it would seem reasonable to surmise that many of the discouraged workers, particularly women, will not register as unemployed, be employed on special Government work programmes or regard themselves as unemployed according to the Census questionnaire.

Unfortunately, available evidence on the importance of economic activity in determining participation rates is limited. However, in New Zealand's Medium Term Outlook (1978) the following aggregate equation was examined:

$$PR_t = a + bt + ct^2 + dU_t$$

where PR = total labour force as percentage of population aged 15-64

U = registered unemployed as a percentage of total estimated labour force

t = time trend

I stated that "The inclusion of the unemployment variable in explaining the participation rate has been given two, very separate, roles. The first, 'the discouraged worker hypothesis' implies that with a labour market in excess supply a number of those unemployed will eventually become discouraged and stop looking actively for paid employment. Alternatively, labour force participation will tend to increase when the labour market is in excess supply. This, it is argued, is due to secondary workers in a family unit seeking and obtaining work when the head of the household becomes unemployed."[1]

Empirical results using annual data covering the period 1961-76 produced a negative coefficient (significant at the 10 percent level) for the unemployed variable, supporting the discouraged worker hypothesis. Inclusion of more recent observations, if they existed, during which unemployment has risen considerably and job opportunities declined is likely to show a marked increase in the significance of the unemployment

1. Haywood (1978),p.80

variable in explaining recent changes in actual participation
rates. [1]

What the available evidence suggests is that the low growth
rate the economy has displayed since the last Census, which is
estimated to continue until at least the next Census in 1981,
will see a labour force recorded at the forthcoming Census
significantly lower than that currently forecast by the
department for that date.    If this is the case and the previous
methodology adopted by the Department is continued then the next
set of labour force projections issued by the department after
the 1981 Census will be significantly lower than those currently
being projected for the next decade or so. [2]

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1.  For additional New Zealand studies supporting the "discouraged worker
    hypothesis" - Neild (1971) and Hyman (1979) and in particular Walsh
    (1978) in which the author using 6-monthly estimated data of male and
    female participation rates for the period 1965-76 obtained results where
    unemployment rates in the same period were significant, with the
    expected negative coefficient, in helping to explain both male and female
    participation rates over the estimation period.

2.  Trend extrapolation is an extremely useful, and simple, method by which
    forecasts or projections can be derived.  However, the procedure does
    assume that those factors determining the underlying movement in the
    series are explained by the time trend and that the influence of these
    factors have displayed a systematic relationship to each other in the past
    and that this relationship  will continue in the future.  If  additional
    information is available to suggest that future developments will differ
    markedly from the past and that this change, it is believed, will alter
    significantly future movement in the series then the trend estimates based
    upon past data should be modified accordingly.  In one area, that of
    migration, the department in preparing its projections has taken into
    account expected short-run changes which implicitly says something
    about economic activity itself over the period.

Even taking into account the above-mentioned differences,
it would seem (particularly given that the numbers employed on
special Government work programmes is of some magnitude) that in
the case of Scenario 1 New Zealand would experience little
improvement in labour market conditions over the decade.  For
Scenarios 2 and 3, both of which display a similar employment
path over the forecast period, while an improvement in the
labour market could be expected during the second half of the
decade significant disguised unemployment could still be expected
to exist at the end of the decade for both of these scenarios.
For Scenario 4, the most optimistic of the runs, total numbers
employed at the end of the decade equals almost exactly the
Department of Statistics projected labour force numbers.
However, even in this case, it should not be forgotten that
the employment numbers still include a significant number
employed on special Government work programmes.  Consequently
even under this scenario a degree of disguised unemployment
is still likely to exist by 1990.

CONCLUSION

A key aspect of any decision-making is being aware of the likely movement of those areas of importance to the particular organisation whether it be a firm, public corporation, or the Government itself. Forecasting becomes more important if, as has occurred over recent years, trends in many key areas such as inflation rates, migration, population growth, economic growth and real consumption have differed significantly from those of the past. Marked changes in trends combined with significant time lags between identifying the changing conditions and adapting often means that significant resources are mis-allocated for a considerable period of time. Consequently, it is of some importance that decision-makers react, not only merely to recent economic conditions, but to those conditions that they expect will prevail in the medium term. Despite their importance scant resources in New Zealand have been allocated to producing medium-term forecasts, especially those projecting 5-10 years into the future.

This study has attempted to fill this gap by producing a set of scenarios that could realistically be expected to occur over the next decade. In this sense Scenarios 1 and 3 of the study must be regarded as unrealistic; they merely show values of what would have occurred if the large-scale investment programme had not taken place. Of course, the estimated trend values are not precise forecasts but rather a representation of the basic trends likely to occur in the series concerned over the period resulting from the particular assumptions adopted. Which of the two, hopefully, realistic Scenarios 2 and 4 is the most likely to occur depends largely upon one's degree of optimism or pessimism. Optimists will no doubt feel Scenario 4 reflects the most likely forecast of New Zealand's pattern of growth over the next decade. However, those who, like myself, are more pessimistic about New Zealand's ability to achieve and sustain an export growth rate double that which occurred over the last decade will tend to accept that the final outcome is likely to be closer to that portrayed in Scenario 2 rather than 4.

APPENDIX A

BASE VALUES

In any forecasting study where future values are calculated on percentage changes applied to a base value the selection of the base value can be extremely important. It is less important when the series from which the base is to be selected displays relatively little variation from year to year. But it is of critical importance when the series displays significant cyclical and irregular fluctuations outside the general trend. (See figure 13).

When I began this study the most recent available statistics were: for the balance of payments, the year ended 31 March 1980; and for gross domestic product the year ended March 1978. As NZIER estimates and forecasts are available to update the of-ficial national income series I decided it would be most appro-riate to adopt the year ended 31 March 1980 as the base year for this study.
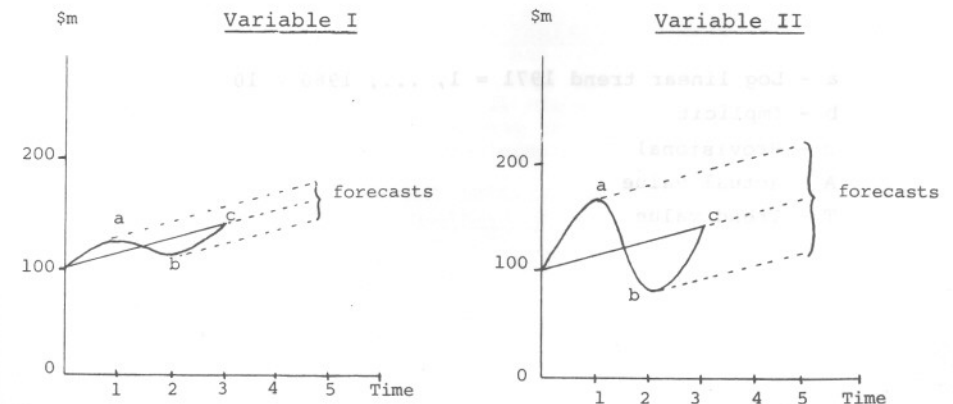
FIGURE 13

THE IMPORTANCE OF SELECTING THE BASE VALUE

## TABLE 21

## ACTUAL AND TREND VALUES[a] FOR BALANCE OF PAYMENTS

($ million)

| Years ended 31 March | | 1976 | 1977 | 1978 | 1979 | 1980[c] |
|---|---|---|---|---|---|---|
| Exports: | A | 2038 | 3018 | 3319 | 3842 | 4893 |
| | T | 2388 | 2799 | 3281 | 3851 | 4514 |
| Imports: | A | -2576 | -3144 | -3211 | -3272 | -4600 |
| | T | -2345 | -2777 | -3288 | -3893 | -4615 |
| Trade Balance[b]: | A | -538 | -126 | 108 | 570 | 293 |
| | T | 43 | 22 | -7 | -42 | -101 |
| Exports of Services: | A | 606 | 700 | 810 | 874 | 951 |
| | T | 524 | 633 | 765 | 924 | 1117 |
| Imports of Services: | A | -839 | -967 | -1179 | -1309 | -1652 |
| | T | -830 | -983 | -1164 | -1377 | -1631 |
| Balance of Services: | A | -233 | -267 | -369 | -435 | -701 |
| | T | -306 | -350 | -399 | -453 | -514 |
| Net O/seas Income: | A | -246 | -423 | -448 | -575 | -596 |
| | T | -251 | -326 | -421 | -541 | -693 |
| Current a/c Balance[b]: | A | -1016 | -832 | -716 | -483 | -987 |
| | T | -514 | -654 | -827 | -1036 | -1308 |

a - Log linear trend 1971 = 1, ..., 1980 = 10
b - Implicit
c - Provisional
A - Actual value
T - Trend value

In general, most balance of payments series and especially the various balance series-trade, services and the current account balance itself - are like variable II. Conversely the employment and real gross domestic product series are like variable I. I used log linear estimates of trends to obtain base year values.

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