

## USES OF SAVINGS IN NEW ZEALAND

The following article is a condensed version of a paper entitled 'Uses of Savings in New Zealand: Implications for Growth' by Robin Clements, a member of the Economic Department's research section. The paper represents work aimed at revising the data for, and interpretation of, New Zealand's savings performance. The December 1983 Bulletin considered this issue for the nation as a whole and this article extends those results in order to apply them to a split between the public and private sectors. The main findings relating to the trend of private savings and its uses are presented here together with an interpretation of some of the implications. The views contained in the article do not necessarily represent official Reserve Bank views.

Most of the descriptive details concerning data construction contained in the full paper are not repeated. Copies of that paper may be obtained on request from the Reserve Bank.

### INTRODUCTION

It is widely acknowledged that investment, while not being the sole relevant consideration, is likely to be a major contributing factor to economic growth. As a result a great deal of analysis has been directed at explaining the reasons for changes in investment expenditures. This analysis has focused on such issues as the cost of capital, the rate of return on capital, expectations and tax incentives.

Another approach to the problem is to ask about the source of the funds to support investment. Much of the recent policy discussion in this area for the United States has referred to declining rates of domestic saving. A large part of the analysis has concentrated on the household saving rate. However, it is more useful to focus on total private saving because this includes business saving, making this total the more relevant one with respect to private investment.

Private sector saving rate data can be distorted by the use of historical cost accounting which, during inflationary periods, overstates investment in inventories and understates depreciation allowances. It is also likely that it will be necessary to make some adjustment on account of the large flow of net interest payments between government and the private sector, to remove from private income and saving the component of those payments that is really attributable to a repayment of principal. These adjustments can be made within the context of a national income and expenditure identity.

Section II provides a brief outline of the inflation adjusted concepts to be used while Section III compares the unadjusted and adjusted data. The finding in Section III, that private savings and investment have both been at historically low levels in recent years, leads to an examination, in Section IV, of the implications which this has for the domestic economy.

### INFLATION ADJUSTED CONCEPTS

The traditional national income and expenditure identity can be stated in the form of an equation in which national income is equal to the sum of consumption plus inventory and non-inventory investment plus exports less imports. This identity is shown in equation (1) as:

$$Y = C + I + V + (X - M) \quad (1)$$

where Y : national income

C : consumption by the public and private sectors

I : non-inventory investment by the public and private sectors

V : inventory investment

X : exports

M : imports

If the separate elements of this equation are divided into that which relates to the private sector (P) and that which relates to the public sector or government (G) the identity can be rewritten as equation (2):

$$Y^P + Y^G = C^P + C^G + I^P + I^G + V + (X - M) \quad (2)$$

$Y^P$  and  $Y^G$  must be suitably defined to take account of taxes and transfer payments.

Private income is divided between consumption and savings. Private savings ( $S^P$ ) can be expressed as the difference between private income ( $Y^P$ ) and private consumption ( $C^P$ ). Similarly the government deficit before borrowing can be expressed as the difference between government income ( $Y^G$ ) and, government consumption and investment ( $C^G + I^G$ ). Private savings and the government deficit before borrowing can therefore be represented as:

$$S^P = Y^P - C^P \quad (3)$$

and

$$G = Y^G - C^G - I^G \quad (4)$$

Using these definitions and the earlier equations we can obtain equation (5) which indicates that private savings are used to finance private investment, the change in stocks, the government deficit and the current account balance.

$$S^P = I^P + V - G + (X - M) \quad (5)$$

While the relationship in (5) could be presented in constant dollar terms, several commentators have noted that this approach still does not remove all the illusory effects of inflation on the data.

The distortions to the conventional measures stem predominantly from the inappropriate manner in which income is accounted for during inflationary periods. If we consider an ideal measure of income we can assess the adjustments required to be made to the composition of (5) to obtain a more accurate measure of private savings. The Haig-Simons definition, that income is that which may be consumed while leaving real wealth intact, defines 'economic income' which is, in current dollars, the sum of the current value of real output, net nominal interest receipts and the current value of any real net capital gain on assets and liabilities.

Using this dissection of economic income we can identify the various ways in which an unstable price level may impart bias to the measure of income. First,

real output must be free from the distortions arising from the use of historic cost accounting techniques which, during periods of inflation, overstate production inventories and understate depreciation charges.

In principle stocks held in inventory need to be continuously valued but in practice this is approximated by an average over the period. The result is that inflation induced increases in stock values produce positive stock changes which do not necessarily reflect increases in stock volumes. These nominal increases in stock values will boost private sector income and, in terms of equation (5), private savings. A stock valuation adjustment therefore needs to be incorporated in the definition of private income in (3) and also, by definition, in the change of stocks in (5).

The depreciation problem is usually handled by examining gross data, before deduction of depreciation. However, this approach makes no allowance for any change in the rate of replacement of capital. Rapid technological change and the increased real price of energy resources in the 1970s both point to a more rapid write-off of equipment and hence to a higher required rate of depreciation. Also, we are more interested in the net-of-economic-depreciation concepts of income and investment wherein net income represents the income available for consumption after allowing for maintaining the capital stock and net investment represents the additions to productive capacity (these are familiar concepts under current cost accounting). Private (gross) income in (3) is replaced by income net of economic depreciation and correspondingly investment in equation (5) is re-stated net of economic depreciation.

The second part of economic income, net nominal interest receipts, is already allowed for in the construction of the raw data series, and so needs no further corrections except with regard to their relationship with net capital gains.

This third area, net capital gains on assets and liabilities, is potentially the most significant area requiring adjustment. However, the significance is dependent on the coverage of the data. National income, for instance, need not be concerned with capital gains or losses between sectors as they cancel out. On the other hand if one is interested, as we are, in a split between private and public income it becomes imperative that some allowance for these factors be made. Initially we can make the simplifying assumption that attention be directed only at financial assets and liabilities. This assumption can be made because there are real capital gains on physical assets only if the rate of inflation of physical asset prices exceeds the general rate of inflation. Therefore, on average the real capital gains on physical assets can be assumed to be zero or at least negligible in terms of this analysis. In contrast financial assets, which in general have a fixed face value, are subject to capital losses at the rate of inflation.

The structure as presented so far separates the domestic economy into the private and public sectors. This separation requires an adjustment for capital gains and losses between these two sectors. The current value of the capital gain to the public sector resulting from the effects of inflation on government debt outstanding is equal to the inflation rate times the net stock of bonds (at face value) issued by the government and held by the private sector.

This quantity (call it  $L$ ) represents the loss to the private sector from the value of the government bonds

being eroded during an inflationary period. The adjustments lead to a reduction in private sector income, and hence savings, so that private sector savings becomes:

$$SP = (YP - L) - CP \quad (3')$$

Government income is increased by the same amount and hence the government deficit is reduced, becoming:

$$G = (YG + L) - CG - IG \quad (4')$$

This correction is equivalent to adjusting nominal interest transactions on the private sector's holdings of government debt to reflect only that part which constitutes the 'real' return. In other words a portion of the nominal interest payment made by government and received by the private sector represents a repayment of principal required to maintain the purchasing power of the bonds. If no allowance is made for this factor inflation tends to increase government's nominal interest payments, hence overstating both the government deficit and private income.

Finally, in adjusting for net capital gains we must consider the position with respect to the overseas sector.

In an open economy the private and public sectors can borrow (and lend) both domestically and abroad. Therefore some account must be made of the capital gains or losses made on overseas debt. The real value of overseas debt is reduced by domestic inflation but since the debt is denominated in foreign currency, it is also increased by exchange rate depreciation. The net position between domestic price and exchange rate changes determines the change in the value of overseas debt.

The net capital gain to the public sector from overseas ( $L'$ ) is given by the stock of bonds issued by the government and held by the overseas sector multiplied by the difference between the domestic inflation rate and the rate of exchange rate depreciation. Similarly the net gain to the private sector from its overseas debt ( $L''$ ) is given by the stock of bonds, issued by the private sector and held overseas, multiplied by the difference between the domestic inflation rate and the rate of exchange rate depreciation.

These adjustments are incorporated into equations (3') and (4') to give the final measures of private savings and the government deficit as:

$$SP = (YP - L + L'') - CP \quad (3'')$$

$$G = (YG + L + L') - CG - IG \quad (4'')$$

A contra adjustment in (5) for the capital gains or losses on private and government overseas debt also needs to be made to the current account balance. The reasoning is similar to that for the correction to interest payments between the domestic sectors. Here both the public and private sectors remit nominal interest payments through the current account — inclusive of the implied capital maintenance portion. The adjusted current account balance is derived by adding both  $L'$  and  $L''$ , so that the adjusted current account is:

$$X - M + L' + L'' \quad (6)$$

## INFLATION ADJUSTED DATA

The national income and expenditure identity in equation (5), with each component expressed as a percentage of national income (annual at quarterly

steps), is shown in Chart 1 with unadjusted data and in Chart 2 with fully adjusted data. The averages for the two sets of series, presented in Table 1, summarise the effects of the adjustments. Some elements are worthy of comment.

**TABLE 1**  
**AVERAGES FOR UNADJUSTED AND ADJUSTED DATA<sup>1</sup>**

Average Over	Item				
	SP	IP	G	X-M	V
1962-71	15.4 (22.8)	11.9 (16.7)	2.0 (4.1)	-0.8 (-1.0)	2.3 (3.0)
1972-83	14.7 (26.7)	10.8 (16.7)	3.9 (8.6)	-2.6 (-3.8)	2.6 (5.2)

NOTE: All statistics are percentages of national income.

<sup>1</sup> The unadjusted data averages are in brackets below the adjusted data averages.

### PRIVATE SAVINGS

Unadjusted private savings fluctuates about a relatively constant 22.8 per cent over 1962-71 and then climbs during the early 1970s to an average of 26.7 per cent over 1972-83. This high level of private savings is apparently preserved into the 1980s and contrasts markedly with the adjusted series. The adjusted ratio is subject to more variation than the unadjusted ratio and, significantly, indicates a fall in its average value over the two periods from 15.4 per cent for 1962-71 to 14.7 per cent for 1972-83. For the last observation, in this latter period, the private savings rate has declined to a level (12.5 per cent) that is well below average. This finding for the trend of the adjusted private savings rate is largely in keeping with that shown in the December 1983 *Bulletin* where the national savings rate was shown to have declined markedly since 1974. The adjustments which had the greatest impact on the private savings rate were those for economic depreciation and for the implied loss sustained by the private sector on government bonds.

### PRIVATE INVESTMENT

Non-inventory investment by the private sector for the unadjusted data has been essentially constant throughout both periods with the two averages being 16.7 per cent. There was a marked decline in the late 1970s but a recovery back to its historical average in the 1980s is suggested.

The adjusted series, however, shows that private investment has not been maintained and, in fact, the whole of the 1978-81 period was at historically low levels. In addition, the final observation for the rate of investment (9.7 per cent) is only marginally above the lowest investment rate experienced in any previous period. The difference between the adjusted and unadjusted data stems mainly from the inclusion, in the adjusted data, of a measure of economic depreciation. This extra item corrects for the bias created in the unadjusted data from the use of a historical cost measure of depreciation.

### GOVERNMENT DEFICIT

The unadjusted government deficit before borrowing (a positive use of private savings) assumes a moderate 4.1 per cent of national income during 1962-71 with a just detectable decline over the late 1960s. The 1970s and 1980s saw a large expansion in the size of the budget deficits with the stimulations of the economy clearly evident in 1972, 1975 and 1978, although 1981 appears to have been an exception to this three yearly pattern.

The adjustments have generally lessened the magnitude of the deficit owing to the capital gains from the private and foreign sectors. However, the three yearly cycle now shows through more clearly, with the 1981 stimulus also becoming visible. The adjusted data show the deficit in 1978 exceeding the previous high in 1975, to reach a peak of 12.3 per cent of national income. The proportion of private savings needed to fully finance the government deficit rose from 13 per cent on average during 1962-71 to 27 per cent over 1972-83. The proportion needed reached a peak of nearly 100 per cent in early 1976 and, for the last (annual) observation, stood at 66 per cent.

The other notable feature of the adjusted government deficit figure is its rise in late 1982 and 1983. While it is not unusual in the historical pattern to detect an upward swing in the period running up to an election, a rise of the magnitude (5.4 per cent points) recorded between 1982(4) and 1983(1) is unprecedented, particularly in a non-election year.

### CURRENT BALANCE

The current account balance, which here is described as a use of private savings, requires a little interpretation. To simplify matters, consider the situation under a pegged exchange rate where there is a current account surplus. In this case New Zealand's total current receipts, from exports of goods and services plus income and other transfers derived from overseas, exceeds total payments. Thus overseas reserves are increased or equivalently, in the long-run, total overseas debt is reduced. Private savings have therefore been used to reduce the stock of overseas debt. The opposite case, a current account deficit, reduces foreign reserves or increases overseas debt. This case can be interpreted as increasing the foreign sector's command over New Zealand resources or as 'net foreign investment'. A current account deficit, a negative use of private savings, therefore adds to the total pool of funds available for the alternative domestic uses of private savings.

The unadjusted current balance has been predominantly in deficit, with an average of -1.0 per cent of national income during 1962-71 followed by a deterioration to -3.8 per cent over 1972-83. The adjustments to the data have emphasised the deterioration of 1974/75 but have otherwise improved the balance, especially in the 1977-81 period. This improvement was largely due to the high domestic inflation rates and rising foreign debt levels producing capital gains to both the public and private sectors.

### CHANGE IN STOCKS

The unadjusted change in stocks follows a fairly stable path over 1962-71 with an average of 3 per cent of national income and then experiences some relatively

CHART 1

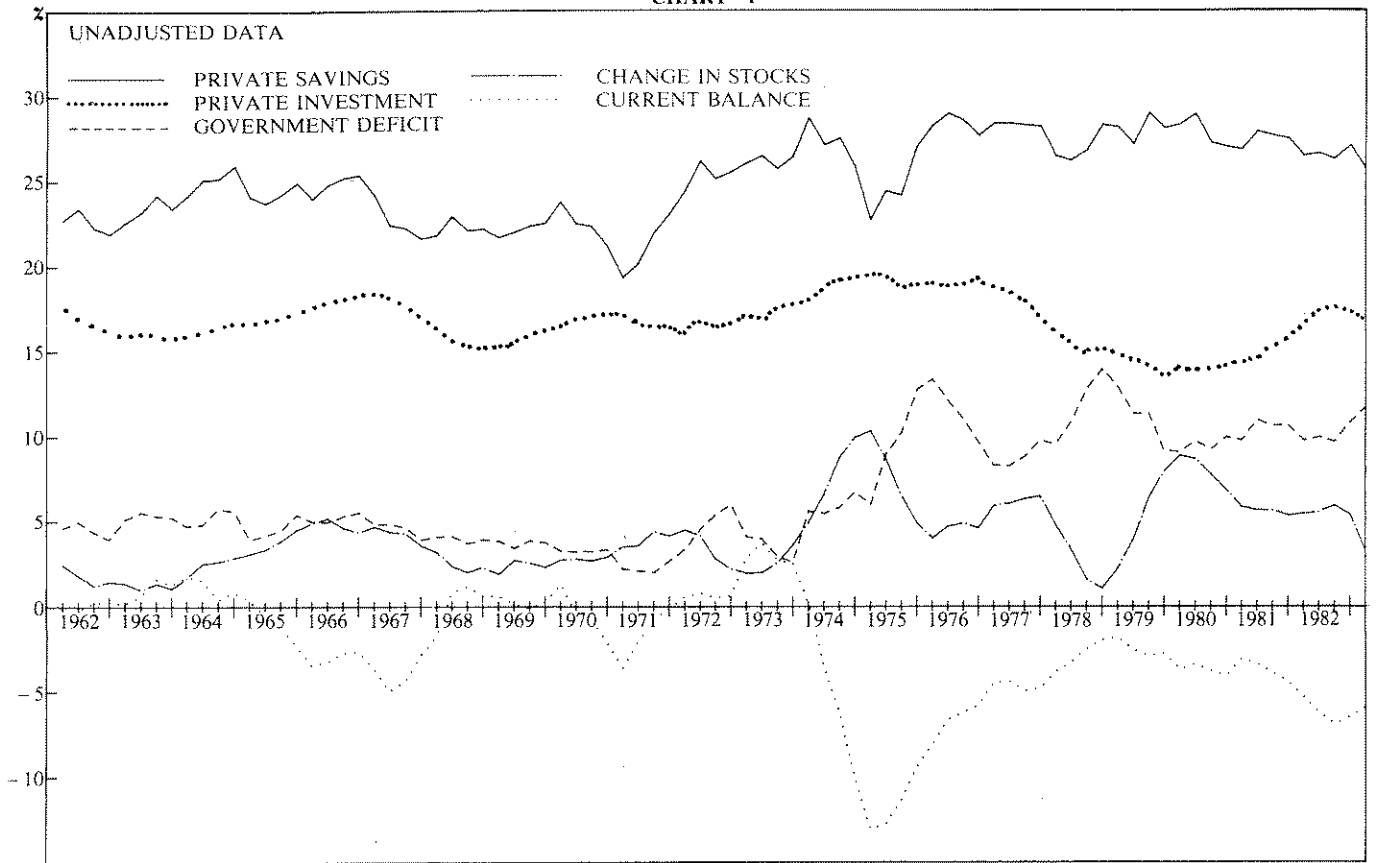
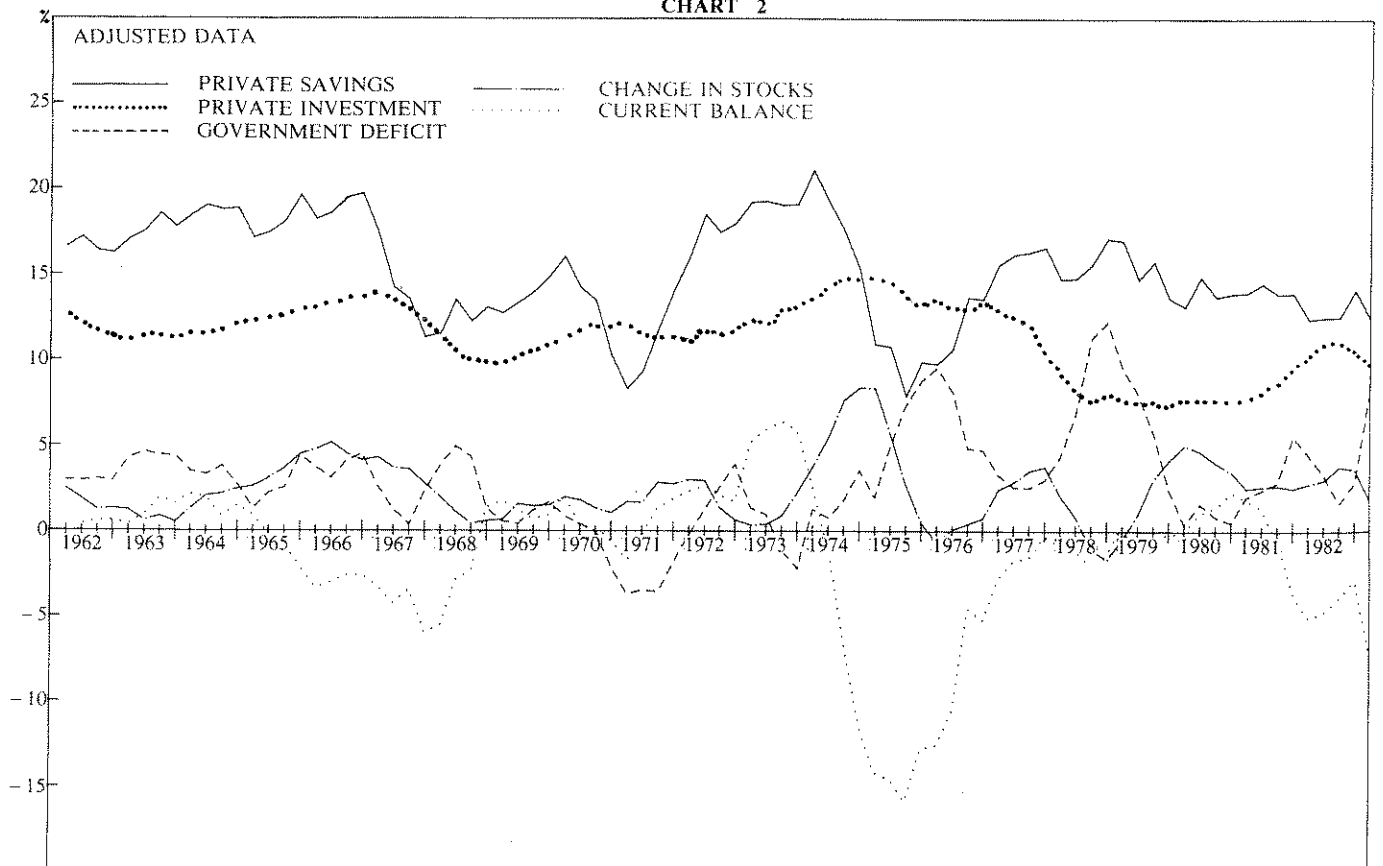


CHART 2



large fluctuations to average 5.2 per cent over 1972-83. These fluctuations still characterise the adjusted data series which shows that stocks tend to vary inversely with the government deficit, suggesting that stock cycles may, at least in part, be caused by cyclical government actions.

## IMPLICATIONS

In the past decade or so much literature has been produced overseas on the 'capital scarcity problem'. This literature has reflected a general belief that investment has been inadequate during the 1970s and that this shortfall has been the source of many current economic difficulties. Many of the policy measures offered to solve the problem have been derived from analysis which has emphasized allocative issues, such as the choice between current and future consumption (savings) and the distribution of private saving among competing uses. Most importantly the models have assigned to relative prices a primary role in the allocation of resources among industries, and to the interest rate the role of determining consumption and saving decisions.

Using such analysis it has been asserted that the main cause of capital scarcity has been excessive taxation of income earned from capital (such as taxation of interest earnings, dividends etc.). According to that view, inflation has substantially raised effective tax rates by moving such earnings into higher tax brackets, thereby lowering the after-tax return. The result has been to make saving, and therefore investment, less attractive.

For New Zealand, the adjusted private investment rate does suggest a decline over the last decade or so with most of this period being at historically low levels. Accepting this decline as an indication, to some degree, of a capital scarcity problem the next step is to consider the possible causes.

The views above posit a direct link between changes in saving and changes in investment. Investment expenditures may be financed from domestic savings — as either retained earnings or loans from financial intermediaries — or alternatively from overseas borrowing. If there were perfect world capital mobility, then savings in all countries would respond to the worldwide opportunities for investment while investment in any one country would be financed from the worldwide pool of capital. In this case there need be no direct relation between domestic saving and domestic investment. On the other hand, if there is less than perfect capital mobility (perhaps due to institutional rigidities such as regulations on capital inflows) then it would be expected that extra domestic saving would tend to be invested domestically and inadequate domestic saving would show up in a fall in domestic investment.

In this situation a drop in the domestic interest rate, say as the result of interest rate controls, will discourage saving via financial intermediaries while at the same time increasing the demand for funds for investment purposes (and indeed for all interest sensitive expenditures). The actual amount of investment may remain the same, if overseas borrowing is used to make up the shortfall in domestic savings, or may fall to match the new lower level of available domestic finance if overseas borrowing is not available. In either case, the excess demand situation in the domestic economy will necessitate some form of credit rationing. In this

situation available finance will not necessarily be matched with those activities which could earn the highest rate of return. Credit then tends to be channelled towards established, low risk, sectors at what are essentially subsidized rates of interest.

The data presented suggests that the private investment rate in New Zealand is positively related to the private saving rate but that the level of capital mobility is sufficient for the investment rate to be partially insulated from large short-run swings in private savings. The swings instead being reflected in international capital flows. Because of the national income identity, this suggestion is equivalent to stating that a larger share of short-run fluctuations in the private saving rate have been reflected in changes in imports and exports that alter the current account balance. These flows were offset to the extent by which there was increased overseas borrowing by the private sector (along with net equity investment) and by residual borrowing by the public sector.

The suggested link between domestic savings and investment implies that national economic policies that affect domestic saving can also influence domestic capital formation. Therefore, examination of government action which has altered domestic saving rates may provide a clue as to the cause of inadequate investment.

The decline in the private investment rate began in late 1974; preceding this decline was the large fall in the private saving rate. Savings fell for a number of reasons. The terms of trade decline cut private sector incomes and would have initially resulted in a fall in the rate of saving because consumption patterns would have taken time to adjust to what was essentially a drop in permanent income.

The initial government reaction was to adopt an expansionary fiscal stance over 1974-75. The budget deficit as a proportion of national income rose from its surplus position in late 1973 to reach a point which, had it been financed internally from the private sector, would have required nearly 100 per cent of private savings in early 1976.

As a consequence of this fiscal policy there was a rapid monetary expansion which resulted in the inflation rate rising from 6 per cent in 1973 to 18 per cent in 1976. The interaction of this higher rate of inflation with the income tax system, combined with regulations on interest rates to distort the choice between current and future consumption. Added to this situation was an increased rate of income re-distribution through transfer payments. This re-distribution probably increased aggregate consumption since the recipients were likely to be low income persons whose rate of saving would be lower. In effect government policies were changing New Zealanders' choice between spending now and saving in order to spend later.

The increased rate of consumption caused a deterioration in the external trade current account balance and made necessary compensatory public overseas borrowing. In that situation the increased external borrowing was being used to maintain certain levels of consumption rather than to finance investment. This situation in turn implies that by running current account deficits, as a response to deficient domestic savings, the rise in indebtedness which results will deplete future consumption levels because the debt must be serviced out of an unchanged level of output. If reduced aggregate investment results

in a fall in the productive capacity of the country's capital stock, the debt may need to be serviced out of a falling level of output which in turn would depress consumption possibilities further.

### CONCLUSION

Under a framework of the national income and expenditure identity the uses of private savings are identified as to finance private investment, the change in stocks, the government deficit and the overseas current account balance. The individual items have then been considered in terms of their measurement and their interaction with inflation. Adjustments were necessary to account for the overstatement of inventories, understatement of depreciation, capital gains and losses between the public and private sectors, and capital gains and losses between these domestic sectors and overseas.

The results have suggested that domestic private savings have constrained domestic private investment and therefore that national economic policies which have directly affected savings will also have had implications for domestic capital formation. A general conclusion indicated is that government fiscal and monetary policies have altered the choice between current and future consumption. Over the past decade New Zealanders' living standards have been maintained above those warranted by market conditions through overseas borrowing. As a result the adjustment that was required in response to external shocks has been prolonged. Regulations and controls over financial markets have led to a change in consumption patterns and to some malfunctioning of market signals. The consequence has been inflexibility in relative prices which has reduced the ability of the economy to adjust and produced an efficient allocation of resources both between competing activities and over time.