

SAVINGS IN NEW ZEALAND

PREFACE

The following article is a condensed version of a paper entitled *Savings in New Zealand During Inflationary Times*. This was presented to the February 1983 conference of the New Zealand Association of Economists (Wellington) and the 1983 congress of the Australian and New Zealand Association for the Advancement of Science (Perth) by its author, Robin Clements. The Bank considers this to be an important area for discussion although the views contained in the article do not necessarily represent official Reserve Bank views. The main findings relating to the trend of New Zealand's savings performance together with the conclusions regarding the determinants of saving are presented here. Many of the detailed results contained in the conference paper are not repeated. Copies of this paper may be obtained from the Reserve Bank.

INTRODUCTION

One of the more perplexing economic phenomena of the 1970s was the apparent rise in the savings ratio (i.e. savings as a proportion of income) in the face of reduced real rates of return, predominantly as a result of increased price inflation, and slow rates of economic growth.

Numerous studies, covering several countries (including England, America and Australia), have addressed this issue. The most common approach has been to test for the effect of inflation on the savings ratio, the rationale being that inflation erodes the real value of financial wealth and therefore causes the savings flow to rise as people attempt to restore the real value of their financial assets. Some economists also consider that because an increase in the inflation rate is associated with an increased level of uncertainty, it could lead to an increased level of so-called 'precautionary' saving. Most of the research efforts which have pursued these lines of approach have not, however, generated convincing results, and the issue has not been resolved.

An alternative approach has been to examine the definition of the relevant income, consumption and saving variables with a view to establishing whether the *measurement* of savings is subject to any bias when the price level is not stable.

MEASURES OF THE SAVINGS RATIO

It is widely appreciated that economic statistics are subject to the illusory effects of inflation, in the sense that they acquire inflated nominal values which mask underlying 'real' values. This is usually accounted for in economic analysis by dividing the actual or money values by a price index, thereby giving estimates of the underlying 'real' magnitudes.

What is perhaps not so widely appreciated is that inflation tends to impart other forms of bias to economic statistics, which are of a more fundamental nature. These biases arise in the determination and measurement of income. Since saving is calculated as the residual between income and consumption in

national accounting frameworks, any inadequacies or errors in the determination of income are passed on to savings. Three possible sources of bias can be identified.

First, the 'conventional' definition of income itself (whether in nominal or 'real' terms) can become inappropriate owing to the way in which inflation causes the conventional distinction between income and capital to become blurred and possibly misleading. The nominal treatment of interest payments leads to an overstatement of both personal and disposable income (and hence saving) since it treats as income what should be correctly treated as a repayment of capital and incorrectly treats as savings any reinvestment of this repayment. As the Government is usually a net borrower vis-a-vis the private sector, income and saving will be overstated if the private sector of the economy is studied in isolation. For the country as a whole, however, interest receipts, if overstated, will tend to be offset by overstated interest payments. This highlights the need for both interest receipts and payments to be fully included in the income calculation.

Secondly, it is vital that the measure of real output and income be free from the distortions which arise from conventional (historic cost) accounting techniques which, when the price level is rising, tend to overstate production inventories and understate depreciation charges. Thirdly, 'capital' gains and losses, arising from growth in asset prices which differ from the average inflation rate in the economy, should be included in income as failure to do so will mean that no account is taken of the change in real wealth during an inflationary period.

In addition to these potential sources of bias the measure of consumption must also be a comprehensive and an unbiased one if an accurate measure of saving is to be arrived at.

Some of our existing measures of income, consumption and saving are now examined with a view to establishing the extent to which they may be subject to measurement bias from the above areas. The aim is to examine the differences in and deficiencies of available data (household or national) that could be used to carry out research into saving behaviour in New Zealand.

Household Savings Ratio

Three sources of data exist which could be used to measure the households' savings ratios:

1. Data on the household savings ratio constructed within the Reserve Bank for use in its econometric model project.¹
2. The data on income and savings in the official National Income and Expenditure Accounts.²
3. The data that appears in the quarterly System of National Accounts (SNA) Household Income and Outlay Account developed by the Reserve Bank.³

1 See Reserve Bank of New Zealand Research Paper No.28, G.H. Spencer (editor).

2 See *National Income and Expenditure 1975-76*, Department of Statistics publication.

3 See Reserve Bank of New Zealand Research Paper No.32, D. Grindell (editor).

Data on the household savings ratio (see Chart (1)), constructed for the Model 8 version of the Reserve Bank of New Zealand Econometric Model, is found to be significantly and increasingly subject to upward bias over the study period. This deficiency stems principally from the following flaws inherent in that formulation of data.

First, the consumption measure that is used is inappropriate in that it fails to provide adequately for the consumption of services, leading to a consequent over-statement of household savings. Further, household income and therefore household savings are over-stated as a result of no allowance being made for the inflated interest receipts inherent in the inclusion of nominal interest transactions. (As noted previously this effect will have greater relevance to the household sector on its own.) In addition household savings are over-stated due to the omission of interest payments, either as a deduction from income or as a component of consumption, while interest receipts are included in household income.

Finally, household income and savings are incorrectly measured because of the failure to make any adjustment on account of the losses on net financial assets resulting from a rising price level. Savings are biased upward by this to the extent that households are net financial creditors. (The prices of real assets are expected to rise commensurately with inflation and, provided they do, they will have no net effect on real wealth.)

The second source of data on income and savings is that contained in the official National Income and Expenditure accounts. This was compiled only up to 1976. Its definitions relate to 'private' income and savings rather than the more narrowly defined 'household' sector (the essential difference is that private income includes the undistributed profits of companies, producer boards and stabilisation accounts).

This measure is likely to have been subject to less (upward) bias on account of the absence of any adjustments for inflation gains and losses on financial assets and liabilities, since it is only the net position of the private sector with the government (and overseas) which is of relevance here — financial transactions between the household sector and the 'business' sector, and any inflation gains and losses associated with them, cancel out. Also, interest receipts and payments are treated in a more comprehensive manner, although there is again an absence of any adjustment for the capital component in nominal interest transactions. But offsetting these advantages are the inappropriate stock valuations and (in the case of the net of depreciation savings ratio) possible inappropriate depreciation allowances which result from including the business sector into the analysis.

Hence, the old national income accounts, as for the Model 8 household saving data, do not provide an entirely adequate statistical basis for an examination of the determinants of saving behaviour and, in particular, the effect of inflation on that behaviour. It is likely that the upward trend evident in these two measures of the savings ratio are, at least in part, due to measurement biases induced by inflation rather than any underlying change in economic behaviour.

The third measure of household or private savings examined is that which appears in the quarterly System of National Accounts (SNA) Household Income and

Outlay Account developed by D. Grindell. Conceptually this represents the best measure of household or private savings available. Like the national income and expenditure accounts a complete treatment of interest receipts and payments is provided (noting that this still means that no allowance is made for the overstatement of income and saving as a result of including nominal interest receipts). Unlike the income and expenditure accounts measure of private savings (which covers businesses as well as households) this measure is not subject to the biases imparted by inappropriate stock valuations and depreciation allowances. It, however, still suffers from the omission of inflation losses on net financial assets.

The household savings ratio derived from Grindell's data is depicted in Chart (1) and, interestingly, it suggests that the ratio has been reasonably flat over the longer run. This contrasts with the previous two household/private savings ratios which both had an upward trend.

National Savings Ratio

For the national savings ratio we have only two sources of data to examine; the National Income and Expenditure data⁴ and the System of National Accounts data.⁵

The national savings ratio series derived from these two sources are broadly similar over the two end periods (see Chart (2)) but with the income and expenditure series maintaining a higher level over the 1965-1974 period. As the first source of data has not been compiled since 1976, this article looks only at the new system of national accounts, as published officially in the Monthly Abstract of Statistics and extended by D. Grindell.

The treatment of interest and the question of inflation gains and losses on financial assets and liabilities are not a cause for concern here. Both are simply transfers, and hence, in respect of all domestic financial assets and liabilities, both interest receipts/payments and inflation gains/losses sum to zero. These factors influence the allocation of savings among sectors but not the overall level of saving.

Whether inappropriate depreciation allowances represent a source of bias in the national savings ratio depends on whether one is looking at gross or net of depreciation measures of saving and income. If the former then there is no problem since gross income and saving are measured independently from depreciation. Net income, though, is arrived at as the difference between gross income and depreciation and hence, to the extent that depreciation is understated, net income is overstated. Correspondingly savings will be overstated by the same amount and the savings ratio will be biased upwards.

An indication of the magnitude of this bias is given by the extent of the divergence between the net and gross savings ratio over the last decade, compared with the previous decade (when the extent of any bias was likely to be small, given that the average inflation rate in that period was less than 3 per cent per annum). Table (1) below shows the relevant measures of the savings ratio

4 Op. cit. Department of Statistics.

5 See Monthly Abstract of Statistics, May 1981 and *ibid.* D. Grindell.

for the two periods 1962-71 and 1972-83,⁶ and suggests that, in the latter period, the net savings ratio *on average* has been biased upwards by 1.0 percentage point. (It is likely that the bias was less in the early 1970s and in the 1980s correspondingly higher).

TABLE (1)
National Savings Ratio Averages (SNA)

	Gross	Net	Difference
	(1)	(2)	(1) — (2)
	%	%	%
1962-71	21.0	13.6	7.4
1972-83	22.9	16.5	6.4
Difference (depreciation bias)			1.0%

The other factor which may introduce bias in the national savings ratio is the way in which stocks are valued. In principle the valuation of stocks requires continuous accounting but this is approximated in the SNA accounts 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 real increases, i.e. increases in stock volumes. In the Grindell SNA data a stock valuation adjustment series has been derived to allow for this. Looking at Chart (3) it can be seen that the adjustment makes a noticeable difference to the trend in the gross savings ratio, the stock valuation adjusted ratio being significantly lower than the unadjusted ratio especially, and increasingly so, in the post 1974 period. A quantitative indication of the extent of this bias is set out below (table (2)) in the same manner as before (by assuming that the difference in their means, during the 1962-1971 period, would have continued until 1983 except for the inflationary bias caused by inappropriate stock valuation methods). The results show that the national savings ratio, based on a gross definition, has been biased upwards to the extent of 1.8 percentage points *on average* during the 1972-83 period.

TABLE (2)
National Savings Ratio Averages

	Gross (Unadjusted)	Gross with SVA	Difference
	(1)	(2)	(1) — (2)
	%	%	%
1962-71	21.0	20.4	0.6
1972-83	22.9	20.5	2.4
Difference (stock valuation bias)			1.8%

In order to ascertain the effect of the two biases (depreciation allowances and stock valuation methods) on the trend of the national savings ratio, the three variants (net, gross and gross with stock valuation adjustment) are plotted as differences from their respective 1962-71 averages (during which it is assumed that the biases noted above have been negligible). Chart

(4) illustrates that the three ratios moved together almost identically up until 1974 (thus providing support for the assumption of negligible bias during this period) but that from this point on the three series move in quite different directions. The net series fluctuates about a relatively constant level, whereas the gross follows a mild downward trend and the gross with stock valuation adjustment shows a more dramatic decline in the national savings ratio to a level which is its lowest during the historical period examined.

SAVINGS, INFLATION AND THE RATE OF INTEREST

The savings behaviour of the household sector rather than national savings has been the major focus for economic analysis and research. This research has been subject to many varying, and at times seemingly contradictory, results especially with regard to inflation and the role interest rates play in determining savings.

Many economists have found that the traditional theories of savings behaviour gave equations which underpredicted the measured savings ratios of the 1970s. Attempts to improve the explanation of savings during this period typically involved (by various theoretical justifications) the addition of the influence of the inflation rate on savings.

The rationale for doing so has usually been the 'real balance effect' or the 'precautionary savings effect' of inflation. The former, it is argued, results in an increase in the savings ratio as a consequence of individuals seeing their real money balances being eroded by price inflation and responding by curtailing consumption in an attempt to build up real balances to their desired levels. The precautionary savings effect is considered to be a consequence of individuals perceiving that increasing inflation rates imply greater economic uncertainty. Both the real balance and precautionary savings effects result in an hypothesized positive relationship between the savings ratio and the inflation rate.

On the other hand, some researchers have suggested that the direction of influence of the inflation rate could be indeterminate, since inflation may also exert a negative influence on savings behaviour. For instance, an increased level of uncertainty regarding the future might be associated with an increased rate of time preference, i.e. an increase in the required rate of return on savings. This would suggest that an increase in the inflation rate should result in consumption being shifted forward and thus, that the relationship between current saving and inflation should be a negative one. Additionally, there is another uncertainty associated with saving, namely that individuals may doubt whether their savings will maintain purchasing power for future consumption, which also suggests a shift in preferences towards consuming now rather than later. Similarly, there exists an incentive to borrow (i.e. dis-save) in these circumstances (due to the expectation that real debt repayments in the future will be reduced by inflation), in order to undertake further current consumption. In other words, inflation may have the effect of raising the required rate of return on savings and of lowering the actual rate of return. Both of these effects suggest that the relationship between inflation and the savings ratio could be a negative one.

⁶ Data for 1982 and 1983 was constructed using New Zealand Institute of Economic Research forecasts of the national accounts.

Another point of dispute has been the relationship between interest rates and savings. One would expect there to be a positive relationship between the interest rate and savings since a higher rate of interest rewards saving and lending, and correspondingly lowers the desire to borrow. This 'substitution effect' may be offset in part by the 'interest income effect' which, by increasing real income, would result in the purchase of more of both current and future goods.

Looking at the economy as a whole, though, it is likely that this negative income effect on saving will be of little significance (or at least less than that of the positive substitution effect). For the nation as a whole a rise in interest rates results in increased disposable incomes for net creditors, but it also results in correspondingly reduced disposable incomes for net debtors. Therefore, provided that net creditors and debtors spend similar proportions of interest income, there will be no interest income effect for the economy.

The question then of the relationship between savings, the inflation rate and an interest rate term, needs to be resolved empirically (i.e. by analysing actual developments). An econometric model has been derived which explained the movements of the savings ratio as being determined predominantly by present and past rates of change in disposable income. This model was then extended by augmenting it with the rate of change in the consumer price index (which represents the inflation rate) and the after-tax real rate of interest (which represents the rate of return to saving).

On the basis of the results of this analysis, it would seem that the impact of rising inflation rates on aggregate saving has been to discourage saving. The finding of a positive relationship between the savings ratio and the real after-tax rate of interest would suggest that the over-riding determinant of savings levels has been the rate of return available on savings. Thus the results indicate that an increase in the real after-tax rate of interest, through either an increase in the nominal interest rate or a decrease in the tax rate or the inflation rate, would normally increase the savings ratio.

IMPLICATIONS

The observation that savings ratios (as 'conventionally' measured) in most Western countries rose during the 1970s, generated a movement in the consumption/savings literature towards the development of causal relationships between savings and inflation. Traditional theories were modified by the proposed positive relationship between savings and inflation which (it was hypothesized) resulted from the real balance and precautionary effects. This research suggests, however, that the savings ratio (for New Zealand as a whole, at least) measured in inflation adjusted terms has in fact been falling since the mid-1970s and not rising as the unadjusted data indicate. This in turn suggests that inflation has had a predominantly negative influence on savings, stemming from the low real (especially after tax) rates of interest which have generally prevailed.

Since the depression of the 1930s macro-economic policy in most Western countries has been largely preoccupied with maintaining aggregate demand so as to keep output at near full employment levels. One manifestation of this has been a desire to hold interest rates at reasonably low levels, the objective usually

being to stimulate investment expenditures and attempt to satisfy social objectives, in housing for example, through the provision of low cost finance. A consequence of these actions has been the discouragement of saving.

It would appear that underlying these kinds of policies has been a belief that under higher interest rates a deficiency in aggregate demand might emerge and that this could throw the economy into a strong 'down swing' as a consequence of the involuntary inventory accumulation which would occur in these circumstances and the production retrenchment which would follow.

Against this background, the perception of a strong 'rise' in the savings ratio, as measured by official economic statistics, might be viewed as something which has contributed to the low rates of economic growth experienced since the middle of the last decade, in the sense that the supposed high level of savings (or its counterpart, a low level of consumption) was a depressing influence on aggregate demand. The common policy response to this slow growth, and the unemployment which emerged, was one of stimulating aggregate demand. At times this involved holding interest rates below their market clearing levels. The outcome, in relation to the true savings performance of the economy however, has been a reasonably steady fall in the inflation adjusted national savings ratio, which may have led to some decline in investment levels (notwithstanding low real interest rates), and also to a deterioration in the external accounts.⁷ The implication of this is that the overall capital base of the New Zealand economy has grown only at a slow rate. This in turn has limited the scope for economic growth, both because of a slowing rate of growth in the physical capital stock and because the foreign exchange constraint has become increasingly binding.

Given that the savings ratio has been falling, what does this infer for the economy and its prospects? As already noted the low rate of saving is indicative of a low rate of overall capital accumulation. Therefore the fall in savings implies that as a nation we are, to some extent, passing up the opportunity to raise our future standard of living.

While it is widely accepted that one of the major objectives of economic policy is to maximise current output or consumption, the overriding objective may be viewed as the maximisation of consumption over time. This implies the existence of a trade-off between consuming a certain amount now, or a greater amount later. For example, if investment in plant and machinery earns a real net annual rate of return of 10 per cent, then by giving up a dollar's worth of consumption today, we can have two dollars worth of consumption (at today's prices) in just eight years time. Therefore it can be seen that a sustained level of savings and investment could result over time in real economic growth, with associated greater consumption possibilities.

One way of improving our rate of economic growth therefore is to identify the policies which have worked to discourage savings, with a view to removing these distortions.

In this regard, financial market rules that have prevented market forces from operating freely (thus depressing the rate of return to savers) may be

⁷ The latter also being the result of adverse movements in the terms of trade.

important. Also important may be certain tax rules that have affected saving.

For instance, substituting a tax on consumer spending for personal income tax can be viewed as a way to stimulate saving. This stems from the fact that income saved is exempt from a consumption tax, while under an income tax system it is subject to tax. Hence the use of a consumption tax may encourage taxpayers to increase their savings so that they can escape the tax liability on the income that is saved.

Also a tax distortion which discriminates against saving, at least so long as interest income is assessed for tax, is the assessment of total nominal interest receipts for tax, inclusive of any inflation premium. The outcome is that real after-tax rates of return to saving are distorted, and in the last decade have been forced at times to negative levels.

It is likely that removal of the tax on the capital maintenance part of interest receipts could significantly increase the rate of return to saving in inflationary periods.

CONCLUSION

The motivation for this research study was the savings phenomena of the 1970s whereby the New Zealand savings ratio (and savings ratios for other countries) apparently rose strongly in the face of reduced real rates of interest and slow rates of economic growth. This prompted a close examination of the available data on savings, particularly in relation to the question of whether measurement distortions had been introduced by inflation, in New Zealand.

Alternative inflation adjusted data series were constructed and these suggested that, in aggregate, the level of saving in New Zealand did not in fact rise in the 1970s, and is presently at its lowest level for at least twenty years.

This inflation adjusted measure of national savings was then used in analysing savings behaviour, where the focus of attention was on the role of inflation, taxation and interest rate variables as determinants of savings. The results suggested that the relationship between savings and nominal interest rates is a positive one, and that inflation and income tax rates are negatively related to saving.