

INTEREST RATE POLICY: A NEW ZEALAND QUANDARY

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PREFACE

This Research Paper represents an attempt to draw together various strands of research carried out within the Economic Department of the Bank over the past year or two, on the role of interest rates in the New Zealand economy. The monetary authorities in this country appear to face something of a quandary with respect to interest rate policy: on the one hand, there are strong political and social pressures to hold interest rates at low levels regardless of the prevailing economic situation, while on the other hand conventional economic analysis suggests that from both efficiency *and* equity points of view, interest rates should be largely determined by market forces.

Accordingly, it seemed useful for this study to have two major aims.

First, the Paper endeavours to set out in a hopefully non-technical fashion the economic arguments underlying the case for a more flexible interest rate policy in New Zealand. As part of this exercise, the background situation is discussed briefly with particular emphasis on the political attitudes underlying the interest rate quandary. Then some of the basic concepts are outlined and a comment is offered on the empirical evidence confirming the validity of these theoretical ideas. Various practical issues and some popular misconceptions are also analysed, and overseas interest rate policies are touched on. Finally, some policy implications are raised for New Zealand.

Secondly, a variety of empirical evidence is assembled and presented in the Paper to illustrate the importance of interest rates in the economy, and hence the need to pursue a rational interest rate policy. This evidence takes four major forms, with the more technical material being deliberately relegated to a series of appendices:

- (a) Some of the institutional-type evidence is discussed in the main paper, and presented in tables 1 to 5.
- (b) The influence of interest rates on expenditures and holdings of financial assets is demonstrated by a series of equations in Appendix III (the notation is in Appendix IV).
- (c) These equations and the interest rate elasticities derived from some of them are discussed in Appendix I (the elasticities are set out in table 6).
- (d) Tables 7 to 12 in Appendix I summarise the results of two simulation experiments in which exogenous interest rate variables were altered within the framework of the Bank's econometric model over a period of several years, and the subsequent impact of these changes on a range of variables in the economy can thus be studied.

Because there has been some interest recently in the idea of index-linked financial assets, a few comments are offered on this subject in Appendix II. It is suggested that the likely objectives of any index-linked financial asset scheme may well be better served by alternative policies, including flexible interest rates and more equitable personal tax exemption policies for items such as interest income and life insurance premiums.

It cannot be emphasised too strongly that the case for New Zealand to revise its present interest rate policies does not rest solely on economic arguments. As the Paper endeavours to point out, it is a continuing and unfortunate irony of our present policies that they often bear most heavily against those sections of society the so-called "low" interest rate policies are ostensibly designed to assist. With this in mind, the Paper focuses considerable attention on the anomalies and inequities which have arisen under current policies, and some suggestions are offered as to satisfactory ways in which these problems could in fact be eased under a flexible interest rate structure. Contrary to what some people seem to believe, economic analysis can be helpful in devising effective social policies as well as economic policies. But it is important that a clear distinction be maintained between ends and means, and in this connection low interest rates seem to have become an end in themselves, rather than a means to an end. Failure to recognise this distinction must inevitably lead to some confusion.

A number of colleagues have generously provided assistance with parts of this Paper and I am pleased to be able to acknowledge their help. David Grindell prepared the interest rate simulation results and Philip Lichtwark calculated the single equation elasticities. John Gallacher worked with me in preparing the material on index-linked financial assets and Gerse Halliday provided ideas related to interest subsidies for the housing sector. These and other members of the Research Section of the Bank assisted with the construction of the 1974 version of the Bank's econometric model, from which the equations are drawn and on which the simulation results are based. Len Bayliss generously granted permission for me to use the material in table 2, which resulted from his research at the Bank of New Zealand.

Finally, it will be obvious that the views contained in this Research Paper are entirely my own responsibility. In particular, they do not purport to represent those of the Reserve Bank.

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INTEREST RATE POLICY: A NEW ZEALAND QUANDARY

1. INTRODUCTION

Interest rate policy in New Zealand is a controversial subject on which many people hold prejudiced views not necessarily supported by a convincing economic rationale. For many years government—presumably with the support of the wider community—has sought to regulate interest rates at artificially low levels, raising a presumption in the minds of many economists that too often too little attention has been paid to the economic aspects of such a policy. While in no way wishing to under-estimate the significance of political attitudes and social considerations in this area, this Paper endeavours to set out some of the major economic arguments in favour of a more flexible interest rate policy in New Zealand. The discussion is necessarily abbreviated; a full treatment would of course require a textbook.

2. BACKGROUND

The historical background, especially as it relates to the extensive net of direct controls over interest rates, is ably summarised elsewhere and will not be repeated here.⁽¹⁾ It will suffice to observe that financial institutions generally are currently subject to the Interest on Deposits Regulations 1972⁽²⁾ which prescribe maximum rates ranging from 4.5 percent for call money to 7.25 percent for deposits of 4 years and over; and that other specific controls are imposed on all forms of savings banks' deposits, trading banks' fixed deposits for periods of under two years and for amounts of under \$25,000 and trading banks' advances. The effect of these controls is illustrated in table 1, which sets out a range of interest rates effective in July 1974. The odd impact which such regulations can have on a yield curve is shown clearly by the sharp difference in the interest rates offered by finance companies for four and five-year deposits: these attracted rates of 7.25 and 10 percent respectively at the time.

In addition, the government exercises a powerful and pervasive influence throughout the financial system by maintaining relatively low interest rates for government securities and Treasury Bills while simultaneously forcing virtually all financial institutions to invest specified minimum proportions of their deposits or assets in official securities. The various interest rate controls and ratio requirements encompass trading banks, savings banks, finance companies, life insurance offices, money market

dealers, building societies, stock and station agents and pension funds.⁽³⁾

Movements in major interest rates over the past decade or so are set out in the table appended to this Paper (table 5).

3. POLITICAL ATTITUDES

There remains a deep rooted suspicion of interest rates in New Zealand: some politicians are wholly sceptical about the advantages of flexible interest rates and firmly believe that all rates should be held at relatively low levels, while others are aware that political and economic forces pull in different directions on the subject. Accordingly, while a survey of *Hansard* parliamentary reports for the past decade does not reveal many comprehensive debates on interest rates, it does provide an interesting range of varied opinions. Some quotations from *Hansard*⁽⁴⁾ may illustrate the dilemma in which politicians seem to find themselves:

(a) "If a Government wants to buy money in the market it has to pay normal rates, though holding them down as much as possible."

(b) "I want to discuss for a minute the effect of these increasing interest rates, because they are a form of increased prices and costs that bear heavily on the people."

(c) "Money for the development of industry would not be forthcoming if interest rates were not competitive."

(d) "Honourable gentlemen opposite somehow like you to believe that money borrowed at 4½ percent is better money than that borrowed at 1 percent from the Reserve Bank."

(e) "Is there any christian principle in charging 8 percent or more for the price of borrowed money, for that is what interest is."

(f) "Interest rates are not excessive in New Zealand. They are generally reasonable in relation to the supply and demand of loanable funds. Interest rates are dependent on the state of the economy. The Government, by relaxing or increasing general economic controls, can set the tone of the market, and can thus have some effect on interest rates, but it cannot completely control them unless it resorts to a host of controls."

(1) See, for example, the Monetary and Economic Council's Report No. 24, *Monetary Policy and the Financial System*, December 1972 (especially Chapters 4 and 5), and Professor F. W. Holmes' textbook *Money, Finance and the Economy*, Heinemann Educational Books, Auckland, 1972 (especially Part 1 and Chapter XI on monetary policy).

(2) As per Amendment No. 3, Regulation 1974/112, which prescribed maximum rates of interest payable by deposit-holding bodies as from 20 May 1974, as follows:

Period of Deposit	Maximum Rate of Interest Percent Per Annum
Repayable at short call	4½
Not less than 3 months but less than 1 year	5½
Not less than 1 year but less than 2 years	6
Not less than 2 years but less than 3 years	6½
Not less than 3 years but less than 4 years	7
Not less than 4 years	7½

(3) The history of the government security ratio requirements over non-bank financial institutions is set out in Deane, R. S., Grindell, D., and Fenwick, A. C., "Quarterly Governments Accounts: Financing Transactions and Analysis of Public Debt Holdings," in Reserve Bank of New Zealand *Research Paper No. 11*, April 1973, especially pp. 44-46.

(4) The quotations were selected from the period 1960 to date and reflect feelings expressed by both major political parties. However, it does not seem necessary or useful in the present context to attribute the quotations to the specific speakers or political parties. The quotations are designed only to illustrate the doubts and confusions which seem to be raised by the subject of interest rates in New Zealand.

TABLE 1
SELECTED INTEREST RATES* BY TERM
(AS AT JULY 1974)

	Call	1 mth	3 mths	6 mths	1 yr	2 yrs	3 yrs	4 yrs	5 yrs	6 yrs	10 yrs	15 yrs
<i>Controlled Market</i>												
Government Securities												
(Issue Rates)	—	—	—	—	—	—	4.1	—	—	5.0	—	6.0
Local Authority Securities												
(Issue Rates)	—	—	—	—	4.5	4.75	5.0	5.25	5.5	5.75	6.25	6.25
Treasury Bills												
(Issue Rates)	—	—	2.0	2.4	—	—	—	—	—	—	—	—
Savings Banks	3.0	—	—	—	5.0	5.5	—	—	—	—	—	—
Trading Banks' Deposits:												
Under \$25,000	—	4.0	4.25	4.25	4.5	4.8	6.5	6.75	6.75	6.75	6.75	6.75
Over \$25,000	—	4.0	5.0	5.0	5.5	6.0	6.5	6.75	6.75	6.75	6.75	6.75
Finance Companies	4.5	4.5	5.5	5.5	6.0	6.5	7.0	7.25	10.0	10.0	10.0	10.0
Building Societies	4.5	4.5	5.5	5.5	6.0	6.5	7.0	7.25	7.25	7.25	7.25	7.25
Official Short-Term												
Money Market	4.5	4.5	4.5	4.5	—	—	—	—	—	—	—	—
<i>Uncontrolled Market</i>												
Commercial Bills	—	9.25	10.0	10.0	—	—	—	—	—	—	—	—
Trading Company												
Debentures	—	—	—	—	9.0	10.0	12.0	10.0	12.25	12.25	11.0	10.5
Average New Mortgage												
Interest Rate												
(excluding Government)												
(May 1974)	—	—	—	—	—	—	8.42	8.42	8.42	—	—	—
Trustee Companies	—	—	—	—	—	—	9.0	9.0	9.0	—	—	—

* Highest rates quoted in all cases.

(g) "Internally the Government is so much the largest borrower that its actions dictate the rates effective in this market."

(h) "The price of money, that is the interest we have to pay for loan money, is undeniably a major factor in costs and prices. . . . No one can escape from the increase in interest rates, and the singular fact is that high interest rates do not add to the level of savings."

(i) "The member . . . asked why these (interest) rates should be increased. The answer is, simply to give incentives for greater savings, to give people on lower incomes, with smaller amounts to save, greater incentive to deposit their savings."

(j) "I can understand the Minister of Finance saying he must have regard to the market rate and to borrow at the market rate, although I have never believed that that is the proper course to follow."

Unquestionably, the doubts implied by some of these quotations reflect the concern of the community generally: do higher interest rates simply amount to higher costs and prices or are there some wider economic benefits? Do higher interest rates really stimulate additional savings? Is there a need to pay rates determined by the market system or can rates be satisfactorily controlled? Are high interest rates unethical?

It is thus the purpose of this Research Paper to provide a hopefully straightforward description of the role of interest rates in the New Zealand economy, on the basis of conventional economic analysis.

4. THEORETICAL CONSIDERATIONS

4.1 Some Basic Concepts

The principal objective of monetary policy is to maintain a level of spending sufficient to keep resources fully

employed while avoiding rapid changes in the price level and preserving international solvency. If policy is to influence spending decisions in this manner, it should be designed to regulate the overall availability and cost of credit; to influence decisions regarding the holding or disposing of liquid assets; to affect future expectations about each of these factors; and to ensure that the monetary system meets the needs of savers and borrowers in an efficient and flexible manner.

The need for monetary policy to regulate the supply of credit and to influence holders of liquid assets arises from the fact that some entities in the economy spend less than they earn while for other units expenditure will exceed income in the same period.⁽⁵⁾ The latter, known as excess spenders or deficit units, have a deficit which may be financed in a number of ways. They can borrow (thereby incurring additional liabilities), run down existing cash balances, convert other liquid financial assets into cash, realise securities, or persuade their debtors to repay debts. On the other hand, surplus units (those which spend less than they earn) run a surplus which enables them to build up their cash balances, accumulate liquid assets and securities, and repay debts.

Obviously, entities which run surpluses finance the deficits of excess spenders. This financing may be carried out directly (e.g. a direct loan from one company to another) or indirectly via a financial intermediary, which may accept deposits from a wide range of indi-

⁽⁵⁾ In this context, earnings or income refers to the process of obtaining funds by playing some part in production. The definition includes wages, profits, rent and interest but excludes gifts, borrowing and the like. Spending constitutes the purchase of goods and services for both current consumption and capital formation. It excludes the acquisition of financial claims, such as bonds, securities, debentures and shares.

vidual units and in turn lend to another group of entities. The intermediary may be a financial institution (e.g. a bank, insurance company, stock and station agent, etc.) or an individual (such as a solicitor or a sharebroker).

The cost of this financing by the borrower, or the return obtained by the lender, is the interest rate. Hence policy is concerned not just with the volume of financing, but also with its cost. The higher the interest rate, the greater the discouragement to borrowing and, of course, the higher the reward for lending—which means foregoing present spending. In New Zealand, the major net borrowers are the central government, local authorities, many companies and farmers, and those private individuals who borrow to finance the purchase of houses, cars and consumer durables.

Economic units can be conveniently regarded as holding their wealth in three forms: money,⁽⁶⁾ financial assets⁽⁷⁾ and real or physical assets. Accordingly, interest rates can be viewed as an important factor in determining the distribution of wealth between:

- (a) Financial and real assets, and
- (b) Different types of financial assets.

4.2 Interest Rates and Expenditure

Economic theory suggests that as interest rates generally rise, and thus the prices of financial assets fall, there will be a tendency for the community to desire to accumulate additional interest-bearing financial assets; to hold less money, which of course does not earn interest; and to spend less on real assets. Similarly, higher interest rates make borrowing more expensive and thus tend to discourage people from increasing their spending as rapidly as might otherwise have been the case. Some investment projects may be delayed if the cost of the finance is pushed up to a level which exceeds the anticipated profit, or the rate of return on the project.

For these sorts of reasons, economists argue that in inflationary circumstances higher interest rates are necessary to achieve some equilibrium between the demand for and the supply of loanable funds. Clearly, in either a so-called demand-pull or cost-push type of inflationary environment, the demand for funds is likely to increase as a result of the desire of the community to make consumption purchases immediately rather than later, in the hope of avoiding future price rises; to invest in new capital formation to facilitate additional output, either to meet the excessive monetary demand for goods and services, or to overcome the shortages and relatively high cost of labour associated with inflation; or to acquire physical assets in relatively short supply, such as land as a hedge against inflation. On the other hand, inflation is likely to inhibit the supply of funds forthcoming unless substantial offsetting factors prevail (such as a massive balance of payments surplus). The most rational and efficient way to resolve the problem of a heightened demand for and reduced supply of finance is to allow the market price—the interest rate—to rise. In a recessionary situation the converse is obviously the case.

4.3 Interest Rates and Financial Assets

Rising interest rates also reduce the demand for money as distinct from other interest-earning financial assets.

(6) Defined as notes and coin plus demand deposits at the trading banks.

(7) Includes interest-earning deposits at various financial institutions, government securities, company shares and debentures, etc.

There are several justifications for holding money as such: to finance current transactions, as a precaution against future contingencies, and for speculative purposes. The speculative demand for money is normally seen as a function of the rate of interest, demand falling as the interest rate rises. This is the case because the further the price of a financial asset falls, the less will be the expectation of additional downward movements. Looking at it another way, the higher the interest rate, the greater will be the opportunity cost of holding money rather than financial assets.

Furthermore, interest rates are important in determining what types of financial assets the community wishes to hold, and this has significant implications for the effectiveness and efficiency of monetary policy. For example, if as in some periods in the past, trading banks were not able to compete effectively for funds, non-bank financial intermediaries would more easily attract funds to their own account. In other words, in this type of situation, non-banks would be able to gain a greater share of bank deposits and, as these represent cash to the non-banks, they would thereby be encouraged to expand their total assets, and thus their lending capacity, at a more rapid rate.

Similarly, the more extensive the regulation of institutional interest rates, the greater are the funds available for direct lending (e.g. between large industrial companies) or non-institutional flows of funds (e.g. through solicitors and sharebrokers). It is of course clear that deposits do not leave the banking system since there is merely a change of ownership of deposits, but the basis for making new loans shifts from the trading banks to other lenders. These activities imply an acceleration in the turnover of the existing total of trading bank demand deposits and facilitate the financing of additional expenditure. This reduces the effectiveness of monetary policy. It also encourages funds to flow through channels which may be more expensive and less efficient than those provided by the trading banks. An extension of this sort of argument applies to other financial institutions which are subject to interest rate controls, such as the savings banks.

In more recent years the trading banks have been both able and willing to compete more actively for deposits, aided no doubt by an unprecedented large balance of payments surplus, at least until the end of 1973. Restoring the banks to more competitive terms with other deposit-acceptors should facilitate, when necessary, the imposition of some indirect limitation upon the extent to which non-banks and other deposit-takers can attract bank deposits, expand their loans and thus frustrate monetary policy.

4.4 A Dual Market

Nevertheless, the fact remains that extensive official controls over interest rates effectively create two interlocking financial markets: one the "official" controlled sector; the other the free market. The wider and more stringent are the government's controls over interest rates, but assuming they are not absolutely comprehensive, the greater will be the upwards pressure on interest rates in the peripheral "free" market. The latter effectively serves as an escape valve, not only meeting the overflow of demands for loans in a presumably less efficient and more costly manner, but also attracting depositors away from the low yield "official" sector. Thus it is logical to claim⁽⁸⁾ that the brunt of the trading

(8) As Holmes, *op. cit.*, does on p. 175.

banks' recent drive for additional fixed deposits has probably been borne by the remainder of the official market—savings banks, money markets dealers and non-captive government security holdings—rather than by the less rigorously controlled institutions, such as the finance companies, and certainly not by the non-institutional intermediaries.

If quantitative restrictions, such as credit ceilings, are associated with interest rate controls, this accentuates the potential diversion of funds to the non-controlled sectors of the financial system. Direct controls unquestionably impair the efficiency of the system, forcing people to resort to less desirable more expensive channels of intermediation; retard the growth of efficient institutions while promoting the activities of the less efficient; do not necessarily reduce the total supply of credit; and do little to influence the basic causal elements, i.e. those factors underlying an excessive demand for funds.

Superimposed on this dual market is the need for government to borrow funds, a need which is satisfied not by competing in the open market but instead by a comprehensive series of government security ratio requirements imposed arbitrarily on most financial institutions. By forcing the latter to accept low yielding securities the government not only creates further distortions but also generates some serious anomalies. These are discussed later.

It is interesting to note that the Reserve Bank has for some time recognised the nature of these problems although unfortunately there have been difficulties in resolving them. For example, in 1968-69, at a time of a sharp increase in overall liquidity in New Zealand, the Bank commented as follows:⁽⁹⁾

"There are several reasons for the virtual absence of easing in interest rates. Experience shows that long-term rates behave sluggishly in response to changes in liquidity. The time lag here is rather long. Interest rates paid for deposits lodged with the largest monetary institutions are almost all officially fixed rates, or officially approved rates, and it was considered unwise to reduce them. Finally the size of the market and the competition within it has been seriously diminished by the credit arrangements . . . whereby the major part of the funds flowing into the main deposit-taking institutions (and a considerable portion of funds in other financial institutions) are, by regulation or agreement channelled into Government securities.

While these arrangements constitute a powerful monetary instrument for diverting funds into the Government sector and thus depriving the private sector of a major source of loanable funds, their continued use causes some potentially dangerous side effects. The development of the market for Government securities and the attractiveness of Government securities to the public are greatly weakened. The weakening of the public's preference for Government securities has been a feature of our capital market for some years, but this trend has been given added strength by the credit arrangements. It is significant that since these arrangements have been in force the growth in holdings of Government securities has been almost wholly concentrated in the financial institutions subject to the regulations or agreements.

It is clear that the arrangements insulate the Government from the pressure of having to compete for funds

⁽⁹⁾ Reserve Bank of New Zealand, *Annual Report*, 1968-69, pp. 9-10.

on the market and from the need to adopt a positive interest rate policy. The cost of Government borrowing is thus kept down. These are substantial advantages. But it also renders the Government's borrowing programme largely dependent on the ebb and flow of liquidity in the economy, which itself is greatly dependent on the outcome of the balance of payments. Furthermore, the diversion of such a large proportion of their funds into Government securities weakens the ability of the controlled deposit-taking institutions to compete with other flows of credit. New channels for credit may also open up because there is a strong incentive for borrowers and lenders to make direct contact with each other, foregoing the services of a financial intermediary. Thus control over the monetary system is gradually weakened. It is probable too that the efficiency of the system is impaired insofar as the expertise of the financial institutions is less fully utilised in directing credit flows to the best advantage, and the average cost of credit to borrowers is higher. In conditions of severe or potentially severe inflation, controls of this kind are justified, but their effectiveness is so great in the short-run that it may overshadow the longer-run, but no less important, disadvantages of operating such a financial system."

5. EMPIRICAL EVIDENCE

Two types of empirical evidence can be adduced to illustrate some of the ideas developed above: first, results from the Bank's econometric research programme provide evidence of the relationships between interest rates and asset portfolios and, secondly, historical data and changing institutional patterns reveal some of the effects of pursuing a monetary policy based on direct regulations and controlled interest rates.

Despite scepticism in New Zealand about the likely effectiveness of a more positive interest rate policy, the Bank's econometric model results make it clear that variations in holdings of financial assets and liabilities do depend on relative rates of interest. In other words, as conventional economic theory would suggest, the demand for say trading banks' fixed deposits tends to increase as the return on these deposits rises and/or as the returns on alternative financial (and real) assets decline. Interest rates are important explanatory factors in a wide range of financial equations in the model.⁽¹⁰⁾

This is of course consistent with some of the really significant changes which have occurred in the New Zealand financial system over the past decade or so, especially with respect to institutional shares of liquid assets and the financing of government's operations. For example, as the gap has widened between private sector mortgage interest rates and yields on official securities, so have mortgages become a more popular outlet for new funds while sales of government securities have had to be propped up with an increasingly widespread net of official controls (i.e. government security investment ratios). Similarly, the very rapid rates of growth of some deposit-accepting institutions, such as finance companies, and other non-institutional intermediaries, such as solicitors and sharebrokers, when compared with the slower growth of some of the heavily regulated traditional monetary sector institutions, such as the Post Office

⁽¹⁰⁾ Including trading banks' demand and fixed deposits, savings banks' demand and fixed deposits, finance company deposits, etc. as well as holdings of government securities by the non-financial private sector, life insurance companies, money market dealers, etc.

Savings Bank and the official short-term money market dealers, can be readily explained in terms of changes in the relative rates of return offered on the respective financial assets.

These points can be confirmed by reference to the accompanying tables:

(a) Table 2 sets out the total assets of the major financial institutions in New Zealand. Reference to the percentage shares of overall total assets shows the difficulties experienced by some intermediaries in preserving their relative positions—such as the Post Office Savings Bank, the official money market, the stock and station agents and, until the late 1960's, the trading banks—while other institutions, such as the finance houses and the Public Service Investment Society, have expanded rapidly, especially over the past decade.

(b) Table 3 shows the way in which non-institutional sources of mortgage finance have increased in relative importance in recent years, as a result of official controls over the traditional institutional channels. In the table, the fast growing "all other" group includes solici-

tors' nominee companies, private superannuation funds, trustee companies, credit unions, and so on.

(c) Table 4 illustrates the long-term decline in the proportion of total government securities being held by non-captive holders, as a result of the unattractive yields on these securities. On the other hand, direct controls have ensured that an increasing proportion of the Public Debt is compulsorily held by the "captive" intermediaries, such as the savings banks and insurance companies.

Apart from the impact of interest rates on the financial system, the Bank's model also shows clearly that interest rates have either a direct or indirect but still significant impact on a range of expenditures, including those on consumer durables, automobiles, imports, and investment in dwellings, commercial buildings and plant and machinery.⁽¹¹⁾

⁽¹¹⁾ See Appendix I of this Research Paper and also Deane, R. S. (editor), "A New Zealand Model: Structure, Policy Uses and Some Simulation Results," Reserve Bank of New Zealand, *Research Paper No. 8*, November 1972.

TABLE 2
ASSETS OF FINANCIAL INSTITUTIONS†

	\$ million					Percent of Total				
	1935	1955	1965	1969	1973	1935	1955	1965	1969	1973
Reserve Bank	56	338	305	433	822	11.4	15.7	7.5	8.0	9.6
Trading Banks	168	600	759	897	1,735	34.1	27.9	18.8	16.5	20.3
Trading Banks' Savings Banks	—	—	56	294	420	—	—	1.4	5.4	4.9
Trustee Savings Banks	25	107	284	427	648	5.1	5.0	7.0	7.9	7.6
Post Office Savings Bank	99	553	864	897	1,053	20.1	25.8	21.4	16.5	12.3
Building Societies	17	62	188	260	395*	3.5	2.9	4.7	4.8	4.6
Stock Firms	n.a.	—	155	171	248	—	—	3.6	3.1	2.9
Public Service Investment Society	—	2	8	18	58	—	0.1	0.2	0.3	0.7
Development Finance Corporation	—	—	—	3	19	—	—	—	0.1	0.2
Finance Companies	3	9	80	120	375*	0.6	0.4	2.0	2.2	4.4
Official Money Market Dealers	—	—	57	73	78	—	—	1.4	1.3	0.9
National Provident Fund:										
Superannuation Fund	8	32	76	114	196	1.6	1.5	1.9	2.1	2.3
Local Body Pool	—	—	98	112	146	—	—	2.4	2.1	1.7
Government Superannuation Fund	6	39	98	139	236	1.2	1.8	2.4	2.6	2.8
Earthquake and War Damage Fund	—	26	76	111	168	—	1.2	1.9	2.0	2.0
Life Insurance Offices	84	310	797	1,173	1,687*	16.8	14.4	19.7	21.6	19.7
General Insurance Companies	25	53	116	166	235*	5.0	2.5	2.9	3.1	2.7
Friendly Societies	9	16	24	30	37	1.8	0.7	0.6	0.6	0.4
TOTAL	500	2,147	4,041	5,438	8,556	100.0	100.0	100.0	100.0	100.0
State Advances Corporation	89	257	636	812	1,099					

Source: Bank of New Zealand.

† In general, the figures are for the end of March each year.

* Estimate.

TABLE 3
SOURCES OF REGISTERED MORTGAGE FINANCE
(March Years)

Source	1965		1970		1974	
	\$m.	% of Total	\$m.	% of Total	\$m.	% of Total
Government and Local Authorities	116.9	27.8	124.3	21.7	223.6	17.2
Selected Financial Institutions*	109.2	26.0	168.9	29.4	326.2	25.1
Private Individuals	134.0	31.9	186.6	32.5	280.9	21.6
All Other	59.9	14.3	94.1	16.4	471.0	36.1
TOTAL	420.0	100.0	573.9	100.0	1,301.7	100.0

* Includes trading banks, trustee savings banks, building societies and insurance companies.

TABLE 4
OWNERSHIP CLASSIFICATION OF INTERNAL PUBLIC DEBT
(End of March Years)

	1960		1965		1970		1974	
	\$m.	% of Total	\$m.	% of Total	\$m.	% of Total	\$m.	% of Total
Government	371.1	26.2	389.9	21.5	474.3	20.2	694.0	21.2
Marketing Authorities	128.3	9.1	138.8	7.7	96.4	4.1	92.1	2.8
Private Sector								
Financial Institutions	594.0	42.0	965.7	53.3	1,521.6	64.7	2,250.2	68.8
All Other Holders	322.2	22.7	318.3	17.5	257.8	11.0	233.0	7.2
	1,415.6	100.0	1,812.7	100.0	2,350.1	100.0	3,269.3	100.0

Whether the analysis is in terms of econometric equations or casual observation of changes in the financial system over time, the conclusion is much the same; responses to interest rate changes in New Zealand seem to be of more significance than government has generally seemed to concede in its policy preferences. On the other hand, this is not to deny the complexity of the transmission mechanism between interest rates and the economy generally, nor the obvious importance of other factors in influencing the level and distribution of different financial and real asset holdings.

Appendix I of this Research Paper sets out in more detail the technical evidence touched on here and especially the material drawn from the Bank's econometric research programme. This evidence includes equations illustrating the importance of interest rates, simulation results from the overall model, and interest rate elasticities calculated from the equations.

6. SOME PRACTICAL ISSUES

This Paper's advocacy of a more flexible interest rate system would be incomplete without some reference to the problems, complications and various practical issues raised in discussion of these matters in New Zealand. Reference is also made to the anomalies inherent in the present structure, the full implications of which too often seem to be overlooked.

6.1 Preferred Sectors

In some cases it is obviously desirable for economic or social reasons to assist special sectors, such as exporters⁽¹²⁾ or housing for low income groups, by the provision of subsidised finance. However, if this is achieved by maintaining interest rates generally at levels below market rates, there is not only the risk of introducing distortions, inefficiencies and inequities, but also the policy may be self-defeating in the sense that it may become very difficult indeed to achieve preferential rates for all persons in those groups judged to require subsidised assistance.

The New Zealand housing market is currently a good example of this type of problem, where the institutions which historically have been important providers of housing finance are responding to official controls, and especially security ratios, by seeking higher yielding assets such as direct purchase of property (e.g. insurance

(12) An interesting example of preference for exporters is the provision by the Reserve Bank of advances at 1 percent interest to the primary produce marketing organisations in New Zealand. Clearly, this involves a hidden subsidy to these bodies, the costs and benefits of which are seldom analysed or queried.

companies). At the same time, many people evidently find the State Advances Corporation policy too stringent, or perhaps do not wish to wait in the queues at savings banks, and thus turn to other channels of finance which may be more expensive than the traditional institutional sources. Accordingly, non-institutional lenders other than private individuals (probably mainly solicitors) accounted for 36 percent of new mortgage registrations in 1973-74 compared with 14 percent in 1964-65 (see table 3). With a normal limit of 70 percent of valuation for first mortgages, borrowers may be forced to resort to short-term, high interest rate second and third mortgages. Moreover, where loans are obtained from the usual institutional sources, there may be other indirect costs involved, such as the need to deposit funds at low interest rates, take out life insurance policies which would not otherwise be desired, or meet other prior conditions.

The crux of the problem is that controls over interest rates and institutional asset structures, especially in inflationary circumstances, encourage the diversion of funds through uncontrolled higher yield/higher cost channels, stimulate speculation in property and real assets, and reduce the flow of funds to socially desirable but less remunerative areas, such as housing.⁽¹³⁾ But further controls would only exacerbate the situation. The answer lies in a more flexible interest rate system generally, with provision of special subsidies of clearly identifiable cost to preferred groups.

(13) The 1973-74 period provided good examples of these points. In summary:

- (a) Controlled interest rates in many areas stimulated the rapid development of the uncontrolled commercial bill market, where interest rates reached levels well in excess of official rates. The emergence of the bill market was an obvious and useful response to the need for an "escape valve" in the financial system, although the authorities no doubt viewed it as a means of avoiding official regulations.
- (b) Pressures on real estate prices became substantial in 1973-74, and government's concern was reflected in the 1973 Budget's introduction of a special tax to discourage property speculation.
- (c) After rapid growth throughout the 1960's and early 1970's, the finance companies were faced with both interest rate controls and a generally tighter liquidity situation in 1974. As a result, they suffered net losses of deposits for the first time in many years and the authorities reacted by giving them an additional competitive edge over the trading banks by altering the interest rate regulations in May 1974.

In each of these cases, difficulties could have been avoided by the authorities if a more appropriate interest rate level and structure had prevailed: the bill market would not have expanded so rapidly; more attractive financial assets could have helped dampen property speculation; and the finance companies could have coped better with their own situation if they had been free to determine their own interest rates.

The way in which this could be achieved for the housing sector warrants some comment. Clearly, administrative decisions would be required on various matters such as to whom the subsidy should apply, the extent and type of subsidy arrangements, and the administering organisation (such as the new Housing Corporation or the Inland Revenue Department). Turning to matters of principle however, it seems likely that potential recipients of any subsidy should be limited to those who would suffer genuine financial hardship resulting from higher interest rates. This would limit the cost to government of operating such a scheme and would also avoid the self-defeating nature of a scheme which was too widely spread. If subsidies were available to all, then the probable effect would be to force up the price of homes and the lower (subsidised) interest rates might be offset by the rise in the capital value of homes.

Any subsidy would presumably need to be limited by some prescribed maximum if over-indulgent housing for the subsidised was to be avoided; the maximum could be varied between applicants to allow for different income and/or wealth characteristics along with differing family sizes, purchase prices and repayment periods. There may be some advantage in increasing the maximum subsidy on table mortgages with relatively short repayment periods as this would encourage home-owners to obtain more quickly full equity in their homes and thus become independent of interest movements and the need for a subsidy.

The subsidy could be a flat subsidy of a few percent on the capital value of home mortgages or vary with changing interest rates; in this case the subsidy would be calculated on the difference between the market rate of interest and the rate of interest which would be decided to be appropriate for the lower income earners. An alternative system could be one based on the difference between interest paid and some percentage of the borrower's income. For those who lived in premises which were also places of business some apportioning arrangement would need to be designed. A flat subsidy would have the advantage that the recipient would not be entirely divorced from the economic environment and economic policies and, providing that the market rate of interest did not move too high, mortgage interest payments by the recipient would still remain at a reasonable level. An added advantage would be that there would be no necessity to determine "the" market rate of interest.

6.2 Institutional Adjustment

If it is accepted that one of the chief ways in which a flexible interest rate policy would be implemented is through the medium of open market operations,⁽¹⁴⁾ then opponents of such a move are likely to argue that the existing market for government securities is too thin and

immature to support these operations. However, the present inadequacy of the market is itself a reflection of government policy: the reluctance to make securities attractive to non-captive holders and the deceptive ease with which funds can be raised by ratio controls. To avoid undue disruption to the financial system it would be necessary to plan changes carefully, to move cautiously, to make available a sufficiently wide range of securities to satisfy the market, and to offer attractive interest rates which would confirm a determination on the part of the authorities to ease financial institutions out of their present onerous captivity. Undoubtedly a market would naturally develop from these changes. The adaptability of the financial institutions should not be underestimated, given the responses to the changes which have been made over the past decade.

A more important difficulty is the "locking-in" effect which would result initially from a significant and sudden upward shift in interest rates, because the latter would imply a fall in prices of existing securities. But this difficulty could be eased in various ways: by gradual introduction of any new arrangements, which would probably be inevitable in any event; by encouraging greater diversity of asset portfolios, and hence facilitating the ability to earn higher returns on assets other than securities; and possibly by increasing rates on existing securities to get a new scheme started. The most cogent argument in this case is that flexible rates imply both increases and decreases in interest rates over time, so that in the longer run the problem is not severe.

Of course, the more stringent and widespread are the official controls, and the greater is the gap between actual or nominal interest rates and likely market rates, the more difficult the necessary adjustments will appear to be. In this sense, the controls have the potential to become self-perpetuating, and the change to a more rational market oriented system may become a politically less plausible alternative, despite being increasingly desirable from an economic point of view.

Care would be needed in the initial stages to avoid large disruptive switches between financial institutions, which could result in liquidity problems. Again, means are available to avoid the problem being serious, including for example the introduction or strengthening of break penalties for term deposits, and the creation of negotiable savings bonds with a widened range of yields and terms. It would need to be remembered that savings banks could only respond slowly to an increase in interest rates on new securities because of the large stock of existing securities which they hold. This strengthens the case for adjusting rates on all securities initially, or alternatively reducing security ratios more rapidly for savings banks than for other institutions in the early stages of any move towards flexible interest rates. This could assist in placing savings banks on a more equitable and competitive footing vis-a-vis other institutions.

(14) Open market operations is a monetary policy technique which normally involves the central bank trading in financial assets, and in particular government securities, on the open market. Through such trading the Reserve Bank can affect conditions in financial markets and thus indirectly exert some influence on spending. For example, sales of securities by the Bank to the private sector would initially reduce the latter's holdings of money and tend to raise yields on securities. This would in turn exert upwards pressures on interest rates generally, so discouraging borrowing and spending and encouraging the acquisition of financial assets. Open market operations have been seldom used in New Zealand in any meaningful way. The

standard official reason for the reluctance to experiment in this field has always been the small size and immaturity of the official bond market. But, ironically enough, the authorities themselves are in part to blame for this latter situation. There have been several factors at work here; the inability of the banks to deal in securities for many years until the late 1960's, the extensive captive market arrangements for government securities and, allied to this, the reluctance of government to offer interest rates which match market conditions. Despite the introduction of Treasury Bills and the move to permit the banks to become fully invested in 1969 little real progress has been made in this area.

6.3 Competition

Legitimate doubts exist about the extent to which institutions would genuinely compete both as between and within particular groups under a regime of flexible rates. But some of the collusion in the past has been associated with governmental restrictions, and the sceptics must be at least partly encouraged by the extent to which the trading banks have exploited their more recent opportunities to compete for fixed deposits. Furthermore, the issues should not be confused: the possibility of competition being insufficient to achieve the efficiencies claimed for it by economic theory is not of itself a case against a more positive interest rate policy. Rather, it suggests the possible need for adequate government policy with respect to restrictive trade practices where these are judged to be not in the public interest. This is equally applicable to industries beyond the financial sector. Additionally, the government could readily exert pressures to eliminate collusion by appropriate directives to the state-owned institutions which operate in the financial sphere. The position could also be aided substantially by pursuing the Monetary and Economic Council's suggestions⁽¹⁵⁾ favouring the provision by financial institutions of much more explicit information on rates of return and investors' rights, and official supervision of institutions to ensure that minimum standards of security, disclosure and performance are met.

6.4 Cost

Typically, the most popular and most easily comprehended argument against flexible interest rates is that these imply higher rates which thereby push up costs and prices, aggravate inflation and raise the cost of financing the government's debt. The argument is also the most fallacious, in that it conveniently ignores the hidden but extensive costs of pursuing a low interest rate policy and the wider benefits to be gained from a flexible structure. The argument is also mainly applicable to the initial change, after which rates would presumably move both up and down over time. There is no evidence of a long-term upwards trend in interest rates, and especially real rates, in the same way as for variables such as incomes and prices.

Those costs which are effectively hidden under the illusion that a low interest rate policy is a low cost policy are referred to extensively elsewhere in this Paper. They include the reduced effectiveness of monetary policy; the inefficiencies and inequities introduced into the financial system by the controls; the diversions of funds via more expensive non-controlled channels; the various resultant anomalies which affect the lower income, less wealthy groups; and the encouragement of socially less desirable activities at the expense of stated official social objectives. In New Zealand, an interest rate on government securities below the market level is equivalent to a tax on those individuals who deposit funds with the so-called captive institutions. Ironically enough, these people are likely to be the low income earners.

As far as the general price level is concerned, pressures come from two often inter-related sources: cost-push and demand-pull. While higher interest rates may be passed on through increased costs, they are also likely to dampen demand, thus alleviating the problem of price rises from this source. With low interest rates and price

inflation creditors, lenders, depositors and savers are discriminated against in favour of debtors, borrowers, spenders and investors. Yet this is the reverse of the overall position policymakers presumably desire in such an economic situation.

A more competitive financial system should in fact ultimately lead to a lower rather than higher overall cost of meeting the requirements of lenders and borrowers. This is because those economic units which are currently forced to deal in the non-controlled market would be able to revert to the lower cost, more efficient, presently controlled institutions. The latter would thereby handle a higher proportion of the overall flows of funds and the community generally could thus benefit from the relative efficiency of these institutions, while those peripheral intermediaries which prospered under the "protection" of controls would presumably lose their relative importance within the system. The real costs of financial services would be reduced and security for lenders and borrowers would be increased.

6.5 Administration

Controls inevitably give rise to administrative problems and raise the doubtful presumption that bureaucrats are better able to allocate funds than the market system. The problems are not unlike those inherent in an import licensing system or in price controls. Because controls fail to get to the core of a problem, they may well fail to solve it, and thus the controls may justify the case for further controls. For example, when it was recognised that a monetary policy which concentrated largely on the level of banks' advances was inadequate to the needs of a financial system where non-banks were expanding rapidly, government commendably decided to extend its influence over the non-banks. The problem was that a rejection of a much more positive interest rate policy left direct controls as the only alternative, despite their accepted deficiencies with respect to the trading banks. Hence New Zealand is still left with the sorts of problems discussed in this Paper; problems which under the present system must become acute rather than ease as time goes by.

The arbitrariness of administrative controls can also be criticised. Why regulate the rate of interest on bank advances but not on finance company lending? What is the justification for widely divergent security ratios over different groups of financial institutions? Why are savings banks forced to offer interest rates on deposits which are so much lower than those offered by other institutions, even under the Interest on Deposits Regulations? The historical reasons underlying the answers to these questions may be clear, but the current justification in economic terms is much more dubious.

6.6 Taxation

It is sometimes suggested that effective interest rates on financial assets can be increased without any change in nominal rates by making interest income tax exempt for personal income earners. For instance, at present in New Zealand there is a \$100 tax exemption for interest income from any source and a further exemption of \$200 specifically for interest received from the Post Office Savings Bank or the trustee savings banks. Although it is obvious that this does in fact push up the effective return to personal savers, it is debatable whether or not it is the most efficient means available. If the object of the exercise is to promote additional personal savings, why not simply increase the interest

⁽¹⁵⁾ See Monetary and Economic Council Report No. 24, op. cit., chapter 6, pp. 91-102.

rate? This would make the extra return obvious and explicit, rather than partly hidden and implicit. The benefits and costs of the measure would thus become clearer.

Furthermore, if equity considerations are judged to be important, as is usually the conventional claim in New Zealand, then increasing the effective yield via tax concessions would seem to be a less than satisfactory procedure within the framework of a progressive personal tax schedule. This is because of the regressive nature of any benefits accruing from the tax exemption, i.e. the relatively greatest benefit accrues to the higher income earners. The lower income earners, faced with both low interest rates on their small savings balances and relatively low tax rates, stand to gain little from such an exemption. On the other hand, if interest rates on savings balances were increased, and if the income from these was taxable, the benefits would be progressive, in the sense that the relatively highest gain would accrue to the lower income earners. On equity grounds, this would appear to be a more desirable outcome.

If equity considerations were to be ignored, of course, it could be argued that tax exemption for interest income provides the relatively greatest incentive to that sector which is likely to save most, i.e. the wealthy and the higher income earners. Nevertheless, the point remains that this is not necessarily the most efficient way of promoting savings even in this particular area.

Another problem in the New Zealand case is the institutional biases introduced by tax exemptions linked to interest received from particular financial intermediaries. It is a continuing irony of the New Zealand situation that the institutions which seem least attractive to small savers are those which the government is regularly concerned with propping up by special arrangements. Hence, for instance, the Post Office Savings Bank finds it difficult to compete with other savings institutions largely because of its inability to offer house mortgage finance. The government has responded to this problem not by endeavouring to overcome this fundamental difficulty—which would involve the sacrifice of government foregoing some cheap loan finance—but rather by a series of minor changes, the latest of which was the 1974 Budget move to increase the tax exemption for interest income from the P.O.S.B. (and the trustee savings banks).

The same type of analysis applies also to the exemption from personal income tax of life insurance premiums up to stated maximum amounts. Again, the exemption is inequitable, favouring the rich rather than the poor; it disguises the true return from investing in life insurance policies; and it provides special advantages to life insurance companies over other financial institutions, despite a lack of evidence that such a subsidy is warranted or reasonable.

Beyond this, it is sometimes argued that because interest payments are a deductible expense for tax purposes for the corporate and business sectors, the same arrangement should apply to individuals and especially house-owners who incur interest charges on mortgages. Apart from the fact that such a move would have strongly regressive characteristics, the argument also overlooks a fundamental distinction between businesses and persons which is involved in the tax system. This distinction rests on the view that interest costs for a business represent expenses genuinely incurred in the generation of business income, such as interest charges for a mortgage over a factory or office building. In this case the income resulting from ownership of the asset is both explicit and taxable. On the other hand, the house-

owner does not earn an explicit income from his house. Instead, the income is implicit⁽¹⁶⁾ and hence non-taxable. Given that this "income" is not subject to tax, the case for deductibility of interest costs is thereby eliminated, or at least greatly diminished.

The conclusion of this section on taxation of interest income and deductibility of interest expenditure must be that any changes should be considered within the overall framework of interest rate policy on the one hand, and the principles underlying the taxation system on the other hand. It is too easy to adopt simplistic views which can result in inefficient and inequitable means of achieving desired objectives.

6.7 Indexation

It has been suggested by the Monetary and Economic Council that it might be desirable to introduce some form of index-linked financial asset in New Zealand. An indexed financial asset or bond is one where increases in the nominal value of the bond are automatically linked to the rate of inflation by some pre-determined formula. The Council's particular concern seems to have been the protection of the small saver from the effect of inflation in eroding his savings. This subject is treated at more length in Appendix II of this Research Paper, where it is acknowledged that the objectives of those who propose indexation are commendable, but that there are alternative means available for achieving these objectives. In particular, the Appendix suggests that more flexible interest rates generally would be a more satisfactory alternative on both equity and efficiency grounds, providing not only the advantages of indexation but also some wider benefits.

6.8 Overseas Inflation

In recent years, those people favouring low interest rates regardless of the prevailing economic situation have adduced another popular but invalid argument to support their case. They point to a number of overseas countries which have experienced both high rates of inflation and high interest rates, and argue that since the latter have not eased the problem of rapid inflation abroad, why should higher interest rates be either tolerated or beneficial in New Zealand? As is suggested throughout this Paper, such an argument overlooks many other considerations. These need not be repeated again in this section. But the argument also gives rise to another type of confusion which does warrant a comment.

The existence of relatively high interest rates in a country will usually reflect a particular situation with respect to the demand for and the supply of funds in financial markets. But high interest rates do not necessarily reflect adequate governmental policies to cope with inflation. In other words, two important factors should be distinguished: first, the prevailing monetary and economic situation which of itself may stimulate high interest rates in inflationary circumstances; and, secondly, government's policy stance, which may or may not put additional pressure on interest rates. The distinction then is simply between the effect of the market system itself and the effect of policy measures superimposed on the market. For instance, high interest rates will not provide an answer to inflation under a regime of fixed exchange rates.

(16) Note that national income accounting procedures confirm this view by imputing an item for the rental value of owner-occupied houses in the measure of national income.

In New Zealand, many if not most interest rates are subject to official control and it is thus easy to assume that high interest rates would only result from government policy in this direction. For many overseas countries, where there are relatively free markets for financial flows, such an assumption would be incorrect and would yield misleading analysis of the cause and effect pattern underlying high interest rates. The facts of the matter are that high inflation rates in overseas countries neither are attributable simply to high interest rates nor do they provide a justification for pursuing low interest rates. Matters are much more complex than this. Basically, inflation arises from a number of causes and its persistence can be attributed to inadequate policies in a number of areas. In particular, relatively high interest rates cannot be taken as an indicator of a strong but unsuccessful monetary stance, as seems to be supposed by the proponents of the argument discussed in this section.

6.9 Anomalies

Apart from economic considerations, the argument in favour of flexible interest rates which is perhaps most likely to carry political conviction is that for the removal of the anomalies attendant to the present system. These anomalies are disconcertingly pervasive and are possibly not explicitly understood by the community. This seems to be the only explanation for the persistence of what appears to be serious inequities.

Some illustrations may be helpful. A high proportion of depositors with savings banks in New Zealand seem likely to be relatively low to middle income earners. They receive low interest rates on their funds, the bulk of which are in turn invested in low yielding government securities. As commented earlier, this amounts to a tax on this group of individuals. On the other hand, personal lending by the trading banks is regarded as a low priority category and, similarly, savings banks are encouraged to lend for housing while only a tiny proportion of their funds can be allocated to other personal loans. Accordingly, the individual borrower, and especially the low income borrower, is frequently forced to resort to high cost avenues for his personal finance. Typically, he would use hire purchase finance, at effective rates of 15 percent and above, to purchase durable goods and automobiles. He is also likely to have to pay high rates for second and third mortgages on his house.

In essence, this means that the low income earner receives a low return on his savings and may pay a high cost for his borrowing. For the wealthy individual or the large corporation, the opposite is the case.

The high income earner is likely to have sufficient funds available to warrant investment in property, equity shares or solicitors' trust fund deposits. These avenues are all likely to be more remunerative than savings bank deposits, especially in inflationary circumstances. When borrowing, the wealthy individual or a commercial enterprise can more often meet the criteria for a bank advance than can a low income earner. Accordingly, the wealthy and the powerful can earn high returns on their investments and yet may pay relatively low rates for their borrowing. The rich are not only probably larger net borrowers than the poor, but are also likely to be more adept in meeting the problems raised by inflation.

The irony of this sort of situation in an egalitarian society is clear. It is also directly related to the government's interest rate and other financial controls, although of course by no means solely dependent on these. A more

flexible and equitable interest rate system would obviously not eliminate problems such as these, but it could assist substantially in easing the anomalies, especially if special provision was either retained or created, as the case may be, for economically and socially deserving priority groups through subsidies. It is of course recognised that such subsidies currently exist to some extent, e.g. State Advances Corporation housing and farm finance, and bank lending priorities for farmers and exporters. But these do not cope adequately with the broader inequities discussed above. For these to be eased significantly the whole structure of interest rates needs review. Without such a review, present distortions will only continue to be aggravated, and there will be an increased reliance on non-institutional financial flows, trade credit and direct lending. This may also increase the risk of chain reactions resulting from liquidity difficulties of relatively few large units.

7. OVERSEAS INTEREST RATE POLICIES

Within the past decade a number of countries—Australia, Canada, and the United Kingdom—have introduced major changes designed to stimulate a more competitive financial system, and especially to promote a vigorous banking sector under a regime of flexible interest rates.⁽¹⁷⁾ In each case, these policy moves arose from dissatisfaction with the ineffectiveness and inefficiencies of direct controls, and a recognition that the market system was likely to provide a more appropriate means of allocating funds, of encouraging the expansion of efficient institutions, and of eliminating anomalies, than a system based on arbitrary bureaucratic intervention. In Australia, flexible interest rates and open market operations have been the key elements in monetary policy, along with trading bank liquidity ratios, since the early 1960's. The Australian case is a good example of the gradual and successful introduction and acceptance of these types of policies, and the growth of a vigorous market in government securities. Recent interest rate changes suggest that the Australian Labour government is prepared to continue to pursue these policies. Similarly, in Canada and the United Kingdom, more freedom for the commercial banks has resulted in more vigorous competition vis-a-vis the "fringe" intermediaries and an encouragement to reduce collusive activity within the banking sector.

The Australian stance has been made clear by Sir John Phillips, Governor of the Reserve Bank of Australia:⁽¹⁸⁾

"The increasing emphasis we have been placing on market-oriented policies as against direct controls has come about because of the need to take into account the increasing flexibility and diversity of the Australian financial system, and its growing relationship with the world outside. In these circumstances direct controls have tended to lose their strength because market forces produce reactions which in time largely offset the direct control. . . . In recent years the main ways in which we

(17) The background to the changes in these countries are described in Phillips, J. G., *Developments in Monetary Theory and Policies*, Reserve Bank of Australia, Sydney, 1971; Report of the *Royal Commission on Banking and Finance*, Ottawa, Canada, 1964 (the Porter Commission); and *Competition and Credit Control*, collected articles from the Bank of England *Quarterly Bulletin*, Volume 11, 1971.

(18) Phillips, J. G., op. cit., p. 31.

have been implementing this strategy have been by attempting to keep government securities attractive to the private sector, and bank interest rates competitive with those offered by other intermediaries. Other moves in the same direction have given rather more freedom in the lending and investment policies of banks, savings banks and short-term money market dealers."

The former Governor of the Bank of England, Lord O'Brien, endorsed these sentiments in explaining a similar shift in attitudes towards monetary policy in the United Kingdom.⁽¹⁹⁾

"We must remember that financial systems are infinitely adaptable and the channels whereby money and credit end up as spending are many and various. We must beware of believing that if we do succeed in restraining bank lending we have necessarily and to the same extent been operating a restrictive credit policy. We may by our very actions stimulate the provision of credit through non-bank channels; we may introduce distortions into the financial system; and we may indeed be distorting in harmful ways the deployment of the real resources of the country. . . . Inhibiting competition between banks can do much damage to the vigour and vitality of the entire banking system. . . . We have over the last couple of years begun to move away from reliance on physical control, in that we have been prepared to see greater movements of interest rates throughout the system and consequently a greater reliance on the price mechanism in allocating credit. . . . It is hoped that these changes will favour innovation and competition, and in their way make some contribution to faster and sounder economic growth."

8. NEW ZEALAND POLICY IMPLICATIONS

This Paper has concentrated on discussing the analysis underlying the case for a more freely competitive financial system and a more flexible interest rate policy. The implications of this for monetary policy are summarised below although the points are not developed in detail here. The need for such changes to be co-ordinated with other policies, such as fiscal, exchange rate and incomes policies, should be obvious. The initial problem would no doubt be to persuade government, and the community, of the desirability of the following changes.

(a) Government would need to introduce policy changes which would be designed to provide an environment in which monetary policy could be exercised through the medium of flexible interest rates and open market operations, with much less emphasis on direct controls and government security ratio requirements.

(b) This would imply the need to abolish the Interest on Deposits Regulations 1972; to eliminate or at least vary according to economic circumstances the maximum interest rate on bank advances; to move towards paying market rates of interest on government securities; and to adopt a more flexible approach towards changes in savings banks' deposit rates.

(c) The authorities would need to encourage the development of an active market in government securities which could in time become the vehicle for utilising open market operations as a major policy tool. This

raises the possible need to review the nature of the present public debt structure and perhaps to vary this to facilitate the use of debt management policies. It would be necessary to co-ordinate monetary policy objectives with government financing requirements. The Reserve Bank would have to hold an appropriate range of securities and both the Bank and the dealers in securities would need to move cautiously in order to acquire the necessary experience and expertise.

(d) If these policy changes were introduced it would be possible and necessary to ease gradually the present restrictive ratio requirements over financial institutions. The latter would then be able to diversify their portfolios and participate actively in the securities market, although they may need to introduce break penalties initially to avoid unduly large and disruptive switches of funds between institutions. For the changes to be eventually successful, the authorities would need to avoid the temptation to resort to quantitative controls as far as possible.

(e) The policy changes should concentrate on the removal or the easing of the inequities, anomalies, distortions and inefficiencies inherent in the present system. This objective could be further assisted by introducing the type of changes suggested by the Monetary and Economic Council designed to protect and inform consumers of financial services. Sectors warranting special treatment within the financial system could be most appropriately assisted by interest rate subsidies. Further inequities could be eliminated by taxation changes, such as revising the policy on exemptions for interest income and life insurance premiums.

(f) Institutional changes, such as amalgamations and mergers, would undoubtedly follow from the above changes and should be positively encouraged by the authorities in those areas where there is clearly an undue multiplicity of units.

9. CONCLUSION

New Zealand experience suggests that direct controls generate the need for further controls. Certainly this has been the case for some aspects of monetary policy in New Zealand. Yet it has been extensively argued in this Paper and elsewhere that controls may well be self-defeating, in the sense that it is unrealistic to assume that in the long run further controls can eliminate the problems raised by earlier controls. Rather, they are likely to aggravate an existing problem.

Accordingly, it is suggested that there is a need to move away from direct controls and ratio requirements towards a greater reliance on market forces. Through the use of flexible interest rates and debt management policies it should be possible to influence the relative attractiveness of financial and real assets, and hence influence spending and saving. These methods are likely to be both more effective and more efficient than present policies, and accordingly less anomalous and inequitable.

It is granted that change takes time and that the authorities should necessarily move cautiously, paying due attention to political and social factors as well as economic considerations. But the longer the delay in instituting interest rate reform, the more complex are the problems likely to become and the more difficult it will be to introduce the necessary changes.

⁽¹⁹⁾ *Competition and Credit Control*, op. cit., pp. 7-10.

SELECTED INTEREST RATES

	Government Security Issue Rates ^{1,6}			Local Authority Security Issue Rates ^{1,7}			Savings Banks Deposit Rates ^{1,8}				New Zealand Registered Treasury Bills ⁹		Reserve Bank Discount Rate ^{1,11}	
	A	B	C	A	B	C	A	AA	B	C	D	A	B	
1963														
Mar.	4.375	5.0	5.0	5.125	5.25	5.375	3		4	..	..	..	..	7.0
May	4.1875	5.0	5.0	5.125	5.25	5.375	3		4	..	..	..	..	7.0
Sep.	4.1875	5.0	5.0	4.5	5.0	5.25	3		4	..	..	..	..	7.0
Oct.	4.0	4.75	5.0	4.5	5.0	5.25	3		4	..	..	..	..	7.0
1964														
Sep.	4.25	4.75	5.0	4.5	5.0	5.25	3		4	..	..	..	..	7.0
1965														
May	4.25	4.875	5.0	4.5	5.0	5.25	3		4	..	..	..	..	7.0
Aug.	4.25	4.75	5.0	4.5	5.0	5.25	3		4	..	..	..	..	7.0
1966														
April	4.75	5.0	5.0	4.5	5.0	5.25	3		4	..	..	..	..	7.0
May	4.75	5.0	5.0	4.875	5.125	5.50	3		4	..	..	..	..	7.0
June	4.875	5.125	5.25	4.875	5.125	5.50	3		4.5	..	..	..	..	7.0
1967														
Feb.	5.0	5.25	5.5	4.875	5.125	5.50	3		4.5	..	..	..	..	7.0
Apr.	5.0	5.25	5.5	5.125	5.5	5.75	3		4.5	..	..	..	..	7.0
1968														
Sep.	4.875	5.25	5.5	5.125	5.5	5.75	3		4.5	..	..	..	..	7.0
1969														
Aug.	4.65	5.15	5.5	5.125	5.5	5.75	3		4.5	..	..	..	..	7.0
Sep.	4.65	5.15	5.5	4.4	5.125	5.75	3		4.5	..	3.9	4.0	..	7.0
Oct.	4.65	5.15	5.5	4.4	5.125	5.75	3		4.5	..	3.9	4.0	..	7.0
1970														
June	4.65	5.15	5.5	4.4	5.3	6.0	3		4.5	..	3.9	4.0	..	7.0
Sep.	4.65	5.15	5.5	4.4	5.3	6.0	3		4.5	5.0	3.9	4.0	..	7.0
Oct.	4.9	5.2	5.5	4.4	5.3	6.0	3		4.5	5.0	4.2	4.35	..	7.0
Nov.	4.9	5.2	5.5	4.8	5.5	6.0	3		4.5	5.0	4.2	4.35	..	7.0
1971														
Mar.	4.9	5.2	5.5	5.2	5.5	6.0	3		4.5	5.0	4.2	4.35	..	7.0
1972														
Mar.	4.9	5.2	5.5	5.2	5.5	6.0	3		4.5	5.0	4.2	4.35	..	6.0
May	4.9	5.2	5.5	5.2	5.5	6.0	3		4.5	5.0	4.0	4.15	..	6.0
June	4.75	5.2	5.5	5.2	5.5	6.0	3		4.5	5.0	4.0	4.15	..	6.0
Oct.	4.75	5.2	5.5	5.2	5.5	6.0	3		4.5	5.0	3.5	3.65	..	6.0
Nov.	4.55	5.1	5.5	5.2	5.5	6.0	3		4.5	5.0	3.5	3.65	..	6.0
1973														
Mar.	4.25	5.1	5.5	5.2	5.5	6.0	3		4.5	5.0	2.5	2.75	..	6.0
May	4.1	5.0	6.0	4.5	5.5	6.25	3		4.5	5.0	2.0	2.4	..	6.0
1974														
May	4.1	5.0	6.0	4.5	5.5	6.25	3		5.0	5.5	2.0	2.4	..	6.0
Oct.	4.1	5.0	6.0	4.5	5.5	6.25	3		5.0	5.5	2.0	2.4	..	7.0
1975														
May	4.1	5.0	6.0	4.5	5.5	6.25	3	4.5	5.5	6.0	6.5	..	..	7.0

For previous table see May 1967 *Bulletin*. Total overdrafts at various interest rates are shown in other regular *Bulletin* tables. Government security yields on the market and average interest rates paid by official short-term money market dealers are also shown in other regular *Bulletin* tables.

¹ Dates at which indicated changes were made after March 1963. Rates shown for March 1963 are rates applying at the end of the month.
² Rates at end of quarter offered by a representative finance company on secured debentures. Statistics are not available prior to 1965.
³ Average rate for the quarter. Monthly figures for total mortgages registered are shown in another *Bulletin* table.
⁴ Government includes Housing Corporation, Government Life Insurance, State Insurance Office, Crown Lands, Maori Trustee, National Provident Fund, Public Trust, and Reserve Bank.
⁵ Average during six months ended March and September (excludes unused limit fees). The permitted average overdraft interest rate was 5.84 percent in March 1963 and was changed to 6 percent in August 1965.
⁶ Years from issue to final maturity: from 1963 to May 1966 A . . . 3 years B . . . 6 years, C . . . over 6 years. June 1966 A and B unchanged, C . . . 16 years. March 1967 A and B unchanged, C . . . 18 years.
⁷ Years from issue to final maturity: March 1963 to October 1969 A . . . 1-5 years, B . . . 6-9 years, C . . . over 10 years. From October 1969 six long-term maturity dates at various interest rates were offered, A . . . 1 year, B . . . 5 years, C . . . 10 years and over. The other maturity rates and dates offered from June 1973 are, 2 years, 4.75 percent; 3 years 5.0 percent; 4 years 5.25 percent; and 6-9 years 5.75 percent.
⁸ A—Ordinary Account, B—1 year Investment Account, C—2 year Investment Account. *March 1963*: A—P.O.S.B., 3 percent for \$1 to \$20,000, Trustee Savings Banks 3 percent for \$1 to \$4,000; B—4 percent for \$200 to \$20,000; Trustee Savings Banks 4 percent for \$200 to \$4,000. *October 1964*: Private Savings Banks were introduced. A—3 percent for \$1 to \$4,000; B—4 percent for \$200 to \$4,000. *June 1966*: A—remained unchanged; B—P.O.S.B., Trustee and Private Savings Banks, 4 percent increased to 4.5 percent; minimum and maximum deposits remained unchanged. *September 1970*: A—remained unchanged; B—remained unchanged; C—2 year Investment Account was introduced at 5 percent.

— PERCENT PER ANNUM

	Trading Banks' Fixed Deposits					Date	Call	Finance Companies ²				Average Rate on New Mortgages Registered ³		Weighted Average Overdraft Interest Rate ⁵	Commercial Bills ¹³
	1 mth and under 3 mths	3 mths and under 6 mths	6 mths and under 12 mths	12 mths and under 24 mths	24 mths and over			3 mths and under 6 mths	6 mths and under 12 mths	12 mths and under 2 yrs	2 yrs and over	All Sources	Excl. Govt. ⁴		
1963 Mar.	2.0	2.0	2.50	3.25	3.50	1963 Mar.	..	..	..	..	..	5.51	..	5.53	..
1965 July	30-180 days 2.50		7-9 mths 2.75	10-23 mths 3.25	3.50	1963 Sep.	..	..	..	..	..	5.51	..	5.59	..
1966 July	3.0		6 mths and under 12 mths 3.50	12 mths and under 24 mths 4.0	4.25	1964 Mar. Sep.	..	..	..	..	..	5.70 5.74	.. 6.27	5.60 5.65	..
1969 July	3.0	3.25-3.50	9 mths and under 12 mths 4.0	4.0	4.25	1965 Mar. Sep.	3½ 3½	4 -4½ 4 -4½	4½-5½ 4½-5½	5½ 5½-5½	5½-6½ 5½-6½	5.86 5.96	6.41 6.40	5.62 5.71	..
1970 Oct.	3.0	3.50	4.0	4.25	See Note ¹⁰	1966 Mar. Sep.	3½ 3½	4 -4½ 4 -4½	4½-5½ 4½-5½	5½-5½ 5½-5½	5½-6½ 5½-6½	6.21 6.19	6.66 6.69	5.68 5.78	..
1972 Mar. ¹⁰	4.5		3 mths and under 6 mths 5.0	6 mths and under 12 mths 5.5	6.0	1967 Mar. Sep.	3½ 3½	4 -4½ 4 -4½	4½-5½ 4½-4½	5½-5½ 5½-5½	5½-7 5½-7	6.46 6.61	6.95 6.96	5.94 6.05	..
1974 May ¹⁰	4.0		3 mths and under 12 mths 4.25	12 mths and under 24 mths 4.5	4.8-6.75	1968 Mar. Sep.	3½ 3½	4½-4½ 4½-4½	4½-4½ 4½-5	5½-5½ 5½-5½	6½-7½ 6½-7½	6.93 6.72	7.36 7.10	6.06 6.07	..
1974 May ¹⁰	4.0		3 mths and under 12 mths 5.0	12 mths and under 24 mths 5.5	6.0-6.75	1969 Mar. Sep.	3½ 3½	3½ 3½	4 4	5 -5½ 5	5½-7 5½-7	6.80 6.72	7.18 7.07	6.09 6.11	..
			3 mths and under 12 mths 4.25	12 mths and under 24 mths 4.5	4.8-6.75	1970 Mar. Sep.	4½ 4½	4½-4½ 5 -5½	4½-5 5½-5½	5½-5½ 5½-6	5½-7½ 6 -7½	6.80 6.77	7.21 7.30	6.14 6.14	..
			3 mths and under 12 mths 5.0	12 mths and under 24 mths 5.5	6.0-6.75	1971 Mar. Sep.	4½ 4½	5½-5½ 5½-5½	5½-6½ 6½	6½-6½ 6½-7	7 -8½ 7 -8½	7.15 7.37	7.53 7.86	6.08 6.10	..
						1972 Mar. ¹² Sep. ¹²	4½ 4½	5 5	5½ 5½	6 6	6½-7½ 6½-7½	7.50 7.55	8.07 8.13	6.10 6.19	..
						1973 Mar. ¹² Sep. ¹²	4½ 4½	5 5	5½ 5½	6 6	6½-7½ 6½-7½	7.79 7.91	8.27 8.27	6.10 6.17	6 -6½
						1974 Mar. ¹² May ¹⁴ Sep. ¹⁴	4½ 4½ 4½	5 5½ 5½	5½ 6	6 6	6½-7½ 6½-10 6½-12	8.06 8.02 8.38	8.42 8.42 8.88	6.11 6.00	8½-9½ 8½-9½ 11-13½
						Dec. ¹⁴ 1975 Mar. ¹⁴	3½-4½ 3½-4½	5-5½ 5-5½	6 6	6½-12 6½-12		8.35 8.28	8.99 9.29	6.01	9½-12½ 10½-11½

P.O.S.B. and Private Savings Banks—maximum deposit \$6,000; Trustee Savings Banks—maximum deposit \$6,100. November 1972: A, B and C—P.O.S.B. maximum deposits \$25,000; Private and Trustee Savings Banks—maximum deposit \$12,000, except non-profit organisations maximum is \$40,000. May 1975: A—remained unchanged; B—increased to 5.5 percent; C—increased to 6.0 percent; AA—6-month investment account introduced at 4.5 percent; D—3-year investment account introduced at 6.5 percent.

⁹ Treasury Bills were first introduced in September 1969. A—13 weeks; B—26 weeks.
¹⁰ The quoted interest rates are for deposits up to \$20,000. For deposits between \$20,000 and up to \$25,000 the maximum rate is 4.25 percent for terms less than 24 months, and 4.80 percent for a term of 24 months. For a term of over 24 months and for deposits of more than \$25,000 the trading banks were freed from control from October 1970. In March 1972 the maximum rates laid down by the Interest On Deposits Regulations 1972, were applied to the trading banks. Two new schedules of rates were introduced in May 1974, for deposits of \$25,000 and under and for deposits of over \$25,000.

¹¹ The discount rate is the Reserve Bank lending rate for borrowing by the trading banks and official money market dealers. Under the special penal borrowing arrangements by the trading banks introduced in September 1969 the same rate was charged. In June 1970 the penal borrowing rate was increased to 8½ percent and between October 1970 and March 1971 a sliding scale was introduced in which penal borrowing was charged in three tranches at 7 percent, 8½ percent and 10 percent per annum. For details see January/February 1971 *Bulletin*, Blue Supplement. The technical details were changed slightly in 1974 with these borrowing tranches being equivalent to 1 percent instead of ½ percent of total deposits.

¹² For Finance Companies these are the maximum rates allowable under the Interest on Deposits Order dated 27-3-72.

¹³ Range of discount rates offered by dealers for a 90-day commercial bill. No figures available prior to September 1973.

¹⁴ The Interest on Deposits Order was amended on 24 May 1974. Secured borrowing for "investment societies" for terms of 5 years and over was exempted from the Order.

APPENDIX I

FURTHER EMPIRICAL EVIDENCE ON THE ROLE OF INTEREST RATES

Apart from the type of empirical evidence discussed in the main paper, there are several other forms of evidence which can be usefully adduced to illustrate the likely role of interest rates in New Zealand under the following headings:

1. ECONOMETRIC EQUATIONS

The equations set out in Appendix III of this Research Paper are a selection from the 1974 version of the Reserve Bank's quarterly macroeconomic model of the New Zealand economy. Appendix IV lists the notation used in the equations.

These equations illustrate the significance of interest rates in three areas.

First, the equations numbered 1 to 7 all contain either a money supply or an interest rate variable, thus illustrating the linkages between expenditures and interest rates. It can be observed that interest rates have either a direct or an indirect (via the money supply) influence on non-durable, durable and automotive consumption spending; on investment expenditure with respect to dwellings, other buildings and plant and machinery; and on imports. In all cases the monetary impact is statistically significant and the direction of influence theoretically appropriate. The negative sign on the interest rate variables (which is also implicit where the effect is via the money supply) indicates that higher interest rates are associated with some dampening of expenditures on both consumption and investment.

Secondly, equations 8 and 9 of Appendix III show the inter-action of the demand for and supply of new mortgage finance by explaining average new mortgage interest rates and the value of new mortgage registrations. The linkages here are straightforward: on the supply side, higher interest rates attract additional mortgage funds, while on the other hand the demand for

such funds is eased by higher interest rates. It will also be noticed these variables play an important part in explaining building activity.

Thirdly, equations 10 to 15 illustrate the influence of interest rates variables in explaining the demand for a range of financial assets: trading banks' demand and fixed deposits, savings banks' demand and fixed deposits, finance companies' total deposits, and the private sector's (non-financial institutions) holdings of government securities. In each case the "own" interest rate has a positive influence on the demand for the financial assets, while the "competing" rate has the appropriate negative impact. In other words, for example, the demand for finance companies' deposits is positively related to the average interest rate on such deposits and negatively related to the yield on short-term government securities.

A full explanation and rationalisation of these equations is available in earlier Research Papers published by the Bank and need not be repeated here. However, the next two sections of this Appendix discuss briefly the results of some simulation experiments with the Bank's model involving changes to exogenous interest rate variables, and the interest rate elasticities calculated from the equations contained in Appendix III.

2. INTEREST RATE ELASTICITIES

Table 6 sets out the interest rate elasticities for a range of financial assets, as calculated from equations 10 to 15 in Appendix III. These elasticities provide an indication of the likely response of the community to a change in interest rates in so far as holdings of financial assets are concerned. For example, if the interest rate on trading banks' fixed deposits rose by 10 percent (or about one half of a percentage point if the actual interest rate is about 5.0 percent), then in the short run table 6 suggests that holdings of these deposits are likely to rise by about 1.5 percent, while in the long run the

TABLE 6
INTEREST RATE ELASTICITIES OF VARIOUS FINANCIAL ASSETS
(Derived from single equation results)

Financial Assets	Own Rate			Competing Rate		
	Interest Rate	Short-Run Elasticity	Long-Run Elasticity	Interest Rate	Short-Run Elasticity	Long-Run Elasticity
Trading banks' demand deposits	(Not applicable)			JGS	-0.1063	-0.3679
				JTFN	-0.0736	-0.2546
Trading banks' fixed deposits	JTFN	+0.1515	+1.1030	JGS	-0.1759	-1.2804
Savings banks' demand deposits	JSO	+0.0234	+0.3065	JGS	-0.0371	-0.4860
Savings banks' fixed deposits	JSF	+0.0870	+2.3012	JGS	-0.1015	-2.6866
Finance companies' total deposits	JFC	+0.5272	+0.5272	JGM	-0.3767	-0.3767
Private non-bank non-financial institutions' holdings of government securities	JGS	+0.2925	+0.4947	JTFN	-0.3342	-0.5652

NOTE: See Appendix IV for definitions of the interest rate symbols. The equation for trading banks' demand deposits was estimated including two competing rates.

increase may be up to about 11 percent. In other words, as shown in the table, the respective elasticities are said to be 0.1515 and 1.1030.

Most of the elasticities in table 6 appear quite plausible, with the possible exception of the long-run elasticities for savings banks' fixed deposits. These may be overstated for a technical reason.⁽¹⁾ However, in most cases short-run impacts are generally small while in the longer run interest rates appear to have quite a significant influence on holdings of these financial assets.

As expected, demand deposit elasticities are considerably smaller than corresponding fixed deposit elasticities, as can be seen in the case of both trading banks and savings banks. These differences reflect the different purposes for which demand and fixed deposits tend to be held, with the former being used for transactions and liquidity purposes while in the fixed deposits case the emphasis is more on interest-earning ability. Obviously, conventional interest rate data do not adequately portray these implicit returns on demand deposits.

It should also be noticed that the "own" rate elasticities are all positive while the competing rate elasticities are negative. The "own" rate is the interest rate on the financial asset in question; the competing rate is the interest rate on a typical alternative asset.

The formulae used to calculate the elasticities were as follows:

Where the basic equation is of the form:

$$A_t = a + bA_{t-1} + dR_t$$

then $e_s = dR_t/A_t$

and $e_l = dR_t/(1-b)A_t$

where $A =$ Level of holdings of the financial asset

$R =$ Interest rate

$a =$ Estimated coefficient

$b =$ Estimated coefficient

$d =$ Estimated coefficient

$e_s =$ Short-run elasticity

$e_l =$ Long-run elasticity

Alternatively, where the equation is of the form:⁽²⁾

$$A_t = a + bR_t + A_{t-1}$$

then $e_s = e_l = bR_t/A_t$

3. MODEL SIMULATION RESULTS

As part of a wider study⁽³⁾ of the multipliers inherent in the Reserve Bank's quarterly macroeconomic model

(1) The high implied co-efficient on the lagged dependent variable in this equation is probably overstated (biased upwards) for various reasons, suggesting an unreasonably long adjustment period. Hence the "long run" is very long, and it would probably be more reasonable to compute say 1 or 2 year elasticities in this case for practical use.

(2) This form applies only to the equation for finance companies' total deposits.

(3) This wider study will be reported on in a separate paper.

of the New Zealand economy, two simulation experiments were carried out to examine the effect on the economy of changes in interest rates:

Case A

The yield on short-term government securities (JGS) was increased by 10 percent (equivalent to between 0.4 and 0.5 percentage points) in each quarter of the simulation period. This variable has important effects throughout the model, being the principal interest rate employed in a range of equations. It influences a range of holdings of financial assets as illustrated in the previous section of this Appendix (see table 6), and also has a strong influence on a variety of expenditures, either directly or indirectly through its impact on the money supply which in turn impinges on spending. The effect on the money supply comes via the impact of JGS on trading banks' demand deposits which constitute the bulk of the narrowly defined money supply. The elasticities revealed by the simulation are set out in tables 7 to 9.

Case B

In this case, all exogenous domestic financial asset interest rates were increased by 1 percentage point. Since the interest rate variables ranged in magnitude from 3 percent to almost 8 percent across different rates and between different time periods, and because changes were made to seven separate interest rate variables, it is most convenient to express the results in terms of the percentage divergences between the simulation and control values, as in tables 10 to 12.

In each case, the simulations covered the period 1966(1) to 1970(4) and were dynamic in character in the sense that although actual historical exogenous values were used (other than where the interest rates were altered as just described), the lagged endogenous values used in each quarter after the initial observation were those generated by the model itself. The 1966 to 1970 time period was chosen because it appeared to cover an interesting range and variety of economic activity. During this period, the model kept on track well in the control simulation. In other words, actual and model-generated control values were pleasingly close for almost all the endogenous variables.⁽⁴⁾

Tables 7 to 9 portray an interesting picture of the impact of the Case A change, where the yield on short-term government securities is increased by 10 percent (about one half of a percentage point) throughout the period with all other exogenous variables remaining unaltered. The major immediate effects are reductions in both consumption and investment expenditures, which in turn push down aggregate expenditures. Offsetting effects flow from the higher levels of trade inventories held as a result of lower sales, and reduced imports. Some of these effects are direct, where the interest rate variable appears in the relevant equations, but in other cases the initial impact is attributable to reduced holdings of money balances which flow from the higher interest rate on official securities. As shown by the expenditure equations in Appendix III, the money supply is an important determinant of several categories of spending.

As expected, after several years these effects tend to either level off, as in the case of consumption and the two aggregate expenditure series, or decline, as in the case of the impact on investment, stocks and imports.

(4) Full details will be provided in a separate paper.

These results seem quite plausible, although it needs to be remembered that in practice other policy changes would no doubt be made over a period of years in response to the effects of the initial change introduced in the simulation experiment. The real aggregate expenditure⁽⁵⁾ effects provide a convenient summary of the influence of the higher interest rate on spending generally: the 10 percent increase in the interest rate resulted in a 1 percent reduction in real aggregate national expenditure (XR) after one year, and a 3 percent reduction after about 4 to 5 years, although most of the impact (2.7 percent) had come after 3 years.

Higher interest rates initially result in a tightening of liquidity and both the money supply and total liquid assets fall below their control values for the first three years. However, after four years the money supply starts to rise above its control level as a result of the much improved balance of payments situation. This is attributable to reduced overseas payments which yield the more favourable current account balance shown in table 8 (\$25 million a quarter after 5 years).

For the government sector, the increased interest rate on short-term government securities certainly makes these a more attractive financial asset vis-a-vis private sector deposits, which explains the fall in holdings of these latter liquid assets. Initially, the increase in holdings of securities improves the government's internal cash balance (before bank borrowing) but after only one quarter this effect is more than offset by lower taxation receipts, resulting from reduced activity and incomes generally, and less borrowing from the traditional captive financial institutions. This latter effect may seem partly spurious at first sight, but it should be noted that the model assumes that most financial intermediaries hold government securities more or less only to the extent of their official ratio requirements and in the simulation these ratios remain unchanged. Hence the position is not divorced from the current reality.

Table 9 shows that consumer prices are not significantly influenced by the interest rate change. Initially, prices rise marginally but by the third year small declines are recorded. However, a comparison of the real and current value aggregate expenditure (XR and X) elasticities in tables 7 and 8 suggests that a more noticeable reduction took place in the aggregate expenditure deflator. The elasticities after five years were -0.31 and -0.45 for XR and X respectively.

Both private sector employment and overall capacity utilisation were reduced by the higher interest rate but by only small margins in the first year of the simulation. Personal real disposable income fell in the longer run in response to lower levels of activity generally.

Summing up, the Case A results suggest that an increase in the interest rate on government securities would achieve the type of result implied by conventional economic analysis: real spending is dampened, imports are lowered and stocks are increased. Liquidity is tightened and the balance of payments improves. Contrary to popular opinion, higher prices do not seem to result to any significant extent. Hence, in inflationary circumstances, higher interest rates seem likely to be a useful tool in coping with a balance of payments problem without having serious side effects on the domestic price level.

In Case B, a wider range of interest rates are simultaneously increased by 1 percentage point. The results in tables 10 to 12 lead to similar basic conclusions to those just offered for Case A. The main differences are in timing and of course in magnitude of change. However, it does not seem to be necessary to repeat the preceding analysis.

(5) This variable is the model's proxy for real gross national product. The series is discussed in several earlier Research Papers.

CASE A

A SIMULATION WHERE THE EXOGENOUS SHORT-TERM YIELD ON GOVERNMENT SECURITIES IS RAISED BY 10 PERCENT

The elasticities in the following three tables (7 to 9) were calculated by dividing the percentage differences between the simulation and the control solutions by 10 percent.

TABLE 7

INTEREST RATE ELASTICITIES FOR VARIABLES IN REAL TERMS

	Consumption XCR	Investment XIR	Change in Inventories Δ KTER	Imports ICAR	Aggregate Domestic Expenditure XDR	Aggregate Expenditure XR	Personal Disposable Income YTPDR
1966(1)	-.14	-.04	.17	-.06	-.08	-.07	-.01
1966(2)	-.18	-.12	.70	-.12	-.11	-.08	-.03
1966(3)	-.22	-.19	.77	-.23	-.15	-.11	-.05
1966(4)	-.24	-.25	2.11	-.30	-.16	-.11	-.07
1967(4)	-.39	-.52	1.11	-.69	-.31	-.20	-.16
1968(4)	-.50	-.53	.81	-.71	-.40	-.27	-.24
1969(4)	-.58	-.46	.93	-.63	-.44	-.29	-.29
1970(4)	-.62	-.35	.57	-.55	-.44	-.31	-.31

NOTE: For full definitions of the variables see Appendix IV.

TABLE 8

INTEREST RATE ELASTICITIES FOR VARIABLES EXPRESSED IN CURRENT VALUES

	Domestic Expenditure XD	Aggregate Expenditure X	Government Balance Before Borrowing GBB	Overseas Current Balance CB*	Money Supply MM1	Liquid Assets LATOT	Government Cash Surplus GCS
1966(1)	-.08	-.07	-.07	.55	-.09	-.05	.13
1966(2)	-.10	-.08	-.15	1.60	-.15	-.10	-.54
1966(3)	-.15	-.11	-.29	3.29	-.20	-.14	-.97
1966(4)	-.16	-.11	-.18	4.81	-.18	-.16	-.58
1967(4)	-.32	-.22	-.39	10.92	-.16	-.22	-1.06
1968(4)	-.44	-.31	-.45	17.55	-.02	-.20	-1.20
1969(4)	-.52	-.39	-.50	21.60	+.15	-.15	-1.36
1970(4)	-.56	-.45	-.50	25.44	+.30	-.11	-1.17

(Additional elasticities for GBB: 1967(1) -.22, 1968(1) -.55, 1969(1) -.88, 1970(1) -1.09).

* This column is the \$m. difference between the simulation and control solutions, the figures in the column are not elasticities.

TABLE 9

INTEREST RATE ELASTICITIES FOR PRICES, EMPLOYMENT, ETC.

	Consumer Prices PC	Private Employment EP	Capacity Utilisation UTCR	Mortgage Interest Rate JMP
1966(1)	-.00	-.01	-.07	.12
1966(2)	.01	-.02	-.08	.17
1966(3)	.01	-.04	-.10	.21
1966(4)	.01	-.06	-.10	.22
1967(4)	.01	-.11	-.17	.21
1968(4)	-.00	-.15	-.22	.16
1969(4)	-.03	-.16	-.23	.11
1970(4)	-.07	-.16	-.22	.05

CASE B

A SIMULATION WHERE EXOGENOUS DOMESTIC INTEREST RATES ON FINANCIAL ASSETS ARE INCREASED BY 1.0 PERCENTAGE POINT

The following rates were increased —	short-term yield on government securities	...	...	...	(JGS)
	medium-term yield on government securities	...	...	...	(JGM)
	long-term yield on government securities	...	...	...	(JGL)
	interest rate for savings bank demand deposits	...	...	...	(JSO)
	interest rate for savings bank fixed deposits	...	...	...	(JSF)
	trading bank non-carded rate on 30-90 day fixed deposits	...	...	...	(JTFN)
	finance companies' average interest rate on deposits, two years and over	...	...	...	(JFC)

Illustrative Actual Rates

	JGS	JGM	JGL	JSO	JSF	JTFN	JFC
1966(1)	4.280	4.290	5.140	3.000	3.860	3.500	6.781
1968(4)	4.830	5.220	5.530	3.000	4.382	4.000	7.055
1970(4)	4.870	5.140	5.490	3.000	4.458	4.630	7.736

TABLE 10

PERCENTAGE DIFFERENCES BETWEEN SIMULATION AND CONTROL VALUES
FOR VARIABLES EXPRESSED IN REAL TERMS

	Consumption XCR	Investment XIR	Change in Inventories Δ KTER	Imports ICAR	Aggregate Domestic Expenditure XDR	Aggregate Expenditure XR	Personal Disposable Income YTPDR
1966(1)	- 3.20	- 0.40	3.80	- 1.27	- 1.84	-1.61	-0.20
1966(2)	- 3.96	- 2.86	16.26	- 3.26	- 2.41	-1.75	-0.62
1966(3)	- 4.95	- 5.20	18.82	- 6.36	- 3.52	-2.31	-1.10
1966(4)	- 5.30	- 6.84	55.24	- 8.18	- 3.79	-2.31	-1.56
1967(4)	- 8.74	-14.03	23.63	-18.33	- 7.33	-4.48	-3.60
1968(4)	-11.49	-14.30	23.16	-18.03	- 9.47	-6.04	-5.29
1969(4)	-13.30	-12.08	24.92	-15.54	-10.33	-6.82	-6.54
1970(4)	-13.90	- 9.26	9.72	-13.00	-10.24	-7.13	-7.06

NOTE: For full definitions of the variables see Appendix IV.

TABLE 11

PERCENTAGE DIFFERENCES BETWEEN SIMULATION AND CONTROL VALUES
FOR VARIABLES EXPRESSED IN CURRENT VALUES

	Domestic Expenditure XD	Aggregate Expenditure X	Government Balance Before Borrowing GBB	Overseas Current Balance CB*	Money Supply MMI	Liquid Assets LATOT	Government Cash Surplus GCS
1966(1)	- 1.80	- 1.58	- 1.61	1.21	-3.93	-1.26	0.82
1966(2)	- 2.35	- 1.70	- 3.53	4.14	-6.37	-2.00	7.31
1966(3)	- 3.44	- 2.27	- 6.74	8.81	-8.40	-2.51	19.76
1966(4)	- 3.73	- 2.32	- 4.17	13.02	-8.16	-2.45	- 0.75
1967(4)	- 7.52	- 5.01	- 9.07	29.18	-7.96	-1.76	-11.76
1968(4)	-10.39	- 7.10	-10.43	46.13	-3.71	0.51	-19.38
1969(4)	-12.10	- 8.92	-11.30	57.32	1.48	2.85	-24.70
1970(4)	-12.94	-10.44	-10.83	68.26	6.62	5.04	-23.27

(Additional percentage differences for GBB: 1967 (1) -5.13, 1968(1) -12.30, 1969(1) -19.88, 1970(1) -24.29.)

* This column is in \$m. and not %'s.

TABLE 12

PERCENTAGE DIFFERENCES BETWEEN SIMULATION AND CONTROL VALUES
FOR PRICES, EMPLOYMENT, ETC.

	Consumer Prices PC	Private Employment EP	Capacity Utilisation UTCR	Mortgage Interest Rate JMP
1966(1)	0.10	-0.20	-1.64	2.75
1966(2)	0.10	-0.53	-1.72	4.08
1966(3)	0.19	-0.92	-2.20	4.57
1966(4)	0.19	-1.29	-2.17	4.70
1967(4)	0.18	-2.62	-3.72	4.07
1968(4)	-0.17	-3.42	-4.68	3.04
1969(4)	-0.80	-2.77	-4.93	1.87
1970(4)	-1.71	-3.82	-4.80	0.79

APPENDIX II

A COMMENT ON INDEX-LINKED FINANCIAL ASSETS

1. INTRODUCTION

This appendix discusses some of the advantages and problems which would be associated with the introduction of index-linked financial assets or bonds in New Zealand. An indexed bond is one where increases in the nominal value of the bond are automatically linked to the rate of inflation by some pre-determined formula. Of course, it is impossible to assess the likely impact of such bonds without a specific statement of the objectives they would be intended to serve. Accordingly, for practical purposes it is assumed here that the widespread introduction of index-linking procedures would not be favoured since this would be tantamount to a general increase in interest rates, a policy course which does not appear to be favoured by government. Furthermore, it could be demonstrated from an economic point of view that widespread index-linking would probably be inferior to a more flexible (and currently higher) interest rate structure. The arguments in favour of the latter proposal are discussed earlier in this Research Paper.

Accordingly, the assumption underlying this appendix is that index bonds would only be introduced on a limited basis, probably sponsored by government to meet the needs of the so-called small saver by granting him some protection from the erosion of his savings by rapid inflation. To ensure reasonable popularity of any index-linked bond, a range of administrative decisions would need to be made; these are touched on in the next section. The remainder of the discussion proceeds on the basis that the degree of inflation-proofing of these bonds would be complete or at least substantial, and that the other conditions attached to them would be such as to ensure substantial popularity for them. In this context, the important effects are likely to be those related to equity considerations, the efficiency of monetary policy, and institutional problems. These are commented on in turn.

2. ADMINISTRATIVE MATTERS

Administrative decisions would be required on the following non-exhaustive list of points:

- (a) The price index to be used as a base.
- (b) The formula linking increases in the nominal value of the bonds to the rate of inflation—is compensation for inflation to be total or partial?
- (c) The rate of interest, if any, to be offered over and above the inflation compensation. Is this interest rate to be fixed or variable on a discretionary basis?
- (d) Whether one bond only is to be index-linked, or whether the procedure might extend to other government and/or private sector bonds (compulsorily or voluntarily).
- (e) Restrictions on holders — who can hold such bonds, the term, minimum and maximum amounts for subscription, etc.

- (f) Negotiability, if any; and whether deposits as well as bonds might be involved.
- (g) Government budgetary aspects—cost to government versus alternative forms of borrowing.
- (h) Taxation considerations, especially with respect to the increments to the capital value of the bonds.

3. EQUITY CONSIDERATIONS

Unquestionably index-tied bonds would be advantageous to the small saver if the scheme was successful enough to attract a worthwhile flow of funds from this source. It would help overcome some of the grave inequities inherent in the current controlled interest rate structure, under which it could be claimed that the small saver is treated inequitably as a result of relatively low interest rates on many savings deposits. For example, demand deposits at savings banks earn 3 percent interest, whereas recent inflation rates have been around 10 percent. This obviously implies a negative real rate of return.

The small saver also has only limited access to other markets which have the potential to afford him some protection from inflation, such as those for shares and debentures, real estate, and so on. Index-linked bonds would make available a type of financial asset which should not be denied to the small saver simply because he is a low income earner.

However, some care is needed in interpreting the equity implications of index-linked bonds. Inflation generally redistributes income and/or wealth from low to high income earners, from lenders to borrowers, and from savers to spenders. Why then compensate only the small saver for inflation? There are strong equity arguments favouring compensation for all low or fixed income earners, all lenders and all savers, and not simply those who fall into the unnecessarily narrow "small saver" category. This in fact is the major equity argument underlying the case for generally flexible and market-determined interest rates. Furthermore, if only the small saver is to be compensated, the subsidy is of course borne by the remainder of the community, on top of which some of the latter will already be suffering other losses from inflation.

Beyond this, it may be observed that equity considerations would suggest that compensation should be met by those who gain from inflation at the expense of others, especially via windfall and speculative gains. This means that it would be inefficient on equity grounds for government to meet the subsidy simply by exploiting the general taxpayer. Rather, just as there is a case for compensating all who lose from inflation, there is similarly a strong case for such compensation to be extracted from all those who gain from inflation. Again, this implies the need for a more rational interest rate policy generally, and also the need for a less antiquated tax system. In an inflationary environment, equity considerations make nonsense of a tax system based primarily on "assessable" income as defined in New Zealand. Other increments to wealth, such as capital gains, should also form part of the tax base.

Clearly, the equity arguments underlying index-linked bonds are more subtle and wide-ranging than is suggested by those who are concerned solely with the protection of small savings from the erosive effects of inflation. The objective is commendable, but it should surely be extended to all who lose from inflation. In this context, there are available more appropriate means of achieving the same objective but across a wider front.

4. POLICY ASPECTS

The introduction of index-linked bonds would attract some of the usual advantages claimed for higher interest rates in inflationary circumstances. To the extent that the community purchased bonds rather than increased their expenditures, inflationary pressures would be eased providing government did not immediately offset the accumulation of claims against it by adopting an expansionary fiscal stance.

Apart from potentially reducing current spending of bond holders and hopefully stimulating private sector savings, other desirable secondary effects would follow. For instance, the introduction of a new and presumably relatively attractive financial asset would probably make fund raising more difficult for other entities in the economy, thereby putting pressure on interest rates generally. This would help to ease expenditures on lower yielding investment projects,⁽¹⁾ push up non-controlled deposit interest rates, raise the cost of consumer borrowing, ease speculative pressures in markets such as that for real estate, increase the flow of funds through "official" (and hence regulated) channels rather than through non-institutional areas, and widen the ownership of the public debt.

All these influences would enhance the efficacy of monetary policy and probably make some contribution to easing inflationary pressures.

On the other hand, it is debatable whether index-linked bonds provide the best means of achieving either these policy objectives, or the equity aims already discussed. There is some risk that indexation procedures would limit the scope for discretionary policy changes, implying a preference for "policy by rules" rather than policy according to the circumstances. Of course, given the reluctance of government to modify the interest rate structure some may judge indexing to be no bad thing in this sense. Nevertheless, it is likely to remain only a second best solution conceptually. The policy objective may be to vary the real rate of return on bonds, in which circumstance it would be undesirable to guarantee regardless of circumstances a fixed real rate (which is implied in some index schemes). On equity grounds, the elimination of the risks of inflation may be desirable for lenders, and especially small savers, but this need not always be the case on policy grounds.

Furthermore, there is the risk that indexing, especially if it became widespread, would "institutionalise" inflation, weaken government's resolve to tackle the problem,

(1) If index-tied bonds were to be widely introduced, which this Paper assumes to be unlikely in New Zealand, then the implications for resource allocation generally would need to be examined. In essence it seems probable theoretically that indexation of all borrowing would have the potential to improve the allocation of resources, by discouraging investment in enterprises which rely on relatively high inflationary expectations being realised to cover their investments in projects with relatively low real rates of return.

and raise the expectation of continued inflation. If this occurred, then any automatic link between bond values and the inflation rate could be likened to the wage/price nexus, under which self-fulfilling expectations allied with inadequate government policy would perpetually hike up the inflation rate. Such a spiralling effect—the familiar cost-push inflation—could only be broken by discretionary interest rate policy pushing up the real rate of return on financial assets to a sufficiently high level to alter such expectations about the inflation rate. This assumes the concurrent use of other appropriate policy measures.

In other words, indexing may turn out to be a rather unsatisfactory means of helping us to live with inflation rather than to cope with and genuinely ease the inflationary problem. The crux of the matter is again the objectives of government: whether it not only wishes to be rid of inflation but is also prepared to attack the problem in a meaningful way.

5. INSTITUTIONAL PROBLEMS

There is the further question of whether an indexed bond system would promote a higher overall level of savings, or simply lead to a redistribution among financial assets. Regardless of the savings impact, such a redistribution is inevitable to some extent, especially in an environment of extensive interest rate controls. This could lead to serious institutional problems, such as large shifts of funds from existing savings intermediaries.

The problem may in practice turn out to be circular: fear of institutional difficulties, associated with a determination to retain interest rate controls, may lead to so many restrictive rules and regulations surrounding any index-linked bond that its popularity would be limited anyway. There is plenty of historical evidence in New Zealand which confirms our conservative approach to the introduction of new financial assets.

Institutional problems could also arise from distorted patterns of yields resulting not only from the limited introduction of effectively high yielding indexed bonds, but also from subsequent changes in the rate of inflation encouraging switches between indexed bonds and other financial assets. The return on the bonds would be much less "sticky" and potentially much more variable than interest rates usually are in this country.

6. OVERSEAS EXPERIENCE

The experience of overseas countries which have widely varying social, economic and political systems may not necessarily be wholly relevant to the hypothetical case of issuing an indexed bond in New Zealand. For example, it is the case that financial assets are indexed in Brazil but this came about through a comprehensive programme of "monetary correction" which itself was only a part of an integrated economic plan to maintain high rates of real economic growth while at the same time aiming to reduce gradually the rate of inflation.

However, a few comments on the experience of some other countries may be of interest.

Very few countries have ever adopted index loans extensively, exceptions being Finland, Brazil, Israel and, for a short period in the 1950's, France. In all four countries both public and private issues were made

whereas in Austria, Sweden and Switzerland, for example, only some private issues have been floated. Of all these countries only one, Brazil, appears to have an extensive system of indexing still in operation, following on the success of the system in helping to reduce substantially that country's enormous rates of inflation without undue harmful effects on economic growth.

An indexing scheme operated in Finland from the late 1940's until 1968 when it was abandoned for fear that cost-push inflation through the comprehensive indexing mechanism would undermine the country's attempts to come to terms with serious balance of payments difficulties.

During a similar period Israel developed a widespread use of indexing. Initially, bonds were linked with the United States dollar/Israeli pound exchange rate but later a cost of living index became popular. The use of index clauses in government loans was finally discontinued during 1964-68 and replaced by grants of fixed annual "inflation premiums".

Indexing still operates in France to a limited extent and reported figures suggest varying degrees of saver protection, depending on whether index bonds were issued by private or public bodies. For public issues during the period 1961 to 1969 bond-holders received a substantially higher return than for non-indexed bonds, but the reverse was the case for private issues.

7. CONCLUSION

The introduction of index-linked bonds to assist small savers would be advantageous to this particular group on equity grounds but may ignore the equally relevant wider equity considerations which arise in an inflation-

ary situation. Similarly, from a monetary policy point of view, some desirable effects would potentially result from introducing these bonds, but the realisation of these is dependent upon there being no weakening of the government's desire to combat inflation and the preservation of the community's faith in that desire. It would be most unfortunate, especially in an open economy like the New Zealand one, if procedures such as indexation turned out to be simply a palliative for living with inflation, and if the real remedies were thus avoided or ignored.

Accordingly, while accepting the objectives advanced by those advocating indexation, the conclusion of this paper would be that better means exist to achieve these particular aims and that these alternative means have additional advantages on both equity and policy grounds which are not shared by indexation. These means include measures such as flexible interest rates generally, taxation of capital gains, and a more equitable approach to the question of personal tax exemptions for items such as interest income and life insurance premiums. This type of approach would also be preferable, at least in the longer term, as far as its institutional impact on the financial system is concerned.

On the other hand, given New Zealand's propensity to adopt second best solutions where first best ones are available, it could be added that the introduction of an indexed bond scheme specifically designed to assist in a meaningful way the interests of this country's small savers would probably be desirable in its own right. Its equity advantages would certainly offset the inevitable institutional problems which could flow from its introduction, although the latter could potentially have considerable nuisance value for the authorities. But whether government would finally be prepared to introduce effectively higher interest rates by a "back door" method must remain debatable.

APPENDIX III

SOME EQUATIONS ILLUSTRATING EFFECTS OF MONEY SUPPLY AND INTEREST RATES

A. EXPENDITURE EQUATIONS INCLUDING MONEY SUPPLY AND/OR INTEREST RATE VARIABLES

1. Retail turnover, non-durables, real

$$\begin{aligned}
 (\text{RTN}/\text{PCNA}) &= 0.38069 \text{ YTDRQ} + 0.01909 (S_2 * \text{YTDRQ}) + 0.01400 (S_3 * \text{YTDRQ}) \\
 &\quad (10.85) \quad (4.44) \quad (3.16) \\
 &+ 0.08227 (S_4 * \text{YTDRQ}) + 0.15428 [(\text{YTPD}/\text{PC}) - \text{YTDRQ}] \\
 &\quad (12.58) \quad (2.23) \\
 &- 754.943 [(\text{EPOS} - \text{EP} - \text{EG})/\text{EPOS}] - 12.16207 \text{ JGS} - 1374.61120 (\text{PCNA}/\text{PC}) \\
 &\quad (6.44) \quad (3.76) \quad (10.50) \\
 &+ 1528.81790
 \end{aligned}$$

\bar{R}^2 .979, S.E.E. \$5.90m., C.V. 1.69%, D.W. 1.33.
 Period: 1961(2) - 1972(4), 47 observations.

2. Retail turnover, durables, real

$$\begin{aligned}
 (\text{RTD}/\text{PCD}) &= 0.03288 \text{ YTDRQ} + 0.03830 (\text{MM1}_{-1}/\text{PC}_{-1}) - 86.94850 (\text{PCD}/\text{PC}) \\
 &\quad (3.76) \quad (7.28) \quad (8.44) \\
 &+ 0.04436 [(\text{YTPD}/\text{PC}) - \text{YTDRQ}] - 0.01914 [\text{XCAP} - (\text{XR}/\text{XRSF})] \\
 &\quad (3.29) \quad (2.77) \\
 &+ 0.23886 \text{ ZHPD} - 7.09566 S_1 - 3.27507 S_2 - 3.74481 S_3 + 49.25012 \\
 &\quad (3.97) \quad (8.15) \quad (4.83) \quad (5.62)
 \end{aligned}$$

\bar{R}^2 .951, S.E.E. \$1.09m., C.V. 3.15%, D.W. 1.86.
 Period: 1961(2) - 1972(4), 47 observations.

3. Automotive products turnover (wholesale), real

$$\begin{aligned}
 (\text{WTA}/\text{PCT}) &= 0.16404 \text{ XRQ} - 115.00368 (\text{PCT}/\text{PC}) + 0.03437 (\text{MM1}_{-1}/\text{PC}_{-1}) + 3.21214 \text{ ZQRA} \\
 &\quad (9.64) \quad (1.93) \quad (1.54) \quad (3.37) \\
 &+ 0.23853 \text{ ZHPA} - 8.25822 S_1 - 9.87752 \\
 &\quad (1.79) \quad (5.12)
 \end{aligned}$$

\bar{R}^2 .936, S.E.E. \$4.05m., C.V. 6.78%, D.W. 1.40.
 Period: 1961(1) - 1972(4), 48 observations.

4. Building work put in place, private dwellings, real

$$[(\text{BWDP}/\text{PDB}) - 0.006 \text{KBD}_{-1}] = 0.02959 (\text{MM1}_{-1}/\text{PC}_{-1}) + 0.47788 \Delta(\text{LPS}/\text{PDB}) - 2.74300 S_1 \\ (24.30) \quad (2.47) \quad (2.09) \\ + \sum_{i=0}^8 w_i \Delta(\text{YTPD}/\text{PDB})_{t-i}$$

w_0	0.08524	(4.37)	w_5	0.01684	(4.37)
w_1	0.06735	(4.37)	w_6	0.00947	(4.37)
w_2	0.05157	(4.37)	w_7	0.00421	(4.37)
w_3	0.03789	(4.37)	w_8	0.00105	(4.37)
w_4	0.02631	(4.37)	Σw_i	0.29993	AVLL 1.89 qtrs.

\bar{R}^2 .772, S.E.E. \$2.60m., C.V. 12.32%, D.W. 1.93.
Period: 1965(2) - 1972(4), 31 observations.

5. Building work put in place, private buildings other than dwellings, real

$$[(\text{BWOP}/\text{PDB}) - 0.006 \text{KBO}_{-1}] = 0.15726 (\text{NMPT}/\text{PDB}) - 1.58700 \text{JMP}_{-1} + 0.02026 \text{MM1RQ}_{-1} \\ (7.71) \quad (4.83) \quad (7.13) \\ + \sum_{i=2}^{10} w_i \Delta \text{XR}_{t-i}$$

w_2	0.01067	(2.43)	w_7	0.03711	(5.55)
w_3	0.01754	(3.59)	w_8	0.03544	(4.03)
w_4	0.02454	(4.86)	w_9	0.02931	(2.48)
w_5	0.03074	(6.00)	w_{10}	0.01780	(1.14)
w_6	0.03524	(6.37)	Σw_i	0.23838	AVLL 6.39 qtrs.

\bar{R}^2 .832, S.E.E. \$1.46m., C.V. 7.89%, D.W. 2.02.
Period: 1965(1) - 1972(4), 32 observations.

6. Investment in plant and machinery, real

$$[(\text{XIM}/\text{PIM}) - 0.040 \text{KIM}_{-1}] = 5.64400 \text{ZQR} - 6.787 \text{ZDS} - 2.66100 S_1 + 0.0888 \text{MM1RQ}_{-1} \\ (7.45) \quad (2.80) \quad (2.24) \quad (8.97) \\ + \sum_{i=0}^7 v_i \Delta \text{XR}_{t-i} + \sum_{j=0}^2 w_j (\text{PIM}/\text{WPPX})_{t-j}$$

v_0	0.00000	v_5	0.08172	(5.78)	w_0	-21.61701	(7.00)	
v_1	0.02701	(2.56)	v_6	0.07269	(3.44)	w_1	-9.60756	(7.00)
v_2	0.04647	(3.78)	v_7	0.04676	(1.45)	w_2	-2.40189	(7.00)
v_3	0.06469	(5.27)	Σv_i	0.41709	AVLL 4.31 qtrs.	Σw_j	-33.62646	AVLL 0.43 qtrs.
v_4	0.07774	(6.54)						

\bar{R}^2 .835, S.E.E. \$3.26m., C.V. 18.70%, D.W. 2.10.
Period: 1961(4) - 1972(4), 45 observations.

7. Imports c.i.f. adjusted total, real

$$(\text{ICA}/\text{PI}) = 0.81797 \text{XRA} - 0.03221 (S_1 * \text{XRA}) + 0.07190 (S_3 * \text{XRA}) + 0.20192 (\text{ICA}_{-1}/\text{PI}_{-1}) \\ (7.22) \quad (2.03) \quad (5.28) \quad (2.25) \\ + 0.08425 (\text{MM1}_{-1}/\text{PC}_{-1}) - 62.81870 [(\text{POT} * \text{FBT})/\text{PC}] - 14.00016 \text{ZDS} + 7.73679 \text{ZQR} \\ (2.38) \quad (1.47) \quad (2.22) \quad (3.73) \\ + 114.17798 [(\text{XR}_{-2}/\text{XRSF}_{-2})/\text{XCAP}_{-2}] - 130.75438 \\ (2.17)$$

\bar{R}^2 .915, S.E.E. \$8.06m., C.V. 4.61%, D.W. 1.87, d 0.60.
Period: 1960(2) - 1972(4), 51 observations.

B. AGGREGATE MORTGAGE MARKET EQUATIONS

8. Average mortgage interest rates, private sector

$$\begin{aligned} \text{JMP} = & 0.65434 \text{ JMP}_{-1} + 0.27323 \text{ ZJMP} + 0.19279 \text{ JGS}_{-1} + 0.00569 \text{ NMPT} + 0.12677 \text{ S}_1 - 0.05523 \text{ S}_2 \\ & (12.01) \quad (4.59) \quad (3.84) \quad (7.48) \quad (4.03) \quad (2.12) \\ & - 0.15951 \text{ S}_3 + 0.96884 \\ & (5.82) \end{aligned}$$

\bar{R}^2 .991, S.E.E. 0.052, C.V. 0.73%, D.W. 1.94, d 0.20.
Period: 1964(3) - 1972(4), 34 observations.

9. New mortgage registrations, private sector

$$\begin{aligned} \text{NMPT} = & 0.26960 \text{ XD} - 0.01076 (\text{S}_1 * \text{XD}) + 0.01580 (\text{S}_3 * \text{XD}) - 0.02571 (\text{JMP}_{-1} * \text{XD}) \\ & (5.83) \quad (4.14) \quad (7.47) \quad (3.40) \\ & + 105.96831 \text{ PU} - 121.67466 \\ & (2.03) \end{aligned}$$

\bar{R}^2 .962, S.E.E. \$6.04m., C.V. 5.40%, D.W. 2.04.
Period: 1964(3) - 1972(4), 34 observations.

C. FINANCIAL ASSET EQUATIONS INCLUDING INTEREST RATE VARIABLES

10. Trading banks' demand deposits

$$\begin{aligned} \Delta \text{DDT} = & 0.06109 \text{ XD} + 0.44099 \text{ S}_2 (\text{GDBA} - \text{QBP}) + 0.31271 \text{ S}_3 (\text{GDBA} - \text{QBP}) \\ & (2.30) \quad (9.58) \quad (2.92) \\ & + 0.55263 \text{ S}_4 (\text{GDBA} - \text{QBP}) - 0.28905 \text{ DDT}_{-1} + 1.18778 \text{ QBP} - 13.61343 (\text{JGS} + \text{JTFN}) \\ & (12.63) \quad (3.38) \quad (3.49) \quad (3.82) \\ & + 191.38012 \end{aligned}$$

\bar{R}^2 .905, S.E.E. \$13.20m., C.V. 2.22%, D.W. 2.39, d -1.76.
Period: 1960(2) - 1972(4), 51 observations.

11. Trading banks' fixed deposits

$$\begin{aligned} \Delta \text{DFT} = & 0.08043 \text{ XD} - 0.00704 [(\text{JGS} - \text{JTFN}) * \text{XD}] + 0.15786 (\text{GDBA} + \text{GDBX}) - 0.13736 \text{ DFT}_{-1} \\ & (2.90) \quad (2.08) \quad (5.22) \quad (2.15) \\ & + 29.42936 \text{ ZIB} + 29.47161 \text{ ZFT2} + 28.27432 \text{ S}_1 + 19.68864 \text{ S}_3 - 67.84914 \\ & (4.30) \quad (6.49) \quad (2.71) \quad (5.62) \end{aligned}$$

\bar{R}^2 .961, S.E.E. \$5.71m., C.V. 2.46%, D.W. 1.87, d -1.70.
Period: 1965(3) - 1972(4), 30 observations.

12. Savings banks' demand deposits

$$\begin{aligned} \Delta \text{DDS} = & 0.10739 \text{ YTPD} - 0.07628 \text{ DDRS}_{-1} + 12.39961 \text{ ZIS2} - 0.01109 [\text{YTPD} * (\text{JGS} - \text{JSO})] \\ & (6.64) \quad (6.46) \quad (3.71) \quad (2.59) \\ & + 0.10277 \text{ GDBA} + 28.06276 \text{ S}_1 - 3.75432 \text{ S}_2 + 9.82958 \text{ S}_3 + 14.16673 \\ & (6.02) \quad (6.65) \quad (1.68) \quad (3.51) \end{aligned}$$

\bar{R}^2 .823, S.E.E. \$5.36m., C.V. 0.54%, D.W. 1.59, d 1.46.
Period: 1960(2) - 1972(4), 51 observations.

13. Savings banks' fixed deposits

$$\begin{aligned} \Delta \text{DFS} = & 0.02987 \text{ YTPD} + 0.00448 (\text{S}_2 * \text{YTPD}) + 0.36595 (\text{TYOR} + \text{TYSR}) + 20.50502 \text{ ZFS} \\ & (2.19) \quad (1.80) \quad (1.84) \quad (4.67) \\ & - 0.02462 (\text{ZIS1} * \text{YTPD}) - 0.03779 \text{ DFS}_{-1} - 0.01078 [\text{YTPD} * (\text{JGS} - \text{JSF})] \\ & (6.05) \quad (3.76) \quad (2.58) \\ & - 0.01711 (\text{ZFT} * \text{YTPD}) + 8.69963 \\ & (4.11) \end{aligned}$$

\bar{R}^2 .804, S.E.E. \$4.11m., C.V. 1.17%, D.W. 2.09, d -0.33.
Period: 1960(2) - 1972(4), 51 observations.

14. Finance company deposits

$$\Delta \text{DF} = 0.00796 \text{ XD} + 0.03497 \text{ GDBA} - 0.02447 (\text{S}_2 * \text{GDBA}) + 7.06583 (\text{JFC} - \text{JGM}) - 18.95240$$

(2.08) (5.18) (1.90) (2.97)

\bar{R}^2 .738, S.E.E. \$3.86m., C.V. 3.98%, D.W. 1.72.
Period: 1965(1) - 1972(4), 32 observations.

15. Private sector's (non-bank non-financial institutions) holdings of government securities

$$\begin{aligned} \Delta \text{GSP} = & 15.76379 \text{ JGS} - 0.59125 \text{ GSP}_{-1} - 26.03451 \text{ JTFN} - 1766.228 [(\text{PCE} - \text{PC}_{-1})/\text{PC}_{-1}] \\ & (2.10) \quad (3.96) \quad (3.82) \quad (2.72) \\ & + 0.32281 \text{ GDBA} - 0.33180 (\text{S}_1 * \text{GDBA}) - 0.42108 (\text{S}_2 * \text{GDBA}) - 0.29783 (\text{S}_4 * \text{GDBA}) \\ & (2.66) \quad (2.23) \quad (3.67) \quad (2.61) \\ & + 179.42787 \end{aligned}$$

\bar{R}^2 .500, S.E.E. \$14.92m., C.V. 5.841%, D.W. 1.84, d 1.58.
Period: 1960(2) - 1972(4), 51 observations.

APPENDIX IV

NOTATION USED IN EQUATIONS AND SIMULATION RESULTS

A. Definition of Variables

<i>Symbol</i>	<i>Definition</i>
BWDP	Building work put in place by the private sector on new dwellings, \$m.
BWOP	Building work put in place by the private sector on new buildings other than dwellings, \$m.
CB	Overseas exchange transactions current account balance, \$m.
DDS	Demand deposits at savings banks, \$m.
DDT	Demand deposits at trading banks, excluding government deposits, \$m.
DF	Deposits (demand and fixed) at finance companies, \$m.
DFS	Fixed deposits at savings banks, \$m.
DFT	Fixed deposits at trading banks, excluding Treasury deposits and wool retention accounts, \$m.
EG	Total full-time government employment, quarterly average, 000 persons.
EP	Total full-time non-government employment, quarterly average, 000 persons.
EPOS	Potential full-time employment, private plus government, 000 persons.
FBT	Effective exchange rate index faced by New Zealand importers of goods. Base 1965 = 1.000 of the N.Z. dollar cost of foreign exchange.
GBB	Government balance before borrowing or Public Account excess of receipts over expenditure, \$m.
GCS	Government cash surplus before financing from Reserve Bank, trading banks or overseas sources, \$m.
GDBA	Government domestic borrowing requirement, adjusted to exclude sundry minor balancing items. This is effectively the sum of the overseas exchange transactions current account balance, net private capital inflow, change in Reserve Bank lending to marketing authorities, less the central government's excess of current receipts over expenditure, \$m.
GDBX	Sundry minor items which when added to GDBA yield an identity whereby the government domestic borrowing requirement ($GDB = GDBA + GDBX$) equals the change in the private sector's total claims on government, \$m.
GSP	Government security holdings, private non-bank, non-financial sector, \$m.
ICAR	Imports, c.i.f., total adjusted to exclude exogenous items (ICE), real, \$m.
ICE	Imports, c.i.f., exogenous, large random items (aircraft, ships, railway equipment and arms of war), \$m.
JFC	Interest rate on finance company deposits for terms of two years and over, average maximum, % per annum.
JGM	Yield on medium-term government securities, % per annum.
JGS	Yield on short-term government securities, % per annum.
JMP	Average private sector new mortgage interest rate, % per annum.
JSF	Interest rate, savings banks' fixed deposits, % per annum.
JSO	Interest rate, savings banks' ordinary deposits, % per annum.
JTFN	Interest rate, trading banks' fixed deposits up to three months term (i.e. non-carded short rate), maximum offered, % per annum.
KBD	Stock of private dwellings assuming depreciation rate of 0.6% per quarter, \$m.
KBO	Stock of other non-dwelling private building, assuming depreciation rate of 0.6% per quarter, \$m.
KIM	Stock of plant and machinery assuming depreciation rate of 4% per quarter, \$m.
KTER	Trade stocks, total manufacturers, wholesalers and retailers excluding primary produce processing stocks, real, \$m.
LATOT	Total selected liquid assets of the public, \$m.
LPS	Lending to the private sector by savings banks, \$m.
MM1	Money supply, \$m.
MM1RQ	Weighted four quarter moving average of real money supply (MM1/PC), \$m. (Weights, .4, .3, .2, .1)
NMPT	Private sector new mortgage registrations, \$m.
PC	Consumers' price index, all groups, base 1965 = 1.000.
PCD	Consumers' price index, durables, base 1965 = 1.000.
PCE	Expected level of consumers' price index, derived from a twenty quarter geometrically declining weighted moving average of the ratio (PC/PC_{-1}) . Scale factor = 0.707, mean lag = 2.0 quarters. Base 1965 = 1.000.
PCNA	Consumers' price index, non-durables excluding tobacco and alcohol, base 1965 = 1.000.
PCT	Consumers' price index, private transport component, base 1965 = 1.000.
PDB	Price deflator for the building sector. Base 1965 = 1.000. A composite index which is two-thirds PWB plus one-third WHIB where (i) PWB = wholesale price index, building materials and (ii) WHIB = wages per hour worked in the building and construction sector (from six monthly data with intermediate quarters interpolated linearly).
PI	Import price index. Base 1965 = 1.000.
PIM	Price index, imports of machinery, base 1965 = 1.000.

Symbol

Definition

POT	Overseas prices index, weighted average of prices in countries which are New Zealand's major trading partners, base 1963 = 1.000.
PU	Price index, urban house properties, base June year 1965 = 1.000.
QBP	Overseas exchange transactions, private capital balance, \$m.
RTD	Retail trade turnover, durables (excluding automobiles), \$m.
RTN	Retail trade turnover, non-durables, \$m.
S _i	Seasonal dummy variables for the i'th quarter. Takes the value 1 in the i'th quarter and zero elsewhere.
TYOR	Tax refunds, other persons, \$m.
WPPX	Wage cost per employee, \$000.
UTCR	Proportion of overall potential capacity being utilised.
WTA	Wholesale turnover, automobiles, \$m.
X	Aggregate national expenditure, \$m. This is the model's proxy for gross national product.
XCAP	Capacity output (from synthetic production function), \$m.
XCR	Total consumption, real, \$m.
XD	Domestic aggregate expenditure, \$m.
XDR	Domestic real aggregate expenditure, \$m.
XIM	Investment in plant and machinery, \$m.
XIR	Total private sector non-inventory investment, real, \$m.
XR	Aggregate national expenditure, real, \$m.
XRA	Aggregate national expenditure, real, adjusted for imports equation, \$m.
XRQ	Weighted eight quarter moving average of XR, $0.1756 \sum_{i=0}^7 (0.9)^i XR_{t-i}$
XRSF	Seasonal adjustment factors for XR.
YTDRQ	Personal disposable income, permanent, real, \$m. Weighted eight quarter moving average of (YTPD/PC), $0.1756 \sum_{i=0}^7 (0.9)^i (YTPD/PC)_{t-i}$
YTPD	Personal disposable income, total, \$m.
YTPDR	Personal real disposable income, total, \$m.
ZDS	Dummy variable to represent the effect of the United Kingdom dock strike in late 1967. Takes the value 1 in 1967(4), -1 in 1968(1) and 0 elsewhere.
ZFS	Dummy variable to represent the effect of an abnormal switch between ordinary and investment P.O.S.B. deposits. Takes the value 1 in 1969(2) and 0 elsewhere.
ZFT	Dummy variable to represent trading bank vigour in competing for term deposits under special institutional conditions prevailing during 1971 and 1972. Takes the value 1 from 1971(1) onwards, and 0 prior to 1971(1).
ZFT2	Dummy variable to account for abnormal seasonal movement in DFT. Takes the value 1 in 1969(4), -1 in 1970(1) and 0 elsewhere.
ZHPA	Dummy variable to represent the overall impact on automobile expenditure of hire-purchase regulations concerning separate classes of automobiles, weighted sum.
ZHPD	Dummy variable to represent the overall impact on consumer durables expenditure of hire-purchase regulations concerning separate classes of consumer durables, weighted sum.
ZIB	Dummy variable to take account of the Interest on Deposits Regulations 1972. Takes the value 1 from 1972(2) onwards and 0 elsewhere.
ZIS1	Dummy variable to account for the period prior to the introduction of the private savings banks. Takes the value 1 up to and including 1964(3) and 0 thereafter.
ZIS2	Dummy variable to account for the influence of the opening of the private savings banks. Takes the value 1,1,1,0.7, 0.3 in successive quarters commencing in 1964(4), 0 elsewhere.
ZJMP	Dummy variable to account for abnormal change in the value of JMP. Takes the value 1 in 1968(1) and 0 elsewhere.
ZQR	Dummy variable to represent the relative strength of quantitative import restrictions. Takes the values: -1 = tight control 0 = moderate control 1 = relaxed control.
ZQRA	Dummy variable to represent the relative strength of import controls on automobiles. Takes the values: -1 = tight control 0 = moderate control 1 = relaxed control 2 = virtual freedom from control.

B. Statistical Measures and Other Points on Presentation

<i>Symbol</i>	<i>Definition</i>
/	In section A above and in equation specifications indicates division.
AVLL	Average lag length. The following formula is used. If $w_i y_{t-i}$ is the typical term in the lag distribution and the lag distribution extends from $i = 0$ to n , then $AVLL = \frac{\sum_{i=0}^n w_i(i)}{\sum_{i=0}^n w_i}$
C.V.	Coefficient of variation. The results are presented as a percentage of the mean of the dependent variable. When the equation has the first difference as the dependent variable the coefficient of variation is measured using the mean of the level of the dependent variable.
Δ	Denotes first difference of the variable which follows, e.g. $\Delta KTE = (KTE - KTE_{-1})$.
d	Durbin's unbiased statistic for testing for autocorrelation in large samples when the lagged dependent variable is among the regressors. "d" is distributed as a standard normal variate. On a one-tail test, if $d > 1.65$ the null hypothesis of zero autocorrelation can be rejected in favour of that of positive autocorrelation at the 5 percent level of significance. Similarly, if $d < -1.65$ the hypothesis of negative autocorrelation would be accepted at the 5 percent level.
D.W.	Durbin-Watson statistic.
\bar{R}^2	Coefficient of determination adjusted for degrees of freedom.
S.E.E.	Standard error of estimate, adjusted for degrees of freedom.
T-values	Absolute T-values appear in brackets below the regression coefficients. Generally the estimated coefficients are regarded as significantly different from zero if the T-value exceeds 2.0 but less stringent criteria are applied to the coefficients of seasonal dummy variables. Note that the individual equation estimation periods and the number of observations covered are shown after each equation. The preferred period was 1960(2) to 1972(4), but in some cases this was shortened either by lack of data or major institutional change during the full period.