proportion consists of social and civil pensions, provincial subsidies and other statutory commitments, which cannot be changed except by amending legislation; here again a reduction would obviously be difficult for any government to propose. Other current payments are unavoidable in terms of contractual commitments, while still other current expenditure, such as that on defence, may be regarded as irreducible for policy reasons.'

Mr Browne thought that public investment projects offered more scope for flexibility. Nevertheless he pointed out that

'. . . large projects, once under way, are frequently difficult to stop. There are usually substantial contractual commitments, and even apart from these there are obvious objections to leaving such projects half-completed. A further difficulty arises from the nature of public investment; a very large proportion is in respect of essential infra-structure services, which cannot be postponed for long without serious effects on the private sector'.

He argued further that

'Structural factors also inhibit the effectiveness of this element of fiscal policy. As far as the central Government is concerned, the Estimates of Expenditure are drawn up in the second half of the calendar year and come into effect in the second quarter of the following year; decisions regarding expenditure are therefore taken from six to eighteen months before the expenditure is actually incurred, and although such decisions can be changed this is not always easy to accomplish. . .'.[13]

During Mr Browne's period of office real government spending proceeded on a steadily growing path. After 1976 central government spending as a proportion of total spending actually declined from about 27% in 1975 to 23% in 1980. This was despite the very severe recession of 1976–79. Government spending declined largely because the balance of payments was under duress and the authorities wished to prove their independence of foreign borrowing. Such a response was in fact anything but Keynesian. Balance of payments considerations have clearly influenced fiscal policy in South Africa. They have had a very important bearing on the conduct of monetary policy, as is discussed in the following two chapters.

CHAPTER 5

SOUTH AFRICAN MONETARY POLICY

Before monetary policy issues in South Africa are considered, some theoretical issues in monetary economics need to be examined. These are the time-honoured issues of why 'money', what 'money' and how 'money' affects the real economy.

'WHY MONEY'?

This question was in part answered in the previous chapter. In short, the money supply is regarded as an important variable because changes in the supply or demand for money influence domestic expenditure, the price level and so real output. The relationship between the supply of money and the level of prices is one of the best-established facts of economic life. The relationship between prices and money supply in South Africa between 1967 and 1980 is illustrated in Figure 1 below. It should be noted that relationship between the stock of money and the level of prices is a very close one, while there is no statistically significant connection between contemporaneous changes in the supply of money and changes in prices. The explanation for this will be provided here and in the following chapter.

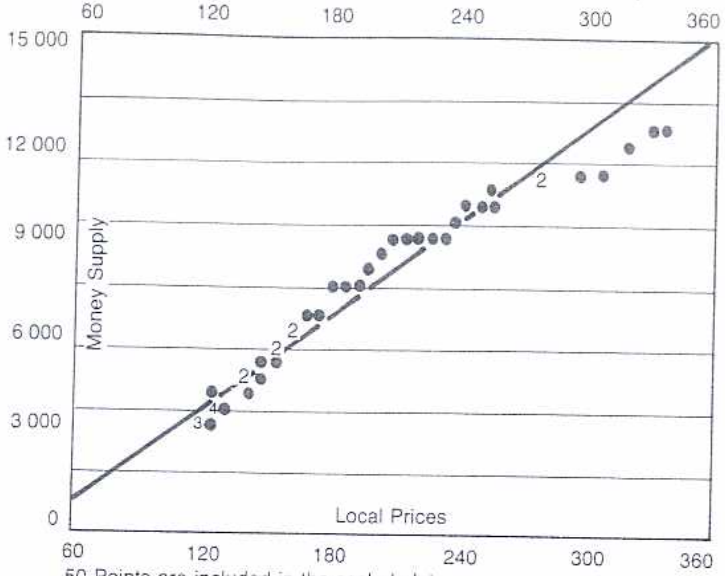
THE EFFECTS OF MONEY

The precise manner in which the supply of money influences prices, interest rates and exchange rates, or is affected by them, depends upon the monetary standard in operation. There are, for practical purposes, two alternatives. The standard followed by South Africa for almost all of its monetary history is what may be called the international standard.[1] Under the international standard a central bank sets out to manage or fix exchange rates. As will be explained below, under this standard the money supply becomes dependent upon the balance of payments. The alternative standard is for the monetary authorities to manage the money supply completely independently of balance of payments considerations. If so, market-determined exchange rates connect the domestic with the world economy.

[1] For a pioneering discussion of the logical implications of alternative monetary

Monetary Policy

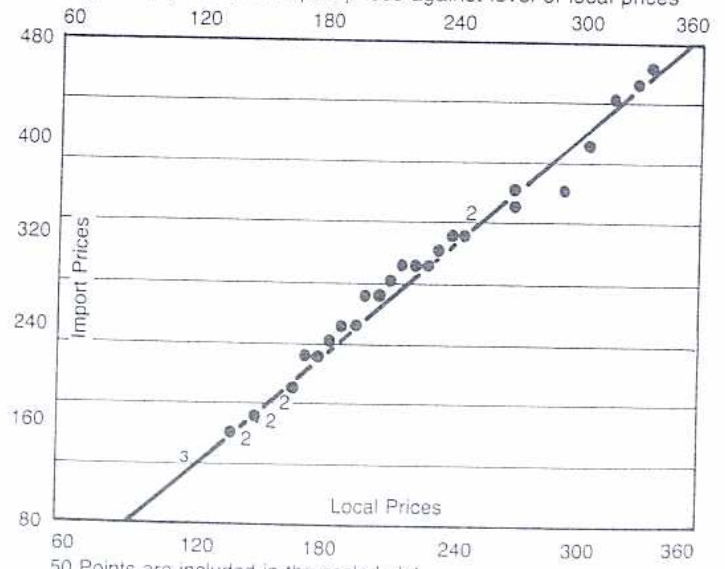
Figure 1(a): Level of money supply against level of local prices



50 Points are included in the scaled plot.
Correlation R = .981, T(48) = 35.00, SIG. PROB. = .000

	Mean	Std. Dev.	Regression line	S.E. REG.
H	185.40	66.92	H = 38.94512 + .012182•V	13.13
V	6711.4	3009		

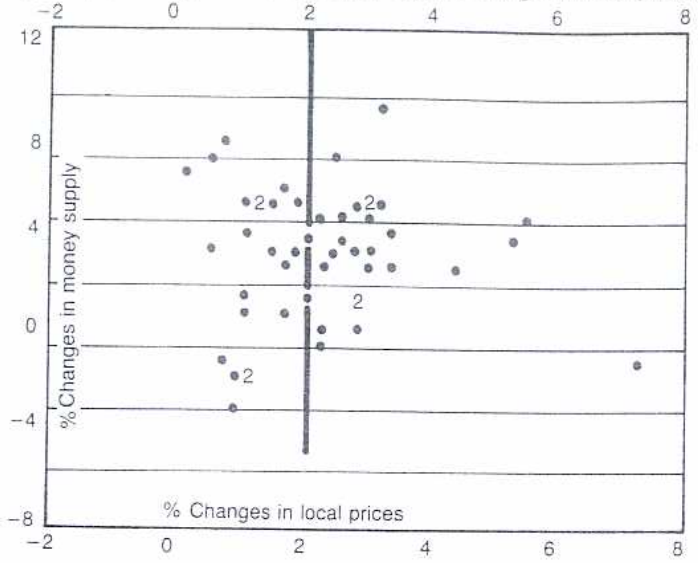
Figure 1(b): Level of import prices against level of local prices



50 Points are included in the scaled plot.
Correlation R = .996, T(48) = 80.45, SIG. PROB. = .000

	Mean	Std. Dev.	Regression line	S.E. Reg.
H	185.40	66.92	H = 45.32105 + .63989•V	5.802
V	218.80	104.2		

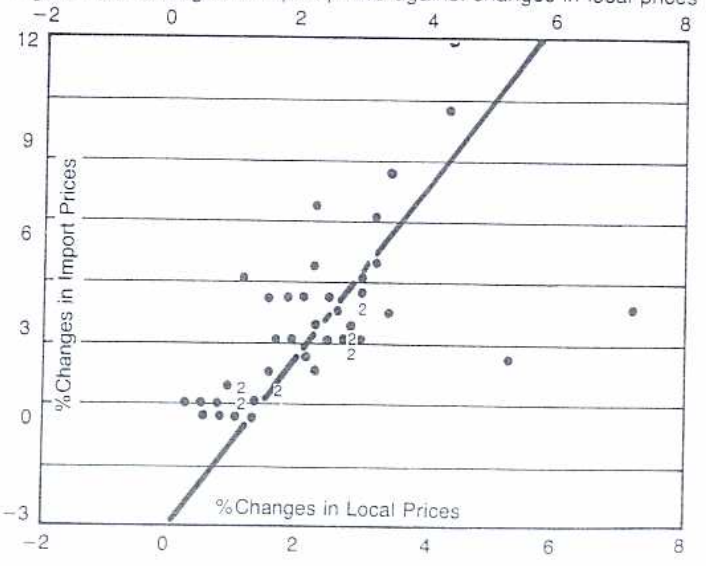
Figure 1(c): Changes in money supply against changes in local prices



50 Points are included in the scaled plot
Correlation R = .005, T(48) = .03, SIG. PROB. = .973

	Mean	Std. Dev.	Regression line	S.E. Reg.
H	2.2216	1.418	H = 2.21372 + .00247•V	1.432
V	3.1779	2.867		

Figure 1(d): Changes in import prices against changes in local prices



50 Points are included in the scaled plot
Correlation R = .635 T(48) = 5.69 SIG. PROB. = .000

	Mean	Std. Dev.	Regression line	S.E. Reg.
H	2.2216	1.418	H = 1.18291 + .36744•V	1.107
V	2.8267	2.448		

For the purpose of understanding how changes in the supply of or demand for money affect the real economy, it is helpful to think of the economy in more broadly general equilibrium terms than was done in the previous chapter. It should be understood that the economic system is a system of very many interdependent markets for goods and services including labour services, financial securities and money of different kinds. 'Goods' and money are demanded and supplied by governments, households, firms and financial institutions, both domestic and foreign. A change in the money market, in the supply or demand for money, will affect supply and demand in all the other markets of the system. Other things held equal (including all prices, wages and interest rates), when the supply of money increases, or when the demand to hold money decreases, economic agents will simply be holding too much money and too little of everything else. They will therefore seek to restore their preferred stock of money. Households will demand more goods, including those produced in other countries. They will demand more financial securities and they may even supply less labour. Firms with more money than they prefer to hold will spend more. They may hire more labour or increase inventories or invest in additional plant. They may also borrow less and import more. Banks with more cash than they prefer to hold would be inclined to lend more, and so on. As a result, prices and output, wages and employment, savings, investment and interest rates, exports, imports and capital flows and exchange rates may all be affected. The precise nature of these monetary effects will depend upon the particular monetary standard in operation. Depending on the standard, as will be explained, either prices of goods or the quantity of goods will be the more affected. Supply and demand everywhere in the system will be more or less affected by changes in demand and by the effects of the resulting changes in prices, interest rates and wages.

We consider the monetary transmission mechanism further in this and subsequent chapters. The main purpose of this chapter is to consider the factors determining the money supply in South Africa and how the money supply process and interest rates are influenced by monetary policy.

'WHAT MONEY'

Under the international standard, the authorities do not attempt to control the supply of money. However, should they seek to control the money supply, the question would then arise

of what particular money, narrowly or widely defined, should be controlled, i.e. 'M_1', 'M_2' or 'M_3' etc? Many of the financial assets available to economic agents may be close substitutes for each other. They may be converted into central bank money quickly and at a predictable value. They are, in other words, highly *liquid* or money-like assets. Precisely differentiating one group of liquid assets from another on theoretical grounds may be extremely difficult. The distinction often made is that something is money if it is both a medium of exchange and a store of value. However, even this distinction cannot always be sustained. Large-denomination notes in the US are clearly held as a store of value and yet cannot be easily cashed in a supermarket or on a bus.[2] In South Africa, regarding bank deposits as money because they are a medium of exchange, while regarding building society or Post Office savings accounts as something other than money, would be a very arbitrary distinction to make. For low-income earners, savings accounts rather than current accounts (demand deposits) are the closest substitutes for Reserve Bank notes.

A logically consistent definition of money is a will o' the wisp and indeed rather unimportant for monetary policy. What is important are the effects of 'money'. What is vital for a monetary authority attempting to control the supply of money is an empirically reliable link between that 'money' they seek to control and the economic magnitudes of interest, e.g. prices and output. The relationship between any 'money' and these variables may in fact change if the direction of policy should change. For example, if the monetary authority should no longer wish to manage interest or exchange rates, and instead sought to control the supply of money, the history of the relationship between 'money' and prices or output might not be of much help in guiding future policy, especially where credit or exchange controls reinforced such management. The central bank attempting such a change in policy will have no option but to learn by doing.

An empirically reliable link between money and prices and real output implies that the demand to hold money is stable. The stability or predictability of the demand for money (or its reciprocal, the velocity of circulation of money) does not require that the demand for money remain a constant. What is meant by stability is that the demand for money bears a well-behaved

[2] See Milton Friedman and Anna J Schwartz, 'Monetary Statistics of the United States: Estimates, Sources, Methods', *Studies in Business Cycles No. 20* (New York: National Bureau of Economic Research, 1970), especially Part 1.

functional relationship to the variables, interest rates, prices and inflationary expectations, that influence the demand for money.[3]

A BRIEF HISTORY OF MONETARY POLICY IN SOUTH AFRICA

The South African Reserve Bank was established in 1921. Its primary objective was to maintain a fixed rate of exchange of South African pounds into pounds sterling and into gold. In this, the Bank was following the tradition established for central banks by the Bank of England in the last half of the nineteenth century. The First World War and its aftermath, especially the German reparations issue, much disturbed the international monetary system. Britain made an attempt to restore the pre-1914 monetary arrangements when sterling was returned to gold convertibility in 1925 at the pre-1914 parity. The experiment failed when Britain left the gold standard in 1931, amidst the great depression of 1930–33. However, after the Second World War a fixed exchange rate system between the major industrialized countries was re-established. Known as the Bretton Woods system, fixed exchange rates between the major industrialized countries were very largely maintained between 1950 and 1970. This 20-year period, certainly not coincidentally, saw huge increases in the volume of world trade and rapid economic growth for the industrialized world.[4]

Between 1925 and 1967, with the exception of 1932, the South African Reserve Bank fixed the rate at which South African pounds or rands could be exchanged for pounds sterling. In 1932, South Africa remained on the gold standard after Britain had abandoned it in September 1931. In 1967, when Britain devalued sterling, South Africa did not follow suit.

We shall examine in some detail below the manner in which fixing exchange rates makes the money supply dependent upon the balance of payments. The effects of changes in the supply of money on expenditure are as described in Chapter 4. The effects of changes in expenditure on prices, wages and interest rates are different when exchange rates are fixed or flexible. We will say a

[3] Milton Friedman emphasized that the Quantity Theory is a theory of the demand for money; see M Friedman, 'The Modern Quantity Theory of Money: A Restatement', in M Friedman (ed), *Studies in the Quantity Theory of Money* (Chicago: Chicago University Press, 1956).

[4] There is a voluminous literature on the development of the international monetary system after 1945. Among the more interesting interpreters of this history has been Robert Triffin. See, *inter alia*, R Triffin, *Gold and the Dollar Crisis; yesterday and tomorrow* (New Haven: Yale University Press, 1961).

Also idem, *Our International Monetary System; Yesterday, Today and Tomorrow* (New York: Random House, 1968).

See also Brian Tew, *The Evolution of the International Monetary System, 1945–1977*

little here about the money transmission mechanism for a 'small' country.

Extra demands for goods consequent upon an increase in the supply of money can be accommodated by additional imports or fewer exports. Imports and exports are sold to and bought from world markets of which a national economy may constitute only a small part. As indicated in Chapter 1, the South African economy is, in this sense, small and exceptionally open to world trade. The world market prices of all but one or two internationally traded goods will be unaffected by additional demands or supplies from South Africa. This is also true of the price of gold where stocks held are large, relative to South African output, and where turnover in the stock of gold or claims to it far exceeds the annual value of South African output. This means that while flows of goods onto and off the South African market will respond to domestic expenditure, South African prices are taken in the long run from world markets.

The domestic rate of inflation should therefore closely approximate the rate of inflation in the currencies to which the domestic currency is tied. A comparison between the low rates of inflation in South Africa, the US and the UK between 1952 and 1967 is provided in Figure 2 below.

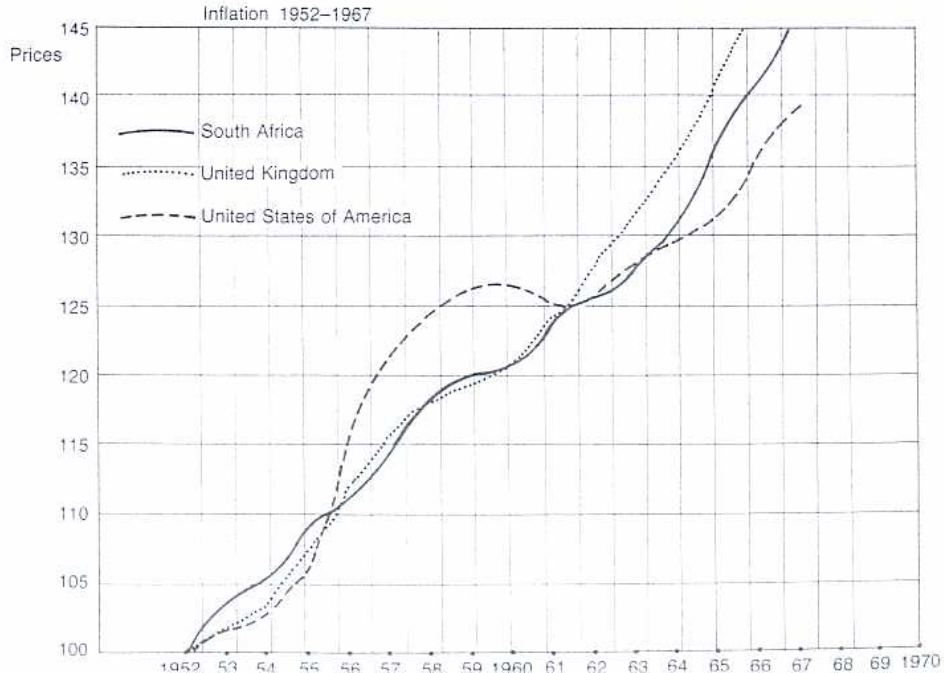
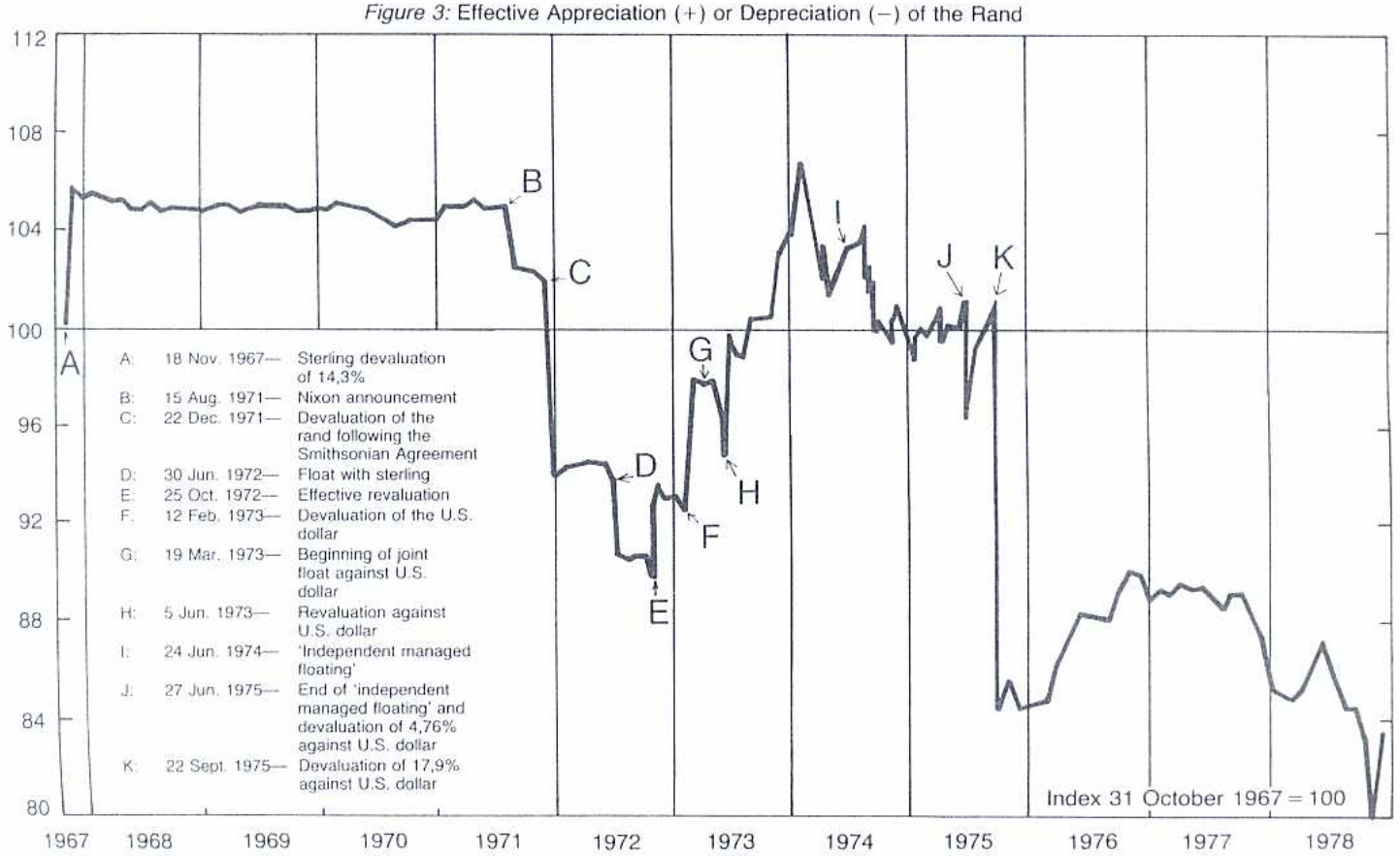
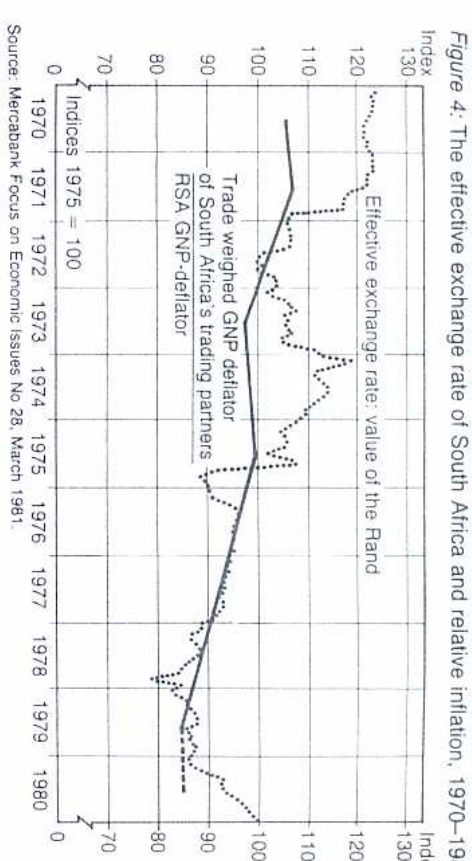


Figure 3: Effective Appreciation (+) or Depreciation (−) of the Rand



Source: Interim Report of the Commission of Inquiry into the Monetary System and Monetary Policy in South Africa RP/112/1978.

Figure 4: The effective exchange rate of South Africa and relative inflation, 1970–1980



Source: Mercabank Focus on Economic Issues No 28, March 1981.

The discipline of fixed exchange rates helped maintain low rates of inflation in South Africa, because the rate of inflation in Britain and the US remained low. Such a monetary policy strategy, for South Africa, became increasingly unsatisfactory with the breakdown of the international fixed exchange rate system after 1970.

It broke down because the United States in the middle and late 1960s began to increase the rate at which dollars were being supplied both domestically and, via balance of payments deficits, to the rest of the world. By 1971 the US could no longer guarantee the convertibility of foreign central bank-owned dollars into gold at the price of $35 an ounce. The dollar–gold link was abandoned and flexible exchange rates between major currencies were somewhat reluctantly permitted. In such circumstances, a fixed exchange rate link with sterling or the dollar became a very uncertain star by which to navigate South African monetary policy. Furthermore, the fixed dollar price of gold which had been a source of stability for the South African economy, became highly variable, based as it was upon expectations about highly variable US monetary policy.[5]

In the early 1970s the rand was fixed to the dollar, then to sterling, then to the dollar again, then connected to a basket of currencies, and pegged again to the dollar in June 1975. After a large devaluation of 18% against the dollar in September 1975,

[5] It is interesting to note in figure 2 how the US rate of inflation accelerated in the late 1950s. This acceleration precipitated a flurry of gold buying which in 1960 briefly pushed the price of gold on the London gold market above the official $35 an ounce. The major central banks then, in response, formed a gold pool to stabilize the price at $35.

In the early '70s, after the dollar had ceased to be convertible into gold, South Africa was at first very concerned at the possibility of the gold price falling below $35.

See Brian Kantor, 'The Gold Agreement and the Future of Gold', *The South African Banker* 67, 1 (Feb 1970): 31–40.

the rand stayed pegged to the dollar until January 1979. The history of exchange rate policy and the effective rand exchange rate between 1967 and 1979 is illustrated in Figure 3.

The rate of inflation in South Africa increased with the rate of inflation in the US and Britain. The rate of inflation in South Africa in fact exceeded the rate of inflation in the US, as can be inferred from the devaluations against the dollar.

Official unease with the practice of monetary policy led, in 1977, to the establishment of a government commission of inquiry into monetary policy issues under the chairmanship of Dr G P C de Kock, then Deputy Governor of the Reserve Bank.[6]

In its interim report on exchange rate policy, the De Kock Commission recommended a managed float of the rand, which was implemented in January 1979. This managed float did not break the dependence of the money supply on the balance of payments. An improved balance of payments reinforced by substantial increases in the price of gold brought some appreciation of the rand, but also a rapid acceleration of money supply growth in 1979 and 1980, as is illustrated in Figure 5.

Figure 5: Money supply % growth month on month

The final report of the De Kock Commission, expected in 1982, may recommend a free float for the rand. If so, only then will South Africa be in a position to operate an independent monetary policy. The issue of the appropriate monetary standard

[6] See *Exchange Rates in South Africa, Interim Report of The Commission of Inquiry into the Monetary System and Monetary Policy in South Africa* (De Kock Commission), RP 112/1978.

is the most important monetary policy question for South Africa, and is discussed fully in the following chapter.

INTEREST RATES AND INTEREST RATE POLICY

The role to be played by interest rates and the interest rate policy also depends crucially on the monetary standard in operation. Given fixed exchange rates, the effects of money in an open economy may be summarized as follows. The balance of payments affects the supply of money which affects the volumes of imports and exports which reverses the direction of the balance of payments and so the money supply growth. Given fixed exchange rates, the supply of money is functionally related to the foreign exchange reserves held by the Central Bank. These reserves fluctuate with the balance of payments. If a central bank were concerned with a decline in its foreign exchange reserves, following a deficit on the balance of payments, it might raise the interest rates at which it would be prepared to lend to banks, i.e. it would raise the rediscount or bank rate. It might also force banks to borrow at this rate by selling government securities from its own portfolio. An increase in interest rates would discourage local borrowing and encourage foreign borrowing by domestic industrial enterprises. It would also encourage foreign and local banks to lend domestically rather than elsewhere. Thus an increase in interest rates would cause capital on balance to flow towards the country with balance of payments difficulties and tend to increase the foreign exchange reserves of the central bank. Such interest rate developments, while helping to protect the foreign exchange reserves of a central bank, do not usually prevent a reduction in money supply growth.

Interest rate changes engineered or reinforced by the central bank came to be regarded as the primary instrument of monetary policy. They were thought to be effective in protecting the foreign exchange reserves that enabled the central bank to maintain convertibility of the domestic currency at a fixed rate of exchange. The more important role played by balance of payments' accommodating money supply developments were unobserved and went largely unappreciated by contemporary students of the gold standard.

Changes in short-term interest rates affected net flows of funds between financial centres with well-developed money markets because the increase or decrease in short-term interest rates were expected to be temporary. They were expected to be temporary because it was regarded as certain that fixed exchange rates would be maintained and that in the longer run the rate of

inflation in the deficit country would not exceed the rate of inflation elsewhere. Long-term interest rates were thus not affected by a change in short-term interest rates.[7]

THE MONEY MARKET AND MONETARY POLICY DEVELOPMENTS IN SOUTH AFRICA

A market for short-term borrowing and lending was only developed in South Africa after 1949. With strong official encouragement, a money market of the London variety was created. London-style discount houses, the first of which was the National Finance Corporation, a subsidiary of the Reserve Bank itself, took deposits from the banks and held mainly Treasury Bills, which were issued by tender. The discount houses in turn had free access to the lender of last resort facilities of the Reserve Bank.[8]

Before this, the South African banks, of whom the more important had their head offices in London, had kept their liquid assets in the London money market. When the South African balance of payments was favourable, they would accumulate liquid assets in London and when unfavourable, run them down. Thus the supply of bank credit in South Africa would, for any given structure of interest rates, respond passively to the demands for such credit by South African borrowers and the supply of cash reserves provided by the balance of payments. Often the upswings or downswings of economic activity would be led in the form of more exports or more foreign investment, which would simultaneously improve the balance of payments and increase the rate of growth of the money supply.

The largely-automatic balance of payments mechanism had worked perfectly well to maintain fixed exchange rates and price stability. The commercial banks in South Africa were quite willing to take a lead on interest rates from the Reserve Bank. However, the Reserve Bank was concerned at not being able to influence the supply of cash to the system and more particularly the supply of bank credit. It wanted to do what it thought the

[7] The classic study of the relationship between short-term and long-term interest rates in Britain is that of R G Hawtrey, *A Century of Bank Rates* (London: Longmans, Green, 1938).

[8] For an account of the early history of the South African short-term money market, see G F D Palmer, 'The Development of the South African Money Market', *South African Journal of Economics* 26 (1958): 239.
See also D W Goedhuys, 'The Discount Houses and the Money Market', in A Hamersma and N H H Czypionka (eds), *Essays on the South African Financial Structure* (Johannesburg: Standard Bank of South Africa Ltd, 1975).
For a more recent account of some of the South African institutional arrangements, see

Bank of England was able to do so successfully, and the South African money market was developed for this purpose. The Reserve Bank officials, in common with most other observers, did not appreciate that the substance of the balance of payments adjustment process was accommodating money supply changes.[9]

With the establishment of a market for short-term borrowing and lending in South Africa, interest rates in South Africa became much more vulnerable to developments in the London money market. Paradoxically, it was the unwillingness of the authorities to accept more frequent changes in South African interest rates after the establishment of the money market that led to the extension of exchange controls to movements of funds within what was then the sterling area. Until then, exchange control operated only to limit the demand for dollars. While these exchange controls diverted some of the channels that linked South African and world financial markets, they did not by any means break the dependence of South African money supply or interest rate developments on the balance of payments.[10]

THE BANK ACT OF 1965

The inability of the authorities to determine interest rates or the money supply independently of the balance of payments was clearly not well understood in official or unofficial circles interested in monetary economics. In 1965, new South African Bank and Building Society Acts were introduced following the recommendations of a Technical Committee Report.[11] The new Acts were intended to give the authorities greater control over the activities of financial intermediaries generally. The Technical Committee had been influenced by the British Radcliffe Committee Report published in 1959.[12]

The Radcliffe Committee was of the view that in a sophisticated financial market, the velocity of money was infinitely high, or that, in other words, the demand for money to hold was highly interest rate elastic. If so, as the Radcliffe Committee argued, a policy-engineered increase in interest rates designed to reduce demands for and supplies of credit, would effectively reduce demands by money holders for bank deposits, while at the same time increasing demands for the liabilities of 'near' banks. These 'near' banks would also bank with the clearing

[9] See the *Annual Reports* of the Governors of the South African Reserve Bank.
See also Brian Kantor, 'The Evolution of Monetary Policy in South Africa', *South African Journal of Economics* 39, 1 (1971): 42–72.

[10] See Kantor, 'Evolution of Monetary Policy', art cit.

[11] *Report of the Technical Committee on Banking and Building Society Legislation*, RP 50/1964.

[12] *Committee on the Working of the Monetary System: Report* (Radcliffe Report), London:

banks who would therefore experience no decline in cash reserves and would not have to reduce lending. The near banks, however, would increase their lending. As a result, supplies of credit and spending would increase and prices or output would rise. Accordingly, the velocity of circulation of money (which is nominal income divided by the money supply) would have risen as prices or output increased and the money supply remained unchanged.

The Radcliffe Committee did not recognize the monetary approach to the balance of payments which applied to fixed-exchange-rate Britain in the 1950s and '60s as much as it did to South Africa. The velocity of circulation of money was clearly not infinite in Britain, otherwise Britain would not have been able to maintain fixed exchange rates. The Radcliffe Committee was described by Harry G Johnson as representing the high tide of Keynesianism. Their view of the economy was essentially a closed-economy view where money didn't matter but interest rates did and the task of monetary policy was to manipulate interest rates to encourage or discourage expenditure. It was the effects of interest rate changes and not the causes of interest rate changes that were the focus of their attention.[13]

The Technical Committee was influenced by the Radcliffe Report. It nevertheless regarded the supply of money as important for monetary policy.[14] To gain control over the supply of money, the Technical Committee thought that additional policy instruments should be made available to the Reserve Bank to prevent financial institutions in addition to banks from doing what it regarded as so dangerous, and that was *creating* money or 'near money'. Accordingly, the 1965 Bank Act extended reserve requirements to all so-defined 'deposit receiving' institutions. Building societies were prevented from competing with banks for corporate deposits. Banks were made subject to variable 'liquid asset' to deposit ratios of which the cash ratio became a fixed proportion. Liquid assets for the purposes of meeting reserve requirements were specified by the authorities. They

[13] 'The Radcliffe Committee's emphasis on "the liquidity of the economy" as the key variable for monetary analysis and policy represented the high tide of Keynesian disbelief in the practical relevance and theoretical importance of money as formulated in traditional monetary theory, and as such met a harsh critical reception from the spokesmen of resurgent monetarism.'
Harry G Johnson, 'Recent Developments in Monetary Theory', in D R Croome and H G Johnson (eds), *Money in Britain, 1959–1969* (London: Oxford University Press, 1970), p 101.

[14] See G de Kock, 'Monetary Policy Under the New Banking Legislation', *The South African Banker* 62, 3 (May 1965): 291. Also J H Meijer, 'Monetary Policy, Principles and South African Issues', in M L Truu (ed), *Public Policy and the South African Economy: Essays in Memory of Desmond Hobart Houghton* (Cape Town: Oxford University Press, 1976).

included Treasury Bills and deposits with the NFC and discount houses. In effect, liquid assets were largely public-sector debt and became increasingly so after the Bank Act was amended in 1972 to further inhibit private-sector debt qualifying as liquid assets.[15] We consider some of the effects of this captive market for government debt below. It should also be mentioned that the Bank Act strengthened the restrictions on entry into South African banking and on the business of banking and financial intermediation generally.

The monetary policy issues that arise concern the justification for interventions in the money and financial markets so readily undertaken by the South African authorities in the 1950s, '60s and '70s.

In order to discuss these monetary policy issues, it is necessary to develop a model of the money supply process.

THE MONEY SUPPLY PROCESS

The model below consists of a set of equations that summarize the forces determining the demand and supply of base or 'high-powered' money (that is, the notes and deposits issued by the Reserve Bank (MB)), the supply of bank money (that is, the deposits issued by commercial banks (D)) and the demand for and supply of bank credit (BC). The model will demonstrate how the demand and supply of bank money and bank credit are determined simultaneously and interdependently. As will be explained, the precise direction of cause and effect in the money supply process depends upon the monetary standard in operation.

Let us begin with a definition of the money supply. The money supply (M) consists of bank deposits (D) and notes (N) issued by the Reserve Bank

$$M = N + D \qquad \text{(Equation 1)}$$

It will be shown that bank deposits are some multiple of the supply of base money (MB) issued by the Reserve Bank. Let us therefore consider a simplified balance sheet of the Reserve Bank in order to explain the supply and demand, or what may be described as the *sources* and *uses*, of high-powered money.[16]

[15] See *Report of the Technical Committee on Banking and Building Society Legislation*, RP 48/1972.
See also T W de Jongh, 'Credit Control and the Task of the new Technical Committee on Banking and Building Society Legislation', *The South African Banker* 68, 2 (May 1971): 150–160.

[16] For a similar approach to money supply analysis, see Ronald L Teigen, 'The Demand for and Supply of Money', in W L Smith and R L Teigen (eds), *Readings in Money, National Income, and Stabilization Policy* (Homewood, Illinois: Richard D Irwin Inc, revised edition 1970), p 71.

RESERVE BANK

Liabilities		*Assets*	
Notes	N	Foreign Assets and Gold	FA
Commercial Bank Deposits	CR	Government Securities	GS
Government Deposits	GD	Private-sector Securities (Bank Borrowing)	B

The notes and commercial bank deposits of the Reserve Bank constitute the high-powered money of the system (MB), so called because they support a larger supply of bank deposits. Notes are largely demanded as money by households and Reserve Bank deposits are held as cash reserves by the banks to settle inter-bank debts and to meet their customers' demands to hold Reserve Bank notes rather than bank deposits.

The proximate sources of changes in the MB are indicated on the asset side of the balance sheet identity. Changes in the foreign assets holdings of the Reserve Bank reflect surpluses or deficits in the balance of payments. If the balance of payments is in surplus or deficit, the commercial banks will acquire or run down deposits with the Reserve Bank and the Reserve Bank will acquire more foreign assets or hold more gold. The Reserve Bank exchanges Reserve Bank deposits for all the gold produced in South Africa. It then sells in exchange for US dollars as much gold as is necessary to meet the demands for foreign exchange by South African importers and others.

Other proximate sources of changes in MB are open market operations by the Reserve Bank. The Reserve Bank, for the precise purpose of affecting the cash reserves of the commercial banks, may, on its own account, buy or sell securities. An increase or decrease in GS will cause a similar increase or decrease in CR. As is also indicated, banks may borrow reserves from the Reserve Bank. The other major source of high-powered money is government finance. An increase or decrease in the government deposits with the Reserve Bank cause commercial bank deposits to decline or increase. Government deposits will increase or decrease according to the difference between government spending (G), taxation (T) and net issues of government securities, i.e. the difference between issues and repayment of debt to all lenders other than the central bank (GB). Thus

$$\triangle GD = T - G + \triangle GB + \triangle GS \qquad \text{(Equation 2)}$$

where $\triangle$ indicates the increase or decrease in government deposits and government debt.

We emphasize 'proximate' causes of changes because the different sources of such reserves for the banking system are not independent of each other, as will be explained.

The Reserve Bank balance sheet identity may be summarized as follows

$$MB = N + CR = FA + GS + B - GD \qquad \text{(Equation 3)}$$

where N + CR are the uses and FA + GS + B − GD the sources of changes in base money. This may be further simplified as follows

$$GS - GD = NDA \qquad \text{(Equation 4)}$$

where NDA represents net domestic assets of the Reserve Bank and FA the foreign assets.

The relationship between the banks' demand for reserves and the supply of money is an important one for the money supply prices. For any given supply of high-powered money, the greater the demand for reserves, the less banks will lend and the smaller the supply of deposits. We demonstrate this below.

A banking system's demand for cash reserves is dependent upon the probability of cash withdrawals at any moment in time and the cost of turning some other asset into cash at short notice. In other words, the demand for cash depends on the return from holding liquid assets, as defined above. Usually a bank's demand for cash reserves is constrained by a reserve requirement imposed by the authorities. Reserve requirements are usually specified as a minimum proportion of cash to bank deposits. These fractional reserve requirements may be varied at the discretion of the authorities.

Banks, in order to preserve some portfolio flexibility so as to be able to take advantage of unexpected lending opportunities and also in anticipation of changes in required reserves, usually prefer to keep a margin of reserves over and above the actual reserve requirement. They have what may be described as a demand for 'free reserves'. These demands are influenced by the return on liquid assets and the cost of borrowing reserves which will be closely related to the return on liquid assets.

Thus

$$CR = CR^R + CR^e \qquad \text{(Equation 5)}$$

where bank reserves are broken down into required reserves CR^R and excess reserves CR^e. Also

$$CR^R = kD \qquad \text{(Equation 6)}$$

where k is the required reserve ratio and D bank deposits. Free reserves, CR^f may be defined as the difference between

and borrowed reserves. As indicated, the demand for free reserves will decline with the rate of return on longer-term or riskier bank lending (γ) and increase with the rate of return on liquid assets (γ_{LA}).

Thus the demand for free reserves

$$CR^f = CR^e - B = CR^f \quad (\bar{\gamma} \quad \overset{+}{\gamma}_{LA}) \qquad \text{(Equation 7)}$$

where the signs above the variables indicate the direction of the interest rate effects.

Returning to our definition of the money supply in Equation 1:

$$M = N + D$$

let us further assume that Reserve Bank notes constitute a fixed proportion of the money supply and deposits the remaining and larger proportion:

$$N = nM \qquad \text{(Equation 8)}$$

$$\text{and} \quad D = (1 - n)\, M \qquad \text{(Equation 9)}$$

Substituting Equation 6 for D in Equation 9 we get

$$CR^R = k(1 - n)\, M \qquad \text{(Equation 10)}$$

Then from Equations 3, 5, 7, 8 and 10, we get

$$nM + k(1 - n)\, M + CR^f \quad (\gamma \quad \gamma_{LA}) = FA + NDA \qquad \text{(Equation 11)}$$

and solving for M, the money supply, gives

$$M = \frac{1}{k(1 - n) + n} [FA + NDA - CR^f \quad (\gamma \quad \gamma_{LA})] \qquad \text{(Equation 12)}$$

Thus the money supply is shown to be a multiple of the reserve ratio, k, the currency ratio, n, the supply of high-powered money and the demand for free reserves. The money multiplier will rise as the reserve requirement or the currency ratio falls. The money supply will increase as the supply of base money increases or as the demand for free reserves declines.

We discussed the alternative sources of base money. We indicated that they could not be regarded as independent. We shall now describe the interdependence of alternative sources of cash reserves, FA and NDA. Let us therefore consider another financial market identity:

$$BC_s = D - CR + B \qquad \text{(Equation 13)}$$

where BC_s represents the supply of bank credit.

The demand for bank credit, BC_d, may be disaggregated into private-sector, BC_p, and government-sector demand, BC_g.

$$BC_d = BC_p + BC_g = BC_s \qquad \text{(Equation 14)}$$

By definition, should the cash reserves of the banking system increase, a further expansion in the supply of money (D) depends

the absence of

such demands, the banks might use the extra cash to repay loans from the Central Bank, in which case a decline in B and NDA could completely offset an increase in FA.

The commercial banks might, in the absence of increased demands for credit, buy securities in the market. Such extra demands would tend to force up the prices of securities and lower interest rates. Such a change in the ownership of securities would not reduce the amount of high-powered money in the system. However, if the lower interest rates stimulated the demand for bank credit, then the banks could lend more and the money supply would expand. The opposite effects would follow if the cash reserves of the banks declined, interest rates rose and demand for bank credit declined.

The demand for bank credit by the private sector may be thought to depend upon interest rates and also real economic activity. Demands for credit would also be in proportion to the price level. The demand for bank credit function could be described as follows

$$BC_p = BC_p \quad (\bar{\gamma}, \quad \overset{+}{y}) \; P \qquad \text{(Equation 15)}$$

where y represents real economic activity and P the price level. The demand for credit is assumed, as indicated, to decrease with increases in interest rates and increase with increases in real economic activity (y).

Government demands for bank credit could be regarded as unaffected by interest rates. Therefore, if government wished to borrow more from the banks, interest rates could rise sufficiently to crowd out private credit.

CASH OR LIQUID ASSET RATIOS

Monetary developments in South Africa since 1965 amply demonstrate that replacing cash ratios with liquid-asset ratios and extending reserve requirements was not sufficient for purposes of controlling the supply of money. The Bank Act of 1965 was based upon a fundamental misconception about the dangers of banks 'creating' money. In the first place it is not the supply of money but changes in the supply of money that is relevant for monetary policy. Furthermore, while bank deposits are a multiple of banks' cash reserves, banks do not 'create' deposits in any magical way as the money 'multipliers' may imply. Banks *supply* or *produce* deposits and the process of supplying deposits is costly, involving bank offices and clerks and computers, etc. A banking licence is not, in fact, a licence to print money. The supply of bank deposits depends ultimately on the profitability of

costs of accepting them. In banking as in other industries, technology may change, reducing the costs of accepting deposits and incomes, and tastes may change, increasing the demand for deposits. The money multipliers for these reasons have increased with economic development. However, such growing financial sophistication does not in itself imply any threat to economic stability.

Replacing cash ratios with liquid asset ratios is neither necessary nor sufficient for purposes of controlling or limiting the supply of money. Even cash ratio controls are neither necessary nor sufficient for the purpose. What is both necessary and sufficient is that the banks' demands for cash reserves be predictable and that the supply of reserves be restrained either directly by the authorities or indirectly via the balance of payments. Clearly the authorities could if they so wished compensate for changes in the demand for deposits rather than central bank notes by adjusting the supply of cash reserves accordingly. As was indicated in the model of the money supply process developed above, specifying required reserves will reduce the demand for free reserves, but not eliminate such demands. Similarly, when required reserves are specified as 'liquid' assets, banks will keep a margin of free liquid assets, rather than free cash reserves, to preserve a degree of portfolio flexibility. The cost of holding excess liquid assets is the interest sacrificed on other higher-yielding assets.

Let us consider the money supply process when liquid asset reserves replace cash reserves and banks keep no excess cash reserves. Returning to Equation 12 where

$$M = \frac{1}{k(1-n)+n}\,[FA + NDA - CR^{f} \quad (\gamma \quad \gamma_{LA})] \qquad \text{(Equation 16)}^{17}$$

If banks keep no excess cash reserves then Equation 16 reduces simply to

$$M = \frac{1}{k(1-n)+n}\,[FA + NDA + B] \qquad \text{(Equation 17)}$$

or

$$M = \frac{1}{k(1-n)+n}\,MB$$

THE SUPPLY OF MONEY AND THE DEMAND FOR, AND SUPPLY OF, CREDIT

The influence of the balance of payments on the money base will be ignored in order to concentrate attention on the influence of government financial arrangements and interest rate policies

[17] For an econometric analysis of the relationship between the money base and the money supply in South Africa, see A M Hurwitz, 'An Econometric Analysis of South

on the Net Domestic Asset component of the money base. From Equation 4, it should be recalled that

$$NDA = GS - GD$$

The increase or decrease in government deposits with the Reserve Bank over any period is by definition equal to the difference between government spending and taxation and additional government borrowing from all sources. Thus from Equation 2

$$\triangle GD = T - G + \triangle GB + \triangle GS \qquad \text{(Equation 2)}$$

where GB is all other government borrowing. GB may be usefully broken down into government borrowing from banks, BC_g, and others, OB.

$$\text{Thus} \quad \triangle GB = \triangle BC_g + \triangle OB \qquad \text{(Equation 18)}$$

substituting Equation 18 into Equation 2 gives:

$$\triangle GD = T - G + \triangle GS + \triangle BC_g + \triangle OB \qquad \text{(Equation 19)}$$

With the aid of these equations it is possible to trace the effects of a change in the demand for and supply of government securities on the supply of cash reserves and the supply of money. The effect of changes in the composition of demand for government securities will also be considered.

It should be clear that if the demand for government securities from either the banks BC_g or the other borrowers OB should fall, then government deposits GD will decline, and NDA and MB and the supply of money will increase. The supply of NDA, MB and money will decline if demands for government securities increase. It should be recognized that the banks' demand for government securities is equivalent to a supply of bank credit.

Commercial bank lending to the government consists of the compulsory liquid asset holdings and 'free' holdings of government securities in excess of required reserves. Thus, if other lending to government remains unchanged, a reduction in free bank lending will mean a reduction in GD and an increase in NDA. The banks may, for example, wish to increase their private lending and reduce their government lending. They would, however, do so and reduce their free reserves only if the rate of return on such government lending seemed relatively unattractive. If so, the demand for bank credit from the private sector, the supply of cash and the supply of money could all increase. However, if all interest rates were simultaneously determined by domestic financial markets then an increase in demands for bank credit by either the government or the private sector

would cause interest rates to rise generally without necessarily causing a switch of portfolios towards private debt and away from government securities. The increase in interest rates on liquid assets would also restrain any propensity for banks to reduce their 'free' liquid assets.

If the authorities sought to manage interest rates on government securities and interest rates lagged behind what would be a true market rate, then the excess demand for credit from the private sector could only be satisfied by reducing the supply of bank credit to the government. If this happened, the demand for free liquid assets by the banks would decline, as would the demand for government securities by other lenders, and NDA would increase.

Similarly, if the government wished to borrow more but was reluctant to pay higher interest rates, it would have to rely on the Central Bank to support government borrowing with a consequent increase in NDA. Alternatively, if private demands for credit declined and government interest rates remained too high, then funds would flow towards the Treasury and NDA and the supply of cash would decrease.

The balance of payments will exert its influence on the money supply whether or not the banks are compelled to hold liquid assets. Quite simply, cash is a liquid asset, and if the supply of cash and the demands for credit are increasing simultaneously, then the supply of cash, credit and money will all increase. Usually with an increase in cash reserves and a favourable balance of payments, there will be some automatic offset through flows of funds to the Treasury and a decline in NDA. In South Africa, the Treasury has the right to borrow unlimited amounts for stabilization purposes (that is, to borrow but not to spend) in order to reduce the supply of cash. Again, if such a policy were used to consistently and completely offset the increase in the supply of money following a more favourable balance of payments, such a policy would be inconsistent with a particular fixed exchange rate.

THE OFFICIAL CASE FOR INTEREST RATE MANAGEMENT

We shall now consider briefly the official case for interest rate management and the causes and consequences of the direct controls applied to lending and borrowing in South Africa.

The views of the Franzsen Commission may be taken as representative of the official case for interest-rate management. The Commission considered that the aggregate demand for

to changes in interest rates and that, therefore, interest rates could not properly ration the supply of funds.

The Commission argued that demands for credit, especially demands for hire-purchase finance are much less interest-rate sensitive than other financial demands and therefore competitively-determined interest and deposit rates would result in a large transfer of savings from financing investment to financing consumer credit. Financing consumer credit was assumed implicitly to be a less socially-desirable application of available savings than some of the other alternative uses for them.[18]

There is a very fundamental objection to the Franzsen Commission views on interest rate flexibility. While it may well be true that certain credit demands in South Africa are indeed relatively insensitive to interest rates over the range of real interest rate fluctuations to which credit markets have become accustomed, it does not follow that supplies of such credit will respond elastically to interest rate differentials and demands for bank credit. Hire-purchase lending and, even more important, bank overdrafts are forms of credit where the risk of default can be high. In these sectors of the credit market, information about the credit worthiness of the ultimate borrower is often costly to obtain. As a result of these information costs, borrowers dependent on bank overdrafts may find it difficult to transfer their borrowing custom from one bank to another. Similarly, credit customers of one retailer may find it difficult to establish the same line of credit at another. Neither banks nor retailers, given credit risks, find it profitable to auction off available supplies of credit to the highest bidder. The rationing mechanism is in large part that of the judgment of the bank or credit manager as to the creditworthiness of customers rather than the interest rate promised.

The significance of such considerations at the micro decision level should not be taken to imply that interest rate differences would not influence the total supplies of bank credit available for alternative uses. As suggested, higher interest rates do not necessarily compensate for greater risks. It may be expected therefore that relatively higher government interest rates, given risks, would attract to the government an increased supply of funds. There seems little in financial history to suggest that lending to government is inherently unattractive. Such lending depends clearly on relative interest rates.

[18] *Fiscal and Monetary Policy in South Africa. Third Report of the Commission of Enquiry into Fiscal and Monetary Policy in South Africa, November 1970* (Franzsen Commission) RP 87/1970.

Finding support for the role that could be played by interest rates in South Africa is complicated by the fact that interest rates until recently have not performed the rationing role it has been suggested they should perform. It may therefore be concluded that given the interest rate policies applied in South Africa there exists a margin of unsatisfied demands for *and* supplies of certain kinds of bank credit. We should however be careful not to attribute such perpetual disequilibrium conditions to any properties of interest rates themselves. The explanation for disequilibrium should be attributed rather to the interest control mechanisms than to any inherent instability of credit markets.

The commercial bank overdraft system is also influenced by the relative inflexibility of bank overdraft rates and some deposit rates. Banks provide their customers with overdraft facilities in excess of the normal rate of use of such facilities. The rate at which overdrafts are utilized therefore tends to increase automatically with increases in the demand for bank overdrafts. The banks finance their extra overdraft lending by switching out of government securities or by extra borrowing directly and indirectly through the discount houses from the Reserve Bank or by competing more actively for wholesale deposits. Such developments and potential developments are considered to complicate monetary policy. It should be understood that the banks can adopt such a relaxed approach to overdraft demands because it is obviously profitable, on balance, for them to do so. It is profitable precisely because the extra cash can be obtained and the extra private credit made available at relatively low cost. If such extra cash were not so inexpensively acquired, the banks would have to adapt their overdraft system. The banks in different circumstances would then be inclined to supervise the rate of utilization of overdrafts and their deposits much more closely than they appear to do.

THE CAPTIVE MARKET FOR GOVERNMENT SECURITIES

The South African authorities supplemented their control over interest rates by commanding that a large and increasing proportion of funds managed by private-sector financial intermediaries be committed to government securities. The controls took the form of prescribed investments, liquid asset ratios and credit ceilings.

The satisfaction of the compulsory requirements make up the aptly described 'captive' market for government and other

accounts for a large proportion of the market's debt issued by ...

.... the central government. Reliance on the captive market provides the authorities with an alternative to either paying more competitive interest rates or to creating more money for the purposes of funding government expenditure.

The controls are also argued to make the future of financial institutions more secure than they would otherwise be and by so doing protect the saver. Some provisos to this point of view should be noted. The first is that in the search for higher overall returns, financial institutions may accept greater risks for the 'free' portion of their portfolios. Secondly, alternative methods for protecting the savers or approved borrowers may be devised without some of the undesirable side effects of the captive market. For example, compulsory or voluntary deposit insurance schemes may be instituted to protect particular small savers who, it might be argued, are insufficiently security conscious.

The captive market has implications for both the efficiency and competitive evolution of the financial system and the distribution of income. There seems no *a priori* reason for believing that the normal conditions for the efficient and competitive utilization of resources do not apply to the financial industry.

Financial regulation inhibits competition in financial markets. It also has implications for the distribution of income. The captive market serves generally to hold down the rate of interest on the government debt. The taxpayer clearly benefits from this, while the savers—the widows, pensioners and orphans—seeking relatively riskless vehicles for saving, are prejudiced.

A policy instrument which has been applied periodically in South Africa is the bank credit ceiling. The impact of this measure is the same as that of the other 'captive' market provisions. If the banks are prohibited from additional lending to the private sector, their additional deposits, and so cash, must perforce be used for holding extra government securities. The Treasury is guaranteed a further demand for its debt issues. The usefulness of this measure and of the other controls on the demand for credit may be undermined by the evolution of the so-called grey market in credit. When the credit ceiling is operative, banks are unlikely to offer depositors attractive terms for their deposits. Nevertheless, the unsatisfied overdraft demands will tend to push up the cost of credit and so lenders will be encouraged to make direct contact with the borrowers.

Given rapid growth in the supply of deposits the credit ceiling and other controls may be bypassed. The result may be less

CONCLUSION ON MONETARY POLICY REFORMS

The monetary policy reforms of the mid-1960s were at best irrelevant. They were irrelevant firstly because they were based on a spurious concern about the creation of money. Secondly, they were irrelevant for the more important reason that they ignored the automatically stabilizing balance of payments effects on money supply developments.

The practice of monetary policy in the 1960s and '70s had nevertheless a perverse effect on the evolution of the financial structure. Controls tended to inhibit entry into financial markets and competitive innovations in it.

INDICATORS OF MONETARY POLICY

In South Africa and elsewhere, a number of alternative indicators of the impact of monetary policy have been proposed. For example, monetary policy is described as easy or tight, or inflationary or not inflationary by observation of the ratio of money supply to gross domestic product. Increases or decreases in interest rates or in required liquid asset reserves or a reduction in excess reserves of the banking system may be referred to as indicating the direction of change of monetary policy. The rate of change of the money base or the money supply may be other possible indicators of monetary policy.

Often a monetary policy described as tight because the money–output ratio is falling or because interest rates are rising or because liquid asset reserve requirements have been increased, may be associated with a rapid or increasing rate of growth of the money supply and/or the money base. It is necessary to reconcile conflicting evidence of this kind.

The source of confusion about monetary policy is the failure to draw the distinction between the supply of, and demand for, credit and the supply of, and demand for, money. Higher interest rates and reductions in excess reserves reveal the state of the credit market. It is possible to have tight credit markets with both a very rapid and a very slow rate of growth of the money supply. This occurs when the rate of growth in demand for credit exceeds the rate of growth of supply of credit. The growth in the supply of bank or other credit may be very rapid if accommodated by an increase in the money base. The increase in demand may be even more rapid, however, if the effect of the increase in the money base and money supply has been to increase prices. Higher prices require more funds to finance a given level of real expenditure.

The distinction between real and nominal interest rates is often ...

... not appreciated. High nominal rates may mean low or declining real rates of interest, if account is taken of the increase in prices. An increase in nominal interest rates or a decrease in excess reserves of the banking system or an increase in the difference between the treasury bill rate and the NCD rate will all indicate tight credit markets in South Africa. However, observation of credit market conditions does not permit the isolation of monetary policy cause and effect. Tight credit markets may be the effect of high rates of inflation caused by rapid money supply growth. Tight credit may also be the effect of a decrease in the supply of money. Similarly, the ratio of money supply to gross domestic product may remain relatively constant despite a rapid or a slow rate of growth in the money supply. Money supply may be doubling or trebling annually and the ratio may fall. Similarly, prices may decrease at a slower rate than the money supply, in which case money supply could be described as easy and not contributing to deflation. Again, it should be noted that money supply and prices and therefore the value of gross domestic product are not independent and therefore the ratio cannot reveal cause and effect.

A failure to appreciate the important distinction between preferred and excess liquid or other asset reserves may also mislead observers and more particularly the monetary authorities. As was discussed above, banks have a demand for excess reserves. Part of the demand may be in anticipation of a call for excess reserves. The supply of reserves and increases in the reserve requirements may increase equally rapidly. If so, increases in required reserves could hardly be taken as evidence of restrictive monetary policy: restrictive monetary policy would need to keep bank reserves from increasing. In other circumstances, if banks do hold their preferred margin of excess reserves, a call for extra required reserves may be highly restrictive. In response to the call, the banks may reduce their lending to the private sector in order to rebuild a preferred margin of excess reserves. It is also possible that an increased or reduced supply of credit and increased or lower levels of spending may occur independently of changes in the supply of money. A change in the demand for money and so in the velocity of circulation of money could have this effect.[19]

[19] For a study of velocity in South Africa, see J. H. Meijer, on the 'Velocity of

CONCLUSION

The interdependence of the supply of money and demands for bank credit in South Africa were explained at length above. The dependence of the supply of money on the demand for credit and the balance of payments is clearly consistent with sharp fluctuations in the supply of money. Such fluctuations have undoubtedly increased economic instability.

An alternative monetary policy for South Africa could be the establishment of money supply targets or a money supply rule. A money base target or rule might have much to recommend it. The money base is the monetary quantity controlled directly by the monetary authority. The money supply is erected on this foundation. Therefore the money base itself provides the most direct form of intervention by the authorities.

Satisfying a money supply target has not, to the time of writing, been the objective of monetary policy in South Africa. If the monetary authorities did seek to control the supply of money, then the issue of what particular money to control would become a live one. As indicated above, such an issue could only be resolved on empirical and not theoretical grounds. As was also indicated, a balance of payments independent monetary policy has as its corollary flexible exchange rates. We consider these issues again in the next chapter.

CHAPTER 6

THE BALANCE OF PAYMENTS AND THE EXCHANGE RATE QUESTION

This chapter will develop a general analysis of the balance of payments and then apply the analysis to South African policy issues. A few simple equations are developed to help organize thoughts on the relationship between aggregate income, expenditure and the balance of payments.

A GENERAL ANALYSIS

The first equation indicates the quality of aggregate supply of goods and services and aggregate demand for them.

$$Y + M = C + I + X \qquad \text{(Equation 1)}$$

Aggregate supply (Y) consists of goods and services produced by the economy, the gross domestic product, augmented by imported goods and services (M). Aggregate demand is disaggregated into consumption expenditure by households and government (C), investment expenditure by firms, government and households (I) and export demand (X). The sum of C + I may be described as the absorption of resources for domestic uses or as domestic expenditure, i.e.:

$$C + I = E \qquad \text{(Equation 2)}$$

The difference between exports and imports (X − M) constitutes the balance of goods and services contributed to the rest of the world from the domestic economy or withdrawn from the world economy (B), i.e.:

$$X - M = B \qquad \text{(Equation 3)}$$

Combining Equations 1, 2 and 3 gives

$$Y - E = B \qquad \text{(Equation 4)}$$

Equation 4 states that the difference between domestic output and absorption determines the net flow of goods and services to or from the economy and the rest of the world. When the national economy generally spends less than it produces (that is, when the economy makes real savings), it will be contributing goods and services to the rest of the world and B will be