THE MONEY SUPPLY AND THE INFLATIONARY PROCESS

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A NECESSARY condition for inflation is an accommodating increase in the money supply. Whatever is taken to be the cause of inflation, the upward movement of the general price level is at least associated with an increase in the money supply, and/or its velocity of circulation. Furthermore in prolonged conditions of mild inflation,[1] there is some relevant limit to velocity.[2] Otherwise it could not remain a mild inflation.

The purpose of this paper is to illustrate the process of monetary expansion which accommodated the South African inflation of 1965-1967. In so doing it will suggest the logical implications of monetary control necessary to prevent inflation.

Suggesting some of the conditions necessary for monetary control may give the incorrect impression that monetary control is thought to be easily achieved. The monetary model is of course simplified, but the appeal to theoretical principles is the fruit of a concern with the practical problems. This paper will, it is hoped, assist clear thinking about them. It is not, however, what could be called monetary or fiscal politics.[3]

A basic assumption, is that within the monetary structure of South Africa, the Commercial Banking system has played a crucial monetary rôle in the current inflationary process. Therefore, in the analysis and the statistical investigation, the money supply is taken to be deposits supplied by the commercial banks and cash, i.e. the money base supplied by the monetary authorities.[4] This may be thought of as too narrow or too broad a view; however, any definition of the money supply is essentially arbitrary. The view taken must include a very important part of any monetary quantity. Furthermore, (though change is of course continuous over time) over the short specified period any change in the monetary structure has not been crucial.

This is another way of saying that while the velocity of circulation of the money supply (as defined) may have increased, the monetary expansion cannot

1. General price increases of 2-3 per cent. per annum.
2. Even where price increases are much more rapid economic units will prefer not to manage without money altogether. The costs of holding money are increased by the depreciation of its value over time. Therefore one of the variables affecting the demand for money will be the rate of anticipated inflation. Increases in the expected rate of inflation will reduce the demand for money to hold. See M. Friedman, "Restatement of the Quantity Theory," M. Friedman (Ed.). *Studies in the Quantity Theory* (*Chicago*). M. Bailey, " Welfare Costs of Inflationary Finance," *Journal of Political Economy*, 1956.
3. On the nature of fiscal politics see R.A. Musgrave, *The Theory of Public Finance*. (McGraw-Hill) p. 4.
4. The monetary authorities of South Africa

be explained by increases in velocity alone.[5] Moreover, the money supply is measured in nominal terms only, not by its real value (nominal money deflated by the general price level). If the competing financial institutions themselves bank with the commercial banking system then the banks, which are parties to the clearing arrangements, will not lose nominal deposits (i.e. as a system) to the non-clearing 'banks.' When some economic unit prefers the combination of benefits which a deposit with a non-clearing 'bank' provides, to a deposit with a clearing bank,[6] the immediate effect of the portfolio switch on the commercial banking system is merely a decrease in the one deposit account, and a corresponding increase in another (that of the financial institution). However, the other financial intermediary,[7] will now have greater capacity to lend (since bank deposits are obviously cash) while the commercial banking system will not have any reduced capacity to lend (no reduction in total cash or deposits). If in this way additional income-generating expenditure is financed, there will be an increase in the velocity of circulation, with a constant money supply (if we define the money supply as simply bank deposits).[8,9] It is also assumed that marginal borrowers from competing financial institutions have not substituted loans from the non-clearing 'banks' for loans from the clearing banks.

It was previously suggested that the commercial banking system will not be competing for nominal deposits with other financial intermediaries. It will, however, be competing for its real share of deposits and loans, i.e. its proportion of total lending and borrowing. The real share of the commercial banks in the South African deposit and loan market has declined noticeably since 1945.[10] Other classes of financial institution, especially the Building Society movement, have exploited profitable opportunities for borrowing and lending.[11] If other financial intermediaries can intervene more effectively between the ultimate savers and investors of the economy, i.e. borrow at higher real rates and/or lend at lower real rates, then as a sector, they will expand relative to other sectors.[12] This is as true of

5. The concepts of 'velocity' and 'money supply' are complementary ones. By a larger or narrower definition of money you rely less or more on the velocity concept. In addition M or V can move or be engineered to move in opposite directions. If so a monetary authority can concentrate on a monetary quantity over which it feels it has control even if the quantity (e.g. Commercial Bank deposits) at least in its liquidity characteristics, may not be nicely distinguishable from a wider group of financial assets.

6. Different financial assets are distinguishable by their different characteristics i.e. their money value certainty, real value certainty, the flow of payments on them and the costs of transferring or withdrawing the asset.

7. Financial Institutions (including Commercial Banks) act as intermediaries between the savers in the economy (the surplus units) and the investors (the deficit units).

8. Whether this means an increase in real incomes or merely money incomes and prices (i.e. Inflation) depends of course on the level of capacity existing in the economy when the additional spending is undertaken.

9. That the Financial Institutions use the medium of exchange provided by the commercial banks is of course crucial to our conclusion. That they do so is part of an economising decision. Having a deposit account is for them (as for many other economic units) the least-cost way of effecting transactions — including as costs those costs (e.g. 'inconvenience') which can only be given an imputed money value. In turn the commercial banks transact most economically with each other through their clearing arrangements and their own deposit accounts with the Central Bank. All the familiar banking habits have developed in response to the search for more efficient ways of making payments and selling loans. Change is a continuous process and the more banking competition the faster the pace of development. A Post Office Giro system may come to reduce the demand for bank deposits. Drawing Rights at the I.M.F. may reduce the Central Banks' demand for gold and so on. Of course the commercial banks provide more than just a convenient means of payment. They are also a very important category of lender. They compete for assets (i.e. to sell their lending facilities) as well as for deposits. Competition in borrowing and lending has led to greater specialization amongst financial institutions. Greater financial specialization has raised the real rewards of saving and lowered the real cost of borrowing over time.

10. For rate refer to note (13).

11. See the *Report of the Technical Committee on Banking and Building Society Legislation.* RP 50/1964 Ch. 2 p. 6.

12. By real costs we again do not only mean explicit money costs and changes, e.g. when a financial institution comes to provide funds for a purpose for which lending was considered too risky (too costly) before, then the real cost of borrowing has been reduced from infinity.

economic institutions within a sector (e.g. the growth of one commercial bank compared with another commercial bank) as when comparing the growth performance of different sectors.[13]

Of course an individual commercial bank loses deposits when the wealth owner prefers one commercial bank to another. The system as a whole loses deposits, when deposits are withdrawn for the purpose of holding additional South African Reserve Bank notes. Of much more importance (since the demand for notes is fairly constant) is when the Commercial Banking system loses equally, deposits and cash, to economic units which bank with the South African Reserve Bank (especially of course the Treasury). Even where deposit losses represent a mere redistribution of existing deposits amongst the commercial banks, no individual bank can view deposit losses with complacency, in the expectation of an equivalent return flow. The switch of deposits from one bank to another is a cash gain to the receiving bank and a cash loss to the paying bank. The banking system cannot distinguish between 'old' cash and newly created cash. Thus banks act naturally, on the assumption that deposits create loans, even if for all banks together, it is ultimately loans that create deposits.

The clearing banks make competitive life easier for each other by agreeing not to compete on the basis of explicit interest paid on deposits. In this way they are, as it were, facing their non-commercial bank competition with a united front. The commercial banks agree not to pay interest on current accounts[14] (demand deposits) which suggests their assumptions about the interest elasticity of the demand for current accounts.[15] However, in practice, the processes of deposit receiving and making loans are contemporaneous. On the basis of their experience, the banks can anticipate a certain flow of deposits and issue loans accordingly. If expectations about future deposit flows prove incorrect then of course the bank can adapt its lending and/or borrowing policies accordingly.

All financial intermediaries (including commercial banks) like all economic units, hold cash for what are essentially Keynes' transactions and precautionary motives. Units hold cash (i.e. notes and deposits) because there is uncertainty about their future cash flow, or because the costs of switching out of cash into some other asset and then back again are too high, relative to the interest earned in doing so. Despite uncertainty, units will have some idea of the probability distribution of their cash position. A developed financial market provides opportunities for economising in the use of non-interest bearing cash. One example of this is the commercial banks themselves and the development of a specialist short term money market. Of course it is in the nature of financial intermediation, that financial institutions must be able to assure the liquidity of their liabilities. They are therefore particularly anxious to avoid a shortage of cash. For this reason

13. Increases in the price level reduce the real value of financial assets (e.g. deposits) that are constant in nominal money terms.

14. By not charging demand deposit account holders the full cost to the banks of managing that account commercial banks are paying an implicit interest on them.

15. At present nil interest on demand deposits in South Africa is a legal maximum enforced in terms of the provisions of the Bank Act No. 23,1965.

financial institutions hedge against uncertainty and preserve the flexibility of their asset portfolios by holding liquid assets (i.e. assets easily encashible without capital loss) and by scheduling carefully the maturity dates of their portfolio. The financial institutions will hedge against uncertainty about both the supply of deposits and the demand for loans.

The authorities in South Africa would seem to regard the commercial banks' liquid assets to deposit ratios as an important control variable. In terms of the South African Bank Act banking institutions are required to hold minimum and variable minimum liquid assets ratios.[16,17]

Banks and financial institutions would hold cash and liquid assets even if there were no legally enforced minimum holdings. The legal minimum may. however, force the banks to hold more cash and liquid assets than they would prefer to hold, on the basis of their judgement about alternative risks and yields. In this way the controls could affect the profitability of their operations. It is incorrect to regard liquid assets holdings as, in some way, limiting the lending capacity of the Banks. This is obviously so of all liquid assets except cash reserves; and even holding cash reserves, deposits with the Reserve Bank or notes, may be considered as lending to the Reserve Bank.[18] Liquid assets holdings represent a particular form of bank lending. By holding a treasury bill the bank is lending to the Government. If the Government spends the proceeds of the treasury bill sale, this spending will create additional income and additional deposits, as will any form of lending to and spending by, the private sector.

For this reason, the liquid assets ratio cannot set any limit to the volume of deposits unless it be a completely unrealistic upper limit. To make this upper limit effective the authorities would have to be able to control the total supply of liquid assets and also the share of that supply going to the Banking Sector. Only when 'outside'[19] holdings of liquid assets are reduced to nil would the banking sector be unable to increase its share. Outside holdings of the defined liquid assets are of course considerable, so that should the authorities, for control purposes, reduce the supply of liquid assets the issue of which they control, e.g. Treasury Bills and Short Term Government Stock, there would be no conceivable way of their being able to prevent the banks from obtaining additional other liquid assets, or the banks obtaining a larger share of the reduced Government issue, if they were prepared to pay more for it.[20,21]

16. See *Bank Act No.* 23, 1965, Chap. 4, Sec. 17. See also the *Report of the Technical Committee on Banking and Building Society Legislation* RP 50/1964 Chap. 3, para. 52-59.

17. Liquid assets are defined as coin bullion, bank notes and balances with the Reserve Bank. Plus, money at call: Treasury Bills, liquid trade bills, promissory notes and acceptances, bills of and advances to the Land Bank; short term Government Stock and Land Bank debentures; demand deposits with monetary banking institutions (as defined) and certain other specific assets such as export credit rates of the Industrial Development Corporation, *Bank Act* 23,1965. Chap. 1 (i) para. (viii). (Cash is of course the most liquid asset being money value certain and the least costly to transfer.)

18. The note issue and the Reserve Bank deposits may be considered as the non-interest bearing portion of the government debt, i.e. if the Central Bank may be considered as part of the government sector.

19. This includes deposits of units other than the Commercial Banks with the Discount Houses and the National Finance Corporation (N.F.C.).

20. That is assuming the commercial banks had no excess liquid assets to begin with.

21. The validity of the so called 'new orthodoxy' (i.e. control of deposits by liquid assets) for Britain is analysed in the following articles: W. T. Newlyn "The Supply of Money and its Control," *Economic Journal*, June 1964. R. L. Crouch "The Inadequacy of 'New Orthodox' Methods of Monetary Control," *Economic Journal*, December 1966. A. B. Cramp "Control of the Money Supply," *Economic Journal*, June 1966.

If the commercial banking sector holds more of the officially prescribed liquid assets than they are required to do, this suggests that it must represent part of the most preferred distribution of their asset portfolio, given the options available to them. (See Table 1.)

The Radcliffe Report emphasized concern with the level of liquidity in the economy rather than with the much narrower supply of money (i.e. bank deposits).[22] It is the liquidity (i.e. 'moneyness') of a wider range of financial assets than bank deposits that gives asset holders the potential to finance additional spending, or other lending, by cashing their assets without incurring any inhibiting capital losses or transaction costs when doing so. Difficulties for future monetary management[23] are intensified if the commercial banks, as key lenders in the economy, are holding portfolios that are liquid enough to enable them to sell liquid assets in significant quantities in order to expand their lending to the private sector. This portfolio switch would depend on the additional demand for bank finance, if it were profitable on the basis of alternative costs and yields and if the banks were so permitted by the monetary authorities.

If the liquid asset is exchanged for a deposit with some other bank the bank losing deposits and cash will have to reduce its other lending in order to replenish cash reserves. (Perhaps by reducing private lending or by similarly selling what have become surplus liquid assets.) However, somewhere in the credit system, some marginal lender will be induced to contract its other lending in order to hold what will have become a marginally more attractive liquid asset (spending would be reduced directly if some unit were induced to save more). The net effects on the level of deposits and money income will be zero as one bank expands lending with the surplus cash obtained while some other bank, losing equally cash and deposits, will have to reduce lending. That is, unless the banking system as a whole were holding excess cash reserves or non-bank holders of cash could be induced to substitute bank deposits or liquid assets for notes and coin or substitute domestic deposits for deposits with foreign banks.

A widespread movement out of liquid assets must tend to lower the price of these assets making them more costly to sell and more attractive to hold relative to the yields on other assets. This would tend to limit the process of substitution of lending to the private sector for lending to the government sector. However, if the government, for the purpose of raising additional finance, for either spending or for reorganizing the maturity pattern of the existing debt, prefers not to pay any higher rate of interest, then the Central Bank itself will have to absorb surplus

22. "Our view is different. Though we do not regard the supply of money as an unimportant quantity we view it as only part of the wider structure of liquidity in the economy. It is the whole liquidity position that is relevant to spending decisions, and our interest in the supply of money is due to its significance in the whole liquidity picture. A decision to spend depends not simply on whether the would be spender has cash or 'money in the bank' although that maximum liquidity is the most favourable springboard. There is the alternative of raising funds either by selling an asset, or by borrowing, (in theory, 'borrowing' is selling an asset, the asset being money forward. The assets sold may also take the form of equity claims to profits) and the prospect of a cash flow from future sales of a product both encourages commitment beyond immediately available cash and makes borrowing easier. The ease with which money can be raised depends on the one hand on the composition of the spender's assets and on his borrowing power and on the other hand upon the methods, moods and resources of financial institutions and other firms which are prepared (on terms) to finance other peoples spending . . ." *Committee on the Working of the Monetary System*, Report Cmnd. 827 para. 389.

23. Including the management of the government debt.

liquid assets in exchange for non-interest bearing government debt, i.e. cash itself. The expansion of the cash base will lead to a multiple expansion of deposits in the normal way.

As shown below the fundamental source of the difficulties for monetary control implied by conditions of excess liquidity derives directly from the method of financing current government expenditure and the responsibility of the monetary authorities for the general management of the government debt.

The government sector as the most important deficit sector in the economy competes with private deficit units for the supply of loanable funds. Additional government expenditure is financed either out of taxation or through the issue of government debt. Expenditure financed by the issue of debt has the normal 'income' effect and an additional 'asset' effect.[24] In exchange for the loanable funds they provide, the financial intermediaries or the surplus units themselves receive financial assets. The degree of liquidity of these assets implies more or less potential for portfolio flexibility at any later stage.

With the full employment of resources additional government expenditure will be inflationary unless there is a compensating reduction in private spending. If inflation is to be avoided lenders must be induced to substitute loans to the government for loans to private borrowers. For this to occur voluntarily the government would have to offer a more attractive rate of return. If, for whatever reasons, it is reluctant to do this there are available broadly three alternative policies and their combinations.

Firstly, the Central Bank may lend directly to the government spending departments (via the Treasury) through an expansion of the note issue or central bank advances. Secondly, the treasury may finance the additional expenditure by the issue of highly liquid assets, which because of their nature, will be mainly to the commercial banking system. In order to guarantee the bank demand for these assets the authorities would seek to prevent the banks developing any shortage of cash as their deposits and assets expand through the effects of the additional government spending. The central bank will guarantee discountability of the liquid assets at the prevailing market rates of interest. (The central bank will be attempting to avoid a firming of the interest rate structure.) In these circumstances the liquid assets are quite literally as good as cash and the volume of deposits will have become some multiple of the liquid assets held by the banks. The volume of cash becomes a passive element responding to the banks' and the public demand for it. The third policy that may be adopted is to force the banks to reduce their lending to the private sector (a physical not a price control).

Obviously any combination of the first two policy alternatives will be inflationary, involving an increase in money incomes and the money supply. Where the policy is predominantly a reliance on short term finance obtained from the banking system then naturally the commercial banks will be holding excess liquid

24. The terminology is R. A. Musgrave's. See R. A. Musgrave "Money Liquidity and the Valuation of Assets" in *Money Trade and Economic Growth*, essays in honour of John Henry Williams.

assets if a minimum liquid assets ratio is defined. There will be no solution to the dilemma posed for monetary control. The authorities can only 'fund' the liquid assets if they raise interest rates, raise taxes or reduce government expenditure. By so doing the authorities will be reducing bank deposits, excess liquid assets and their reliance on bank finance simultaneously (it is the inflationary expectations that make fixed interest bearing stock generally less attractive). However, as was noted previously, to use the liquid assets ratio as a contol variable would still require that the authorities control both the supply of liquid assets and the share of a (perhaps reduced) supply held by the commercial banks (see page 317). If the authorities can avoid excessive reliance on short term bank finance they can assume control of bank deposits through their control of the cash base of the system and then provide re-discount facilities at penal rather than market rate.[25]

The monetary authorities in South Africa over our period have controlled the volume of private lending by the commercial banks by fixing upper limits to their private advances and investments. Therefore, the commercial banks have been obliged to use additional deposits (cash) for lending to the Government. The marginal demand for bank facilities has been determined by the Government sector's need for funds. In the statistical analysis this is taken to be the current government deficit, less government borrowing from outside the 'monetary sector'[26] plus borrowing from the commercial banks by the Land Bank and the local authorities (see Table 3). The justifications for including borrowing from the 'monetary banking sector' rather than from the commercial banks alone is firstly that the commercial banks provide a large proportion of deposits held by the Discount Houses and N.F.C. (see Table 2). Moreover Cash Reserves of the commercial banks with the Reserve Bank may also be used by the Reserve Bank to finance government spending. Secondly, any additional spending by the government sector will create deposits. It should be noted that some government borrowing may be for control purposes, by making our total figure for government borrowing net of the government balance at the Reserve Bank (see Table 3).

Of course, if the commercial banking system held excess cash, then attempts by the authorities to control the volume of bank deposits through their control of the money base would also run into similar difficulties. The banks could support additional lending by running down their excess cash reserves. Alternatively, the banks might be able to attract extra cash from the public. However, it will be shown that, over the specified period, both the public and the commercial bank demand for cash has been stable and can be presented as almost constant ratios (see Table 4).

Where the authorities do not maintain too low a level of interest rates when government expenditure is increasing the relevant quantity limiting the volume of bank deposits has been the commercial banks' preference for cash. The more cash the banks hold the lower will be the level of spending they can finance. Less

25. For a further development of this argument see pages 322 and 323.
26. Defined as the South African Reserve Bank, commercial banks, merchant banks, the National Finance Corporation, discount houses and the short term business of the Land Bank.

spending means lower money incomes and so fewer deposits. The volume of cash the banks hold therefore sets a limit to the size of the cash deposit multiplier.[27]

The supply of cash or base money (cash base) available to the economy is determined by the monetary authorities. If the Treasury builds up its balance with the Reserve Bank then the cash base of the economy is being reduced. That is, if the Treasury sells an additional Treasury Bill or levies an additional tax for control (as opposed to spending purposes) and uses the proceeds of the sale or tax to build up the Exchequer balance with the Reserve Bank then this is manifestly control through the cash and not the liquid assets ratio.

The effects on the commercial banking system of an additional tax or treasury bill sale are an equal decline in bank cash and bank deposits. The Reserve Bank will also show an increase in government deposits and so a decline in bank deposits by the equivalent amount. If the sale or tax was for control purposes the banks (if they held no excess cash) will have to sell some of their earning assets to obtain additional cash. Since for the banking system it is loans that create deposits these attempts to obtain extra cash must lead to a multiple destruction of deposits (i.e. by a multiple of the cash loss). However if the sale or tax is used for spending purposes the cash base and deposits will re-expand up to their previous levels at the rate at which the government sector spends.

It has been suggested that the supply of money is directly related to the supply of cash (base money).[28] The supply of bank deposits is linked to the banks' holdings of cash.[29] Therefore, control of the money supply is possible through the authorities' control of the money base.

The Determination of the Volume of the Cash Base in South Africa

The cash base of the South African economy we take to be the notes, deposits and other liabilities of the Reserve Bank. We exclude, however, the deposits of the Central Government (the Exchequer), Postmaster-General and "other Accounts."[30] Changes in the money base are caused by changes in the assets of the Reserve Bank (viz. Gold and Foreign Exchange Reserves, Bills acquired from and advances to the Central Government and provincial administrations, the National Finance Corporation (N.F.C.) and Discount Houses, the Commercial Banks and Merchant Banks, the Land Bank and 'other' discounts and advances, Government securities and 'other' assets.)[31] Increases in the Government Balance reduce the supply of base money while decreases in the Government Balance increase the money base (the Government Accounts appear on the liabilities side of the Reserve Bank balance sheet).

27. That is assuming what could be called Reserve Bank neutrality. Neutrality is taken to mean that the Reserve Bank does not use the extra deposits placed with it by the commercial banks (which are of course part of commercial banks' cash reserves) to increase its own portfolio of government or other assets. The Reserve Bank would either reduce its note issue or the Exchequer would use funds obtained by extra Reserve Bank investment in Government securities to increase its own balance with the Reserve Bank.
28. Bank notes and balances with the Reserve Bank.
29. Note the non bank holdings of cash are stable. See Table 4.
30. The provincial accounts cannot be useful for control purposes within the present South African fiscal framework. See T. van Waasdijk, *Public Expenditure in South Africa* (Witwatersrand University Press), especially part 3.
31. See Reserve Bank balance sheet.

To summarise algebraically:

$MB = F + D_1 + D_2 + OM$ where F represents Reserve Bank holdings of Gold and Foreign Exchange. D_1 represents Reserve Bank discounts and advances to the N.F.C., Discount Houses, and Commercial and Merchant Banks. D_2 represents Discounts and Advances to the Central Government and Provincial Administrations, the Land Bank and 'other' discounts. OM represents what we call net open market operations, i.e. Reserve Bank holdings of Government Securities and other 'assets' less the Central Government Balance. An increase in OM could be the effect of an increase in Reserve Bank holdings of Government Securities and other assets, or, the effect of a decrease in the Government balance with the Reserve Bank.[32] Similarly a decrease in OM could be caused by an increase in the Government balance or a decrease in holdings of Government Securities and other assets. OM could have a negative value.

The Reserve Bank holdings of gold and foreign exchange may be considered to have been outside the control of the authorities during the period under review. The authorities cannot control the inflow of private capital or the outflow of exports. The system of Exchange Control and Import Control give effective control of the outflow of capital and the inflow of imports. While the authorities therefore could prevent the reserves falling below a certain level over our period, the inflow of private capital has made the total reserve position unpredictable. However, despite being unpredictable, the effect of changes in the reserve position may be offset by changes in net open market operations. This is the obvious control variable available to the authorities.

Unlike open market operations, discounting (D_1 and D_2) is generally undertaken at the initiative of the borrower. The only condition being that the borrower has an asset eligible for discounting and is of course prepared to pay the borrowing charge, or discount rate, set by the Reserve Bank. The official discount rate is set above the market rate on the asset discounted. If borrowing is at this rate, then it is borrowing at a loss, and the loss margin is intended to discourage permanent reliance on the Reserve Bank as a source of funds. However, for the period, 1965-1967 the Discount Houses and the N.F.C. were persistently large borrowers at the Reserve Bank (see Table 2). This suggests that either the loss margin is not the disincentive it might be expected to be or that a goodly proportion of borrowing has been at market rates.

In the London money market the different forms of borrowing are known as discounting at the 'front door' of the Bank of England or at the 'back door' of the Bank. When the discount houses adjust their cash positions at the front door they are doing so at the official discount rate. This is a 'penal' rate, for the marginal cost of borrowing exceeds the marginal revenue of the discount houses portfolio. Borrowing at the back door is borrowing at market rates. By allowing borrowing at market rates the Bank of England seeks to prevent any undue tightness in the money market and consequent firming of the interest rate structure.

32. The Government balance over our period was in fact subject to much greater month to month variation than the Reserve Bank portfolio.

As W. T. Newlyn has explained, cash obtained at the penal rate cannot remain a permanent part of the cash base. Because such borrowing is unprofitable, the discount houses will attempt to repay the Bank of England and/or reduce the unprofitable margin between borrowing and lending rates. Since the commercial banks will be short of cash[33] the discount houses will attempt to attract 'outside' money. They will also expect higher returns on their share of the Treasury Bill issue and on other assets. To do so they will lower their tender price for Treasury Bills. The better yields available on treasury bills may attract more outside money to the tender. More outside money with the Discount Houses and more outside money at the treasury bill tender would have the effect of transferring deposits and cash from the commercial banks to the authorities. The public in this way will have replaced the banks as a source of exchequer finance. Rates of interest in the economy will of course rise in these circumstances.

The process of contraction will not end there. The commercial banks have lost further cash and will need to call once more from the discount houses. The discount houses would again be forced into the Bank of England and further deposits/cash would be attracted away from the commercial banks. However, at each round, the total level of deposits is lower. Equilibrium will be reached when the stock of bank cash, unaugmented by penal borrowing, is sufficient to support the existing stock of deposits erected upon it.[34]

Thus the 'lender of last resort' facility provided by a Central Bank is not necessarily inconsistent with control of the cash base. As has been suggested control of the cash base in these circumstances would imply higher interest rates. This may therefore conflict with the authorities' interest rate policy. This is the fundamental dilemma discussed previously.[35] The authorities can choose either to control the interest rate structure in the economy or the supply of money. They cannot do both. If they choose an interest rate policy they will be obliged to adapt the volume of cash to the level of deposits (i.e. supply of money) consistent with the chosen interest rate policy. Base money (partly via non-penal borrowing from the Central Bank) is adapted to deposits; not deposits to cash.[36]

The implications for monetary policy in South Africa are direct. The South African money market has been purposely modelled after the London Market. The discount houses and the N.F.C. (which is a state owned discount house) intervene between the commercial banks and the monetary authorities in the short term money market. The commercial banks do not hold excess cash and do not normally borrow directly at the Reserve Bank but meet temporary shortages of cash by recalling loans to the discount houses. If the shortage of cash is general to

33. This will have caused the pressure on the market.
34. W. T. Newlyn "The Supply of Money and its Control", *Economic Journal*, June 1964; also W. T. Newlyn *The Theory of Money* (Oxford) Chap. 2.
35. See pages 318 and 319.
36. A. B. Cramp has emphasized the difficulties the monetary authorities in England might have in letting the interest rate find its own level. See A. B. Cramp (1966) above.

the banking system then the discount houses are obliged to borrow from the Reserve Bank.

It was noticed that the discount houses and the N.F.C. have been permanently indebted to the Reserve Bank (see Table 2). The conclusion is therefore that a significant proportion of this borrowing has been at market rates.

This is consistent with the South African monetary authorities' practice of an interest rate policy. Irrespective of the level of interest rates, if the interest rate structure is controlled then the monetary base will be a passive element in the monetary situation, adapting itself to the demands made by the public and the banks on it.

The determination of D_1 and OM can be summarized as follows:

$$D_1 = f(F, OM, D_2, M)$$

$$OM = h(F, D_1, D_2, M, r)$$

r represents the chosen interest rate structure and M the money supply.[37]

Discounts by the discount houses and the commercial banks are designed to supplement the banking systems' cash reserves. Therefore D_1 will vary inversely with the other variables that determine the cash base F, OM and D_2 and vary directly with M, the money supply (mainly bank deposits).

Similarly what has been defined as open market operations (OM) has been consistent with the chosen interest rate structure and not used primarily as a method of controlling the money base and so the money supply. OM is thought to vary inversely with F, D_1 and D_2 and directly with M.[38]

A behavioural explanation of D_2 has not been attempted. This is linked with the cash flow position of the government departments. These cannot be easily visualised as having potential for control purposes. Also included in D_2 is borrowing by the Land Bank. The Land Bank is essentially an institution designed to provide economic aid to the agricultural sector and not normally susceptible to price and profit incentives.

The application of a restrictive monetary policy might require changes in OM to offset increases in F. Furthermore applying the penal rate to D_1 may prevent the banking system obtaining permanent relief from monetary restriction through the 'lender of the last resort' facility provided by the Reserve Bank. However it is possible that during a period of tight money D_2 may increase if, for example, the Land Bank had to depend more directly on the Reserve Bank as normal lines of credit prove insufficient. That is D_2 might react perversely to the designed direction of monetary control.

37. The other variables D_1, D_2, F and OM are defined on pp. 321 and 322.
38. See the Mathematical Model, p. 319.

Summary and Conclusions

The demand for the savings of surplus units will come from the private sector or the Government sector (taking the two broadest categories of deficit units). Taking the supply of savings as given (the rate of interest will not have much influence on the level of savings but rather on the distribution of savings between different uses and financial institutions), the more the Government sector borrows, the less savings there will be available for use by the private sector *unless* spending is financed by money creation. Inflation occurs when current money demands are greater than current output measured at constant (pre-inflationary) prices.

The Government can finance its expenditure in a non-inflationary way either by taxing or through genuine borrowing, i.e. borrowing that does not depend on an increase in the money supply[39] (money creation). With no excess capacity in the economy and the given level of savings, additional non-inflationary government spending must imply reduced private spending. The Treasury can obtain a larger share of the real volume of savings (after taxes) only by offering a larger reward for it. Alternatively or in addition the share of funds going to the private sector may be physically controlled (e.g. by fixing limits to the banks' private lending) and the share going to the public sector artificially encouraged. 'Prescribed' investments, minimum liquid asset ratios and required increases in them, fall within this category.

The additional Government borrowing over our period in South Africa has not all been genuine borrowing. Some additional government borrowing (spending) has been financed by money creation by the banking system and by the monetary authorities. On this the series in Table 4 and Table 3 for the money supply, the money base, and for Government borrowing, is revealing. The marginal demands for bank funds have come from the public sector and the money base has been allowed to expand to support the additional volume of bank deposits so created. Another way of stating the same is that private spending, even though controlled, has been too high, given public spending.

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39. The definition is W. T. Newlyn's. See W. T. Newlyn, *Theory of Money* (Oxford) p. 31.

TABLE 1

COMMERCIAL BANKS

1965	% Excess Liquid Assets	Total Excess Liquid Assets
		R millions
March	8.4	159.9
April	5.1	99.4
May	6.1	121.1
June	4.0	81.2
July	1.9	38.2
Aug.	4.2	86.0
Sept.	1.9	38.9
Oct.	3.5	39.9
Nov.	5.9	43.0
Dec.	5.8	59.6
1966		
Jan.	3.2	64.6
Feb.	4.3	87.4
Mar.	4.3	88.2
April	6.4	129.4
May	8.4	174.7
June	10.0	220.0
July	7.7	163.4
Aug.	11.1	243.1
Sept.	8.9	195.4
Oct.	9.8	217.1
Nov.	10.1	226.1
Dec.	10.1	232.8
1967		
Jan.	6.3	139.3
Feb.	5.3	121.2
Mar.	5.2	118.9
April	3.3	73.2
May	5.5	125.2
June	6.9	166.5
July	6.7	154.3
Aug.	10.4	246.6
Sept.	10.3	239.4

Source: Quarterly Bulletin of Statistics; South African Reserve Bank

TABLE 2
(R millions)

DISCOUNT HOUSES AND THE N.F.C.

Selected Liabilities

1965	Total Liabilities	Deposits of Monetary Banking Institutions.	Discounts and Advances from The Reserve Bank
March	351.7	116.7	72.7
April	297.6	106.4	52.4
May	315.7	164.6	76.4
June	315.0	137.2	76.5
July	310.3	127.4	65.9
Aug.	297.3	162.9	44.5
Sept.	313.7	178.9	26.4
Oct.	337.0	185.8	25.1
Nov.	316.0	178.0	34.1
Dec.	335.9	187.6	26.3
1966			
Jan.	330.4	162.2	41.2
Feb.	313.9	163.8	20.9
Mar.	333.3	172.0	38.9
April	353.3	211.2	43.8
May	363.5	244.1	38.1
June	385.1	263.1	27.2
July	398.5	269.6	Nil
Aug.	415.3	280.5	87.8
Sept.	514.6	226.2	105.2
Oct.	374.6	214.1	87.1
Nov.	349.0	185.3	95.5
Dec.	355.6	186.0	87.0
1967			
Jan.	355.9	109.0	71.4
Feb.	358.1	149.5	89.8
March	373.9	162.3	57.1
April	319.2	164.9	65.3
May	305.8	161.3	87.2
June	329.2	204.8	53.9
July	322.9	176.1	35.7
Aug.	356.4	233.9	73.6
Sept.	409.9	263.1	56.5
Oct.	419.5	247.2	41.0

Source: Quarterly Bulletin of Statistics; South African Reserve Bank.

TABLE 3
(R millions)

BORROWING FROM THE MONETARY BANKING SECTOR

1965	GST	GLT	LAB	LB	Exch.	GB
Jan.	290.6	129.5	na	na	117.2	na
Feb.	309.6	129.2	na	na	163.5	na
March	349.4	106.0	4.4	19.3	141.5	337.6
April	332.3	98.4	6.4	19.1	103.8	352.4
May	334.5	98.4	4.1	26.6	79.6	384.0
June	351.1	96.4	5.9	32.1	78.6	406.9
July	365.7	78.5	10.4	44.2	75.6	423.2
August	367.0	81.6	9.6	31.6	75.0	414.8
Sept.	363.5	83.2	6.1	34.8	18.5	469.1
Oct.	363.4	83.3	7.0	31.3	14.0	471.0
Nov.	369.5	87.1	7.3	38.9	15.5	387.3
Dec.	372.1	116.5	8.4	34.9	77.2	454.7
1966						
Jan.	380.7	112.9	8.9	39.6	89.4	452.7
Feb.	419.1	118.9	8.8	38.9	104.7	481.0
March	425.6	120.1	5.4	42.6	107.7	486.0
April	440.1	127.3	7.2	35.3	112.5	497.4
May	451.9	132.1	4.6	38.6	143.4	483.8
June	502.3	141.0	3.7	44.0	154.7	536.3
July	501.8	142.1	4.4	42.5	171.5	519.3
August	502.5	149.7	5.5	45.0	221.7	481.0
Sept.	510.6	141.2	4.1	43.6	238.4	461.1
Oct.	542.8	124.3	5.3	42.2	221.9	492.7
Nov.	540.6	134.9	5.9	42.0	233.5	489.9
Dec.	550.3	144.7	9.8	44.9	178.8	570.9
1967						
Jan.	554.3	140.7	8.1	37.5	207.5	533.1
Feb.	547.2	137.6	7.5	32.4	194.9	529.1
March	542.2	136.0	6.2	43.4	101.5	626.3
April	531.1	131.1	6.2	35.9	68.6	635.7
May	543.1	130.1	5.8	42.6	83.9	637.7
June	556.1	130.2	4.6	44.9	30.0	655.8
July	553.2	140.3	5.7	57.3	128.5	628.0
August	570.0	153.8	5.	60.7	151.7	637.9
Sept.	582.9	144.0	3.6	48.3	187.5	591.3

Where GST — Government Short term borrowing from the Monetary Banking Sector.
GLT — Government Long term borrowing from the Monetary Banking Sector.
LAB — Commercial Bank lending to the Local Authorities.
LB — Commercial Bank lending to Land Bank.
Exch. — Central Government PMG and (other) Balances with Reserve Bank.
GB = GST + GLT + LAB + LB − Exch.

Source: Quarterly Bulletin of Statistics; South African Reserve Bank.

TABLE 4

MONTHLY FIGURES AND RATIOS
(R millions)

1965	D	MB	P	Rb	$M = D + P$	$p = \frac{P}{D+P}$	$g = \frac{Rb}{D}$
March	1861.6	567.5	398.7	168.8	2260.3	.1763	.0906
April	1894.9	536.7	403.6	133.1	2298.5	.1755	.0702
May	1914.9	517.9	381.8	136.1	2296.7	.1662	.0710
June	1961.1	539.8	394.5	145.3	2355.6	.1674	.0740
July	1901.3	541.0	400.1	140.9	2301.4	.1738	.0741
August	1957.9	550.7	409.5	141.2	2367.4	.1729	.0721
Sept.	1938.7	575.8	428.2	147.6	2366.9	.1809	.0761
Oct.	1926.1	564.2	423.4	140.8	2349.4	.1802	.0731
Nov.	1973.2	571.8	415.4	156.4	2388.6	.1739	.0792
Dec.	2045.3	584.7	418.2	166.5	2463.5	.1786	.0814
1966							
Jan.	1973.0	589.2	429.2	160.0	2402.2	.1786	.0811
Feb.	1992.0	600.7	457.4	143.3	2449.4	.1867	.0719
March	1965.9	641.0	476.4	164.6	2442.3	.1950	.0837
April	1983.4	601.3	442.9	146.6	2426.3	.1825	.0739
May	2048.8	616.4	458.0	158.4	2506.8	.1827	.0773
June	2155.2	625.8	468.0	157.8	2623.2	.1784	.0732
July	2089.7	646.4	489.8	156.6	2579.5	.1898	.0749
August	2154.9	636.6	473.1	163.5	2627.6	.1801	.0789
Sept.	2167.2	651.6	504.6	147.0	2671.8	.1888	.0678
Oct.	2177.8	655.8	482.6	173.2	2660.4	.1814	.0795
Nov.	2201.2	642.3	469.5	172.8	2670.7	.1757	.0785
Dec.	2265.3	665.6	472.8	192.1	2638.1	.1726	.0848
1967							
Jan.	2175.7	644.2	469.6	174.6	2645.3	.1775	.0802
Feb.	2224.0	633.5	476.6	156.9	2700.6	.1765	.0705
March	2242.6	692.1	529.9	162.2	2772.5	.1911	.0723
April	2178.1	638.6	485.7	152.9	2663.8	.1823	.0701
May	2220.7	637.7	476.5	161.2	2697.2	.1766	.0725
June	2345.6	650.6	503.3	147.3	2848.9	.1767	.0627
July	2268.9	667.3	490.8	176.5	2759.7	.1778	.0777
August	2314.9	660.3	494.2	166.1	2809.1	.1759	.0717
Sept.	2271.5	678.3	516.2	162.1	2787.7	.1851	.0713

$\bar{p} = .1789$ $\bar{g} = .0753$

Where D is Total Commercial Bank Deposits.
MB is the Money Base (as defined in text pp. 319-320).
P is Base Money currency outside the Commercial Banks. i.e. MB − Rb.
Rb = Bank cash.
$M = D + P$; is the total money supply.
$p = \frac{P}{D+P}$ public cash ratio.
$g = \frac{Rb}{D}$ bank cash ratio.

Source: Quarterly Bulletin of Statistics; South African Reserve Bank.