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CHAPTER ONE

INTRODUCTION

In the U.K. local authorities are responsible for the provision of a wide range of services, are large employers of labour and account for about a fifth of gross domestic fixed capital formation. As can be seen from Table (1.1) they have also been responsible for a considerable proportion of public sector investment and since 1968 have invested more than the public corporations.[1] Most of this investment has been devoted to the provision of housing and educational services; and it is the volume of capital expenditure that is the primary determinant of the extent of local authority borrowing. Table (1.1) shows that since 1960 approximately seventy per cent of capital expenditure has been financed by borrowing. The remainder is met either by capital grants from the central government or from local authority current revenues.

Borrowing places the burden on future ratepayers because of need to service the existing volume of debt. In Table (1.2) it can be seen that as a proportion of total current expenditure the payment of interest on debt has risen from about 17 per cent of total current expenditure in the early 1960 s to over 21 per cent in 1970. It declined for the next two years only to start rising again recently. An important influence on this proportion is the level of interest rates. How quickly a rise in interest rates will increase debt interest as a proportion of current expenditure will depend upon the size of the new borrowing requirement and on the average term to maturity of the existing debt. The longer the period that has to elapse before

Table (1.1) The capital expenditure and borrowing of local authorities; and capital expenditure of other sectors 1961-74

Gross domestic Fixed Capital Formation	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
1) Personal sector :	852	817	867	928	989	997	1117	1237	1147	1161	1722	2350	2436	2212
2) Companies :	2026	2053	2019	2482	2680	2726	2711	3071	3577	3976	4039	4424	5888	7132
3) Public Corporations :	905	933	1024	1187	1293	1453	1661	1619	1482	1673	1857	1776	2029	2678
4) Central Government :	219	216	227	284	301	335	395	458	486	576	601	643	773	937
5) Local Authorities :	702	814	883	1112	1185	1345	1568	1712	1757	1851	1960	2236	2755	3321
Total :	4704	4833	5020	5993	6448	6856	7452	8097	8449	9237	10,179	11,429	13871	16280
Row (5) as % of total :	14.92	16.84	17.59	22.15	18.38	19.62	21.04	21.14	2030	20.04	19.26	19.56	19.86	20.40
Net local authority borrowing :	475	565	607	738	1015	944	1079	1171	1151	1249	1399	1396	2369	3342

Source: National Income and Expenditure; Financial Statistics, H.M.S.O.

Table (1.2) Local Authority current expenditure and debt interest 1961-74

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Total current expenditure	1931	2127	2322	2526	2875	3245	3641	4009	4423	5032	5582	6356	7380	9145
Debt interest	335	364	342	445	522	600	671	791	930	1068	1104	1164	1403	1860
%	17.35	17.11	16.88	17.62	18.16	18.49	18.43	19.73	21.03	21.22	19.78	18.31	18.51	20.34

Source: Financial Statistics, H.M.S.O.

much of the existing debt must be renewed the longer it will take for a rise in interest rates to be reflected in the total debt interest that has to be met out of current revenues.

To put it in its proper perspective borrowing is just one of the means by which local authorities seek to make provision for recurring capital and current expenditure. Since the war there have been major developments in the techniques of revenue raising and in the administration of local finances. Local government has been reorganisied very recently and major changes in the methods of local finance are expected as a result of the deliberations of the Layfield Committee.[2] This study however, is not concerned with the wider issues of local government finance or with the problems of financial management.[3] It is instead an attempt to explore in detail the relationship between local authority borrowing and the exercise of monetary policy.

Local authority borrowing has been linked with monetary policy for a number of reasons. In the first place, on most of the occasions since the war when local authority borrowing has been the subject of public debate the discussion has turned invariably on the consequences that the pattern of borrowing has had for monetary policy. The existing literature, however, has been concerned with the institutional and operational side and is almost completely descriptive. At present there appears to be no published analytical or empirical study of local authority borrowing.

The second reason emerges from the possibility that borrowing behaviour can be understood as a type of monetary phenomena

Tobin and Brainard (1967) have argued that "monetary theory broadly conceived is simply the theory of portfolio management by economic units: households, businesses, financial institutions and governments. . . . Like other branches of economic theory, monetary theory has both a microeconomic and a macroeconomic side. Monetary microeconomics concerns the balance sheet or portfolio choices of individual units. . . . The choices are constrained by the wealth of the unit and by its opportunities to buy and sell assets and to incur and retire debt. Within these constraints, the choices are affected by the objectives, expectations and uncertainties of the unit."[4]

Finally, since local authorities are large net issuers of financial assets, the ways in which they choose to borrow both by the source from which they acquire funds and the type of debt instrument they supply may have wide ramifications for financial flows. Because the monetary authorities must work through the medium of the financial system in order to affect the level of economic activity a better understanding of how parts of it might react to changes in the monetary climate is useful for policy making. This is especially so when local authorities are concerned because not only do they account for a large proportion of capital investment, as has been noted, they are also an important component of the public sector and their actions affect the ways in which the public sector borrowing requirement is financed and therefore can have a very direct bearing on monetary policy. There is the additional implication that a formal analysis of local authority borrowing will allow this area of the monetary system to be integrated more fully into large-scale econometric models so that policy makers can be more aware of how, for example, a rise in interest rates

will alter the demands that local authorities make on the temporary money markets, affect the supply of negotiable bonds or change the amounts that local authorities borrow from the Public Works Loan Board and thereby from the Exchequer.[5]

The conception of monetary policy underpinning this essay is very broad.[6] It is a widespread belief that before 1971 the Bank of England did not have a monetary policy in the sense of making control of the money supply a policy target. On the other hand, the Bank has been intimately concerned with the management of the national debt, with the placement of new debt issued to finance budget deficits, with the structure and volatility of interest rates, and with the problems created by short-term capital flows. In chapter 2 it will be seen that the borrowing of local authorities has touched the exercise of monetary policy at all these points.

It is assumed in this study that the volume of capital expenditure and the extent of local authority borrowing are unresponsive to variations in the rate of interest. Since, then, the demands that local authorities make in total on the capital and money markets and the P.W.L.B. are insensitive to the changes in the costs of borrowing some other means of central control is required to ensure that the allocation of resources is in line with government policy. In consequence the primary means of control has been fiscal.

Borrowing by local authorities has almost always been the subject of close central control and this has enabled Governments to control not only the total of local authority capital spending.

but also to ensure that the purpose of the expenditure was in accordance with government policy. The main instrument of control has been the loan sanction. This is a consent obtained from a sanctioning authority, usually the Department of the Environment, to raise a loan. Until recently any capital project which was to be financed by borrowing required a specific loan sanction.[7] But today block sanctions are often issued for what are called key sector projects, such as housing, education and principal roads, which reduces the need for detailed administration while allowing the local authority the maximum discretion to assess local needs and determine priorities. At the same time the central government's ability to monitor the total level and main trends of capital expenditure is hopefully to be improved while reducing the detailed control of individual projects.

Once in the light of projections about future demands on resources the volume of local authority capital expenditure has been determined, the borrowing requirement is fixed and must be met either by borrowing from the Public Works Loans Board or the capital and money markets. And it is this that provides the starting point for this study.

Chapter 2 brings together much of the literature that has been published on local authority borrowing since the war and even before. The various policy changes that have been made, particularly those of 1955 and 1963, are considered, and the reasoning behind them subjected to scrutiny. In chapter 3 a number of models of local authority borrowing are developed and their merits tested against the data in chapter 4. The

success of the 1963 measures is also evaluated within the framework provided by the models of chapter 3. In chapter 5 the bearing of local authority borrowing on the exercise of monetary policy is dealt with more explicitly in the light of the findings of chapters 3 and 4. Finally, in chapter 6 some conclusions are drawn and some of the possibilities for further work considered.

CHAPTER TWO

MONETARY POLICY AND LOCAL AUTHORITY BORROWING

A Historical Account

The aim of this chapter is to look closely at the form local authority borrowing has taken and the arrangements that have surrounded it mainly between 1945 and the present. Special emphasis will be placed on the various ways in which it has complicated the exercise of monetary policy. This is not, of course, the only feature of the way in which local authority borrowing and monetary policy are interrelated since many of the actions of local authorities themselves have been influenced by the techniques the monetary authorities have used and the view that they have taken of the role played by the market in central government debt in the working of the financial system. This two-way relationship provides the main area of interest. Many subsidiary issues will be taken up in the discussion but there will be no attempt to provide a comprehensive account of the numerous issues raised by local authority capital finance or by monetary policy. If the account which follows has a unifying theme it is that when interest rates are subject to a more or less cyclical variation it is natural that local authorities should attempt to minimise the charge on local revenues by varying the maturity structure of their debt and the sources from which they borrow. This objective, however, has come into conflict with the monetary authorities in their attempts to pursue national objectives. It is to the consideration of the circumstances surrounding this conflict to which the discussion now turns.

2:1 Local Authority Borrowing Before 1945

The situation prevailing immediately after the war can be understood better if some brief remarks are made on the state of affairs both before and during the war. Ever since local authorities have had occasion to borrow, subject to the approval of the central government, they have done so in the open market. An additional source of funds was provided from 1817 by the Public Works Loan Board[1] (P.W.L.B.) appointed to make loans so as to help alleviate the distress caused by the ending of the Napoleonic Wars and the unemployment that resulted. The scope of the Board and the purposes for which it could make loans were modified during the nineteenth century[2].

A reform, near the end of the century, provided a clear presentiment of what was to occur in the post 1945 era. In 1895 interest rates charged by the Board relative to those obtainable in the open market were very high. Since under an Act of 1875[3] premature repayment of loans was allowed, local authorities found it advantageous to borrow in the open market and use the proceeds to repay loans previously obtained from the Board. The Exchequer, however, was in no position to repay its loans; in consequence so as to prevent any loss to public funds, the Treasury altered the rules governing repayments. In 1900, moreover, market interest rates moved well above those charged on loans made by the P.W.L.B. with the consequence that applications for loans became so heavy that the funds voted by Parliament[4] were insufficient to meet them. It was decided, therefore, to restrict the granting of loans so as to exclude altogether the larger authorities and all local authority undertakings which would be self-financing because of their commercial nature. These were, perhaps, the first occasions on which the natural desire of local authorities to minimise the cost of their borrowing came into conflict with the objectives of the monetary authorities; and the result was an alteration in the arrangements and rules to the benefit of the central government.

During the inter-war period local authorities began to assume new responsibilities many of which had to be financed by borrowing. There also occurred concurrently, a debate about whether or not capital expenditure should be financed out of current revenue.[5] This in part reflected a concern for the increasing total indebtedness of local authorities but also the possibility during an era of falling prices that the real burden of the debt would make some local authorities insolvent. The numerous rules governing the manner in which local authorities obtained sanction to borrow and then raised the finance were revised and modernised in 1933[6] and this has provided the framework of rules within which they have financed capital expenditure until very recently[7].

With the outbreak of war in 1939 borrowing by local authorities became subject to the Defence Regulations concerning capital issues[8]. Capital expenditure, understandably, fell to low levels under the system of wartime control. Towards the end of the war the Treasury in a memorandum referred to the heavy demands which the needs of the central government, local authorities and industry would make on the money market. So as to co-ordinate this borrowing the Local Authorities Loans Act of 1945 prohibited local authorities from borrowing except from the P.W.L.B.[9]. The prohibition was to cease after five years unless Parliament directed otherwise.

2:2 The Immediate Post-War Period

In the first few years after the war the system of controls and the fact that local authorities were restricted, almost entirely, to borrowing from the P.W.L.B., plus the abeyance in which the use of monetary policy was held, produced few difficulties. The central government borrowed in the open market and funds were channelled to local authorities at rates of interest determined by the government's own credit. These rates of interest, however, become a matter of contention because of the government's belief that since the war had been successfully financed on low interest rates[10] it was appropriate to finance the peace-time recovery in a similar manner. Until 1948 this policy of 'cheap money', as it became known, was pursued and P.W.L.B. rates were fixed at $1\frac{1}{2}$ per cent for loans of less than five years duration, 2 per cent for 5 to 15 years and at $2\frac{1}{2}$ per cent for over 15 years.

Although local authorities were able to obtain funds at very favourable rates all of their requirements were not met by the Board as can be seen from Table 2:1. In the first full financial year after the war only 64 per cent of their requirements were so obtained because there occurred a major redeployment of internal funds built up during the war.

TABLE 2:1 LOCAL AUTHORITY BORROWING : 1946 - 1960

Year	Total Loans Raised (includes internal borrowing)	Loans Raised From P.W.L.B.	% of Total
	£mn	£mn	
1946-1947	149.9	95.4	64
1947-1948	266.9	214.2	80
1948-1949	287.3	215.1	75
1949-1950	307.5	247.3	80
1950-1951	340.4	280.7	82
1951-1952	397.9	337.7	85
1952-1953	473.9	366.4	77
1953-1954	494.9	272.9	55
1954-1955	491.4	340.3	69
1955-1956	511.9	311.9	61
1956-1957	501.0	109.2	22
1957-1958	470.7	105.2	22
1958-1959	463.7	36.7	8
1959-1960	511.5	39.9	8

Source: I.M.T.A. (1957) and P.W.L.B. Annual Reports.

These funds were mainly for housing repairs which were not carried out until after the war and then only over a period of time. The amount of internal borrowing carried out was also increased by the rapid growth in superannuation funds after the war and by the general power granted by the Local Authorities Loans Act, 1945, to use all internal funds; previously only certain specified funds could be used.[10a] Even by 1951-52 when borrowing from the Board reached its height, expressed as a percentage of total loans raised, 15 per cent was still being obtained from other sources.

The 'cheap money' policy ran into considerable difficulties and its demise is usually associated with the resignation of Hugh Dalton as Chancellor of the Exchequer in November 1947. His immediate successor, Sir Stafford Cripps, duly reaffirmed his belief in a policy of 'cheap money', but, according to Dow[11] actually wrote its epilogue a few months later by issuing Transport Stock at 3 per cent and by raising all P.W.L.B. rates by half a per cent. In announcing the new rates the Chancellor declared that "the rates of interest charged to local authorities are fixed from time to time to correspond broadly with government borrowing rates for comparable periods"[12]. The problem became a question of how broad was broad because although interest rates on long-dated government bonds rose well above three per cent during 1948 and 1949, P.W.L.B. rates remained the same. The effect of this reluctance to re-align interest rates charged to local authorities with those on government debt was that local authorities were the recipients of a thinly concealed subsidy. Some steps were taken to reduce it after the Conservatives came to power in the winter of 1951. In response to the foreign exchange situation Bank Rate was raised from 2 to $2\frac{1}{2}$ per cent on the 8th of November. Two days later P.W.L.B. rates were raised one half of a per cent for loans for more than five years. Although this did not of itself remove the subsidy since long-rates were still moving steadily upwards it is considered as being part of the 'new monetary policy' which was an attempt to reinstate, in part, the cardinal virtues of monetary restraint after almost a decade in which monetary policy as an effective regulator of economic activity was out of favour[13].

P.W.L.B. rates were increased again in February 1952, by three-quarters of a per cent on loans up to 15 years, and by one per cent on loans for more than 15 years. This increase was seen at the time as a confirmation of the new Chancellor's determination to rule out concealed subsidies[14]. Although Bank Rate rose again in March 1952 to 4 per cent, P.W.L.B. rates remained the same and did not change again until October 1953 when they were reduced marginally after Bank Rate fell to $3\frac{1}{2}$ per cent.

One aspect of the 'new monetary policy' which had been given particular emphasis by the authorities was that the clearing banks should watch very closely the ratio of advances and investments to deposits. The legacy of the war and its aftermath had left banks and financial institutions with a large volume of short-term Government paper which put them beyond the reach of normal restrictive measures. The task, furthermore, of post-war reconstruction fell heavily on the public sector and as it was not possible to finance this expenditure through taxation the Government was obliged to become an habitual net borrower. This borrowing requirement, in as far as it could not be met by the sale of long-term debt, further swelled the volume of treasury bills held by the clearing banks. As a result of this, and the fact that the banks had also been 'requested' to steady their lending, the liquidity ratio[14a] rose to 35.9 per cent in July, 1952, from a level of 32 per cent in the previous November, and 31.6 per cent just at the close of the 1951-52 financial year. The Economist in commenting on this state of affairs, suggested that if the policy of credit restraint was to remain effective it was necessary to take steps to reduce the Exchequer deficit, particularly the scale of lending to the local authorities, as well as trying to fund debt more, instead of borrowing short from the banks[15].

The Local Authorities Loans Act of 1945, as explained above, was to lapse after five years unless Parliament directed otherwise. After the period expired the powers of the Act were extended on a annual basis for another two years. From the beginning of 1953 local authorities were allowed to borrow if they wished in the open market. This change was in line with the wider policy of dismantling the various controls which were inherited from the war and used extensively during the period of reconstruction. It met, however, with considerable opposition in some quarters, not because of the measure in itself but because of what it seemed to presage.

It was feared that it merely paved the way to a point at which local authorities would be obliged to borrow in the open market without much recourse to the P.W.L.B.[16] The Financial Secretary to the Treasury emphasised that this was not the policy of the government which expected that for the majority of local authorities the normal sources of capital would remain unchanged. In support of this claim it was pointed out that along with the lapse of the statutory prohibition the limit on advances from the P.W.L.B. had been raised from £950mn to £1,050mn. A move which "...suggests ...there is no intention for the present at least to induce local authorities to seek their finances through market or banking channels[17].

Opinion for and against the change turned in part upon disagreement about the efficacy of the interest rate mechanism as an arm of monetary policy and also upon the political argument as to how large the public sector ought to be. There was a suspicion on the part of those who questioned the point of the change that the eventual objective was to bring pressure on the volume of local authority capital expenditure, especially on housing. This appeared to be confirmed by comment in the financial press which took it for granted that this was the eventual aim and believed the government had not gone far enough[18]. The view was also expressed that the monetary authorities could effectively encourage local authorities to reduce their demands on the Exchequer by fixing P.W.L.B. interest rates at levels sufficient to provide an incentive[19].

Those local authorities who chose to go into the open market were empowered to borrow, under the 1933 Act, mainly by issue of stock[20], by mortgage[21] and by bank overdraft or short-term deposit[22]. The government seemed to expect that any open-market borrowing that occurred would be by the issue of stock by large local authorities. Birmingham was the first authority to go into the stock market, in April 1953, followed by Liverpool in May.

P.W.L.B. rates, however, had remained unchanged since February of 1952 and although market rates had declined by the middle of 1953 it was apparently cheaper, once the costs of underwriting had been taken into account, to borrow from the Board. The two local authorities chose the open market because of the expectation that opportunities would present themselves within the optional redemption period of the loans to refinance them on more favourable terms. Refinancing was not possible with loans from the P.W.L.B. because they were always earmarked to a particular loan sanction[23]. The loan sanction for housing, for which the funds were required, was issued for sixty years. Long-term interest rates it was felt were above the normal rate and there was the reasonable expectation, based on the past pattern of rates, that they would fall.

The requirement that loans made by the P.W.L.B. were to be earmarked to a loan sanction granted for a specific capital project was criticised as early as 1952 and was under official discussion between the Treasury and the local authority associations from the middle of 1954. As a result it was agreed that, as from September 1954, a loan could be raised from the Board for a shorter period than that of the relevant departmental sanction[24].

During the remainder of 1953 and into 1954 the steady rise in gilt-edged prices allowed some local authorities to raise quite large sums in the stock market although in total they were only a small part of all local authority external borrowing most of which was still from the Board. A more significant development was the increasing resort of local authorities to the use of mortgage loans arranged by stock exchange brokers who channelled funds from institutional clients to local authority clients. The first signs of a specialised market were also emerging marrying local authorities to building societies, savings banks, insurance and pension funds, and industrial firms among others

The main advantages of this form of borrowing lay not in its cheapness but in its convenience. Local authorities also began to return to the pre-war practice of borrowing short, but with two lines of defence against the deposits being called in suddenly. They could either turn to the banks by the use of overdraft facilities or fall back on the P.W.L.B. as a lender of last resort.

Any original misgivings about the nature of the change made in 1952 and the way the monetary authorities would interpret it were assuaged by the subsequent events. No attempt was made to use P.W.L.B. rates as an instrument to drive local authorities into the open market[25]. The flexibility provided by mortgage loans and short term deposits was much to the liking of local authorities safe in the knowledge that the P.W.L.B. would always provide funds if they were unobtainable elsewhere.

2:3 Local Authorities Are Excluded From The P.W.L.B.

The arrangements after 1952 although they were probably to the advantage of local authorities were considered by some to have not gone far enough; they were also not without their problems for the monetary authorities. The result was that in the Budget of October 1955, it was announced that the Board in future, before it granted any loans, was to put all applicants on inquiry as to their ability to raise the capital on their own credit, either in the stock market or in the mortgage market. Housing subsidies were also removed, except for slum clearance, new towns and overspill areas; along with a request that capital expenditure in 1956 to 1957 be kept to a level not in excess of the amount spent in the preceeding financial year.

The reasons for the shift in policy cannot be fully understood without some knowledge of the events leading up to the Budget[26] The new monetary policy introduced into November, 1951, placed emphasis on Bank Rate and on loans made by banks. A credit squeeze had been imposed throughout 1952 and into 1953 when its relaxation was signalled by a cut in Bank Rate in September, and a further cut in May 1954. The economy began to pick up again in the second half of 1954 and by the beginning of 1955 it was booming. Already by the last two quarters of 1954 there were signs of a gathering investment revival and a deterioration in the gold and dollar reserves. In January 1955 Bank Rate was increased. Despite this measure pressure continued on the official sterling-dollar exchange rate and Bank Rate was increased again in February. At the same time restrictions on hire purchase, which had been lifted in the previous September, were reimposed. This was part of a package of measures meant to reduce the pressure of demand and ease the strain on the reserves. Despite the rise in Bank Rate and a reduction in the available supply of treasury bills the banks were still able to finance a large increase in advances by the sale of short-dated government stock. The apparent failure to restrain advances by reducing the liquidity of the clearing banks led the authorities to make a request to the banks for a "positive and significant reduction in their advances over the next few months"[27]. Hand in hand with a restrictive monetary policy, however, fiscal policy was expansive with a reduction in taxation and an increase in the budget deficit announced in the April 1955 budget.

It was also made known in the Budget statement that it had been estimated that the local authorities would become less dependent on the P.W.L.B., borrowing about £320mn in the coming financial year as compared with £353mn in the preceding year.

The effect of monetary and fiscal policies pulling in opposite directions failed to check, understandably, the level of demand particularly for investment goods and imports. Fears of inflation depressed gilt-edged prices during the summer and, so as not to encourage local authorities to use the P.W.L.B. overmuch, rates were raised four times between March and September. Whether because the falling gilt-edged market could not absorb local authority stock issues or because the rise in P.W.L.B. rates was insufficient, there was a considerable switch towards the Board and by October local authorities had borrowed £223mn from it, £83mn more than in the equivalent period in the previous financial year.

The strain which this put on the borrowing requirement of the Exchequer was given by the Chancellor as one of the reasons why along with direct measures to contain local authority capital expenditure he intended to expose local authorities to the pressure of interest rates. The increased borrowing from the Board had raised the amount of floating debt and thus impeded the operation of a restrictive credit policy. A second reason given by the Chancellor was that the open tap provided by the Board meant local authorities had less incentive to consider, when capital commitments were incurred, how the money to meet them was to be found. Their financial responsibility, it was felt, was eroded by being able to obtain capital at rates of interest reflecting the credit of the government. Any advances, therefore, which the Board were to make would be at rates of interest reflecting not government credit, but the credit of local authorities of good standing in the market for loans.

Some indication of the extent to which local authorities switched to the P.W.L.B. in 1955 can be obtained from Table 2:2. After borrowing £18mn in 1954 in the stock market nothing was raised in the first three quarters of 1955.

TABLE 2:2

New Capital Issues By Local Authorities

		£mn			£mn
1953	1st Qtr	5.9	1957	1st Qtr	14.4
	2nd	6.8		2nd	4.7
	3rd	6.8		3rd	-
	4th	-		4th	6.6
1954	1st Qtr	4.9	1958	1st Qtr	17.3
	2nd	6.4		2nd	14.1
	3rd	2.0		3rd	8.9
	4th	5.0		4th	11.8
1955	1st Qtr	-	1959	1st Qtr	6.6
	2nd	-		2nd	19.8
	3rd	-		3rd	-0.3
	4th	8.8		4th	7.6
1956	1st Qtr	7.0	1969	1st Qtr	12.7
	2nd	14.6		2nd	3.0
	3rd	3.7		3rd	10.7
	4th	28.6		4th	19.5

Source:
Monthly Digest of Statistics

A number of issues are raised by the reasoning behind the decision to force local authorities into the open market. The argument that local authorities by switching to the Board increase the amount of floating debt available to the banking system depends crucially upon the policy of the monetary authorities.

If because of a policy committed to maintaining the even keel of the gilt-edged market the banks are able to sell short-dated stocks so as to maintain an increase in their advances, a reduction in the floating debt is unlikely to have much impact on the volume of credit. The belief that the volume of treasury bills was the key to the determination of the level of deposits of the banking system came under attack in the 1960s and it is better to postpone a detailed consideration until monetary policy is discussed more fully in a subsequent chapter. This belief, however, provided some justification because it was felt that if the Exchequer could unburden itself of the task of financing 40-45 per cent of public sector capital expenditure, the ability of the monetary authorities to control the money supply would be enhanced.

The argument that local authorities should not be free of the deflationary pressure of a restrictionary monetary policy was based in part on the belief that local authorities would curtail their capital expenditure in response to rising interest rates as the higher burden of servicing the debt weighed on the local revenues. The implication was that capital programmes especially for housing and education which are largely a reflection of central government policies and require the loan sanction of the relevant ministry, would be jettisoned because of prohibitive interest rates. A situation could arise, so it was suggested at the time, in which a capital project, that had the full backing of the central government, and for which loan sanction had been granted, could be cancelled or postponed because of high interest rates brought about by a restrictive monetary policy.

The decision to make the P.W.L.B. effectively a 'lender of last resort' was received with some surprise in local government circles; the reaction, however, was mollified at first by uncertainty about how strictly the new conditions would be interpreted. The Chancellor, in his budget statement, had indicated that no local authority would be denied the right of access to the Board, only that applicants would be put on inquiry.

This may have contributed to the belief that local authorities would only have to prove sincerity of effort in trying to raise loans in the open market before they would be able to fall back on the Board[28]. The interpretation put upon it, however, was much stricter as can be seen from Table 2:1. In the first financial year of the new arrangements only 22 per cent of total loans raised were from the Board; by 1958-59 it was down to 8 per cent.

This rapid fall-off in borrowings from the Board meant alternative sources had to be tapped very quickly. These took a variety of forms. In the first three quarters of 1956 few public issues were possible because of heavy sales of government stock and a prolonged fall in gilt-edged prices. An added reason may have been that the Bank of England, mindful of the large issues of government stock, was reluctant to allow many local government issues to come forward. In the absence of many stock issues local authorities were obliged to place greater reliance on sales of mortgages. They were assisted in this by the granting of Treasury consent for local authorities to borrow by mortgage for periods of less than seven years; something which had been denied them under successive Control of Borrowing Orders since the beginning of the war. A new market, or rather a continuation of that which had been emerging between 1952 and 1956, evolved which channelled funds from many institutional lenders who found the rates more attractive than could be obtained in quoted securities. These loans were often only for a few years as local authorities were most reluctant to commit themselves to long term loans at rates of interest they believed to be too high.

Rose (1957) in a careful analysis of the capital market during 1955 and 1956 pointed to the reluctance of local authorities to fund while interest rates were high while large institutional investors were unwilling to lend short unless the return was well in excess of that on long-term loans. Because of these differing preferences, Rose considered that this would have tended to depress the volume of local authority borrowing, since by and large local authorities were unwilling to pay the rates Insurance Companies and Pension Funds

required, but for the fact that short-term mortgages, partly as a result of the effect of surtax were very attractive to private individuals. Roughly £150mn was raised by the middle of 1956; a large part of which was for relatively short periods of under ten years at rates of interest higher than those payable on long-term loans[29].

Another significant development in the pattern of local authority borrowing was the even larger volume of business done in the temporary money market for periods up to a year. "Institutional money, temporary liquid surpluses of industrial companies, some bank money, quite substantial temporary deposits of foreign funds and much of the temporary surpluses of the local authorities themselves go into this volatile market"[30]. The funds which were attracted into this market may well have gone otherwise into the treasury bill market, been held as a bank deposit or deposited with a Building Society. The net inflow into Building Societies did drop off during 1956 but this normally happens whenever market rates move above the inelastic rates of the Building Societies. The lack of data makes it impossible to judge how much local authority temporary borrowing occurred at the expense of central government sales of treasury bills to the non-bank private sector.

The poor state of the stock market and the tight control which the Bank of England exercised over any stock issues local authorities wished to place resulted in the emergence of a queue of would-be borrowers which meant that those at the end were having to wait months and even years before being able to issue stock. Many of those who were in the queue may only have been keeping their options open so that when their turn came a choice whether or not to proceed, could be made in the light of the prevailing market.

The queue became so long, notwithstanding the possibility that many in it would eventually not take advantage of the option to issue stock, that the Bank, in May 1957, attempted to pare it down to manageable lengths by the prohibition of any issues of less than £3mn. This had the obvious effect of excluding all small and many medium sized authorities from the stock market and left them with the only alternatives of borrowing by mortgage or on a temporary basis.

It has already been mentioned that one of the reasons given for ushering local authorities into the open market in 1955 was a need to reduce the borrowing requirement of the central government. Within six months, however, the nationalised industries stepped into the place vacated by the local authorities and began to receive all their funds for capital purposes from the Exchequer. The total borrowing needs of the nationalised industries were in excess of those of local authorities with the consequence that below-the-line expenditure actually increased. The monetary authorities may have been unwilling to countenance the higher interest rates which would have been the consequence of both the local authorities and the nationalised industries competing in the capital and money markets.

A very widespread view held in local authority circles during the first eight years of the new arrangements was that "...the P.W.L.B. does not follow the market in its rates but that, on the contrary, it tends to establish the market rate"[31]. This accusation was studiously denied by the Board claiming that it received instructions from the Treasury about which rates to charge and that they only reflected market rates. The question of which is cause and which effect can be answered in part by a direct comparison of the rates that the Board charged and those paid on mortgages.

The poverty of data,[31a] however, makes this very difficult for most of the period; the conclusions, therefore, that can be drawn must be tentative. The Radcliffe Report, paragraph 597, plots the local authority mortgage rate on loans for one to ten years against the P.W.L.B. rate on loans for up to five years. The P.W.L.B. rate rose in January 1956 to $5\frac{1}{2}$ per cent and to $5\frac{5}{8}$ per cent in March. The mortgage rate rose during January and February dipped slightly in March and then continued to rise throughout the rest of the year; fell sharply at the beginning of 1957 and then started to rise again. The P.W.L.B. rate was reduced in June 1956 to $5\frac{1}{4}$ per cent and remained unchanged until July 1957 when it was increased to $5\frac{3}{4}$ per cent. This rise occurred only after mortgage rates had been rising for four months.

On the 19 September 1957, Bank Rate was increased to seven per cent in response to a sterling crisis. A week later the P.W.L.B. rate was raised to $7\frac{1}{4}$ per cent. The mortgage rate rose rapidly after the Bank Rate rise but did not exceed the P.W.L.B. rate for another month when the rate peaked, fell during December below the P.W.L.B. rate, and continued to fall during January 1958. The P.W.L.B. rate was not reduced until the end of February and then to $6\frac{1}{2}$ per cent. The mortgage rate continued to fall during 1958, moving below the P.W.L.B. which was then reduced in July to $5\frac{3}{4}$ per cent. No figures can be cited for 1959 and 1960 because the Radcliffe Report's chart ends in 1958. For the three years, 1956-1958, however, there is little indication that the Board acted as a market leader. Only the large increase in September 1959 was out of step with the market. As far as it is possible to draw inferences from such a survey, it appears that the Board, in most instances, followed rather than led the market.

Table 2:3 lists interest rates in 1961 and 1962 (data is unavailable for 1959 and 1960). Though the two rates may not be strictly comparable, the Table gives little support to the local authority belief. On June 3rd 1961, when the P.W.L.B. rate was raised to $6\frac{1}{2}$ per cent it appears that it may have lead the mortgage rate;

TABLE 2:3 INTEREST RATES ON LOCAL AUTHORITY DEBT: MONTHLY : 1961-62

	Mortgage Rate*	P.W.L.B. Rate**		Mortgate Rate*	P.W.L.B Rate**
1961 Jan	6.19	6.25	1962 Jan	6.81	6.75
Feb	6.19	"	Feb	6.81	"
Mar	6.31	"	Mar	6.75	"
Apr	6.31	"	Apr	6.75	"
May	6.31	"	May	6.75	"
Jun	6.50	6.50	Jun	6.75	"
Jul	7.13	"	Jul	6.69	"
Aug	7.13	7.00	Aug	6.56	6.63
Sept	7.13	"	Sept	6.25	6.50
Oct	6.88	"	Oct	5.77	6.25
Nov	6.81	6.75	Nov	5.88	5.88
Dec	6.81	"	Dec	5.77	"

* On loans for over ten years.

** On loans for fifteen to thirty years.

Source:

Financial Statistics

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but the increase in August follows the rise in mortgage rate, and the fall in November again follows the mortgage rate. In 1962 a similar pattern of movement prevails, the P.W.L.B. rate is led down in August and again in September, October and November. In the four year period studied, only on one occasion in September 1957 is there a strong indication that the Board's rate led the market. Some evidence points to the possibility of that having occured once more in June 1961, but it is less clear-cut. At all other times when P.W.L.B. rates were altered, they followed the market. Of course it is possible that the two years not considered tell a different story[32].

2:4 The Radcliffe Report: Its Implications For Local Authority Borrowing

In response to controversy about the efficacy of monetary policy and the nature of the financial system, the Chancellor of the Exchequer appointed a Committee in May 1957, under the chairmanship of Lord Radcliffe "to inquire into the working of the monetary and credit system, and to make recommendations"[33]. The Report[34] was of great importance to the theory of monetary policy, both as a reflection of views current at the time and as a stimulus to further discussion. The major issues that the Report considered and the numerous recommendations it made fall outside of the scope of this work. Only the questions it raised about local authority borrowing and the recommendations it made are dealt with here; these recommendations, however, are of necessity coloured by the general tone of the Report and its view of monetary theory and policy.

The Report came down in favour of centralizing all local authority borrowing through the P.W.L.B.; it was recommended that "the Exchequer should stand ready to provide long-term capital through the Public Works Loan Board, at the current gilt-edged rate (at time of borrowing) for the relevant maturity, to any local authority that is not able or does not want to raise the money it requires in the market on its own credit at a comparable rate"[35]. Three reasons were adduced in support. First, because the sums borrowed are so large, the exercise of monetary policy would be best served by their timing being completely at the discretion of the monetary authorities. "Secondly, the fragmentation implied by independent borrowing involves unnecessary cost, in that the lower marketability of small issues has to be paid for in a yield differential which, if they borrowed from the Exchequer... could be avoided". Thirdly, most of the capital expenditure of local authorities is in furtherance of central government social legislation, some of it is mandatory, and all of it is subject to close supervision through the mechanism of the loan sanction.

The Committee did give some acknowledgement to the argument that local authorities had been able to attract some local capital that would not otherwise have been channelled into the finance of the public sector; but did not think it sufficient to outweigh the advantages of centralised borrowing. Local authorities, it was pointed out, had been borrowing from much more than local sources and offering rates of return much higher than those offered by the central government. In particular "...they have been piling up short-term debt in a way that is clear contrary to the funding policy of the monetary authorities". Two reasons for this increase in temporary debt were identified. Local authorities, it was felt, were reluctant to borrow long-term at rates of interest considered to be abnormally high. Secondly, a queue of would-be borrowers was maintained by the Bank of England "...with the knowledge that it was causing a rapid accumulation of highly-liquid short-term local authority debt".

The Committee's reasoning is not completely clear on this point. It appears that they were suggesting that local authorities were accumulating short-term debt in the anticipation that they would be able to fund it by the issue of stock. But in an earlier part of the Report (para 93) it was claimed that local authorities were forced to turn extensively to the mortgage market; making "a virtue of this necessity, since they reckoned that interest rates were abnormally high, and went in for extensive short-term borrowing in the expectation of being able to fund their borrowing when long-term rates were lower" It is not obvious whether this short-term borrowing refers to mortgages or to temporary debt. There was a widespread belief in local government circles that mortgage funds were hard to come by and that this made short-term borrowing unavoidable. Strictly speaking, however, sufficient funds were unavailable at rates of interest local authorities considered 'reasonable'. The argument that local authorities borrowed short because long-term funds were not available reduces to the simple argument that long-term interest rates were reckoned too high and likely to fall in the future, and therefore local authorities borrowed short in anticipation of being able in the future to fund.

The prime reason, then, for short-term borrowing lay in expectations that were held about the future course of interest rates. Interest rates had been around three per cent in 1955 but had risen almost continuously during the next three years only declining a little in 1958. Before 1955 they had been 'low' for twenty years and so there existed strong expectations, and not only in local government circles, that the normal long-term interest rate was about three per cent. Expectations were only slowly revised upwards as the trend of interest rates moved upwards.

The only justification that the Committee were able to see for the virtual connivance of the monetary authorities in the development of the local authority temporary money market was that "...the alternative (given their view of the appetite of the long-term gilt-edged market) was an increase in treasury bills which would have made the banks more liquid in the technical sense" (para.598). Because they attached such importance to the regulation of bank liquidity, the Committee was willing to acknowledge this to be broadly correct "if only a very short period were in question". In the long run the demand for short-term deposits by local authorities must, because of the inter-dependencies of the various capital and money markets, work back and impede the actions of the monetary authorities in the central market which the restrictions on long-term issues were meant to protect. This argument could be extended, although the Committee did not do so, to encompass all forms of local authority borrowing, but particularly short-term borrowing, since the aim was to reduce the borrowing requirement of the central government; but if local authorities, because of the higher rate of return offered, were able to attract funds which would otherwise have gone into gilt-edged stock and even into treasury bills, the monetary authorities would be obliged to sell more treasury bills to the banks[36].

Official reaction to the Committee's recommendations on the subject of local authority borrowing was not encouraging.

It was announced that no change would be made in the existing system[37]. The Chancellor considered in some detail the analogy which the Committee had made between local authorities and the nationalised industries, who a few months after local authorities went into the open market were made completely dependent on the Exchequer for capital finance. It was emphasised, however, that there were strong differences; in particular that the nationalised industries before 1956 had made large and infrequent issues of Treasury guaranteed stock which to preserve an orderly market had to be treated as if they were government stock, purchased on their day of issue by the authorities and sold gradually. The large size and the infrequency of nationalised industries stock issues made it necessary to bring them completely under the control of the monetary authorities.

In a later part of the debate on the Radcliffe Report, the Financial Secretary to the Treasury dealt with the problems created by the increase in the proportion of local authority short-term debt. He said that "it is a fact that local authorities benefit...because they are paying a lower rate on these short-term moneys than they would be paying if they were borrowing on long-term from either the market or the Public Works Loan Board. It is, to some measure at least, because local authorities choose to borrow short that their short-term debt is high"[38]. A simple comparison of long-term and short-term interest rates may give the above answer, but what is relevant to the cost of borrowing is the pattern of interest rates over the period for which funds are required, not whether the short-term interest rate is above or below the long term rate. If interest rates, both short and long, rise then it will turn out that in fact it would be cheaper to have paid the normally higher long-term rate in the first place. It is what is expected to be the future course of interest rates that determines whether or not short-term borrowing is considered cheaper.

There is one final point that should be made about the recommendations made by the Radcliffe Committee. It was proposed that a local authority, for the reasons adduced, should have completely free access to the facilities of the P.W.L.B., if it "...is not able or does not want to raise the money it requires in the market..." Because the rate of interest governing loans from the Board was to reflect current gilt-edged rates, other things being equal, local authorities would choose to borrow from the Board rather than in the market. There is one important exception to this rule. If current interest rates are high and local authorities expect them to fall they will be loath to commit themselves to long-term loans from the Board at high rates of interest. Local authorities, depending upon how long they expect the high rates to prevail, might borrow for much shorter periods, such as one to ten years or even on a temporary basis, provided that the Board would be willing to supply loans for such short periods. If, however, the Board only supplied loans on a long-term basis, local authorities would have to seek short-term finance in the open market until rates fell; upon which they would fund by borrowing long-term from the P.W.L.B. This, needless to say, would introduce a degree of instability in the workings of the Board and make Exchequer financing difficult in the same way as it did during 1955 and even as early as 1895 and 1900[39].

In addition to the Radcliffe Report, the various memoranda submitted by interested parties were published in two separate volumes. They appeared a year after the Report, and as the initial furore had subsided met with comparative indifference. From the point of view, however, of monetary policy and local authority borrowing those submitted by the two local authority associations and by the L.C.C., are more interesting than the Report itself.

The Memoranda[40] were submitted in response to a request from the Committee which, among other things, asked what monetary measures of the central government had impinged on the actions of the local authorities, and how effective had they been.

The Association of Municipal Corporations (A.M.C.) emphasised variations in interest rates as being the most significant monetary measure from the point of view of its members. They were felt to affect the capital spending of local authorities by changing the resulting local revenue charge. But the demand for funds was inelastic with respect to the interest rate because a large proportion of the loan debt of municipal corporations were in respect of expenditure on housing and education services. The restrictions on access to the P.W.L.B., and the limitation of stock issues to a minimum of £3mn were also mentioned along with government requests to curb capital expenditure backed up with the use of the loan sanction, although this later measure is more properly fiscal than monetary. In general it was the considered opinion of the A.M.C. that monetary measures may have done something to restrict the rate of new capital expenditure, even so, the central government already had an effective means of restricting capital investment by the refusal of a loan sanction.

The County Councils Association was more certain that monetary measures had had little if any effect on the capital spending of its members; citing in support a survey conducted in August 1957 which showed that out of 61 County Councils, 53 reported that no schemes had been abandoned or deferred because of high interest rates and the effect on the remaining 8 was small. The restrictions on advances of the banks were also considered as a monetary measure and 51 County Councils reported no change in the arrangement for meeting short-term requirements as a result of restrictions of bank advances.

The London County Council was more sure that monetary measures were having or beginning to have some consequences for its capital expenditure. One step taken to reduce the burden of high interest rates was to raise in 1957-1958 from £500,000 to £2,500,000 the amount of capital expenditure defrayed from current rate income. There were further attempts to limit the need to borrow by reducing the amount earmarked for loans to house purchasers.

In addition to these steps the L.C.C.claimed that "...borrowing difficulties are now causing the Council to consider some postponement of capital works...[41]".

The lack of agreement[42] on whether or not local authorities capital expenditure was sensitive to interest rates did not prevent D.S. Lees (1961) in a criticism of the submissions to the Committee from asserting that "...by varying the level of interest rates, the government can regulate the tempo of local investment[43]". Local house building is highly sensitive, it was claimed, to changes in rates of interest; and the requirement that local authorities seek funds in the open market made them more watchful over capital expenditure[44].

2:5 The White Paper Of 1963: Local Authorities Get Limited Access To The P.W.L.B.

Although the central government was reluctant to countenance any reform in the arrangements for local authority borrowing, the underlying factors that had given the Radcliffe Committee cause for concern persisted; and in particular the rate of increase of temporary borrowing. Table 2:4 shows some figures for types of debt which were obtained by Treasury survey[45] for 1955, 1958, 1959, 1969 and 1961. Temporary debt which had stood at 4 per cent of total loan debt, had risen by £342mn to 9 per cent in 1958, by 1959 to 11 per cent, and then to 12 per cent in 1960 and 15 per cent in 1961. There also occurred at the same time a marked decline in local authorities' reliance on the stock market and the P.W.L.B. as sources of funds, while mortgage debt grew rapidly, although not by as much as temporary debt.

These developments aroused criticism of the government's policy in other quarters. H. Cowen (1960) recorded that there was "...a widespread suspicion that local authority finance (was) a badly slipping clutch in the national financial machinery[46]".

TABLE 2:4 (a)

COMPOSITION OF LOCAL AUTHORITY LOAN DEBT AT 31ST MARCH

£Million	1955	%	Due for re-payment in 1 yr or less	1958	%	In 1 yr or less	1959	%	In 1 yr or less	1960	%	In 1 yr or less	1961	%	In 1 yr or less
P.W.L.B.	2728	64	1	3081	56	1	3051	52	2	2964	48	1	2919	45	3
Other Mortgages	596	14	32	973	18	86	1145	20	167	1353	22	252	1441	22	295
Temporary Borrowing	170	4	170	488	9	488	646	11	646	756	12	756	1009	15	1009
Other Borrowing (incl. from internal funds)	333	8	35	455	8	34	496	8	38	537	9	66	584	9	52
Stocks	424	10	8	501	9	28	520	9	16	556	9	67	606	9	16
Total	4251		245 (6%)	5498		638 (12%)	5859		868 (15%)	6167		1082 (18%)	6557		1405 (21%)

TABLE 2:4 (b)

MATURITY STRUCTURE OF TEMPORARY DEBT

£Million	Total	At Call or 7 Days' Notice	7 Days To 3 Months	3 Months To 12 Months	Revenue Balances Temporary Used For Capital Purposes
1955	170	104	23	7	37
1958	488	275	84	63	66
1959	646	312	123	121	90
1960	756	371	120	157	108
1961	1009	508	188	163	150

The high levels of temporary borrowing found in 1960 and 1961 did much to alter the official view and in the summer of 1962 discussions began between the Treasury and local authority representatives to work out ways in which temporary borrowing could be kept within manageable limits. Official disquiet, belated though it was, did not spring solely from a fear that the pattern of local authority borrowing was financially imprudent. It was felt, in addition, that it posed a threat to any attempt to squeeze spending. The clearing banks had been quick to point out that during the recent squeeze, in the second half of 1961, when they had cut local authority overdrafts, local authorities were able to make good the loss with funds acquired in the money markets. It was not made clear, however, what kind of reform would ensure that local authorities, who had an interest-inelastic demand for capital finance, did not switch from the use of bank overdrafts to the money markets when circumstances compelled them to do so. The various reforms that were mooted at the time revolved around the idea that some upper limit should be placed on temporary borrowing; but this in itself would not prevent the sort of switching that the clearing banks had in mind; only a total prohibition on temporary borrowing would achieve that.

It was widely believed that in whatever way temporary borrowing was to be limited[47] it would have to be part of a package deal that would help to widen the market for local authority debt and enable local authorities to meet part of their capital needs by borrowing from the Exchequer which meant the reopening of the P.W.L.B. to all local authorities. This was the official view also as can be seen from the Chancellor of the Exchequer's Mansion House speech of 1962 in which he recognised "...that if temporary debt is to be kept within reasonable bounds, we must make it easier for the authorities to meet part of their capital needs by borrowing from the Exchequer"[48] The notion that a necessary condition for moderation in temporary borrowing was a greater access to Exchequer funds, was based on a widespread belief that a separate factor determining the volume

of temporary borrowing was the 'availability' of long-term funds and the 'narrowness' of the mortgage market. The imperfections of the capital markets meant that local authorities who borrowed by mortgage may have had to pay a small premium reflecting the inflexibility of the mortgage as a borrowing instrument. Access to the P.W.L.B. might then provide loans at a lower interest rate; but the problem could also have been solved in part by the use of more flexible borrowing instruments which would have enlarged the market for local authority debt by appealing to a greater range of investors. There is no real guarantee, however, that the new set of interest rates in partially segmented markets, reflecting the shifts in the supply and demand for funds, would be any more favourable to the local authority sector.

This brings the argument back to the point made in Section 2:4. The reason why local authorities had recourse to the short-term market was not because funds were not available on a long-term basis - there must have been some interest rate which would have attracted the funds - but that most local authorities took the view that interest rates were likely to fall and therefore borrowed short, hoping to fund at a more favourable rate. Rates rose further, however, and the higher they went the more local authorities were convinced that they would fall.

If this climate of expectations prevailed, exacerbated perhaps by a further rise in interest rates, access to the P.W.L.B. would not of itself be sufficient to halt another rise in the proportion of temporary debt. That is why an actual limitation on the rate of growth of temporary borrowing was deemed necessary. Many expected that this would be achieved by the extension of the Local Government (Scotland) Act of 1947 to England and Wales. In Scotland there was ceiling of 15 per cent of total loan debt which temporary debt could not exceed.

The proposals to reform the arrangements for local authority borrowing were made known in a White Paper published in October 1963.[49] They fell into two main parts. The first placed restrictions on temporary borrowing. It was prescribed that:-

(a) Temporary borrowing for each authority for up to three months should not exceed 15 per cent of its outstanding loan debt or, if higher, its capital expenditure in the preceding twelve months.

(b) Temporary borrowing for up to twelve months should not exceed 20 per cent of outstanding loan debt or, if higher, one and a third times capital expenditure in the preceding twelve months.[50] Since the temporary debt of many local authorities was well in excess of the limits, these authorities were to be allowed four years in which to make a progressive reduction.

The second part reopened the P.W.L.B. to all local authorities but not to the extent prevailing before 1956. Local authorities were ultimately to be permitted to obtain up to 50 per cent of their annual long term finance from the P.W.L.B. This was to be made available at gilt-edged rates with a small addition to cover costs. The arrangements, however, were not to be introduced immediately because otherwise the impact on the borrowing requirement of the central government would seriously complicate monetary management. In the first year of the new arrangements local authorities were to be allowed to meet up to 20 per cent of their long-term borrowing needs from the Board. Thereafter the aim would be increase the percentage by 10 per cent each year until the 50 per cent maximum was reached after four years.[51]

The White Paper also set out the official case for control of local authority borrowing. Three reasons were adduced. First, local authority short-term borrowing had on occasions forced temporary borrowing rates up to high levels which failed, however, to check the demand since the only alternative had been long-term borrowing at even higher rates.

"This has meant that their borrowing has...been less affected by changes in Bank Rate. Thus the development of a local authority temporary borrowing market has meant the growth of a large volume of short-term debt that is insensitive to interest rate policy." This was a cause for concern because of the importance the government attached in its management of the public sector debt to the proportion that is held short-term. "Given the ease with which liquid assets can be turned into cash without loss, the greater the stock of liquid assets the more difficult it becomes...to influence spending, especially spending on capital account."

Second, in the interest of monetary management there may be a need from time to time for the government to reduce the short-term element in its borrowing. The pattern of local authority borrowing cannot be allowed to hinder the achievement of this objective and therefore the ratio of short-term to long-term borrowing by local authorities must not be determined solely by relative costs of short-term and long-term borrowing and, therefore, some regard has to be paid to national considerations.

Thirdly, local authority temporary borrowing may cause an ebb and flow of short-term international capital which has a direct impact on the reserves. "It is particularly important that the Government should be able to influence interest rates in a field to which foreign funds have been substantially attracted..."

The monetary authorities' arguments can be assessed on two levels. First, whether they are an accurate description of the ways in which local authority borrowing complicated monetary policy; and secondly, whether the reforms that the White Paper outlined would serve to overcome these complications.

Radcliffe argument that local authority short-term debt is a of 'near-money' which can be turned into cash without loss so holders are insulated from the impact of a credit squeeze, is a common view of monetary policy, although its detailed nature is not of concern here.

All the same it is not clear that if local authorities were to forsake short-term borrowing this would necessarily reduce the volume of liquid assets in the system by itself. Short-term interest rates would fall, to a degree dependent upon the relative scale of local authority short-term borrowing, portfolios would be readjusted and funds would flow into the various substitutes for local authority short-term debt, such as building society deposits, bank deposits, finance house deposits, and even treasury bills. The increased supply of long-term debt would tend to raise long-term interest rates and attract funds. The eventual volume of liquid assets in existence would depend upon the various elasticities of substitution of one asset for another and upon the structure of interest rates.

The measures proposed to reduce the stock of liquid assets, or at least their rate of increase, were unlikely to be successful. Although the limits on temporary borrowing might have been effective on their own, the access to the P.W.L.B. would increase the Exchequer borrowing requirement and, if the gilt-edged market could not be tapped, increase the volume of treasury bills which were not only a liquid asset but also considered to be an important component of the reserve assets of the clearing banks.

The second justification for the reforms was given a slightly different interpretation in a speech by the Economic Secretary to the Treasury[52] who anticipated the points made in the White Paper. He suggested that local authority temporary borrowing interfered with monetary policy because it provided a highly liquid asset which was held in non-bank portfolios as an alternative to treasury bills. This obliged the monetary authorities to sell more treasury bills to the banks than was conducive to a successful monetary policy.

This certainly puts the argument in a clearer light. "But there seems to be a fallacy here. The reopening of the Exchequer to local authorities will not in itself affect the volume of treasury bills in bank hands.

True, non-bank holders may again hold more treasury bills rather than local authority deposits. But in this measure the local authorities will presumably need to get alternative finance from the Treasury - which will ordinarily involve more treasury bills in total. And funding sales by the government will be no easier than now."[53]

Whether or not these criticisms made by The Economist are valid depends upon: first, in what circumstances local authorities would find themselves prevented from borrowing short-term because of the ceiling and second, if faced with this constraint local authorities would increase their borrowing from the P.W.L.B. If a restrictionary monetary policy forces interest rates up local authorities in the expectation that rates will fall may increase their short-term borrowing. Whether or not they are able to do this over and above the twenty per cent of new debt will depend on whether or not they had maintained some slack in their ratio of short-term to long-term debt. If they have done so then short-term borrowing can increase. If the ceiling is eventually met the question them becomes do they borrow more from the P.W.L.B. which will increase the Exchequer borrowing requirement. This possibility is unlikely because the P.W.L.B. in a majority of circumstances cannot lend for periods of less than ten years; and local authorities may prefer to borrow for medium-term periods, of one to five years, rather than commit themselves to long-term loans from the P.W.L.B. at high rates of interest.

It seems probable then, though the final answer is an empirical one concerned with the substitutability of various forms of local authority debt, that if local authority borrowing is restrained in the ways proposed it need not result in a greater call being made on the P.W.L.B.

A related, though quite separate, issue is concerned with the factors that determined temporary borrowing before 1964 and were likely to determine it after. In the discussion of the Radcliffe Report and the

events leading up to it particular emphasis was given to the role of expectations about the future course of interest rates. If t is is a correct interpretation of local authority behaviour, something which will be considered in greater detail in subsequent chapters, then it is possible that in the long-run the proportion of their debt local authorities held on a temporary basis might have moderated as they revised their expectations upwards. In the period after 1956 expectations about interest rates may have been very inelastic after thirty years of 'low' interest rates. Only a sustained period of higher and rising interest rates could revise these expectations and encourage local authorities to manage their debt in a different economic climate.

This of course is a judgement of hindsight and does not mean that if local authorities came to expect the trend of long-term interest rates to be rising this would preclude short-term borrowing - although there might be a strong bias in favour of funding - because they would still wish to use short-term borrowing as a means of overcoming the short-run fluctuations in the upward trend.

The third, and last, argument in the White Paper concerned short-term international capital flows. This subject will be examined more closely in section 2:6 below, and also in chapter 5. One small point, nevertheless, will be made here. A quote was given above from the White Paper which made it clear that the monetary authorities believed it important that they should be able to influence the rates of interest in the local authority money market because of the key role it played in causing inflows and outflows of capital. It is certainly a legitimate aim of the authorities to control capital flows by varying Bank Rate. What is not obvious is how the measures in the White Paper were likely to achieve this aim or at least make it easier to achieve. Any measures to place an upper limit on the proportion of short-term debt held by local authorities were not likely to increase the substitutability of treasury bills for local authorit short-term deposits in the portfolios of either domestic or foreign residents, tie the two interest rates closer together, or make changes

in the local authority rate more sensitive to changes in Bank Rate.

In addition to the various reforms contained in the White Paper, out of the discussions which took place between the Treasury and local authority representatives there emerged the decision to allow the issue of 'over the counter' or 'local' bonds. These bonds because of their easier registration and transfer were expected to be used in place of the now practically out-moded mortgage.[54]

In February 1964, two months before the new regulations came into force, Manchester Corporation used powers under a Local Act to issue bonds[55], for which a daily market with 'same' day transferability was created in London. The power to issue such bonds was extended to all local authorities in England and Wales on the 8th July when regulations made under the Local Government (Financial Provisions) Act, 1963, came into force. The monetary authorities took the view that a large volume of negotiable bonds, which because of being a more attractive investment commanded a lower rate of interest and it was evident that many authorities wished to issue them, might disturb the gilt-edged market in short-term stocks. Accordingly, in order to preserve orderly markets, an amended General Consent under the Control of Borrowing Order, 1958, was brought into force which required the timing and terms of negotiable bonds issued to be agreed with the monetary authorities.[56]

Negotiable bonds were designed to appeal mainly to the Discount Houses. This created some official unease because, although the Bank of England declined to accept them as security for loans to the discount market, it was possible that the clearing banks might take them as collateral for call money lent to the discount market. This would tend to increase the liquidity of the banking system, which was not to the liking of the monetary authorities. The Bank of England informed the clearing banks, therefore, that it would not look kindly on the new bonds being used on a large scale as collateral; and to reinforce this it was made known that the official view of the

tolerable size of the market was of the magnitude of £30 to £40mn.[56a] There was the added fear that the emergence of the negotiable bond would result in the appearance of a new market in one-year bonds on the edge of the temporary money market which had only recently been restrained. To prevent this getting out of hand, in marshalling the queue of borrowers, some preference was to be given to those prepared to issue bonds with maturities longer than one year.

As a result of the reforms which took place in 1963 local authorities were able, in addition to mortgages and stock, to borrow by negotiable and local bonds as well as gaining greater access to the P.W.L.B. Another addition was made to their armoury of borrowing instruments in the shape of the revenue bill which was a short-term negotiable document acknowledging a loan to be issued normally for a term of three months. It was announced by the monetary authorities that it would be acceptable for rediscount at the Bank of England and as collateral for call money lent to the discount houses by the clearing banks. There was a willingness to treat revenue bills in this way, as compared with the discouragement offered negotiable bonds, because not too many local authorities would be able to issue them; they were to be self-liquidating since they were to be issued in anticipation of revenue from grants and rates, and to ensure that this occurred for sixty days in the year a local authority had to have no bills on issue.[57] This stipulation, however, was dropped in 1969.

2:6 The "Parallel" Money Markets, The Euro-Dollar Market And Local Authority Borrowing.

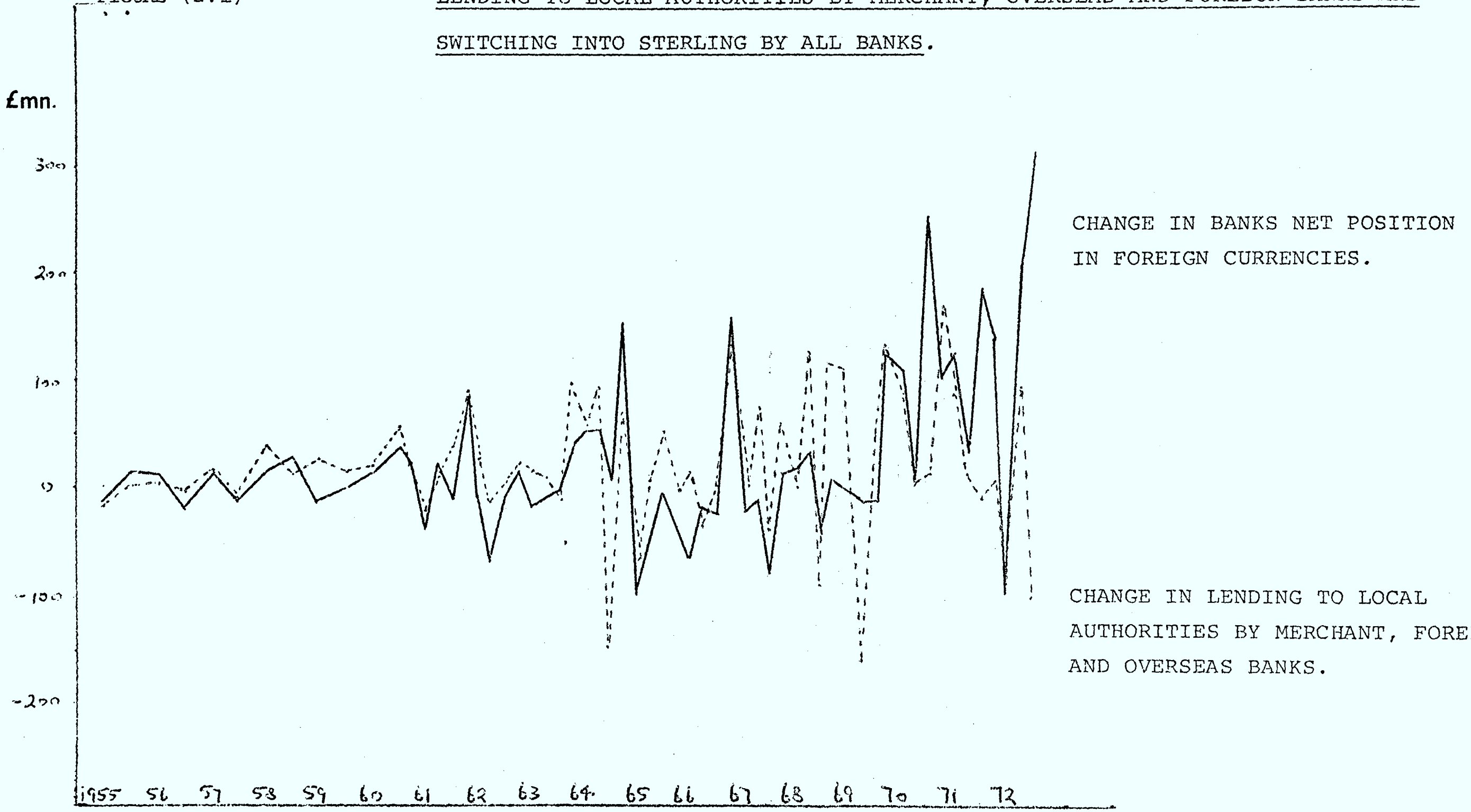
The various changes which occured in the structure of the financial system during the late 1950s and the 1960s and which have continued up to the present mean that the monetary authorities have had to alter both the scope of their measures so as to encompass new areas of the financial system and their techniques as some measures were found wanting or were considered inappropriate to the new circumstances or as new techniques were developed.

The need to adapt to the consequences of local authority borrowing is one example of this tendency. The pattern of local authority borrowing, however, is only one aspect of a much more significant development: the emergence a network of money markets sometimes called the 'parallel' money markets,[59] which were distinct, at least in the early stages, from the traditional discount market that lay at the heart of the orthodox system of monetary control. Moreover, this development was closely linked to the evolution of an international market in dollars, and subsequently in other currencies, known as the Euro-dollar market.

It is not of direct concern here for what reasons the Euro-dollar market appeared; this is better explained in Bell (1973), Clendenning (1970) and Einzig (1964), but it is of interest to note that as early as 1956 temporary deposits of foreign funds were being lodged with local authorities channelled to them through an embryonic money market.[60] Most observers, while not agreeing over the causes,[61] place the origins of the Euro-dollar market in 1957 or 1958. The Merchant Banks and the Overseas and Foreign Banks based in London played a pivotal role in its development by accepting foreign currency deposits usually denominated in dollars and lending them on; or, if the interest rate differential justified it, switching them into sterling and lending the proceeds to borrowers in the U.K. In the early years the borrowers were primarily hire purchase finance houses and local authorities. Local authorities because of their better credit probably took the major part. The statistical series for this period are incomplete but some idea of the relationship between lending to local authorities and switching from foreign currencies into sterling by these banks can be gleaned from figure 2:1. Changes in the net position of banks in foreign currencies measures switching into sterling. The only drawback is that the figures refer to all banks in the U.K. This matter is discussed more fully in chapter 5. Moreover, the figures for lending to local authorities for 1955 to 1961 are on a six-monthly basis. Nevertheless a reasonably clear relationship is obvious although it begins to deteriorate in the mid-sixties.

FIGURE (2.1)

LENDING TO LOCAL AUTHORITIES BY MERCHANT, OVERSEAS AND FOREIGN BANKS AND SWITCHING INTO STERLING BY ALL BANKS.



Apart from funds that originated from abroad large sums were drawn into the local authority temporary money market from domestic sources such as industrial and commercial companies, financial institutions and the private individuals. Banks also lent on a temporary basis funds other than those that had been obtained from switching foreign currency into sterling. The clearing banks, however, only lent to local authorities on a short-term basis by overdraft the level of which was usually established by argreement with the banks. The non-clearing banks, on the other hand, were more flexible in their short-term lending because unlike the clearing banks they were not subject to minimum cash or liquid assets ratios. The main reason why they were not lay in the fact that most of the overseas and foreign banks were considered to have sufficient backing from their head offices abroad; in addition, both they and the merchant banks make advances which were mostly for longer terms than a clearing bank would offer. Since these banks were not subject to a standard liquidity ratio they chose to use as liquid assets not traditional readily marketable assets such as cash, bills and money at call but higher yielding deposits with local authorities. The structure of their assets changed as new money markets emerged, particularly the inter-bank market, but certainly in the later 1950s and early 1960s the major form of liquid asset held by them remained deposits in the local authority money market[63].

The Merchant Banks and the Foreign and Overseas Banks received a new lease of life from the evolution of the Euro-dollar market. The restrictions on the use of sterling to finance foreign trade after the sterling crisis of 1957 gave them an incentive to employ dollars in replacement. Much of the rapid rise in their deposits after 1958 occurred in foreign currencies. Since a very large proportion of these deposits were on-lent to borrowers abroad there was no impact on monetary conditions within the U.K. Only to the extent to which these foreign deposits were switched into sterling and employed domestically were there any consequences for the structure of interest rates and for the money supply.

The detailed consideration of these important issues is left to chapters 5 and 6; nevertheless since a large part of the sums which were switched ended up on deposit with local authorities this had some clear implications for the monetary authorities approach to the problems raised by short-term capital flows. Traditional monetary policy, particularly under the Gold Standard, relied upon variations in Bank Rate to stem or encourage flows of short-term capital. Variations in Bank Rate were supposed to alter the attractiveness of treasury bills in response.

The development of the local authority temporary money market provided foreign residents and also the non-clearing banks with a higher yielding asset than treasury bills; and which although not quite as liquid was practically as secure as central government bills. Consequently the treasury bill was dislodged from its traditional position as the linchpin of all financial markets and in particular from its position of dominance in the framework of international short-capital movements. The monetary authorities became aware of this in 1960 when because of inflows of short-term capital it became necessary to lower Bank Rate twice. Much of the inflow it was recognised was not into treasury bills but into the alternative short-term assets available in London. By 1962 it was being suggested elsewhere that "...rates on deposits with local authorities rank among the key rates in the international money market[64]". This was given official acknowledgement in 1964 when it was stated that "...although the treasury bill comparison continues to have considerable significance especially for official holders, the growth of the Euro-dollar market has increased the relative importance attached to the dollar deposit - local authority interest rates comparison[65]".

One question that can be asked concerns whether or not the decision to force local authorities into the open market after 1955 resulted in the diversion of capital flows from the traditional channels to the local authority market and thereby weakened the control the monetary authorities could exercise over these flows.

It is perhaps not strictly correct to attribute the loss of control solely to the diversion of funds into other channels since even before, when Bank Rate was central, control of financial markets in the U.K. was at best imperfect; while after, the monetary authorities might have been able to exercise sufficient influence over capital flows if the rates of interest in the parallel money markets had been closely geared to Bank Rate. Although these rates were certainly not completely free of controlled interest rates on government securities they appeared to have a considerable degree of independence. It should be noted that if the monetary authorities had been willing to countenance the swings in interest rates that it would have entailed, they could have determined the level of capital flows; they were reluctant, however, to do this because of the impact on both the gilt-edged market and domestic economic activity.

Clendenning[66] in an examination of the impact of the Euro-dollar market on domestic monetary conditions in the U.K. reaches three conclusions. Firstly, the existence of the Euro-dollar market has increased the elasticity of supply of short-term capital; secondly, has increased the elasticity of demand by increasing the ability of the rest of the world to absorb or release capital in response to small changes in relative interest rates; and thirdly, probably increased the ease with which short-term capital can move in response to relative interest rates by partly circumventing national exchange controls. The result is to further weaken the effectiveness of domestic monetary policy since this is dependent, under a regime of fixed exchange rates, upon the interest-elasticity of capital flows.[67]

The question of whether the pattern of local authority borrowing has weakened the effectiveness of monetary policy can be divided into two parts; whether the emergence of the local authority temporary money market increased the interest-elasticity of capital flows; and whether this new market reduced the ability of the monetary authorities to neutralise such flows. An attempt at an answer to this will be attempted in chapter 5; but it can be noted here that if local

authorities had not been in the market the increased central government borrowing requirement would have entailed, in the absence of larger sales of gilt-edged stock, the issue of a larger volume of treasury bills. Any increase in the holding of treasury bills by the non-clearing banks would depend upon the yield relative to alternative assets both abroad and in the U.K. If the non-clearing banks refrained from switching foreign currencies into sterling to buy treasury bills because the yield was insufficient, and in the absence of some other alternative short-term asset with the characteristics of local authority short-term deposits of security and high yield, the result would be, other things being equal, a lower interest-elasticity of short-term capital and therefore a slightly more effective monetary policy.

As it was there did occur flows of short-term funds between the Euro-dollar market and the local authority temporary money market whenever the differential between the two respective rates, after allowance had been made for the cost of forward cover, changed. After the devaluation of sterling, however, the covered differential[68] was almost continuously in favour of the Euro-dollar which led to the gradual weakening of this link. In addition the non-clearing banks were steadily increasing their lending to industrial companies especially after 1968 when company liquidity was tight. The central position of the local authority temporary money market in both the network of new sterling markets and in the area of capital movements was eroded further by the growth of the inter-bank market, sterling certificates of deposit, and the inter-company market. The inter-bank market[69] was and still is used by the non-clearing banks to adjust their liquidity positions from day to day. They lend and borrow clearing bank deposits between themselves on an unsecured basis. This has been in part at the expense of local authorities because local authority short-term deposits cannot provide the flexibility required for day to day adjustments. In 1968 a number of non-clearing banks began to issue sterling certificates of deposits which are negotiable instruments which makes them attractive short-term assets in competition with local authority deposits.[70]

A more recent development, the inter-company market[71], arose out of restrictions on advances by the banks and added further to the competition for funds. The effect of all these new markets was to make the local authority sector only one among a number of borrowers in the parallel money markets and to increase the proportion of the financial system that lay outside of the effective influence of the monetary authorities.

2:7 Borrowing From The P.W.L.B. After 1963

In the early months of the new arrangements there was, in most cases, little firm evidence on which the twenty per cent quota could be estimated. To provide some sort of basis the Board relied upon estimates of longer-term borrowing supplied by the authorities themselves. These tended, however, to reflect projected capital programmes without any allowance for the various factors which cause delays in the execution of these programmes. Consequently, the Board found it necessary to scrutinise applications very carefully in order to avoid substantial over-issues which would have swollen the borrowing requirement of the central government.[72]

It had been envisaged that the freer access to the P.W.L.B. would provide local authorities with an opportunity to fund their temporary debt. This, however, became unlikely with the rise in interest rates during 1964. Furthermore, those local authorities which had been heretofore reluctant to make much use of temporary borrowing were presented with an official document which gave its blessing to a 'permanent' amount of 'temporary' borrowing; this, added to the weight of opinion, virtually compelled them to make more use of it.[73] Because of the rise in interest rates local authorities put off borrowing from the Board until later in the year in the hope that interest rates would have fallen by then. The sterling crisis of November 1964 resulted in the withdrawal of substantial amounts of foreign funds from the local authority temporary money market[74] which placed an upward pressure on interest rates.

The P.W.L.B. rates which had been raised previously in August, remained unchanged[75]. These factors coupled with the large volume of quota entitlements that had been held over from earlier in the year, produced a considerable drain on the Board.[76]

The difficulties created during 1964 for the orderly functioning of the P.W.L.B., and thereby for the borrowing of the Exchequer, by local authorities who tended to switch between the P.W.L.B. and the open market as monetary conditions altered, were equivalent to those experienced during 1955 and 1900. On the two previous occasions the Treasury had countered by denying all but the smallest local authorities access to the facilities of the Board; in 1964, however, it was not possible to reverse a policy only a year old.

The increase in Bank Rate in November 1964 was followed by a rise in other short-term and long-term rates during December. P.W.L.B. rates for quota loans, remained, however, unchanged. The reason for this lay in the Labour Government's Commitment 'to do something' about interest rates which were regarded as too high. One thing which was done to mitigate the effects of the rise in Bank Rate was to allow local authorities to draw the first £100,000 instead of the first £50,000 of their longer-term borrowings from the Board. The figure of £50,000 had been announced in the White Paper[77] so as to assist small local authorities who made little demand on the capital market and who even under the old arrangements had satisfied a large part of their needs from the Board. This concession made known by the Chancellor of the Exchequer in January 1965 resulted in an increase in quota allowances of about £30mn during the last quarter of the financial year. In all, during the financial year, 1964-65, because of the minimum quota provision of £100,000 and overdrawing by some authorities of their quotas, the Board advanced about 30 per cent of gross longer-term borrowings of local authorities, and 40 per cent of net longer-term borrowings.

For the next financial year, as had been agreed, the quota was increased to 30 per cent. Interest rates in the market for mortgages and bonds rose during the first quarter but P.W.L.B. rates remained unchanged. This was part of the new government's two-tier system of interest rates which left P.W.L.B. rates at the level of gilt-edged rates in August 1964. The relative attractiveness of P.W.L.B. rates led to a large switch of demand for funds to the Board away from the open market, as local authorities attempted to take up their quota before the rates were increased. Some went as far as to take up their quota before it was needed for capital expenditure and used it to reduce short-term debt or else lent it to other local authorities. Table 2 lists monthly loans made by the Board from April 1964 to Dec. 1965. By the end of June 1965 local authorities had borrowed £191mn from the Board as compared with £45mn in the equivalent period in the previous financial year. One other factor may have contributed to the demands made on the Board; in the April 1965 Budget the Chancellor of the Exchequer announced, as part of measures to assist various regions, that higher quotas were to be made available to certain local authorities coming within what were called 'less prosperous areas'.[78] The higher quota was to be 40 per cent.

The increase in drawings from the Board had the expected impact on the borrowing requirement of the central government. In addition "The high rate of public spending in general, and in particular the very heavy drawings made by local authorities on the Public Works Loan Board... attracted criticism abroad as well as at home".[79] The measures which were introduced in July 1965, although primarily concerned with the correction of the external deficit by deflationary means, were also in part directed at the problem of regulating local authority borrowing from the P.W.L.B. To ensure that this was spread more evenly through the remainder of the year, the rest of the year was divided into four issue periods. Any local authority, however, that had already taken more than half its quota could draw no more in the first period which ended in October, but could take

the remainder by equal instalments in the other three periods; quota instalments could be accumulated and taken in a later issue period if desired[80].

TABLE 2:5

Gross Loans Made By P.W.L.B. Monthly Totals
April 1964 - December 1965

		£mn			£mn
1964	April	2.0	1965	Jan	33.9
	May	22.0		Feb	33.6
	June	20.8		Mar	42.3
	July	22.8		Apr	99.1
	Aug	18.1		May	57.4
	Sept	16.9		June	34.4
	Oct	15.5		July	52.6
	Nov	31.6		Aug	28.0
	Dec	60.8		Sept	13.3
				Oct	39.2
				Nov	25.1
				Dec	72.2

Source:

Annual Reports of P.W.L.B.

If this phasing scheme had been allowed to expire at the end of the year it appeared likely that the same problems would have arisen whenever market rates moved sufficient to give local authorities an incentive to delay or accelerate their borrowings from the Board. In the next financial year, therefore, six issue periods of two months length were introduced with the proviso that a local authority drew up one-sixth of its year's quota in each period or accumulated the

instalments and took them later in the year. This measure improved substantially the regularity of lending by the Board even though it did not rule out the possibility that an unfavourable pattern of interest rates in the early part of the year might encourage local authorities to accumulate most of their quota until later in the year, with a consequent heavy drain on the Board concentrated in the last months of the year.

Although the phasing of loans ensured that the burden on the Exchequer fell reasonably evenly throughout the year, it could not influence the total amount borrowed from the Board. It had been estimated in the White Paper of 1963[81] that the call on the Exchequer would be about £300mn in 1965-66. The estimate given in the Budget Statement of April 1965 was £360mn; but in fact a net total of no less than £535mn was drawn from the P.W.L.B., well over half of total net borrowing from all sources. There were two inter-connected reasons for this. The interest rates for quota loans made by the Board remained based on the rates the government itself could borrow at in the market during the summer of 1964. Market rates, however, rose during 1965 and there emerged a considerable differential between rates on P.W.L.B. loans and market rates on loans for equivalent periods. This provided local authorities with a strong incentive to borrow as much from the Board as was possible. One of the ways in which this could be done was by turning over long-term debt more rapidly so that gross borrowing, on which quotas were calculated, was increased. This was made possible by introducing 'yearling' bonds and by relying heavily on mortgages and local bonds, with a life of one year or a little more. Again, it had been assumed that in the April 1965 Budget local authorities would raise their total of temporary debt in line with the increase in total debt; they, in fact, reduced it which further increased their entitlement to funds from the P.W.L.B.[82].

In an attempt to reduce the volume of funds being lent by the Board it was decided that for the financial year, 1966-67, the quota entitlements were to be fixed at the levels of 1965-66 rather than raised by another 10 per cent of long-term borrowing as had been agreed in 1963. Moreover, long-term borrowing was redefined more narrowly to exclude the refinancing of debt that had been included before as part of an authority's long-term borrowing in the calculation of its quota. This meant, in other words, short-dated mortgages and bonds could only be included once in such a calculation and could not be renewed for another year or a little more and then reused again when they matured. It was expected under these modified arrangements that about £400mn would be drawn from the Board during 1966-67. The increase in Bank Rate, however, in July 1966 to 7 per cent raised short-and long-term interest rates to almost unprecedented levels; in consequence a number of authorities were faced with the invoking of 'break' clauses in mortgages by lenders seeking higher interest rates.[83] The re-borrowing that this entailed increased the amount local authorities were able to borrow from the P.W.L.B. The increase in interest rates generally also raised temporary borrowing which had the opposite effect and reduced entitlements to loans from the Board. These two influences did not offset each other completely because temporary debt fell by £114mn between September 1966 and April 1967. The final result was that net drawings from the Board amounted to £543mn a sum well in excess of what had been expected.

Since the existing system introduced an unacceptable element of uncertainty into calculations of what the requirements of the P.W.L.B. from the Exchequer would be over any financial period it was decided that some major revision needed to be made of the basis upon which loan quotas were calculated. Prior to this long-term borrowing had consisted of three elements. These elements were, respectively, borrowing required to finance new capital programmes, the replacement or renewal of maturing debt and the funding of short-term debt. The

first element was the most stable and most easily estimated. The last two elements were "...dependent on day to day decisions made by the lenders or by individual local authorities which are governed by a number of continuously variable factors, the most important being current views about the likely course of interest rates[84]".

The major revision amounted to confining the definition of long-term borrowing to the first element, borrowing required to finance new capital programmes. A transitional element was added as a concession to those local authorities that had not yet reduced the proportion of their temporary debt below the prescribed limits that were to come into force in 1968;[85] any funding of this excess temporary debt would allow more to be borrowed from the Board.

The various modifications, by Treasury request, that the P.W.L.B. found it necessary to make in the arrangements ruling advances made to local authorities sprang from the same clash between local authority interests and the interests of the monetary authorities that had produced the changes of 1955 and 1963. In a period of fluctuating interest rates it is natural that local authorities should attempt to minimise the cost to local revenues by varying the maturity structure of their debt and the sources from which they borrowed. Their large borrowing requirement, however, cannot but be of considerable importance for the capital and money markets and therefore for the actions of the monetary authorities who are obliged to accomplish their various objectives through the medium of the financial system.

Despite these modifications other difficulties emerged in the following years which necessitated further changes. For the 1967-68 financial year it was decided that the general economic situation did not justify raising quotas by another 10 per cent of long-term borrowing, the quota, therefore, was set at 44 per cent for local authorities in the development areas and 34 per cent for local authorities in other regions. At the end of May 1967, following the change in arrangement

for housing subsidies, P.W.L.B. interest rates, which had remained unchanged since August 1964, were increased to levels reflecting gilt-edged rates. Later in the year interest rates rose after the devaluation crisis which resulted in a fall in loans made by the Board during January 1968 as local authorities left off the taking up their quotas in the hope that interest rates would fall again. Eventually many local authorities did take up their quotas, even though there was no fall in interest rates. Many, however, were willing to forego the opportunity to borrow from the P.W.L.B.; rather than commit themselves to high long-term interest rates they borrowed in the short-term money markets. The result was that advances by the Board fell short of the estimates made earlier in the financial year by approximately £150mn.

Before the 1966-67 financial year it had been the practice if a local authority over-drew its quota that the excess was deducted from the following year's quota. Equally any undrawn quotas could be carried forward. While the former tended to be very small substantial undrawn quotas had been carried forward. Since this made it difficult for the P.W.L.B. to estimate the level of loans both for the year in which it is due and the year in which it is advanced, it was decided for future years that borrowings effected in the open market near the end of the year would no longer affect the main element of an authority's quota. This meant that any capital payments made in the last few months of the financial year that had not been previously anticipated and therefore used in the estimation of the quota for the year would not be eligible for an additional quota.[86] This measure effectively reduced the proportion of a local authority's quota that could be carried forward. The shortfall, therefore, of £150mn in estimated drawings from the Board resulted in only £24mn being carried forward. The local authority associations who were aware that,if interest rates were high at the end of any year, considerable sums could be lost to the local authority sector, asked that any 1968-69 quotas which were not taken up should be reallocated to other local authorities. The Board, to achieve this, had to amend

the method of phasing loans in order to assess the likelihood and possible extent of any shortfall that could be reallocated. "The financial year was accordingly divided into four issue periods of three months each; a local authority could draw one-third of its year's quota in each of the first three periods or could accumulate these instalments until the third period, but not more than one-quarter of the year's quota could be applied for during the fourth period[87]". This measure had the effect of concentrating a large amount of drawings from the Board into the final few months of the calendar year and enabled any sums that had not been taken up by local authorities before the end of December to be reallocated.

Just before the beginning of the 1968-69 year it was announced that the quotas which were to be made available in that year were to be even less than in the previous year. Local authorities who were within the designated development areas were to receive a quota of loans amounting to 40 per cent of net capital payments or £100,000 whichever was the greater; those authorities in other areas were to receive 30 per cent or £100,000. In the January of 1969 the Board began to estimate the amounts of quota which had been allowed to lapse by then and the likely volume of applications during the remainder of the financial year. It was concluded that about £55mn would be available for reallocation and so proportional quotas on net capital payments were increased by 3 per cent and the minimum quota of £100,000 was raised to £200,000. Table 2:6 sets out the proportionate quotas, the minimum quotas and the approximate number of local authorities who obtained all their borrowings from the Board, from 1964 to 1973. The effect of the rise in interest rates at the end of 1967-68 financial year can be seen in the fall in the number of local authorities obtaining all their borrowings from the Board. The P.W.L.B. acknowledged that if their calculations proved to be incorrect the original budgetary estimate might be exceeded by as much as £75mn. In fact total advances for the year fell short of the budget estimate by £38mn because interest rates which started to rise in November of 1967 continued to do so until March. Many local authorities, as in the past, preferred to borrow

for shorter periods while interest rates were 'high' than those for which the Board could grant loans.[88]

TABLE 2:6

P.W.L.B. Loan Quotas 1964-73

	Quota %	Minimum Quota (£)	Approximate No. Obtaining All Borrowings From Board
1964-65	20	50,000	600
1965-66	30(40)*	100,000	750
1966-67	30(40)	100,000	700
1967-68	34(44)	100,000	500
1968-69	33(43)	200,000	750
1969-70	35(45)	300,000	1000
1970-71	40(50)	400,000	1100
1971-72	45(55)	400,000	1150
1972-73	40(50)	500,000	

* Quota for less prosperous areas in brackets. The intermediate areas were added in 1970.

Source:

Annual Reports of the P.W.L.B.

The original arrangements outlined in the 1963 White Paper introduced too much uncertainty into the calculation of the likely level of advances made by the P.W.L.B. and therefore made uncertain the borrowing requirement of the Exchequer. The uncertainty was reduced, first, by more clearly demarcating the basis upon which the quota was to be calculated. This measure enabled a more accurate estimate to be made of the total amount the Board would advance in the coming year. Second, the distribution of this

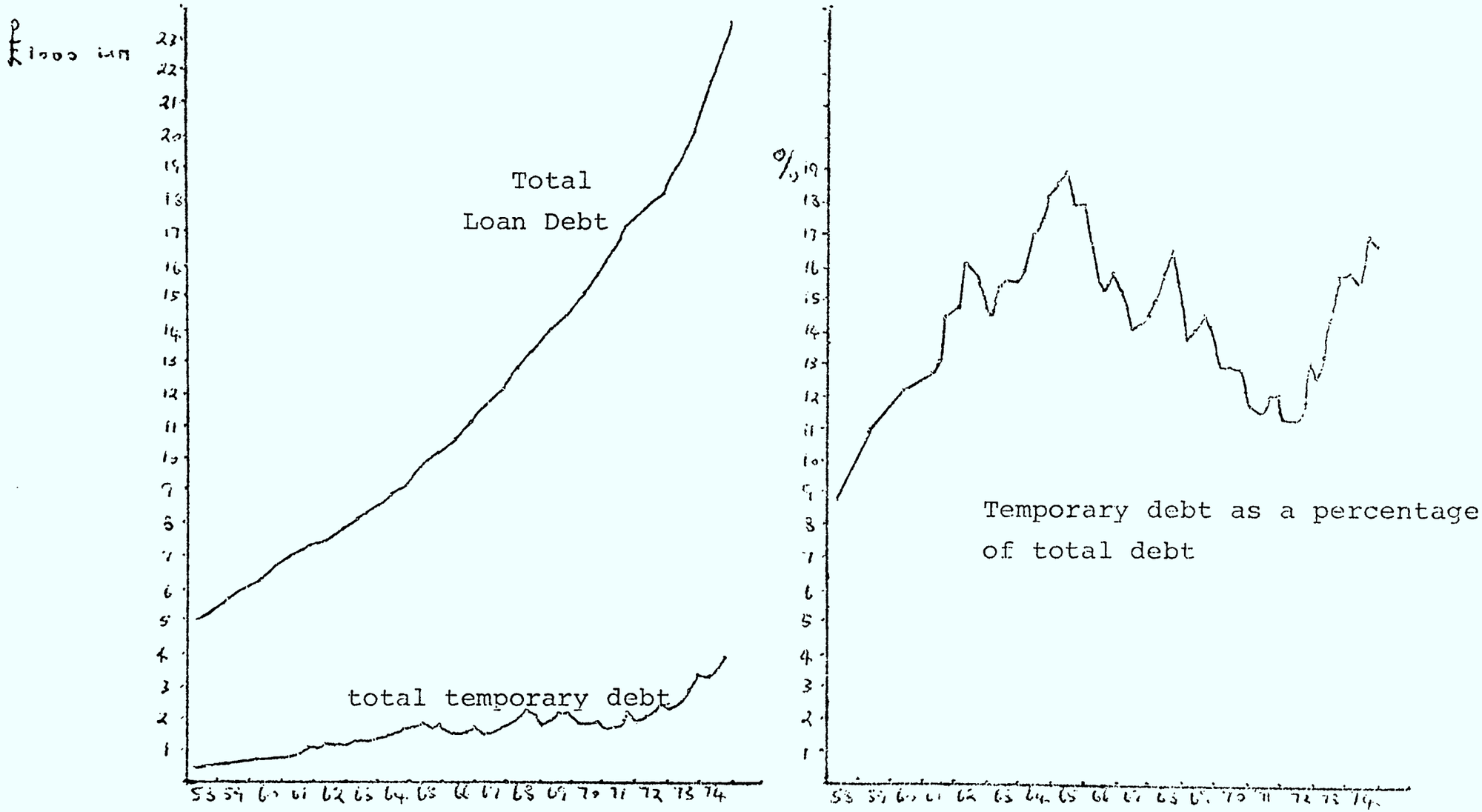
total was spread more evenly throughout the year, or at least spread in a manner that could be anticipated and therefore appropriate provision made for, to ensure that the P.W.L.B. and thereby the Exchequer was not faced with a large number of applications from local authorities at certain times of the year just because local authorities considered the pattern of interest rates to their own advantage.

2:8 Recent Developments In Local Authority Borrowing And Monetary Policy.

Once the reforms outlined in the 1963 White Paper came fully into force and lending by the P.W.L.B. had been stabilised the topic of local authority borrowing, once the source of considerable public debate, slipped from the limelight. It was suggested by The Economist[89] that "this is a measure of the success of the change in the rules...in the event short-term debt has been brought under control as envisaged". Furthermore, "...there seems to be little direct connection between the local authority market and the international money market". This has been alluded to in section 2:6 above and explained in part by the high cost of forward cover as a consequence of the disruption in the international monetary system following upon the devaluation of sterling.

These comments were made in the middle of 1971. Figure 2:2 plots the growth in total loan debt and in temporary debt, and also the ratio of temporary to total debt. Compared with the increase in total debt that of temporary debt appears less daunting than would be supposed from the unease that it caused in the 1950s and early 1960s. A better idea of the issues involved can be gleaned from the ratio of temporary debt to total debt. It rose continuously from 1958 to 1962, declined slightly and then continued to rise to a peak in 1965; then it fell continuously, except for short periods, to a low point at the beginning of 1972. After this it rose rapidly to a peak in 1974. These fluctuations are something which ought

FIGURE (2.2). LOCAL AUTHORITY DEBT: LONG-TERM AND SHORT-TERM: 1958 - 1974

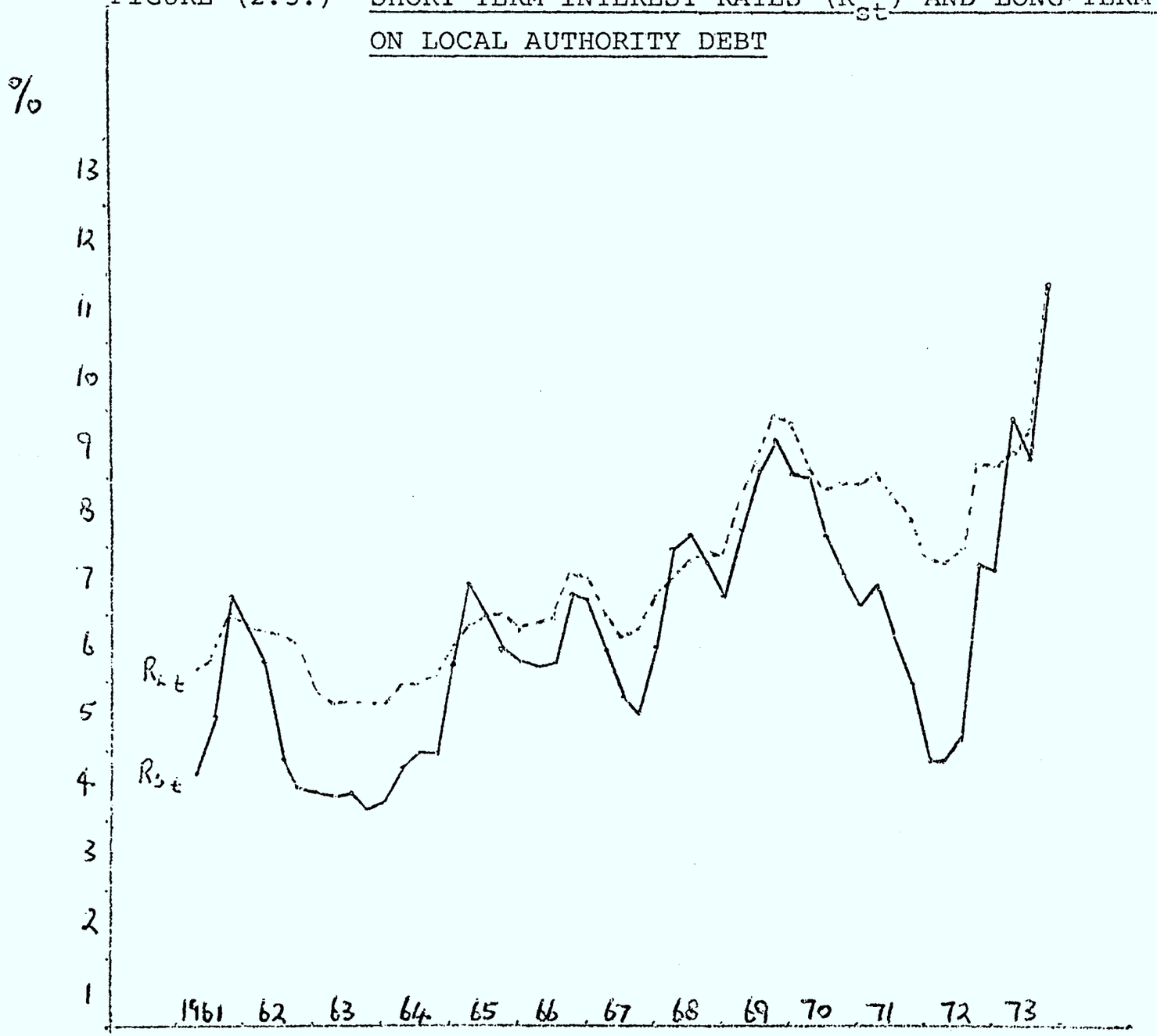


to be explained and an attempt will be made to do so in subseqent chapters. It can be noted here, nevertheless, that a comparison with figure 2:3 which plots short and long-term interest rates from 1961 to 1973 indicates a close visual relationship between rises and falls in the ratio and rises and falls in the interest rates. The rapid rise in temporary borrowing since the middle of 1972 has been associated with an unprecedented rise in interest rates after June 1972; with the result that temporary borrowing has almost doubled in the space of three years while total loan debt has only increased by 40 per cent.

The answer to the question whether or not the 1963 measures have controlled temporary borrowing depends upon how the level of temporary borrowing would have behaved in their absence. Of course, control has been successful in the sense that an upper limit has been set in terms of the ratio of short to long-term debt; but it has to be established that temporary debt would otherwise have exceeded this ratio. There are two parts to this matter; first, there was, before the introduction of the limits, a considerable variance among local authorities in the ratio of their temporary debt to their total debt. While some were reported to have had as much as eighty per cent on a short-term basis, others had comparatively little. Second, many of the problems created for monetary policy arose from the temporary borrowing of all local authorities taken together.

Some local authorities after 1955 borrowed almost completely on a short-term basis because they held the view that interest rates would eventually fall back to what they considered to be the normal long-term interest rate; others were more cautious in the degree to which they were willing to back up their expectations about the future course of interest rates by accumulating short-term debt. Nevertheless it does not seem unreasonable to suppose that faced with interest rates that failed to return to the 'normal' level those local authorities with a considerable volume of temporary

FIGURE (2.3.) SHORT-TERM INTEREST RATES (R_{St}) AND LONG-TERM INTEREST RATES (R_{Lt}) ON LOCAL AUTHORITY DEBT



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debt would begin to reconcile themselves to high interest rates and fund. On this interpretation the rapid increase in temporary debt after 1955 was mainly due to the slowness with which some local authorities adjusted to the new monetary climate. Once they had adjusted, their temporary borrowing would have been moderated. This does not mean necessarily that temporary borrowing would cease since obviously fluctuations in interest rates provide ample scope for careful timing of funding operations directed towards the aim of minimising the costs of capital financing. Even if interest rates were constant short-term finance would still be used to iron out day to day movements in cash flows, in anticipation of revenue and pending the raising of a long-term loan. This is likely to be, however, a much smaller proportion of total loan debt, more at the level of temporary debt prevalent in the 1930s.

The twenty per cent limit would constrain any local authority that judged it to be to its advantage to hold a larger proportion on a short-term basis; but equally it has been pointed out that a number of local authorities hitherto more cautious have since 1963 increased the amount of short-term finance they use. It is not, therefore, possible to state categorically that the controls have restrained the level of temporary debt that otherwise would have been; it has, nevertheless, prevented a few authorities from taking too many risks in the management of the maturity structure of their debt.[89a]

The effects that the pattern of local authority borrowing had on the exercise of monetary policy sprang from the total amount of temporary borrowing as well as from its rate of increase. The remarks made above about the total are of relevance here too; it is not possible to be certain whether or not the total amount of temporary debt would have been larger in the absence of the controls. The rate at which local authorities accumulate short-term debt is of importance for monetary policy because a very rapid rise in temporary borrowing is likely to put pressure on

short-term interest rates and create disorderly money markets which may be to the detriment of monetary policy. If local authorities choose to maintain a proportion of temporary debt up to the limits then clearly the rate at which temporary debt could be accumulated would depend upon the rate of increase of total debt. They would, however, be able to reduce the proportion at any chosen rate, only constrained by the difficulties that wholesale funding would create for the long-term capital markets. If, on the other hand, they decided to maintain a level of temporary debt below that level prescribed then there would be opportunity to take up the slack when the pattern of interest rates necessitated it. During 1969, 1970 and 1971 the ratio of short to long-term debt was falling almost continuously; when interest rates rose after June 1972 local authorities began to build up their temporary debt at a rate even greater than that of the late 1950s (see figures 2:1, 2:2). The rate of increase eventually levels off when the ceiling is reached; how long this takes will depend upon how far below the ceiling the ratio has fallen beforehand and how fast the slack is taken up. As the restrictions on temporary borrowing now stand there are very imprecise checks on the rate at which local authorities can accumulate and decumulate temporary debt. There are, of course, strong market forces that would counteract this through shifts in relative interest rates but these movements might be contrary to the aims of the monetary authorities and have serious consequences for the regularity of the money and capital markets.

There remain two very important developments which have not yet been touched upon. These are, one, the long-term borrowing of local authorities in foreign currencies[90]; and two, the introduction in September 1971 of 'Competition and Credit Control'.

The first inkling that the government was well disposed towards the possibility of local authority borrowing abroad emerged from a statement made by the Financial Secretary to the Treasury in

February 1969 in which he announced that local authorities would be encouraged to borrow foreign currency for the benefit of the reserves. To make this feasible a clause was included in the Finance Bill to enable local authorities to pay interest without deduction of tax. The encouragement given local authorities was tempered somewhat by the opinion expressed by the Treasury that the existing Local Government Acts did not confer power to borrow abroad and therefore, any authority wishing to borrow in this manner would have to obtain power through a Private Bill; with the exception of the G.L.C. which had already obtained it after the London reorganisation. Moreover, the Treasury stipulated that local authorities should obtain official consent for the amount, terms and conditions of any loan; the loans were to have a life of about seven years; and bearer bonds were to be used. In addition the Treasury offered to guarantee the interest and the loan repayments against fluctuations in exchange rates but not the loan itself since this was secured on the rates and revenues of the authority concerned. A charge was to be made for this exchange cover such that the final cost to the local authority would be one-quarter per cent below the ten year P.W.L.B. quota rate prevailing at the time of the loan.

In the event only Derby and the G.L.C. raised loans in foreign currencies. By the time statutory powers had been obtained by a number of local authorities foreign rates had become less attractive. The development of this source of funds was further dampened by the withdrawal, in March 1972, of the Treasury guarantee. The exchange cover had been given at a time when the encouragement of capital inflows was important to the balance of payments. By 1972, however, the problem had become one of containing the expansionary effects of capital inflows as the external position was in substantial surplus[91]. The Local Government Act of 1972 also included a general power to borrow in foreign currencies and there may have been the fear that this would have led to a large increase in capital inflows. Local authorities were still allowed

to borrow without exchange cover, subject to obtaining exchange control consent but none chose to do so.

In March 1973 it was announced that exchange cover facilities similar to those withdrawn a year before would be restored[92]. The nationalised industries were also included in this scheme and both parts of the public sector expressed immediate interest because interest rates in the domestic money and capital markets were well in excess of those in the Euro-bond market. The government decided to restore these facilities because of the desire to finance the deficit on the current account by borrowing from abroad rather than reversing the reflationary policies of 1971 and 1972.

As with the previous scheme, a number of conditions were imposed. They differ, however, on a number of points. Only local authorities with an outstanding loan debt in excess of £100 million at March 1972[93] are eligible for the scheme. Borrowing must be in U.S. dollars for a minimum of five years[94]; and the total cost to the borrower is one-half per cent below the ten year P.W.L.B. quota rate. This last condition was subsequently modified to give borrowers a greater share in the savings involved in foreign borrowing. They are now permitted to retain a third of the difference between the P.W.L.B. quota rate and the cost of the loan. Table 2:7 lists the various sums borrowed since the beginning of 1973.

TABLE 2:7

Foreign Currency Borrowing By Local Authorities 1973 - 1974

	Foreign Currency Borrowing By Local Authorities £mn		Foreign Currency Borrowing By Local Authorities £mn
1973 1st Qtr	30	1974 1st Qtr	129
2nd "	103	2nd "	188
3rd "	28	3rd "	-
4th "	64		

Source: Financial Statistics - December 1974 - Table 30

When local authorities have borrowed in a foreign currency they sell the proceeds for sterling to the Exchange Equalisation Account. This is recorded as a net addition to the foreign currency reserves; and the larger sterling borrowing requirement that this transaction gives rise to has implications for the exercise of monetary policy and will be explored in chapters 5 and 6.

The second development, that of 'Competition and Credit Control', was heralded by the monetary authorities themselves as a major change in their approach to monetary policy[95]. The reason for such a change have been explored fully in a number of recent studies and it is necessary only to refer to them in passing[96]. The main purpose here is to explain the role local authority securities play in the new monetary arrangements and to explore the consequences, if any, for local authority borrowing.

In place of the previous liquid assets ratio that only the clearing banks had been obliged to maintain, it was proposed that all banks were to be put on a common basis and obliged to hold not less than $12\frac{1}{2}$ per cent of their sterling deposit liabilities in certain specified reserve assets. This measure extended reserve requirements to the secondary banking system and was intended to enhance the influence the monetary authorities could exercise over the level of sterling deposits. Such influence was to be reinforced by the calling of Special Deposits by the Bank of England whenever monetary conditions were believed to warrant it. Eligible reserve assets comprise cash at the Bank of England, and certain assets which the Bank is willing to convert into cash. Local authority bills eligible for rediscount at the Bank of England are one of these along with, among others, treasury bills and money at call with the money markets[97]. This last asset does not include, however, money placed in the inter-bank or local authority temporary money markets. A similar arrangement was made for deposit-taking finance houses with the difference that their minimum reserve assets ratio is set at 10 per cent.

A further feature of the new techniques of monetary control was a restriction on the extent to which the Bank proposed to operate in the gilt-edged market. This abandonment of the policy[98] of 'leaning into the wind' was a necessary part of the new reliance on changes in interest rates as a means of regulating lending by the banking system. Since 1952 the Bank of England has exercised control over the terms and timing of any local authority stock issues and from 1964 over negotiable bonds on the grounds that unfettered local authority issues would disrupt the careful nurturing of the gilt-edged market which the monetary authorities considered essential to the management of the national debt. The reversal of this view, nevertheless, did not result in any relaxation in control over local authority issues.

Separate proposals were made for the Discount Market. Part of the changes for the clearing banks was the abandonment of their collective agreements on interest rates. This had clear implications for the weekly tender for treasury bills by the discount houses and it was decided that they would continue to cover the weekly tender of treasury bills but no longer at an agreed price. Since money at call with the discount market is an admissible reserve asset it is necessary that the monetary authorities have sufficient influence over the credit extended by the discount market. To achieve this the houses agreed to hold a minimum of 50 per cent of their funds in public sector debt. This debt comprised treasury bills, local authority bills and bonds, British government, British government - guaranteed and local authority stocks with not more than five years to run to maturity.

The inclusion of local authority bills and bonds and short-dated stocks among the set of reserve assets, and the exclusion of local authority temporary debt can be explained quite simply by which forms of local authority debt the monetary authorities had adequate influence over. It also accounts for the decision to retain discretion over the terms and timing of any local authority

issues of negotiable bonds and stocks instead of allowing local authorities freer access to a market no longer managed by the monetary authorities. The supply of local authority bills was limited originally by the need for a local authority to obtain local powers; general powers were granted, however, by the local Government Act 1972. At present a local authority can issue revenue bills up to twenty per cent of their rate intake for the year providing the rate intake is not less than £3mn.

Local authority negotiable bonds are issued for minimum amounts of £250,000 and the maximum which any authority may issue is based on their total debt. Table 2:8 details the way in which this works.

TABLE 2:8 MAXIMUM ISSUES OF NEGOTIABLE BONDS FOR INDIVIDUAL LOCAL AUTHORITIES OF VARYING SIZES

Outstanding Loan Debt	Ceiling (£mn)
Not exceeding £40mn	1.5
Over £40mn but not exceeding £60mn	2
Over £60mn but not exceeding £100mn	3
Over £100mn but not exceeding £200mn	5
Over £200mn but not exceeding £300mn	7.5
Over £300mn	10

Source:

Long, Till and Colvin Ltd (1972) Section 5

The result is that there is an upper limit to the amount of negotiable bonds local authorities can issue but this limit grows as the total indebtedness of local authorities grows. There is no upper limit, however, on issues of stock. The government

broker on behalf of the Bank of England operates lists of local authorities wishing to issue stock. Only when an authority is at the head of the queue can they proceed. One list comprises issues of less than £10mn, another issues of over £10mn, and there are special lists for very large issues, e.g. G.L.C. and for yearling bonds[99]. In practice, however, local authorities prefer to issue negotiable bonds because they are more convenient and large issues of stock are likely to follow only after the issue of negotiable bonds have reached the upper limit.

Although there appear to be limits to the volume of bills and bonds that local authorities can issue it is possible that the volume can fluctuate and this may undermine the control that the monetary authorities are able to exercise over the reserve assets of the banks and the discount houses. Some of the causes of fluctuations in the supply of these forms of local authority debt will emerge from the next few chapters and the consequences for Competition and Credit Control will be explored in chapter 5. Table 2:6 shows net changes in issues of revenue bills, negotiable bonds, and quoted stocks from the beginning of 1971. There appear to be variations in the issue of these forms of debt. Revenue bills exhibit a strong seasonal variation reflecting the rate collecting periods of the year. The figures for negotiable bonds from the beginning of 1973 include borrowing in foreign currencies. Stock issues have fallen considerably since the second quarter of 1972 because of an unfavourable stock market and reluctance on the part of local authorities to borrow long term at high rates of interest.

The exclusion of temporary money in the local authority market from the list of reserve assets meant that the non-clearing banks that hitherto had held local authority deposits along with funds in the inter-bank market as liquid assets were obliged to switch towards the more traditional markets particularly money at call with the discount houses and treasury bills in order to satisfy the minimum reserve assets ratio.

TABLE 2:9

Net Issues Of Bills, Negotiable Bonds And Stocks 1971-74

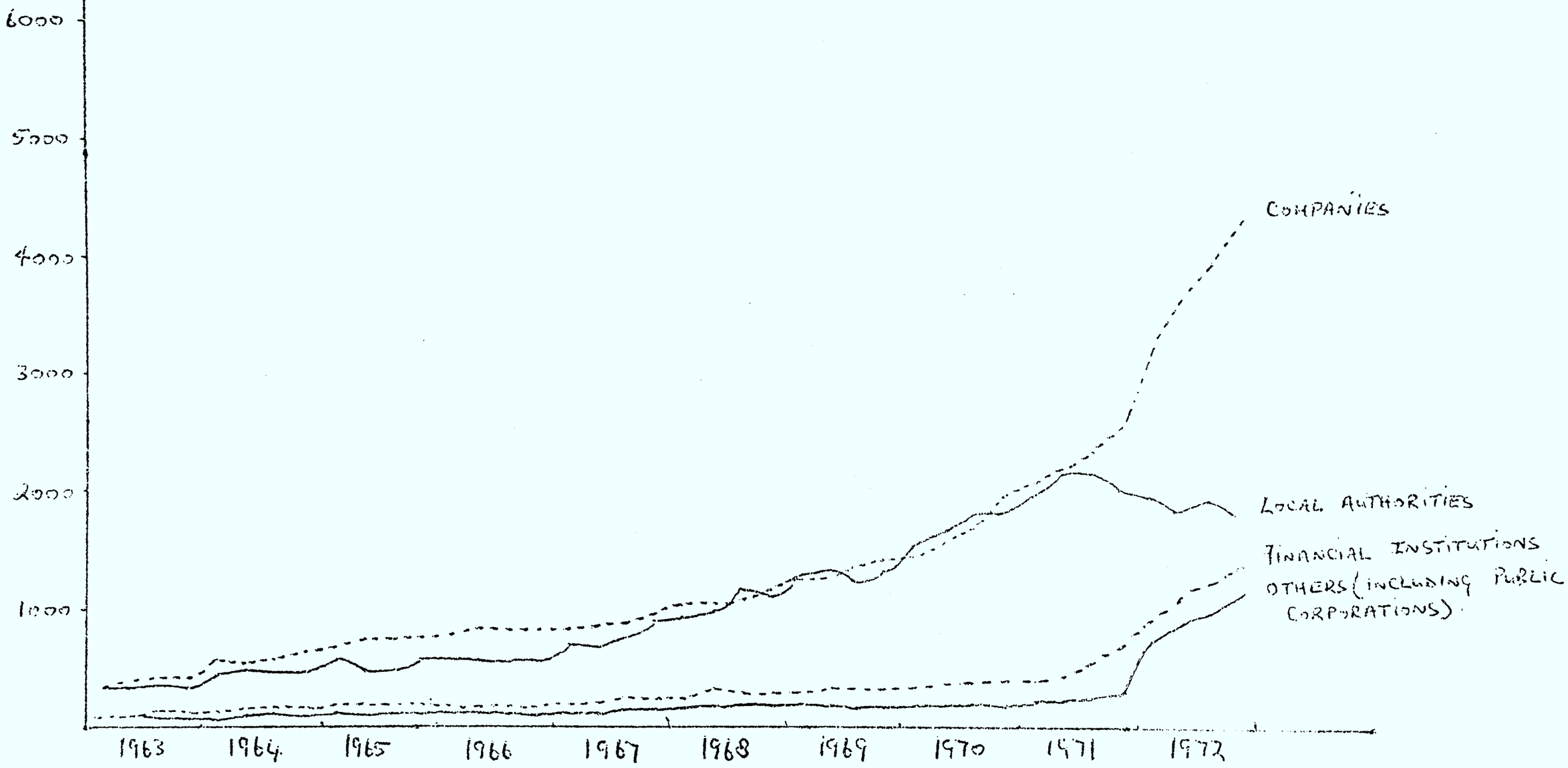
£mn			Revenue Bills	Negotiable Bonds	Quoted Stocks
1971	1st	Qtr	9		
	2nd	"	43	41	17
	3rd	"	24	67	- 11
	4th	"	14	61	30
1972	1st	Qtr	-2	41	53
	2nd	"	21	32	- 52
	3rd	"	28	4	2
	4th	"	4	25	- 20
1973	1st	Qtr	-11	36	18
	2nd	"	36	109	6
	3rd	"	5	- 15	- 9
	4th	"	12	40	- 25
1974	1st	Qtr	- 5	80	- 11
	2nd	"	54	6	- 29
	3rd	"	44	47	- 29

Source:

Financial Statistics Table 30

The fall off in lending to the local authority sector by the non-clearing banks can be seen in figure 2:4. The switching to treasury bills and money at call is shown in Table 2:10. The greater part appears to be into money at call. While advances to local authorities by the non-clearing banks have fallen, all the more significant given the increase in the total volume of temporary

FIGURE (2.4.) ADVANCES BY ACCEPTING HOUSES, OVERSEAS BANKS AND OTHER BANKS TO U.K. RESIDENTS



debt since the middle of 1972, advances by the clearing banks have risen. Although the non-clearing banks reduced their advances to local authorities the funds were diverted back because the discount houses used the funds deposited with them at call to purchase negotiable bonds.

TABLE 2:10

Some Liquid Assets Of Non-Clearing Banks: Treasury Bill Holdings Of Clearing Banks (£mn)

	NON-CLEARING BANKS			CLEARING BANKS
	Advances To Local Author.	Money At Call And Short Notice	Treasury Bills	Advances To Local Author.
1971 1st Qtr	1967	96	54	161
2nd "	2142	89	33	80
3rd "	2161	112	82	121
4th "	2035	132	161	171
1972 1st Qtr	1974	147	55	195
2nd "	1859	126	59	363
3rd "	1921	131	102	303
4th "	1828	165	100	312
1973 1st Qtr	1715	229	33	344
2nd "	1747	260	30	267
3rd "	1837	262	127	382
4th "	1835	260	104	440
1974 1st Qtr	1739	247	57	375
2nd "	1346	220	46	281
3rd "	1795	205	104	291
4th "	1757	180	116	308

Source: B. E. Q. B. Table 11

Since the inception of 'Competition and Credit Control' circumstances have driven monetary authorities to make some changes which have modified the role played by local authority debt. These changes will be considered in chapter 5.

This more or less completes the survey of the post-war period. In the next three chapters some attempts will be made to construct a framework that can be used to explain why local authorities borrow in the way they do. The value of this will be tested and the interaction of local authority borrowing and monetary policy considered further.

CHAPTER THREE

MODELS OF LOCAL AUTHORITY BORROWING

Tobin and Hester[1] have described monetary micro-economics as being concerned with the balance sheet or portfolio choices of individual economic units; choices are constrained by the wealth of the unit and by its opportunities to buy and sell assets and to incur or retire debt. An important part of this branch of theory is concerned with the study of decision-making under uncertainty[2]. If it is assumed that the decision-making unit is rational then many aspects of portfolio and debt selection behaviour can be analysed. Whenever local authorities[3] decide to issue stock in preference to taking funds on temporary deposit or borrow from the P.W.L.B. in preference to the banks they are making decisions that may have wide repercussions for the rest of the monetary system. The nature of these decisions are the concern of this chapter. If the small amount of lending to house-purchasers is ignored[4] a local authority's choices are essentially one-sided concerned with the incurring and retirement of debt. Local authorities do, of course, accumulate real physical assets as a result of capital spending; but since they are not commercial undertakings and profit maximisation is considered an inappropriate objective, the making of decisions about the structure and size of their debt is separated from the making of decisions about the scale of capital investment. Capital budgeting theory, therefore, is not directly relevant to the study of borrowing and some modified framework of analysis is called for that makes greater allowance for the assumption that the scale of capital spending is unresponsive to the rate of interest[5].

The approach taken in this chapter is to postulate that a local authority will attempt to minimise the cost of a pre-determined borrowing requirement, subject to the constraint that the requirement is met, by varying the maturity structure of its debt. The maturity structure refers to the average period that must elapse before debt incurred comes up for renewal or repayment. Primary emphasis is placed on the ratio of short to long-term borrowing; where short-term borrowing, as in chapter two,

is defined as that made for less than one year. Within this category of debt, however, there are loans contracted for periods of up to one week, for up to three months and for up to one year, and it may well be that the factors that determine the very short term loans may differ from those determining loans for a little less than one year. In order to test this possibility temporary borrowing is disaggregated into its component parts; and the implications of this are considered in section 3:4. In the same section a distinction is also drawn between the various forms in which local authorities borrow long-term. Using the simple models of debt selection behaviour that are developed in sections 3:1, 3:2, and 3:3, an attempt is made to explain the supply of bonds, mortgages and stock and to enlarge upon some of the problems raised in chapter two, section 2:7 with regard to lending by the P.W.L.B.

Section 3:1 contains a model of local authority debt selection behaviour which formalises the ideas contained in the comments the Radcliffe Committee made about local authority borrowing. Section 3:2 extends the analysis by employing the mean-variance approach on the lines first set out by Tobin (1958). Section 3:3 takes the argument one step further and attempts to show that the model of the previous two sections because of the stress it places on the role of expectations about the future course of interest rates, can be subsumed under those species of theories formulated in order to explain the term structure of interest rates. Section 3:5 reviews briefly the demand side of local authority debt and considers some of the recent literature on the portfolio selection behaviour of a few financial institutions; and in particular of those which are large holders of local authority debt.

3:1 A Radcliffean Model Of Local Authority Borrowing

In the previous chapter's account of the relationship between the exercise of monetary policy and local authority borrowing some importance was attached to the part expectations of interest rates played in the determination of the large amount of short-term borrowing that many local authorities went in for after 1955.

The observation is encapsulated in the view of the Radcliffe Committee that "...many authorities...reckoned that interest rates were abnormally high, and went in for extensive short-term borrowing in the expectation of being able to fund their borrowing when long-term rates were lower[6]".

The notion that local authorities have a concept of what is the 'normal' long-term interest rate which influences their debt management is in some ways analogous to Keynes' analysis of the speculative demand for money[7]. He postulated that on the basis of past experience investors have in mind a normal level of long-term interest rates, towards which current rates are expected to move. If the current interest rate is below the 'normal' level then the current rate is expected to rise an investor holds money so as to avoid the capital loss involved in holding bonds; if the current interest rate is above the 'normal interest rate the investor expects the current rate to fall, and holds bonds to take advantage of the expected rise in bond prices. An aggregate demand for money can be derived by assuming a market of numerous investors all of whom hold a different conception of the 'normal' or 'expected' interest rate.

The application of the 'normal' rate hypothesis to the explanation of the debt selection behaviour of local authorities first requires some clarification and some simplifying assumptions. The clarification refers to the difference between stock and flow variables. The total amount of debt incurred is a stock variable; the amount of borrowing whether short or long-term is a flow variable[8]. Furthermore, it is important to distinguish between net and gross borrowing. Net borrowing is that debt incurred in consequence of new capital expenditure while gross borrowing includes the replacement of debt that has matured. The model presented in this section is based on net borrowing, that is a flow; and it will be assumed that each financial quarter is regarded

as a single decision period within which each local authority must satisfy a given borrowing requirement. It will also be assumed that a decision has to be made within the period whether to borrow short-term or long-term. This dual-maturity case will provide a framework that then can be used to explain the actual pattern of borrowing behaviour.

If a local authority believes, along with Keynes' speculative investor, that the long-term rate of interest has some 'normal' level when the current long-term interest rate rises above this level the local authority will borrow on a short-term basis. When the long-term rate falls back to the 'normal' level it will fund the short-term debt by borrowing long. The high cost of long-term borrowing, then, will be avoided while interest rates are high and the burden on the rates and revenues of the local authority minimised. Of course, while the long-term rate is above the expected rate there is the cost of borrowing on a short-term basis. If the short-term interest rate is above the current long-term rate then the reduction in capital cost as a result of unfunding will be accordingly smaller and <u>vice versa</u>.

The capital cost (cc) of a sum, B, borrowed for 'n' periods will be[9]:-

$$CC = \left[(1 + R_{L(t)})^{n} B\right] - B \qquad [3.1]$$

where $R_{L(t)}$ is the current long-term rate of interest. If it is supposed that the local authority expects at the end of the first period the long-term interest rate will be at the 'normal' level, below the current rate, then it will borrow short-term for one period, at a rate of interest, $R_{S(t)}$. The capital cost saving (D) the local authority expects to achieve by this debt management will be equal to:-

$$D = B\,(1 + R_{L(t)})^{n} - \left[(1 + R^{e}_{(t)})^{n-1}\,(1 + R_{S(t)})\right] \qquad [3.2]$$

where $R^{e}_{L(t)}$ is the long rate expected to rule at the beginning of the next period. Thus when D is greater than zero the local authority will borrow short and fund at the end of the period. This need not always necessarily happen since it may be expected that the current long-term rate will not return to its 'normal' level until the completion of two periods; in which case the local authority can contract a short loan for two periods duration or two one period loans; the first to expire at the end of the first period and the second to begin at the start of the second period. This, however, would entail the generation of expectations about what short-term interest rates will be at the start of the second period. Since a small change in short-term interest rates is unlikely to have much impact either way on the capital cost saving this complication can be safely ignored for the present. It is interesting to note that if the current long-term interest rate is at the 'normal' level, a rational borrower, within the confines of the framework that this section deals with, may still borrow on a short-term basis if the current short-term interest rate is below the current and 'normal' long-term interest rate and the long-term rate is expected to prevail until the end of the first period; or for that matter up to the 'normal' period as long as short-term rates remain unchanged.

All these conclusions are based on the supposition that the 'normal' rate is expected with certainty so that the decision to meet a borrowing requirement on a long-term or a short-term basis is an all-or-nothing choice depending upon whether D is less than, equal to, or greater than zero.

When all local authorities are aggregated it is possible to write an equation for either long-term borrowing or short-term borrowing The analysis which follows is for the latter, the only difference using the former makes it the reversal of the signs of the coefficients. Thus:-

$$TB_{(t)} = a_o + a_1 (R_{L(t)} - R^{e}_{L(t)}) + a_2 (R_{L(t)} - R_{S(t)}) + a_3 B_{(t)} \qquad [3.3]$$

where $TB_{(t)}$ is net temporary borrowing; $R_{L(t)}$, the current long-term interest rate; $R^{e}_{L(t)}$, the expected long rate; $R_{S(t)}$, the current short rate; and $B_{(t)}$ the net borrowing requirement. This last term needs some explanation. The larger the borrowing requirement the more that needs to be met on a temporary basis if the actual rate exceeds the expected rate. The constant term, on the other hand, can be thought of as that temporary borrowing which occurs in anticipation of revenue[9a].

Local authority net temporary borrowing is a function of the difference between the current and the expected long-term interest rate, the difference between the current long-term and the current short-term interest rate, and the borrowing requirement. This model as advanced is essentially Radcliffean with the emphasis placed on the role of expectations about the future course of interest rates. The problem with the use of expectational factors in economic models is that expectations as such are unobservable. Fortunately, many ways have been found to make expectations operational; the most widely used since the seminal work of Cagan (1956) and Nerlove (1958) has been the adaptive expectations hypothesis. Applying it to the local authority sector, if the long-term interest rate rises it is suggested that local authorities are unlikely to become convinced of its permanence until a considerable period has elapsed. Instead they will revise their expectations in proportion to past forecasting errors. If the long-term interest rate at the beginning of the second period turns out to be different from what was expected at the beginning of the first period the local authority will alter its expectations of the future rate by a fraction of the forecasting error. This can be formalised in a discrete model as:-

$$R^{e}_{L(t)} - R^{e}_{L(t-1)} = (1 - \lambda)\left[R_{L(t)} - R^{e}_{L(t-1)}\right] \qquad [3.4]$$

Equation [3.4] can be rewritten as:-

$$R^{e}_{L(t)} = R^{e}_{L(t-1)} + (1-\lambda)\, R_{L(t)} \qquad [3.5]$$

lagging [3.5] one period

$$R^{e}_{L(t-1)} = R^{e}_{L(t-2)} + (1-\lambda)\, R_{L(t-1)} \qquad [3.6]$$

and repeated substitution into [3.5] gives

$$R^{e}_{L(t)} = (1-\lambda) \sum_{i=o}^{\infty} \lambda^{i}\, R_{L(t-i)} \qquad [3.7]$$

The effect of the term $R^{e}_{L(t-i+1)}$ fades away since its coefficient λ^{i+1} approaches zero as 't' increases, as $o<\lambda<1$.

The result, therefore, is that the 'expected' or 'normal' long-term interest rate is expressed in terms of an infinite distributed lag on $R_{L(t)}$ with geometrically declining coefficients.

Substituting [3.7] into [3.3] and adding an error term yields

$$TB_{(t)} = a_o + a_1 \left(R_{L(t)} - (1-\lambda) \sum_{i=o} \lambda^{i}\, R_{L(t-i)}\right)$$
$$+a_2 (R_{L(t)} - R_{S(t)}) + a_3\, B_{(t)} + u_t \qquad [3.8]$$

A distributed lag variable is practically useless for purposes of estimation; but the application of the Koyck transformation that is lag [3.8] once, multiply by λ and substract the result from [3.8] gives the estimatable equation after rearrangement

$$TB_{(t)} = b_o + b_1 \Delta R_{L(t)} + b_2\, TB_{(t-1)} + b_3\, (R_{L(t)} - R_{S(t)})$$
$$+b_4\, (R_{L(t-1)} - R_{S(t-1)}) + b_5\, B_{(t)} + b_6\, B_{(t-1)}$$
$$+ V_t \qquad [3.9]$$

where
$$b_o = (1-\lambda)\, a_o$$
$$b_1 = a_1\lambda$$
$$b_2 = \lambda$$
$$b_3 = a_2$$
$$b_4 = -a_2\lambda$$
$$b_5 = a_3$$
$$b_6 = -a_3\lambda$$
$$v_t = u_t - \lambda u_{t-1}$$

The problems involved in estimating an equation that contains a lagged dependent variable as an independent variable will be considered in chapter 4.

The use of an adaptive expectations model as a means of casting expectational factors in an operational and an estimatable mould raises some interesting issues. First, the idea, embodied in the previous discussion of the 'normal' rate, that local authorities hold their expectations about the long-term interest rate which will prevail at the beginning of the second period with certainty does not lie well with an hypothesis that suggests that if these expectations are found to be wrong they are revised in proportion to the error made. It implies particularly myopic behaviour since it suggests that once the revision in the expected rate has been made the new 'expected' or 'normal' long-term interest rate is once more considered to be a certainty. It appears that the borrower does not learn from past mistakes to beware of making new mistakes in the future.

The second issue concerns the more general plausibility of using the adaptive expectations hypothesis as a means of generating a proxy or surrogate for the expected or normal interest rate in the form of autoregressive schemes. This type of hypothesis

has been described as 'weak-form' because it is assumed, in this instance, that borrowers base their expectations of the future only on the information contained in the past history of long-term interest rates. Nerlove (1958) distinguished between expectations that are induced by past movements in the variable in question and autonomous expectations which are not; only the former he believed were amenable to economic analysis[10]. A recent study, by Rutledge (1974) casts some doubt on this proposition; Rutledge was concerned with the generation of expectations about the rate of inflation and with the possibility that market participants utilise information other than that furnished by autoregressive models; and in particular that they will learn to understand the structure of the economic process generating the variable being forecast. Forecasting is regarded, by Rutledge, as a productive activity into which information enters as an input such that each source of information will be exploited until the marginal cost of exploitation is equal to the marginal return[11]. The idea that market participants are encouraged, as an optimising form of behaviour, to gather information about the structure of the economy and thus that expectations will depend upon the understanding of the structure of the economy was first advanced by Muth (1961) in his path-breaking work on the theory of Rational Expectations; in which expectations, being informed predictions of future events, are "...essentially the same as the predictions of the relevant economic theory..[12]". Since Muth chose to illustrate the theory with a model in which only one exogenous variable appeared the result was that the rational expectations which would be formed by market participants in full knowledge of the structure of the economic system was reducible to an autoregressive form; the only information required to produce an optimal forecast was the past behaviour of the relevant variable. It has been argued by Nelson (1972) and by Walters (1971) that this is a misinterpretation since if more than one exogenous variable enters into the forecasting of a variable the forecast

cannot be reduced to the virtual extrapolation of the history of the variable in question; in other words 'weak-form' hypotheses, including adaptive expectations, cannot be deduced from well-grounded axioms of optimal behaviour and must be regarded as 'ad hoc'.

There is the added implication that when market participants, within the logic of the adaptive expectations hypothesis, revise their expectations in response to previous errors they will also take into account information, provided from other sources of a non-autoregressive nature, that arises from the structure of the economic system. The costs of information processing may be prohibitive for individual market participants so that some pooling of the forecasting activities may occur. The development of the money markets, though in the past due to an attempt to minimise the search costs of borrowers and lenders, can also be ascribed to the pooling of information-processing that money brokers achieve. The results are then passed on as forecasts to local authorities who pay for them through the commission charged on loans negotiated. Although the empirical results considered in chapter 4 are concerned only with autoregressive models it is as well to bear in mind their shortcomings.

One final point will be made about adaptive expectations models. It has been pointed out by Bierwag and Grove (1966) that if the parameters of adaptive expectations functions differ among economic units and the market expectation is a weighted combination of individual expectations then the function representing aggregate behaviour is not a Koyck function with geometrically declining coefficients but rather some other function belonging to the general class of Pascal distributed lag functions. This problem could only be obviated by assuming that the same expectations are held by all local authorities; but of course this is incompatible with the assumption of the normal rate hypothesis that local authorities differ in their idea of the critical normal rate.

3:2 (a) Local Authority Borrowing Under Conditions Of Risk

The framework of section 3:1 in which a limited dual-maturity debt selection process was explained in terms of a 'normal' rate hypothesis is open to the same criticisms that were leveled at the original Keynesian form. Johnson (1961) regarded Keynes' concentration on expectations of future charges in interest rates as the determinant of the asset-demand for money as a major limitation[13]. Tobin (1958) in his seminal work on liquidity preference was able to show that it was not necessary to assume inelastic interest-rate expectations only that there is uncertainty about the future course of interest rates. In what follows there will be an attempt to show that when mean-variance analysis is applied to the rationalisation of debt selection behaviour, it is necessary, in fact, to assume that borrowers have inelastic and not unit elastic expectations of interest rates.

For the purposes of the model[14] it will be assumed that:-

(a) All local authority borrowers are single-period expected capital cost minimisers.

(b) Borrowers have identical expectations of the future course of interest rates.

(c) There are only two forms of debt differentiated by maturity: a short-term debt incurred for the duration of the decision period; and a long-term debt incurred for 'n' periods.

(d) The borrowing requirement made necessary by capital expenditure is fixed for the decision period; and must be satisfied within the period by either short-term or long-term borrowing, or both.

(e) There are no limitations on the amount of the borrowing requirement that can be satisfied by short-term borrowing.

(f) At the beginning of the first period there is no inherited debt.

(g) Borrowing short-term or long-term does not affect inter-temporal relative interest rates.

A number of these assumptions will be relaxed in both this and subsequent sections.

If a borrower at the beginning of the first period contracts for a loan the expected capital cost saving can be written from equation [3.2] as:

$$E(D) = TB_{(t)} \left[(1 + R_{L(t)})^{n} - (1 + R^{M}_{L(t+1)})^{n-1}(1+R_{St}) \right] \quad [3.10]$$

where E(D) is the expected capital cost saving as compared with D the capital cost saving expected with certainty; $R^{M}_{L(t+1)}$ is the mean expected long-term interest rate; and $TB_{(t)}$ is the proportion of the borrowing requirement met on a temporary basis.

In Tobin's original paper uncertainty about the future rate of interest on consols meant that investment in consols involved a risk of capital gain or loss. Since the investor was assumed to hold unit-elastic expectations the expected capital gain was zero; so that the expected return on a portfolio invested in cash and bonds was equal to the rate of interest times the proportion of the portfolio invested in bonds. In the case of borrowing if borrowers are assumed to hold unit-elastic expectations then the expected difference between the current and the mean expected long-term interest rate will be zero; this is because of the expectation that, on average, at the beginning of the next period the long-term interest rate will be the same as at the beginning of the first period. But since the current short-term interest rate is known the value of E(D) is known and whether local authorities borrow on a short-term or a long-term basis will depend upon the difference between the short-term and the long-term interest rate, the lon term rate and the risk entailed by the probability distribution of possible capital cost savings. Thus:-

$$E(D) = TB_{(t)} \left[(R_{L(t)} - R_{S(t)})\ (1+R_{L(t)})^{n-1} \right] \quad [3.10.a]$$

is the expected capital cost saving; and:

$$\sigma_D^2 = E\left[(D - E(D))^2\right] \qquad [3.10.b]$$

is the percentage variance of capital cost savings. The more that is borrowed on a temporary basis the greater the total risk, thus the total variance is:-

$$\sigma_T^2 = TB_{(t)}\,\sigma_D^2 \qquad [3.10.c]$$

where σ_T^2 is the total variance.

The terms on which the borrower can obtain greater expected capital cost savings at the expense of assuming more risk can be derived from [3.10.a] and [3.10.c] .

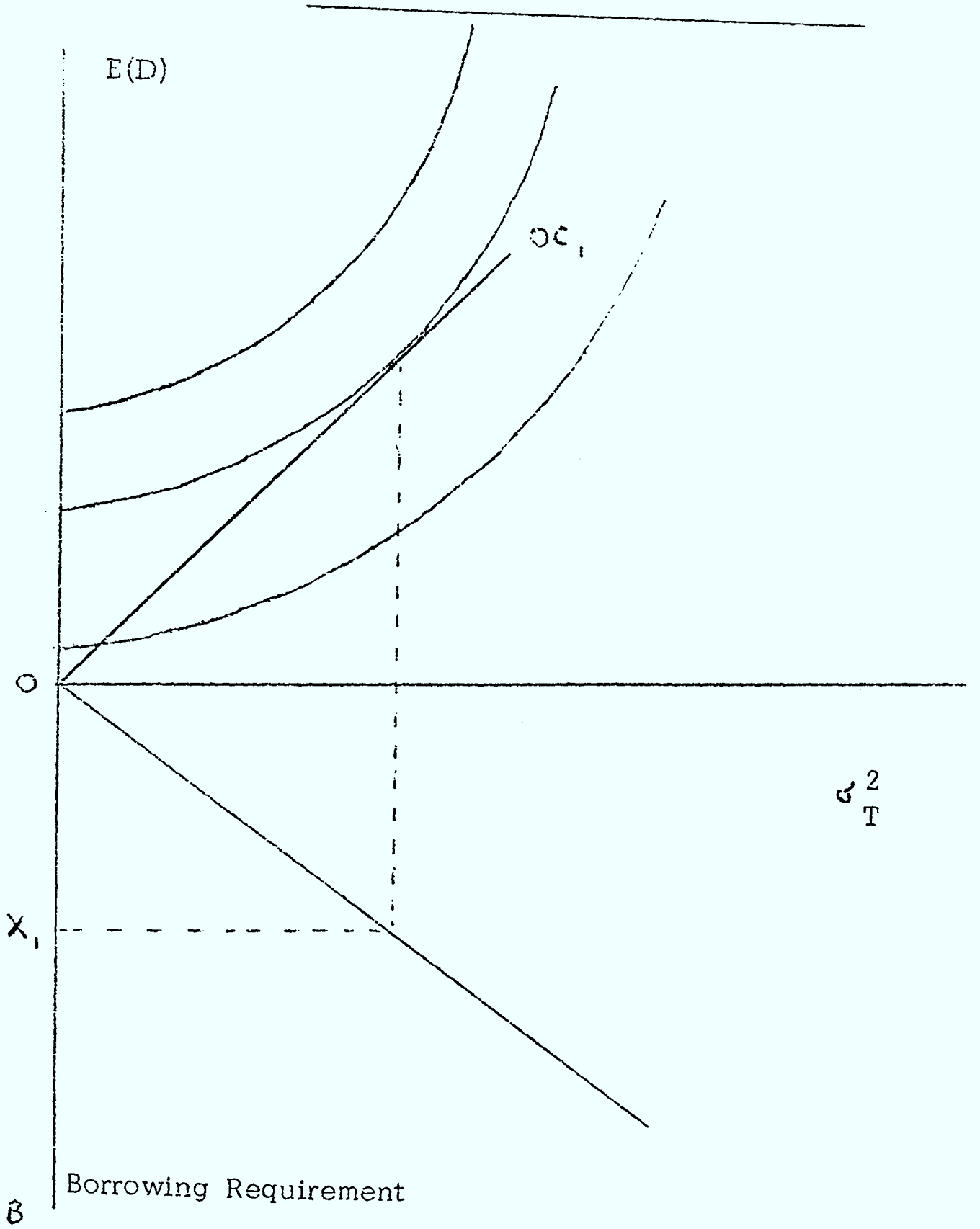
$$E(D) = \frac{\sigma_T^2}{\sigma_D^2}\,(R_{L(t)} - R_{S(t)})\,(1+R_{L(t)})^{n-1} \qquad [3.10.d]$$

This gives the technical situation facing the borrower - the opportunity locus along which is traded increased risk and increased expected savings. The slope of the line is $\left[(R_{L(t)} - R_{S(t)})\,(1+R_{L(t)})^{n-1}\right] / \sigma_D^2$; shown as OC_1 in figure [3.1]

The length of the lower vertical axis, OB, is the borrowing requirement. The amount of temporary borrowing is measured from the origin; long-term borrowing is then (OB-TB). For any given σ_T^2 the value of TB can be located by multiplying by or by reflecting it from the line with slope $1/\sigma_D^2$ in the lower quadrant of figure 3:1. The equilibrium risk and expected capital cost saving can be determined by assuming that a borrower have preferences between E(D)and σ_T^2 such that the borrower is indifferent between all pairs $(E(D), \sigma_T^2)$ that lie on curve I_1, in figure 3:1.

FIGURE 3:1

Debt Selection At Various Values Of
$(R_{Lt} - R_{S(t)})\ (1 + R_{L(t)})\ n-1$



It will be assumed that the map of indifference curves describe risk-averting behaviour so indifference curves are concave upwards and borrowers will only accept more risk for more expected cost saving. The tangency of OC_i and the indifference curve I_1 gives the equilibrium values of σ^2_T and $E(D)$. The determined value of σ^2_T makes it possible to establish the level of temporary borrowing as OX_1.

Holding constant the borrower's estimate of the dispersion of possible capital cost savings, with positive or negative values, an increase in the difference between the long and the short-term interest rate, or more precisely the excess of the long over the short rate, will rotate the opportunity locus to the left so for the same level of risk a higher expected capital cost saving can be achieved. An increase then in the difference between the long-term and the short-term interest rate will increase the amount borrowed on a temporary basis. If, however, the short-term interest rate exceeds the long-term interest rate the opportunity locus will rotate into the lower quadrant and no temporary borrowing will occur.

It appears, therefore, that the application of mean-variance analysis, under some restrictive assumptions, to the supply-side of the market in assets and liabilities, and on the basis of unit-elastic expectations of the future interest rate, results in the conclusion that the proportion of a borrowing requirement that is met by short-term borrowing will depend on the difference between the long and short-term interest rate. Even casual inspection of the available data, however, suggests that is not a very important determinant of temporary borrowing. The triviality of the model outlined so far may be due to its confinement to a single-period; if more than one period is considered it becomes necessary for the borrower to forecast not only the expected interest rate but also the short-term rate that will prevail at the beginning of each successive period.

An alternative way of providing a more realistic model is to drop the assumption that the borrower holds unit-elastic expectations. This means that the expected long-term interest rate becomes, as in section 3:1, a function of past interest rates. For expositional purposes it will be assumed that the mean expected long-term interest rate is equal to the long-term interest rate in the previous period: that is, $R^{M}_{L(t)} = R_{L(t-1)}$. Thus equation [3.10] can be rewritten

$$E(D) = (1+R_{L(t)})n - \left[(1 + R_{L(t-1)})n-1 \ (1 + R_{S(t)})\right] \qquad [3.11]$$

It is not necessary to repeat the mean-variance analysis to see that temporary borrowing is now a positive function of both the first difference of the long-term interest rate $(R_{L(t)} - R_{L(t-1)})$ and $(R_{L(t)} - R_{S(t)})$; very much the form arrived at in section 3:1 and described by equation [3.9].

3:2.b A Relaxation Of Some Of The Assumptions Of The Mean-Variance Model

The conclusions of section 3:2 are only clear-cut because many of the complications were assumed away by focusing on a single-period, by ignoring the difficulties created by inherited debt; and by assuming that two forms of debt, differentiated only by maturity, were available to local authorities. No attempt will be made to deal with all of the difficulties the relaxation of the assumptions produce. Instead the approach will be to show how they can be integrated into the analysis without actually providing detailed solutions.

First, inherited debt. By assuming that no inherited debt was in existence from prior periods there was no need to allow for temporary debt incurred at the beginning of the first period, t, coming up for renewal at t+1. If the proportion of the borrowing requirement met on a temporary basis in the first period is a_1 then the temporary debt due for

renewal in the second period will be $a_1 B_{(t)}$, where $B_{(t)}$ is the first period borrowing requirement and $o \leq a_1 \leq 1$ The decision in period $t+1$ will involve not only the new borrowing requirement $B_{(t+1)}$ but also $a_1 B_{(t)}$ thus:

$$a_1 B_{(t)} + B_{(t+1)} = GB_{(t+1)} \qquad [3.12.a]$$

where $GB_{(t+1)}$ is the gross borrowing requirement[15]. If in period $t+1$, a_2 of the gross sum is met on a temporary basis the inherited short-term debt in period $t + 2$ is:

$$a_2 (a_1 B_{(t)} + B_{(t+1)}) \qquad [3.12.b]$$

where $o \leq a_2 \leq 1$

and the gross sum in period $t + 2$ will be:

$$a_2 (a_1 B_{(t)} + B_{(t+1)}) + B_{(t+2)} = GB_{(t+2)} \qquad [3.12.c]$$

therefore after ' n ' periods the inherited short-term debt will be:

$$(a_n a_{n-1} \ldots a_1) B_{(t)} + (a_n a_{n-1} \ldots a_2) B_{(t+1)}$$

$$+ \ldots + (a_n a_{n-1}) B_{(t+1n-1)} \qquad [3.12.d]$$

After 'n ' periods it is possible that the long-term debt, $(1-a_1)B_{(t)}$, incurred in the first period will come up for renewal. Whether this occurs will depend upon the period over which the debt incurred has to be serviced. If the loan sanction is for ' n ' periods then there will be no renewal of any maturing long-term debt.

The consequence of including inherited temporary debt in the model is that after the first period net temporary borrowing can be negative because of funding. In the second period temporary

debt carried forward from the first because of an expectation that the long-term interest rate was to fall in the second, could be funded because the expectation of a fall was realised. Alternatively, if in the second period the long-term interest rate did not fall the inherited temporary debt could be carried over into the next period along with a proportion of the current borrowing requirement that is met on a temporary basis.

While it is clear that the introduction of inherited short-term debt into the model provides more realism it has still been assumed that only two forms of debt are involved. In fact debt selection decisions involve more than one-period and 'n' period horizons; there is also the possibility of holding expectations about two or more periods so that if there is an expectation that the long-term interest rate will not fall until the end of three periods a local authority could borrow for three periods and then fund. In addition the local authority could contract three one-period loans; the first to begin immediately and the other two to begin at the beginning of the subsequent periods. Once the possibility of multi-period borrowing is allowed it becomes necessary for the borrower to hold expectations not only about the long-term interest rate at the beginning of the next period but also of short and long-term interest rates over all subsequent periods and for all maturities. The need to know, in other words the term structure of interest rates both now and in the future brings local authority debt selection behaviour within the compass of the various theories, both expectational and institutional, that have been advanced to explain the term structure. These theories are discussed in the next section; and a number of alternative models of debt selection behaviour which are suggested by the discussion are considered. The assumption that the pattern of local authority borrowing does not affect inter-temporal relative interest rates is of relevance also and the implications of its relaxation will be considered as well.

3:3 Theories Of The Term Structure Of Interest Rates And Local Authority Borrowing

It is usual to distinguish three competing theories of the term structure of interest rates: the traditional Expectations Hypothesis; Hicks' Liquidity Premium Theory; and the institutionally grounded Hedging Pressure (also denoted 'Preferred Habitat' and 'Market Segmentation') Theory. The second theory, that of Hicks', will not, however, be considered[16]. In its place there will be substituted a variant of the Expectations Hypothesis developed by Malkiel (1966), because the main focus of this study is concentrated on the borrowing side of the market and Malkiel's ideas are of particular interest in this context.

The impact of the supply side of the market on the term structure of interest rates raises some problems of simultaneity since in the model outlined in the previous sections it was assumed that the pattern of local authority borrowing does not affect long and short-term interest rates This, nevertheless, does not accord with the view of the monetary authorities that in the early sixties, at the very least, local authority temporary borrowing raised short-term interest rates independently of any rise caused by the monetary authorities. Thus "competition for short-term funds by local authorities has on occasions forced...rates up to high levels"[17]. If shifts in the maturity composition of local authority borrowing do alter the spread between the long and short-term interest rate any results reported on the basis of the model already outlined will be biased. The theoretical possibilities of such an effect occurring will be pursued in what follows; the empirical relevance will be explored in chapter 4.

Almost without exception explanations of the term structure of interest rates have been confined to the behaviour of investors. One possible reason for this may be that most studies have used yield curves constructed from data on default-free government securities; and it is usual to assume that governments supply securities of various maturities according to criteria different from those that influence investors[18]. This is not to suggest, however, that the supply side plays no part in theories of the term structure - in fact it plays a crucial role in the Hedging Pressure Theory - it is just that little if any formal analysis of the behaviour of borrowers has been carried out as compared with that of the behaviour of lenders[19].

3:3.a The Expectations Hypothesis

The traditional expectations hypothesis, as conventionally stated admits of no role for changes in relative supplies of debt; so that a change in relative supplies of securities with different maturities will not alter either the level or the spread of interest rates. It appears to follow, then, that a switch by local authorities into the short end of the market cannot, contrary to the claim of the monetary authorities, raise short term interest rates. Whether or not, within the context of the expectations hypothesis, this is correct depends on the factors determining the relative supplies of local authority debt. The above claim is based on the assumption that the supply of debt is exogenously determined, something regarded as appropriate for the supply of government debt. If, however, the supply of local authority debt is dependent upon the same factors that determine the demand for securities of various maturities, then the supply side is likely to determine the term structure as much as the demand side.

This contention will be clearer when the hypothesis has been explained in more detail.

The expectations hypothesis rests on three basic premises which were originally detailed by Lutz (1940).

a. Everyone involved in financial markets knows what future short term interest rates will be.
b. Transactions costs for borrowers and lenders are zero.
c. There is total shiftability for lenders and borrowers. The lender is equally prepared to buy a ten year bond or to make ten one-year loans. The borrower is willi equally to issue a ten-year bond or to issue ten one-year bonds in succession.

From these assumptions follows the 'Equalisation Theorem' which states that the expected return from investing a unit of money for any given length of time should be the same no matter what length-of-life assets are purchased by investors in financial markets. The theorem can be writter using a different notation from that in sections 3:1 and 3:2, as:

$$(1 + R_n)^n = (1 + R_1)(1 + r_2)\ldots(1 + r_n) \qquad [3.13.a]$$

where R_n is the current long-term interest rate for 'n' periods, R_1 is the current one-period rate and $r_2 \ldots r_n$ are 'forward' or expected short-term rates (note $R_1 = r_1$). The long-term interest rate is a geometric average of the current spot one-period rate and all 'expected' one period rates up to the 'n'th period. This describes an equilibrium and is brought about by investors shifting between the long and short ends of the maturity spectrum in

response to differences in expected returns.

The same theorem, moreover, must follow from the behaviour of borrowers. If borrowers act under the same three premises the maturity structure of debt will be such that the expected cost of borrowing for 'n' periods will be the same as for borrowing successively for single periods. Equally any combination of length-of-life issues will yield an identical capital cost. The equialisation theorem must then follow as it does from the behaviour of investors[20]. When both sides of the market are considered the resulting term structure must be determined simultaneously such as to ensure equalisation of expected costs and expected returns for borrowers and investors.

The expected short-term interest rates are actually unobservable but, given the assumptions of the expectations hypothesis, are embodied implicitly in the equalisation theorem. If equation [3.13.a] is written:

$$(1 + R_{n-1})^{n-1} = (1 + R_1)(1 + r_2) \ldots (1 + r_{n-1}) \qquad [3.13.b]$$

divided into equation [3.13.a] and rearranged it gives

$$r_n = \frac{(1 + R_n)^n}{(1 + R_{n-1})^{n-1}} - 1 \qquad [3.13.c]$$

Thus from the actual long-term interest rate on 'n' and 'n' period bonds the expected one-period rate at the beginning of the 'n'th period can be calculated

If there is the expectation (it is assumed that all market participants hold the same expectations) that short-term interest rates will rise monotonically in the future then at

time 't ' the long-term interest rate will exceed the short-term rate of interest because investors will shift to the short end in the expectation of capital gains while borrowers will fund in the expectation that it will be more expensive to borrow in the future. Alternatively, if monotonically falling short-term interest rates are expected investors will buy long-term bonds and borrowers will shift into the short end of the market in the expectation of being able to fund in the future.

The assumptions on which the expectations hypothesis rest are particularly extreme but they do enable some substantial conclusions to be drawn. Some relaxation, however, is necessary if the hypothesis is to provide a framework to explain the actual pattern of local authority borrowing. The last assumption, that of complete shiftability, is not tenable when local authority behaviour is under scrutiny. It has already been hypothesised that local authorities shift between the long and the short end of the market in response to variations in the expected cost of borrowing. Local authorities, however, are constrained by how much of their total debt they can hold on a temporary basis - more attention will be given to this shortcoming in the next chapter. Furthermore, much of the debt issued by local authorities is not marketable; and yet a cornerstone of the pure expectations hypothesis is that the asset in question is available in the open market to be bought or sold in response to differences in expected returns. If there is no secondary market in previously issued debt and there exists no provision for the premature retirement of outstanding obligations a local authority will be locked into an irreversible commitment until the debt entered into comes up to redemption. This will create a large measure of inflexibility in both debt and portfolio management.

Decisions, therefore, on which period to borrow for can only be made as existing debt matures or as new obligations arising from new capital expenditure are taken up.

The second assumption, that of zero transactions costs, will not be discussed here; but reference will be made to it when Malkiel's ideas are considered later. The first assumption, that market participants know what future short term interest rates will be has been the subject of much debate. It can be interpreted in two possible ways. In the sense that market participants have 'objective' knowledge of future rates; or in the sense that market participants have 'subjective' knowledge of future interest rates. The first interpretation is based on the view that perfect information of the future makes all future interest rates known with certainty. The second and weaker interpretation only maintains that market participants believe they know with complete certainty the future. This is more in accordance with the Keynesian expectation - held-with-certainty formulation used to explain local authority borrowing in section 3:1. The subjective knowledge assumption of the expectations hypothesis has been given a different and very important twist by Meiselman and his contribution will be considered next.

3:3.b. Meiselman's Contribution To The Empirical Testing Of The Expectations Hypothesis

Prior to the work of Meiselman empirical testing of the expectations hypothesis rested on the assumption that for the hypothesis to have any relevance as an explanation of market behaviour and of the term structure it was necessary that the expectations upon which market participants acted were correct[21]. But "...to assert that

behaviour is governed by expectations is something quite different from asserting that expectations are accurately formed"[22]. Meiselman's contribution was to abandon the assumption that expectations need necessarily be correct and to substitute in its place the assumption that if expectations turn out to be confounded they are revised in a consistent fashion. This is equivalent to the adaptive expectations model employed earlier and means in this context that if the actual one-period rate at time ' t ' is different from what it was expected to be in the previous period, market participants will revise their expectations of future one-period rates in proportion to the degree of error incurred in forecasting the present one-period rate. The twist which he gives to the empirical verification of the expectations hypothesis is that no attempt is made to explain the term structure itself; instead he explains how the term structure changes over time - that is by changes in expectations induced by errors in forecasting the level of the one-period rate - and tests this hypothesis.

More formally, let ${}_{t}r_{n}$ represent the expectation formed in period ' t ' concerning the one-period interest rate on a loan to be made at a fixed point of time in the future ' n The notation is that used by Meiselman. Then ${}_{t-1}r_{n}$ is the expectation of the one-period rate at time ' n ' formed at time ' t-1 ', and ${}_{t-1}r_{t}$ is the expectation of the current one-period rate formed in the previous period. Meiselman postulated that the one-period rate expected to prevail in ' n ' periods will be changed in proportion to the difference between the actual current one-period rate and what it was expected to be in the previous period. Thus:-

$$ {}_{t}r_{n} - {}_{t-1}r_{n} = b\left({}_{t}R_{t} - {}_{t-1}r_{t}\right) \qquad [3.14.a] $$

Since these are 'expected' rates they are not directly observable. Meiselman did not employ any scheme based on previous observed rates to generate expected values because according to the hypothesis he wanted to test "...expectations are already impounded and discounted in the term structure[23]". Thus the 'forward' rates revealed by the market and embodied in the yield-to-maturity curve, he takes as unbiased indicators of the market's expected rates[24]. The equation that he actually fitted was:

$$_{t}r_{n} - _{t-1}r_{n} = a + b\,(_{t}R_{t} - _{t-1}r_{t}) \qquad 3.14.b$$

where $_{t}r_{n}$ is the forward rate implicit in the term structure and calculated from equation 3.13.c and the constant term allows for the possibility of liquidity preference[25].

Meiselman's hypothesis is an attempt to explain changes in the term structure by changes in expectations about short-term interest rates. It is clear, however, that to have such a link it is necessary that any change in expectations is acted upon; in other words, market participants, both borrowers and lenders, must alter the composition of their portfolios and the maturity structure of their debt; a step which will in turn alter the term structure of the previous period and thereby embody in the new one the new expected one-period rates. Meiselman's attention was directed at the lending side of the market; but as with the traditional formulation the analysis on the supply side is completely analogous. If borrowers find that they are wrong in their expecations about short-term interest rates they will revise their expectations in proportion to the error. If the actual interest rate turns out to be greater than was expected then expectations of future one-period rates are revised upwards. The difficulty lies in trying to specify in what

ways a local authority will alter its borrowing behaviour, according to the premises of the Meiselman Hypothesis, in response to an upward revision of expected one-period rates. The effect on borrowing can be seen more clearly if in the first instance attention is concentrated on a first period decision and expected long-term interest rates. For instance, since the long-term rate is an average of current and forward short-term rates, if expected short-term rates are revised upwards expected long-term interest rates will also be revised upwards. Thus if there is an error in the forecasting of the one-period rate the expected long-term interest rate at ' t+1 ' will also be revised. At the beginning of the first-period, 't+1', the expectation will be that at the margin the expected unit capital cost of borrowing for ' n ' periods will be the same as the expected capital cost of borrowing for one period and then borrowing for 'n-1' periods at the beginning of the subsequent period. That is:

$$(1 + {}_{t}R_{nt})^{n} = (1 + {}_{t}R_{n-1(t+1)})^{n-1} \quad (1 + {}_{t}R_{1t}) \qquad [3.15.a]$$

where ${}_{t}R_{n-1(t+1)}$ is the long-term rate of interest expected to prevail at the beginning of the second period and ${}_{t}R_{1t}$ is the short-term interest rate prevailing for the first period. If the forecasted long-term rate turns out to under-estimate the actual long-term rate at 't+1' expectations, according to Meiselman, are revised upwards. The expectation that the long-term interest rate will be higher in the future leads to the inference that borrowers will choose to fund while interest rates are low; and so temporary borrowing will be a negative function of the forecasting error. The increased supply of long-term debt will raise long-term interest rates and lower short-term interest rates and produce a steeper term structure; which is the same profile obtained from an analysis of the behaviour of investors.

An extention of the argument to many issue periods for debt raises a number of difficulties. Although expectations are regarded as referring to periods over a considerable period of time into the future it is not clear how revisions in such expectations are related to changes in the maturity composition of debt. Such a relationship could be formalised as:-

$$t\,{}^{B}_{n} - t-1\,{}^{B}_{n} = f\,(t\,{}^{r}_{n} - t-1\,{}^{r}_{n}) \qquad [3.15.b]$$

where $t\,{}^{B}_{n}$ are net amounts of debt issued at time ' t ' for issue periods 1 to n . Changes in the amount issued, then, within each bond of the maturity spectrum will be related to revisions in expected interest rates. While, however, it appears that net short-term debt should be reduced if expectations turn out to under-estimate the actual rate, and very long-term debt increased, there is no certainty as to what happens in the middle range between the two. There is an additional complication involved in the use of the revision in expectations as an independent variable in any model explaining the pattern of borrowing. There is, by assumption, a simultaneous relationship between the new term structure incorporating the revised expectations and the pattern of borrowing. How important this bias will be depends upon how significant local authority borrowing is in the capital and money markets.

3:3.c Malkiel's Hypothesis

Malkiel (1966) has proposed an alternative formulation of the expectations hypothesis. He takes the view that although the expectational approach is in principle correct a more reliable explanation of the term structure of interest rates can be achieved if a short decision period is substituted for the long-run horizon implicit in the

traditional view; and if more attention is paid to the role of expected bond price changes rather than expected future short-term interest rates. Thus investors will pay particular attention to bond price movements when deciding whether to invest at the short end or the long end of the market; and in turn this will determine the term structure.

In forming a judgement about likely movements in bond prices, Malkiel suggests that the investor has in mind, what he calls, an 'expected normal range of interest rates'. This is a frame of reference against which likely changes in specific current interest rates can be judged. In this way an opinion can be formed of 'expected' specific interest rate changes which provide guidance on possible capital gains or losses from investing in different parts of the market. If it is believed that interest rates are going to rise to the upper bound of the normal range it will imply for investors as a whole that short bonds are relatively more attractive to hold than long bonds. The short rate will fall while the long rate will rise. The yield gap will be positive and will be reflected in an upward-sloping yield to maturity curve. Alternatively,if the rate of interest is expected to fall to the lower bound of the normal range, investors will attempt to divest themselves of short bonds in an endeavour to increase holdings of long-term bonds which promise to produce the greater capital gain. There will emerge a downward sloping yield to maturity curve.

The actual hypothesis which he tested was that when the level of interest rates is near the upper bound of the normal range, the spread between long and short rates will be small and possibly negative. When the level of rates is near the lower bound the spread will be relatively large. By taking the long term interest rate as

representative of the general level of interest rates, Malkiel was able to write the postulated relationship as:

$$R_{L(t)} - R_{S(t)} = f\left[\frac{(R_{L(t)} - R_{LN(t)})}{(R_{LUN(t)} - R_{LN(t)})}\right] \qquad [3.16.a]$$

where $R_{L(t)}$ and $R_{S(t)}$ are as before, $R_{LN(t)}$ is the lower bound of the normal range and $R_{LUN(t)}$ is the upper bound[25].

Equation [3.16.a] is not in an operational form and it is therefore necessary to indicate how the normal range is to be calculated. Malkiel suggested that investors form their expectations of the limits of the normal range by taking some average of rates over some period in the past, with the more immediate past being more influential, and adding a specific number of standard deviations to each side of the average. The standard deviations are calculated over a very long period of time and are considered constant from year to year. Thus the upper and lower bounds of the normal range can be written as:

$$R_{LUN(t)} = R^{n}_{L(t)} + k\sigma \qquad [3.16.b]$$

$$R_{LN(t)} = R^{n}_{L(t)} - k\sigma$$

where $R^{n}_{L(t)}$ is the moving average of long-term interest rates and is equivalent to $R^{e}_{L(t)}$ of section 3:1, the expected or normal long-term interest rate; and k is a constant. Substituting [3.16.b] into [3.16.a] gives the amended hypothesis:

$$R_{L(t)} - R_{S(t)} = f\left[\frac{R_{L(t)} - R^{n}_{L(t)} + k\sigma}{2k\sigma}\right] \qquad [3.16.c]$$

A straight-forward approximation to equation [3.16.c] is:

$$R_{L(t)} - R_{S(t)} = f\ (R_{L(t)} - R^{n}_{L(t)}) \qquad [3.16.d]$$

and linearising gives:

$$R_{L(t)} - R_{S(t)} = a_o + a_1\ (R_{L(t)} - R^{n}_{L(t)}) \qquad [3.16.c]$$

The only remaining task is to specify how $R^{n}_{L(t)}$ is to be calculated. Malkiel proposed that investors have in mind when forming their expectations the course of interest rates over the previous ten to fifteen years. A number of averages, both arithmetic and geometric, were then calculated and used in the regressions that he ran.

Although Malkiel conducts his analysis largely from the point of view of the investor he does acknowledge that the same arguments can be employed on the borrower's side. "An analysis of the introduction of expectations to the supply side of the market is completely analogous to our previous argument. If issuers of securities believe that interest rates are relatively high compared with their expectations of what constitutes a normal range, they will tend, to whatever extent possible, to issue short-term securities rather than longer bonds. Conversely, if rates appear attractive, issuers will take advantage of the opportunity and issue long term securities. The motivation of issuers cannot be cast in terms of price risks but must rather be explained by considering the desire to minimise long-run financing costs."[26]

This describes in a nutshell the model outlined in section 3:1. One difference between it and that proposed

by Malkiel is in the use of a 'normal' or expected interest rate. While Malkiel employs an average of past rates to measure the normal rate, in section 3:1 an adaptive expectations hypothesis was used to generate a distributed lag scheme which was then rendered estimateable by a Koyck transformation.

Dodds and Ford[27] have pointed out that the introduction of expectations to the supply side in Malkiel's hypothesis means that the difference between the long and the short rate is accentuated at each point in time. "Thus, suppose that the long rate is near the lower bound of the normal range. Just looking at the investors' side of the market would produce the conclusion, according to the Malkiel hypothesis, that the current long rate should stand above the current short rate. Investors will move into the short end of the market and out of the long end. ...Borrowers 'ought' to borrow long-term, in which case the supply of long bonds will increase and the supply of shorts may fall. These supply changes will aggravate the decline in the price of long bonds and the decrease in short yields. The yield-gap will be larger than it would have been if supply had been passive; but it will be of the same sign"[28].

The possibility could be tested that in the market for all forms of local authority debt, because supply is not passive the yield-gap is accentuated at all points in time.
An alternative way in which the Dodds-Ford hypothesis could be tested would be to compare the market in local authority debt with a market in which supply sometimes actually off-sets demand with the consequence that the yield-gap is narrowed at all points in time. Such a market might be that in government securities in the U.K.

Goodhart (1974) has argued that the view which the monetary authorities have taken, before 1971, of how investors in financial markets act is very much that propounded by Malkiel[29]. According to the monetary authorities, investors have short planning periods and are influenced decisively by expectations of short-term capital gain and loss. This has meant that they have been very reluctant to attempt to lead the market by buying and selling gilt-edged securities. They have preferred, instead, a policy of continuously 'leaning into the wind'. This means in practice that, in terms of the discussions above, any tendency on the part of investors to switch between government bonds of differing maturities has been accommodated by the monetary authorities to prevent wide fluctuations in bond prices. The moderating influence on the market of official intervention should mean that the resulting term structure at any moment in time will be different from that which would otherwise have prevailed as a consequence of the climate of expectations at that moment in time.

If it is to be maintained that the spread between short-term and long-term interest rates in the local authority market will differ from the spread in the market for government debt because the monetary authorities pursue a policy of leaning into the wind while local authorities, because they switch between each end of the market in response to changes in expected capital costs, actually accentuate the yield-gap in the market for local authority debt, it is necessary to assume that a degree of capital market imperfection exists sufficient to ensure that arbitrage does not erase any differential between long rates and short rates in the two markets that is not due solely

to differences in marketability and risk of default.

It is possible, moreover, that the influence of the supply of local authority debt will differ as between the long and short end of the market. A considerable and, since 1964, gradually rising proportion of local authority long term funds have been obtained from the P.W.L.B. The monetary authorities have exercised, in addition, control over the terms and timing of local authority issues of negotiable bonds and stocks and these factors may weaken the impact on the long end of the market. Atthe short end, on the other hand, despite the restrictions on temporary borrowing described in the previous chapter, local authority borrowing is likely to have more effect.

3:3.d The Hedging Pressure Theory

In its extreme form the Hedging Pressure Theory (also called 'Market Segmentation' or 'Preferred Habitat') is in complete opposition to the traditional Expectations Theory. It is maintained that the difference between yields on bonds of differing maturities is caused by an imbalance between the maturity structure of debt demanded by investors and that supplied by borrowers. Lenders (and possibly borrowers) do not shift up and down the maturity spectrum in response to differences in expected returns. Instead investors have 'preferred habitats' determined solely by the structure of their liabilities. If an investor's liabilities are primarily long-term then, it is argued, holdings of assets will be primarily long-term. This, of course, is subject to the proviso that there is an adequate supply of long-term debt. If there is not then the investor will be unable to match fully assets and liabilities. Investors, then, will not be influenced by expectations; even if they form expectations of future interest rates, they do not act upon them.

A weaker version of the Hedging Pressure Theory allows for some switching out of preferred habitats when interest rates move sufficiently to outweigh the desire to match assets and liabilities. Alternatively the theory can be formulated so that investors have a preferred habitat range and short run expectations will stimulate movement between bonds but only within the relevant maturity range.

Whichever interpretation of the Hedging Pressure Theory is chosen, one prediction results: ceteris paribus, the term structure is determined by the maturity structure of outstanding debt. Supply, therefore, is the critical factor in this theory.

It is not altogether clear whether speculative activity on the part of borrowers, in a situation in which investors have 'preferred habitats' for their assets, is a sufficient condition to generate a term structure in accordance with the postulates of the traditional theory. That this possibility has not been considered in the literature is an indication that it is felt to be implausible. Concentration on government bond yields makes it unlikely that this possibility would suggest itself since governments, as has already been noted, do not act in the ways postulated by the traditional theory.

Malkiel in an analysis of the supply side of market comes to the conclusion that bond issuers (borrowers) are unlikely to move much up and down the maturity spectrum because, what he calls, new - issue costs are so high that the saving in interest rate charges arising from speculative movements are unlikely to be sufficient to tempt borrowers out of their preferred habitat area[30]. He acknowledges, therefore, that the advocates of the Hedging Pressure Theory are probably correct in asserting that, in the U.S.A

at least, private - and municipal - bond issuers do not appear to have been induced to make long-run changes in the maturity composition of their debt. He does, however, point out that the high level of transactions costs does not exclude anticipatory or delayed funding. That is to say, if interest rates are high borrowers will postpone issuing bonds until rates fall; or if rates are low they will attempt to bring issues forward[31]. Thus, "The timing of long-term debt issues may still conform to the behaviour suggested by the expectations theory"[32]; so that the flexibility afforded borrowers to adjust the timing of their long-term bond issues will allow "expectations to exert considerable influence"[33].

Malkiel's comments apply to the institutional features of the American economy which differ in some crucial aspects from those in the U.K. If we consider the local authority money market, its highly organised nature and the volume of transactions seems to reduce transactions costs. The credit-worthiness of local authorities enables them, furthermore, to move between the short end and the long end of the market without too much difficulty - subject to the restrictions on temporary borrowing, on revenue bills, and on negotiable bonds and stocks operated by the monetary authorities. This has meant that local authorities in the U.K. have been able to shorten the maturity composition of their debt in the short-term and in the long-term.

In the U.K. at least then, there is some indication that one sector, the local authority, acts in a way which is contrary to the behavioural tenets of the Hedging Pressure Theory. It has already been suggested that their borrowing behaviour is influenced by expectations about the future course of interest rates. This is not, however, a

sufficient condition to refute the Hedging Pressure Theory of the term structure of interest rates or for that matter to establish the expectations type theory. The evidence can only be indicative and how important it is found to be will depend on how influential local authority borrowing is relative to the total flow of funds.

3:3.e Recent Empirical Evidence On The Term Structure: The Influence Of The Supply Of Debt

Much of the recent work on both the theoretical and empirical aspects of the term structure, in contradistinction to the Meiselman approach, has concentrated on explaining the difference between the short and the long rate by weighted values of past interest rates - much on the lines developed by Malkiel but with some important differences. The seminal work is that of De Leeuw (1965). From demand equations for short-term and long-term government debt, he derived a reduced form equation which included as explanatory variables amounts of debt outstanding in different maturity classes, changes in these amounts and expected capital gains. His main contribution was in the estimation of capital gains. He first employed the Keynesian notion of a normal rate towards which the long term interest rate was expected to gravitate. This form has already been discussed above. Duesenberry (1958), however, has pointed out that logically this hypothesis could be reversed so that a rise in interest rates led to an expectation of a further rise and vice versa. Expectations, therefore, could be extrapolative as well as regressive.

From the premise that the long-term interest rate is equal to the short-term interest rate plus the expected capital gain which is taken to be proportional to the expected fall

in the long-term interest rate[34]

we can write

$$R_{L(t)} = R_{S(t)} + \beta \Delta R^{e}_{L(t)} \qquad [3.17.a]$$

Modigliani and Sutch (1966, 1967) have written De Leeuw's formulation of the 'normal' rate as:

$$R^{n}_{L(t)} = v \sum_{i=1}^{m} u_i \, R_{L(t-i)} + (i-v)\, c \qquad [3.17.b]$$

where the normal rate is approximated by the average of the long rate over the previous 'm' periods and a constant, C, which can be thought of as a very long-run normal level. The regressive hypothesis can then be formalised as:

$$\Delta R^{e}_{L(t)} = a_1 \, (R^{n}_{L(t)} - R_{L(t)})$$

$$= a_1 \left(\sum_{i=1}^{m} u_i \, R_{L(t-i)} + (1-v)\, C - R_{L(t)} \right) \qquad [3.17.c]$$

a_1 is a measure of the speed with which $R_{L(t)}$ is expected to return to $R^{n}_{L(t)}$.

The Extrapolative hypothesis, on the other hand, can be expressed as:

$$\Delta R^{e}_{L(t)} = a_2 \, (R_{L(t)} - \sum_{i=1}^{n} \lambda_i \, R_{L(t-i)}) \qquad [3.17.d]$$

where 'n' should be appreciably smaller than 'm' and the weights, λ_i, decline much more rapidly to reflect the influence of recent past rates. Since it is quite conceivable that expectations contain both extrapolative and regressive elements the right-hand sides of equations [3.17.c] and [3.17.d] can be combined to obtain:

$$\Delta R^{e}_{L(t)} = -a_o R_{L(t)} + \sum_{i=1}^{m} b_i R_{L(t-i)} + dc \qquad [3.17.e]$$

where $a_o = (a_1 - a_2)$

$b_i = a_1 v u_1 - a_2 \lambda_i$

and $d = a_1 (1-v)$

De Leeuw tested various lag structures[35] with the expectation that for averages spread over many past quarters the coefficient on the difference between the current long-term interest rate and weighted averages of past long-term interest rates would be negative, while for averages bunched in recent quarters the coefficient would be positive.

Modigliani and Sutch[36] have made a number of modifications to De Leeuw's basic model. First, rather than estimating the lag structure by choosing various values for the lag coefficients they have employed the Almon Interpolation Technique[37] which involves the calculation of Lagrangian interpolation polynomials which are used to weight past values of the variable whose lag is to be estimated. Secondly, they overcame the difficulty of explaining the long-term interest rate in terms of lagged values of itself[38]. They proposed that $R_{L(t)}$ be expressed as a function of $R_{S(t)}$ and a weighted sum of all previous short-term interest rates. Thus:

$$R_{L(t)} = b_o + b_1 R_{S(t)} + \sum_{i=1}^{m} b_i R_{S(t-i)} \qquad [3.18]$$

As Modigliani and Sutch put it "Whether it is more convenient and efficient to approximate the basic model

by a long lag on the long rate or on the short rate is, in the last analysis, a purely pragmatic and empirical issue"[39]. They were able to arrive at the basic equation of De Leeuw which explains the spread by simply substracting $R_{s(t)}$ from the two sides of equation [3.18] the only change being that the coefficient on $R_{s(t)}$ on the right-hand side becomes $(1-b_1)$.

The model of De Leeuw and the modifications made to it by Modigliani and Sutch suggest a number of ways in which the Radcliffian model of section 3:1 can be improved upon. First, the adaptive expectations model is implicitly regressive; but it may well be that if the long-term interest rate rises there may be the expectation on the part of local authorities that it will rise further before eventually falling back towards its normal level. The problem lies in determining how such an expectation will influence the relative supplies of long and short term debt. If there is the expectation at the beginning of the first period that the long-term interest rate at the beginning of the second period will be higher than now funding may well occur. If, however, the current rate is above the 'normal' rate local authorities could choose to ride out the further rise by borrowing for two periods. Even if, therefore, expectations are extrapolative[40] a rise in interest rates in the first period will increase temporary borrowing. The same need not be the case if the rate of interest falls and there was the expectation that it would fall further; since local authorities might choose to postpone funding until the interest rate had returned to its normal level. As a result there is an asymetrical response of borrowing to a unit change in the rate of interest which may prove very difficult to capture. Nevertheless, the Almon Interpolation Technique may be a better way of estimating the lag structure of interest rates;

especially in the light of the econometric difficulties involved in estimating equation [3.9] and the structures of Bierwag and Grove.

Secondly, the use of lagged values of the short-term rather than the long-term rate of interest by Modigliani and Sutch suggests that such a procedure would be applicable to the determination of temporary borrowing. This question is taken up in more detail in the next chapter.

The studies of Modigliani and Sutch and of De Leeuw refer to the U.S.A. Rowan and O'Brien (1970) and Hamburger (1971) have used the same framework for the U.K. They differ, however, in the way in which they proceed from equation [3.17.a] . Substituting equation [3.17.e] into equation [3.17.a] and solving for gives:

$$R_{L(t)} = \frac{\beta dc}{1+\beta a_o} + \frac{1}{1+\beta a_o} R_{s(t)} + \frac{\beta}{1+\beta a_o} \sum_{i=1}^{m} b_i R_{L(t-i)} \qquad [3.18.a]$$

which is the form Modigliani and Sutch arrived at before they switched to short-term interest rates as in equation [3.18] . Instead of estimating the distributed lag directly Rowan and O'Brien chose to describe[41] b_i as an exponential decay function of the form:

$$b_i = \lambda(1-\lambda)^{i-1};\ i = 1, \ldots, m \qquad [3.18.b]$$

Substituting this value into [3.18.a] , lagging the result once and multiplying by $(1-\lambda)$ and substracting the product yields (since this is a Koyck transformation).

$$R_{L(t)} = B_o + B_1 R_{S(t)} + B_2 R_{S(t-1)} + B_3 R_{L(t-1)} \qquad [3.18.c]$$

where

$$B_o = \frac{\lambda(\beta dc)}{1 + \beta a_o}$$

$$B_1 = \frac{1}{1 + \beta a_o}$$

$$B_2 = \frac{-1 - \lambda}{1 + a_o}$$

$$B_3 = \frac{\beta\lambda - (1-\lambda)}{1 + \beta a_o}$$

Since this reduced form is overdetermined Rowan and O'Brien proposed that the equation:

$$R_{L(t)} - R_{L(t-1)} = B_o + B_1 (R_{S(t)} - R_{L(t-1)}) + B_2 (R_{S(t-1)} - R_{L(t-1)}) \qquad [3.18.d]$$

be tested and its explanatory power compared with that of equation [3.18.c] . They pointed out that it is a necessary although not sufficient condition for the acceptance of their model that the variance explained by the former is not significantly greater than that explained by the latter. Hamburger has also proposed that another test of the distributed lag model is that λ does not equal zero. A comparison, therefore, of:

$$R_{L(t)} - R_{L(t-1)} = B_o + B_1 (R_{S(t)} - R_{S(t-1)}) \qquad [3.18.e]$$

a first difference relationship which implies that λ is equal to zero, with equation [3.18.d] provides a further test of the model.

Hamburger concluded on the basis of the tests[42] which he made of the Rowan-O'Brien model that there was no support for the hypothesis that there is a systematic relationship between past movements in rates and expectations of the future[43]. Hamburger attempted to provide an alternative approach to the explanation of the long-term interest rate in the U.K. He derived his explanation from the macro-economic approach to the determination of interest rates developed by Ball (1965), Feldstein and Eckstein (1970), Hamburger and Silber (1969) and Walters (1966). The methodological characteristics of these studies differ markedly from those of term structure theories. Reduced-form equations are derived from models which include as variables income, the supply and demand for money, the expected rate of inflation and past values of the interest rate. Because of the open nature of the U.K. economy and London's role as a major financial centre, Hamburger proposed that the euro-dollar interest rate and the forward exchange rate should also be included in an equation to explain the long-term interest in the U.K. In fact he only included among the independent variables, with which he sought to explain changes in the consol rate, the change in the euro-dollar rate and the current and lagged-once change in the forward discount on sterling.

Okun (1963) in a study of the effects of changes in the supply of long and short-term government securities on long and short-term interest rates in the U.S.A. specified separate equations for each rate that included income and money stock as explanatory variables. A more complete explanation of interest rates in the U.K. would have to include not only the influence of external factors but also the effect of the level of internal activity and relative supplies of long and short-term debt. Hutton (1972) has attempted to incorporate the first two aspects in an equation to explain the change in the local authority

short-term interest rate as part of a model of U.K. short-term capital flows.[44] From reaction functions of the monetary authorities who attempt to maintain a desirable level of reserves and of domestic economic activity, Hutton proposes that the change in the local authority short-term rate, $\Delta R_{S(t)}$, is dependent upon changes in reserves, changes in the euro-dollar rate, lagged values of changes in income, the lagged spot rate on sterling, the change in the forward rate, and the lagged visible balance of trade. A modified version of Hutton's model will be used of the form[45].

$$\Delta R_{S(t)} = b_o + b_1 \Delta R_{ed(t)} + b_2 \Delta C_{(t)} + b_3 \sum k_i \Delta Y_{(t-i)} + b_4 VB_{(t-1)} + b_5 TB_{(t)} \qquad [3.19]$$

where $\Delta R_{ed(t)}$ is the change in euro-dollar rate, $\Delta C_{(t)}$ is the change in the forward discount on sterling, $\sum k_i \Delta Y_{t-i}$ is a distributed lag on changes in income, $VB_{(t-1)}$ the visible trade balance and $TB_{(t)}$ local authority net temporary borrowing. It has been suggested therefore that the maturity composition of local authority borrowing will influence changes in the short-term interest rate. As it stands the interrelationship between $\Delta R_{S(t)}$ and $TB_{(t)}$ is indirect since in equation [3.9] the short-term interest rate only appears in the yield differential term, $R_{L(t)} - R_{S(t)}$. This difficulty can be overcome if the model suggested by Malkiel's hypothesis is employed so that temporary borrowing is a function of the difference between the current interest rate and its normal level, and where drawing on the study of Modigliani and Sutch the interest rate is defined as short-term; and in which, making the somewhat extreme assumption that the normal short-term interest rate can be approximated by $R_{S(t-1)}$, the temporary borrowing function can now be written as:

$$TB_{(t)} = a_o + a_1 \Delta R_{S(t)} + a_2 B_{(t)} \qquad [3.20]$$

Both equations can be estimated by an appropriate econometric technique such as two-stage-least-squares. It should be noted though that equation [3.20] may be seriously mis-specified which may throw doubt on the estimates that result[46]. The change in the long-term interest rate can be accounted for in a similar manner with the long-term interest rate replacing the short-term interest rate in the two equations. Since an increase in temporary borrowing is understood to increase the short-term and depress the long-term interest rate and vice versa, it is to be expected that the ordinary least squares estimate of the coefficient on the change in the short-term interest rate in equation [3.20] will overstate the real value of the coefficient; while it will understate the real value of the coefficient on a change in the long-term interest rate.

3.4 Disaggregation Of Short-Term And Long-Term Borrowing

The analysis of the proceeding sections has been based upon a division of local authority borrowing into that made on a temporary basis, of less than one year, and that on a long-term basis, of more than one year. This particular level of aggregation served a useful analytical purpose in focusing attention on the one-period decision-making process and enabling some fairly substantive propositions to be derived about the manner in which local authorities would choose to borrow in response to changes in monetary conditions. The category of long-term debt includes bonds, stock and mortgages which possess differing characteristics and which are taken up by varying sectors including the central government which purchases mortgages through the offices of the Public Works Loan Board. Ideally, from the point of view of an analysis of the maturity structure of

local authority borrowing, it would be better if long-term borrowing were disaggregated by its term to maturity. Gross figures for long-term borrowing are available on a term to maturity basis; net figures, however, are only differentiated by their type (stock, mortgage, etc) and by their source (banking sector, P.W.L.B., industrial and commercial companies, etc). The following disaggregation is, therefore, proposed.

(a) Net borrowing from the P.W.L.B., usually for more than ten years in a non-negotiable form.

(b) Net borrowing by the issue of stock and negotiable bonds. These two are combined because they are close substitutes for each other in the sense that the gradual introduction of negotiable bonds after 1964 has been at the expense of stock issues.

(c) Net borrowing by the sale of mortgages and local bonds. These are non-negotiable instruments and are close substitutes for each other ever since the local bond was introduced in 1964 with the intention of superceding the antiquated mortgage.

Disaggregation of net long-term borrowing in this way does raise the possibility that some light can be thrown on the determinants of the supply of negotiable bonds and stock. The concern with which the monetary authorities regarded the volume of stock and negotiable bonds issued by the local authorities has been described along with the reasons for it in chapter 2. In any regressions which seek to explain the supply of this form of debt some allowance needs to be made for the effects of the control exercised by the monetary authorities over timing and terms of issue. Very little, however, is known of the

criteria by which the monetary authorities decide the appropriate amount of new issues they will permit within a certain period. Before the introduction of 'Competition and Credit Control' the primary reason why they controlled the timing and terms of local authority issues sprang from a desire to preserve an orderly market for government debt.[47] If the borrowing requirement of the central government were very large at any one time it might leave little scope for issues of local authority debt. Equally, if the monetary authorities were being successful in placing government debt on a rising market they might look more favourably upon local authority issues.

Another constraint upon the supply of this category of debt is that a local authority is limited in the extent to which it can issue negotiable bonds by its outstanding loan debt. These limitations are set out in Table 2.8. It is difficult to measure such a constraint other than by assuming that it will be captured by the use of total net borrowing as an explanatory variable.

As can be seen from the discussion in chapter 2 lending by the P.W.L.B. has been subjected to numerous forms of control. In particular the gradual increase in quota entitlements and the phasing of loans during each financial year imply that considerable difficulties may arise from trying to identify the influence of interest rate expectations on local authority borrowing from the Board. Some ways in which dummy variables might be used to handle these complications will be considered in the next chapter.

Mortgages and local bonds are the forms of long-term debt most free from restriction and there is no need to include in the supply function any additional variables, other than

those specified in previous models.

Supply functions for each component of long-term borrowing can then be written in the most straight-forward manner as:

$$SB_{(t)} = b_o + b_1 (R_{L(t)} - R^e_{L(t)}) + b_2 B_{(t)} + b_3 Z_{(t)} \qquad [3.20.a]$$

$$MB_{(t)} = c_o + c_1 (R_{L(t)} - R^e_{L(t)}) + c_2 B_{(t)} \qquad [3.20.b]$$

$$PW_{(t)} = d_o + d_1 (R_{L(t)} - R^e_{L(t)}) + d_2 B_{(t)} + d_3 X_{(t)} \qquad [3.20.c]$$

where $SB_{(t)}$ is net issues of negotiable bonds and stock, $MB_{(t)}$ mortgages and local bonds, $PW_{(t)}$ loans from the P.W.L.B.; $Z_{(t)}$ a vector of variables which influence $SB_{(t)}$, probably including controls and ceilings on issues; and $X_{(t)}$ is a vector of variables that account for the phasing and for the changes in quota entitlements.

Writing the equations in this form, however, raises a number of important theoretical problems about the correct features of a model of debt selection behaviour in which a borrowing requirement has to be met. The first problem concerns the exclusion of any relative interest rates among the set of explanatory variables. In the former model in which there was only long-term and short-term debt it was sufficient to explain the ratio of one to the other almost completely in terms of expectations about the future course of interest rates. Since, however, the disaggregation of net long term borrowing outlined above has been made necessary by the availability of data and does not coincide exactly with the maturity structure of long-term debt,

relative interest rates on loans of the same maturity will become influential. For example, if in a given climate of expectations a local authority wants to issue a ten years bond or mortgage it will seek to borrow, subject to the restrictions described above, from the cheapest source. Since quota loans from the P.W.L.B. have been obtained at rates reflecting government credit they have been generally cheaper than mortgages and local bonds so that with the upward trend in lending by the Board sales of mortgages and local bonds have declined. On the other hand P.W.L.B. loans and negotiable bonds and stock are unlikely to be substitutes except in the expectational sense because the Board rarely makes loans for less than ten years while the majority negotiable bonds have a life of rarely more than two to three years.

The second problem relates to the necessity that the total effect of a difference between the current and expected interest rate summed over the whole borrowing requirement must equal zero[48]. For since

$$B_{(t)} = TB_{(t)} + SB_{(t)} + MB_{(t)} + PW_{(t)} \qquad [3.21.a]$$

the sum of the coefficients

$$a_1 + b_1 + c_1 + d_1 \qquad [3.21.b]$$

must equal zero; and it is further implied by the form of the model that

$$b_1 + c_1 + d_1 = -a_1 \qquad [3.21.c]$$

This further implies that the complete list of relevant variables must appear in all equations; and that if three equations are estimated the coefficients of the remaining

equation can be calculated. This may not be as serious a problem as it first appears since many of the variables which have been treated as peculiar to a particular equation are probably not measureable and therefore probably will have to be ignored, anyway. These issues will be taken up again in the next chapter.

The disaggregation of temporary debt raises slightly different issues from those produced by the disaggregation of long-term debt. The one-period decision-making framework employed in the previous sections did not accord with any particular period of time and there is no strong reason for supposing that in reality the decision period should coincide with the conventional definition of temporary debt as that incurred for less than one year. Decisions whether to borrow for a week or less or for just under a year are unlikely to be a reflection of the same expectations about the future course of interest rates. Data is available for temporary borrowing for up to seven days, over seven days and up to three months, and over three months and up to twelve months. Other than it being differentiated by term to maturity, temporary debt is also differentiated by the source of funds. From the point of view of monetary policy whether local authorities borrow by overdraft or in the money markets by accepting short-term deposits is important because of the implications it has for the level of clearing-bank advances. Local authorities have tended to switch between the use of their overdraft facilities and the money markets in response to the difference between the rate charged by clearing banks on overdrafts and the equivalent rate ruling in the open market. The extent to which local authorities are able to switch towards the use of overdrafts will be constrained of course by the ceiling on advances that the banks impose by agreement with individual local authorities.

Revenue bills, issued in anticipation of revenue from rates and government grants normally for a period of three months are also classified as temporary debt. It is not possible to separate them out from the total of temporary debt because figures for revenue bills are only available on a separate basis from the beginning of 1971. They differ, furthermore, from other forms of short-term debt in being excluded from the particular definition of short-term debt applicable under the 1963 Restrictions, and explained in chapter two. Into which part of the maturity spectrum revenue bills actually fall will depend upon where within a financial quarter they are issued. If a revenue bill is issued near the beginning of the quarter by the time the quarterly returns are made to the C.S.O. the revenue bill will not be very far from its date of redemption and may be so close as to be classified as temporary debt on seven days notice. Equally if a revenue bill is issued near the end of the quarter and the term is more than three months then it may be classified as temporary debt incurred for over three and up twelve months. Consequently there is no obvious way of knowing into which part of the maturity spectrum revenue bills will fall at any moment in time.

The disaggregation of local authority borrowing brings into play a number of important influences which have been overlooked in the abstract model building of previous sections. One other factor, moreover, which has not yet been considered adequately in this chapter is the effect upon temporary borrowing of the 1963 Restrictions. These restrictions and their possible effects were considered at some length in chapter two. It was noted there that whether

or not the restrictions on temporary borrowing have had any real effect will depend upon what the level of temporary borrowing would have been in their absence. This question will be taken up and considered in the next chapter. It should be noted that a market which has been characterised by rapid growth and frequent institutional and statutory changes is likely to present many difficulties for econometric study. Since, nevertheless, attempts have been made to apply econometric techniques to a variety of aspects of the monetary system all of which have suffered similar transformations, there are few reasons to suppose that the local authority market will prove to be any less tractable.

3:5 The Demand For Local Authority Debt

The primary concern of this chapter has been to specify a number of models, or perhaps a number of variants of a basic model, that purport to explain the supply of variou categories of local authority debt. No attention has been paid to the demand side. This omission could be justified by the argument that the supply of local authority debt is not of sufficient moment in the capital and money markets to warrant any need to specify a larger model in which the rate of interest is endogenous. The question whether the rate of interest is exogenous to the models of local authority borrowing has already been considered above; and the reduced-form approach does embody at least some demand influences. Nevertheless it would require a fully detailed econometric model of the financial system to produce a complete answer; since this is not within the scope of this study there will be substituted in its place a very brief review of a number of partial studies of the portfolio behaviour of some financial institutions; and in particular those portfolio's into which local authority

debt enters as an asset; and a very brief mention of the Sheffield model of the U.K. financial system.

A now common approach to the study of financial institutions, pioneered by Parkin among others[49], is to try to explain their portfolio and debt selection behaviour within a "...simple but strongly specified model..."[50] that places particular emphasis upon decision-making under conditions of uncertainty. The approach itself owes its origins to the earlier theoretical work of Markowitz (1959) and Tobin (1958, 1945) and usually postulates that the financial institution under study possesses a utility function such that the aim is to maximise its expected value subject to a balance sheet constraint; this equality constraint requires that the total of assets is equal to the total of liabilities. From this constrained maximisation framework demand functions for assets and supply functions for liabilities are derived. The first studies were of the clearing banks and of discount houses and local authority securities did not appear among the list of assets in their portfolios[51]. A more recent study[52], of Building Societies, does include both short-term and long-term local authority debt as assets. The empirical results, however, were disappointing for the demand equations for local authority debt. The own-rate coefficient for local authority short-term debt was perverse, though not at a significant level, while the own-rate coefficient for long-term debt was also perverse and at a very significant level. In some more recent work which extends these results Ghosh (1974) still finds no significant own-rate coefficients of the correct sign for short-term and long-term local authority debt.[53] It would be very premature to suggest that these results are a partial consequence of the implicit assumption that supplies of local authority debt are exogenous but the possibility cannot be ruled out completely.

Clayton, et.al., have developed a general equilibrium model of the financial system in the U.K.[54]. It is a nine sector model containing sixteen categories of assets-liabilities. Attention will be given only to their treatment of local authority debt. First they aggregate over all forms of local authority debt but do not dispute the contention that disaggregation is desirable. Second, because local authority debt is the only item to appear in the balance sheet of all sectors of the model it was chosen, for convenience, to assume the role of residual item. It could then be found from the balance-sheet identity after estimation. The first results reported were those for a pilot model and it was acknowledged that further work was required. One direction this took was to try to allow for the effects of the funding of government debt by separating government securities into short-term and long-term; and thus explore the effect of changes in the maturity of debt on the term structure of interest rates. The outcome was published in Dodds and Ford (1974)[55].

From the point of view of local authority debt the Dodds and Ford model provides a far better framework for testing the proposition that changes in relative supplies of long and short-term local authority debt alter the term structure. As it is, their concern is only with the influence of supplies of government debt. This being so they take the view that supplies of local authority debt can be regarded as exogenous to their model; clearly this does not accord with the explanation of the supply of local authority debt employed in this chapter; how far this view is from reality is an empirical matter and some light will be thrown on it in the next chapter.

CHAPTER FOUR

EMPIRICAL RESULTS

In this chapter the models developed in chapter three are tested against quarterly data from 1961 (III) to 1973 (III). The precise form of the data and their sources are described in appendix B.

With the exception of that derived from the Meiselman approach, the hypotheses used to account for the maturity structure of local authority borrowing are all of a kind differing only in the type of variables included and the form by which the distributed lag structure is approximated. Section 4:1 reports some results for the Radcliffe model, the Malkiel model, the Modigliani-Sutch model and the Meiselman model of temporary borrowing[1]. The question whethe the restrictions on temporary borrowing have had any measurable impact is taken up in section 4:2 and the period during which there were no restrictions is compared with the period during which restrictions have been in force. The models tested in section 4:1 are applied, with suitable modifications, in section 4:3 to disaggregated long-term and short-term debt. The possible way in which th pattern of local authority borrowing has altered the term structure of interest rates is considered on a rudimentary level in section 4:4. A direct comparison, however, of the term structure in the local authority market with that ruling in the market for central government debt is postponed until chapter five when monetary policy is examined in greater detail.

4:1. Models of Temporary Borrowing: The Empirical Evidence

Before the results are presented three points need to be raised. First, allowance has to be made for the seasonal pattern of borrowing from the Public Works Loan Board. Normally this could be accounted for by the inclusion in the regressions of

seasonal dummy variables. As was explained in chapter two, section 2., while during the financial years 1965-66, 1966-67 and 1967-68 the phasing scheme meant that a large part of quota entitlements were taken up between December and April, from 1968-69 a switch in policy, for the reasons given, meant that the bunching of loans from the P.W.L.B. become concentrated in the last few months of the calendar year. Since if local authorities fail to take up a certain proportion of their quotas by the deadline they forfeited them, other things being equal, temporary borrowing will be less during the relevant quarter. A single dummy variable, DQ(t), is therefore included in the regressions[2].

Secondly, it could be objected that the adaptive expectations hypothesis given by equation [3.8] (in chapter three), which implies further the distributed lag given by equation [3.9], includes in an estimate of the expected rate, $R^{e}_{L(t)}$, the current actual interest rate, $R_{L(t)}$. In order to exclude $R_{L(t)}$ it is necessary to write the adaptive expectations hypothesis as:

$$R^{e}_{L(t)} - R^{e}_{L(t-1)} = (1-\lambda)\,(R_{L(t-1)} - R^{e}_{L(t-1)}) \qquad [4.1.a]$$

which after manipulation gives

$$R^{e}_{L(t)} = (1-\lambda)\sum_{i=1}^{\infty} \lambda^{i-1}\, R_{L(t-i)} \qquad [4.1.b]$$

This turns out to be a rather convenient formulation as will become clear later. Its inclusion in equation [3.8] only results in a slight change in the coefficient b_1 in equation [3.9]; b_1 now becomes equal to a_1, rather than λa_1[3].

The third and final point concerns the argument of Modigliani and

Sutch that the underlying expectations model can be approximated by a distributed lag on short rates as well as on long rates. This can be achieved by substituting $R_{s(t)}$ for $R_{L(t)}$ in equation [3.9]

An O.L.S. estimate of equation [3.9], with the dummy variable, is shown in Table 4.1. As it stands it is of little value. The appearance of a lagged dependent variable among the explanatory variables means that the O.L.S. estimates are biased and inconsistent. Moreover, it is impossible to obtain a unique, consistent estimate of λ, the coefficient of expectations, because the equation is over-identified. The difficulties are compounded by the collinearity of lagged dependent and lagged independent variables. It is possible to estimate equation [3.9] subject to non-linear restrictions; but since an appropriate computer package has not been available some alternative procedures are adopted.

The dependent variable, $TB_{(t)}$, can be transformed thus:

$$TB^{*}_{(t)} = TB_{(t)} - \lambda TB_{(t-1)} \qquad [4.2.a]$$

where λ is the autocorrelation coefficient and also, since an adaptive expectations framework has been used, the coefficient on $TB_{(t-1)}$. The value of λ was varied between 0.1 and 0.9 at intervals of 0.1. This coarse search procedure was used to determine the approximate optimal value of λ ; the criterion used was the minimisation of the standard error of estimate. The transformed function is listed as equation [3.9.a.] in Table (4.1) with $\lambda = 0.3$. Although this transformation overcomes, in part, the econometric problems created by a lagged dependent variable the parameters on the right-hand side are still non-linear. To overcome this additional transformed variables were obtained of the form[4].

$$B^{*}_{(t)} = B_{(t)} - \lambda B_{(t-1)} \qquad [4.2.b]$$

TABLE (4.1)

The Radcliffe Model Of Net Temporary Borrowing; Long-Term Rate Of Interest - 1961(111)-1973(111) O.L.S.Estimates

Equation	Dependent Variable				
3.9	$TB_{(t)}$	-38.80 (1.37)	$+ 0.28\ TB_{(t-1)}$ (2.44)	$+ 49.89\ \Delta R_{L(t)}$ (1.91)	$+ 0.46\ B_{(t)}$ (2.95) $- 0.15\ B_{(t-1)}$ (0.98)
		$-44.55(R_{L(t)} - R_{S(t)})$ (2.31)	$+ 50.16\ (R_{L(t-1)} - R_{S(t-1)})$ (2.73)	$- 125.16\ DQ_t$ (4.32)	
		$\bar{R}^2 = 0.612$	S.E.E. = 64.11	D.W. = 2.15	
3.9.a	$TB^*_{(t)}$	-39.17 (1.40)	$+ 48.10\ \Delta R_{L(t)}$ (2.03)	$+ 0.43\ B_{(t)}$ (3.07) $- 0.15\ B_{(t-1)}$ (1.06)	$- 44.94\ \{R_{L(t)} - R_{S(t)}\}$ (2.37)
		$+ 50.65\ \{R_{L(t-1)} - R_{S(t-1)}\}$ (2.83)	$- 125.56\ DQ_t$ (4.40)		
		$\bar{R}^2 = 0.561$	S.E.E. = 63.37	D.W. = 2.178	$\lambda = 0.3$
3.9.b	$TB^*_{(t)}$	-36.81 (1.38)	$+ 56.72\ R_{L(t)}$ (2.30)	$+ 0.51\ B^*_{(t)}$ (4.08) $- 15.33\ \{R_{L(t)} - R_{S(t)}\}^*$ (1.01)	
		$- 129.72\ DQ_t$ (4.50)			
		$\bar{R}^2 = 0.505$	S.E.E. = 67.69	D.W. = 1.89	$\lambda = 0.3$

('t' - statistic in parenthesis)

$$(R_{L(t)} - R_{S(t)})^* = (R_{L(t)} - R_{S(t)}) - \lambda (R_{L(t-1)} - R_{S(t-1)}) \qquad [4.2.c]$$

where λ is again the autocorrelation coefficient and is allowed to vary between o.1 and 0.9 at intervals of 0.1. Since the distributed lag model of equation [4.1.b] is now being used, the variable $\Delta R_{L(t)}$ remains unchanged[5]. The second transformed function is listed as equation [3.9.b] in Table (4.1) with $\lambda = 0.3$. With the exception of $(R_{L(t)} - R_{S(t)})^*$ all the coefficients are of the correct sign and significant at the 5% level. There is no evidence of autocorrelation. The value of λ suggests that some 70% of an adjustment to a divergence between the actual and the expected long-term interest rate occurs in the first quarter. The wrong sign on $(R_{L(t)} - R_{S(t)})^*$ may be due to a spurious correlation with the dependent variable because as can be seen from the work of Malkiel and Modigliani and Sutch the spread between the long and the short-term interest rate can be accounted for by a distributed lag on past interest rates; this implies some collinearity between $\Delta R_{L(t)}$ and $(R_{L(t)} - R_{S(t)})^*$ - the more serious the closer λ is to zero[6].

Table (4.2) contains the results obtained for the Malkiel Model which is equivalent to equation [3.9] above with the omission of the lagged and current values of $(R_{L(t)} - R_{S(t)})$ and therefore provides a means of circumventing the collinearity noted in the previous paragraph. The transformed equation, listed as equation [3.9.e] has correctly signed and significant coefficients on all the variables. That on $\Delta R_{L(t)}$, with the dropping of $(R_{L(t)} - R_{S(t)})$, is larger and more significant than in equation [3.9.b]. The standard error of estimate is also not significantly different which suggests that $(R_{L(t)} - R_{S(t)})$ makes no significant contribution to the explanatory power of the model. There is no indication that the Malkiel model is rejected by the data; even so only half of the variance in net temporary borrowing is accounted for. This may not be too serious

TABLE (4.2)

The Malkiel Model Of Net Temporary Borrowing: Long-Term Rate Of Interest 1961(III)-1973(III) O.L.S. Estimates

Equation	Dependent Variable						
3.9.c	$TB_{(t)}$	-31.86 (1.13)	$+ 0.23\ TB_{(t-1)}$ (1.93)	$+ 73.59\ \Delta R_{L(t)}$ (2.96)	$+ 0.59\ B_{(t)}$ (3.75)	$- 0.28\ B_{(t-1)}$ (1.86)	$- 135.67\ DQ_t$ (4.45)
		$\bar{R}^2 = 0.562$		S.E.E. = 68.09		D.W. = 1.89	
3.9.d	$TB^*_{(t)}$	-31.39 (1.13)		$+ 76.27\ \Delta R_{L(t)}$ (3.40)	$+ 0.58\ B_{(t)}$ (3.84)	$- 0.27\ B_{(t-1)}$ (1.88)	$- 134.81\ DQ_t$ (4.49)
		$\bar{R}^2 = 0.520$		S.E.E. = 67.37		D.W. = 1.848	$\lambda = 0.2$
3.9.e	$TB^*_{(t)}$	-49.14 (2.08)		$+ 66.74\ \Delta R_{L(t)}$ (2.96)	$+ 0.52\ B^*_{(t)}$ (4.13)		$- 127.55\ DQ_t$ (4.44)
		$\bar{R}^2 = 0.502$		S.E.E. = 67.70		D.W = 1.92	$\lambda = 0.3$

a failing, however, since net temporary borrowing is equivalent to the first difference of total temporary borrowing; and it is much more difficult to 'explain' the variance of a difference than that of an absolute value.

It was suggested above that the models could be estimated on the basis of the short-term in place of the long-term interest rate[6]. Since the Malkiel Model appears to be the most suitable form as suggested by the results for the long-term interest rate, Table (4.3) only reports results for the Malkiel Model with $\Delta R_{S(t)}$ substituted for $\Delta R_{L(t)}$. Again the econometric difficulties remain with the untransformed variation so comment will be confined to the second transformation, listed as equation [3.9.g] in Table (4.3), which is equivalent to the results for equation [3.9.e] in Table (4.2.). Although the best fit was obtained with λ equal to 0.3, the same value as that found when the long-term interest rate was employed, the overall fit is improved. As measured both by $\bar{R}^2$, the corrected coefficient of multiple correlation, and by S.E.E., the standard error of estimate, the short-term interest rate appears to provide a better proxy for the influence of expectations on the pattern of net temporary borrowing. This may reflect only the common tendency of the long-term interest rate to fluctuate less than the short-term interest rate. Since net temporary borrowing is subject to marked variation it is likely to be better correlated with movements in the short-term interest rate.

The work of De Leeuw, and Modigliani and Sutch, on the term structure of interest rates, it was proposed in chapter three, suggests the possibility that expectations held by local authorities about the future course of interest rates may be extrapolative as well as regressive. That is to say, if interest rates rise there is the chance that they will rise further; while if they fall there is some prospect of their falling further. From the point of view of the investor this will imply that extrapolative expectations will

TABLE (4.3)

The Malkiel Model Of Net Temporary Borrowing: Short-Term Rate Of Interest 1961(111)-1973(111) O.L.S. Estimates

Equation	Dependent Variable	
3.9.f	$TB_{(t)}$	$-33.88 + \underset{(1.31)}{0.28}\ TB_{(t-1)} + \underset{(4.63)}{47.64}\ \Delta R_{S(t)} - \underset{(4.47)}{126.02}\ DQ_t + \underset{(3.01)}{0.46}\ B_{(t)} - \underset{(0.99)}{0.15}\ B_{(t-1}$
		$\bar{R}^2 = 0.627$ S.E.E. = 62.78 D.W. = 2.122
3.9.g	$TB^*_{(t)}$	$-35.88 + \underset{(1.64)}{47.38}\ \Delta R_{S(t)} - \underset{(4.88)}{124.85}\ DQ_t + \underset{(3.92)}{0.45}\ B^*_{(t)}$
		$\bar{R}^2 = 0.593$ S.E.E. = 61.424 D.W. = 2.143 $\lambda = 0.3$

predominate at first giving way after a short period to the influence of regressive expectations. It was noted, however, that as far as the behaviour of borrowers is concerned the response of the pattern of net temporary borrowing to a change in the rate of interest is unlikely to be symmetrical.

If there is the expectation that a rise in the interest rate only presages a further rise the borrower can borrow short-term and ride out the higher level of interest rates. If interest rates fall, on the other hand, and are expected to fall further the borrower may choose to leave off funding until interest rates fall to what is regarded as their floor.

This asymmetrical response may not be captured by the geometrical lag profile derived from the adaptive expectations hypothesis and so the equations have been re-estimated using Almon Variables[7]. Of course, it is not been maintained that this is likely to be a sufficient means of identifying the kinds of lag structure which are implied by the mixing of extrapolative and regressive components; the Almon Technique, however, is very flexible since it allows both the degree of the polynomial and the length of the lag to be varied and the best fitting equation selected.

The equation to be estimated, then, is of the form:

$$TB_{(t)} = a_o + a_1 R_{(t)} + a_2 \sum_{i=1}^{n} b_i R_{(t-i)} + a_3 B_{(t)} + a_4 DQ \qquad (4.3)$$

where $R_{(t)}$ can be either the long or the short-term interest rate; and 'n' takes values between five and nine[8].

By experimenting with various combinations of the degree of the polynomial, r, and the length of the lag, n, the equation that

maximised $\bar{R}^2$ and minimised the S.E.E. was selected. It is normal practice to provide the standard errors for each of the lag coefficients but since a computer programme to do this calculation was not available the actual coefficients on the Almon Variables, which number r+1, as well as the calculated lag coefficients are listed in Table (4.4). Since the scheme used to calculate the polynomial lag is a simplified version of the original, a direct test of the correct degree of the approximating polynomial is provided by a test of significance of the coefficient of the r- degree term. For instance, equation 4.3.a. in Table (4.4) is a third degree polynomial over nine quarters and since there are r+1 Almon Variables the 't' statistic on the coefficient on A4 is an appropriate test. Clearly the coefficient is significant. As the lag is calculated on long-term interest rates it is useful to compare the explanatory power of the equation with equation [3.9.e] which simply employs a geometric lag scheme (i.e. implying r=1). The addition of a polynomial lag scheme appears to have improved the fit by the criterion of $\bar{R}^2$. If the S.E.E. is used as the criterion the improvement is less marked. The lag profile spread over nine quarters indicates that the influence of expectations is clearly regressive in the first three quarters becoming extrapolative for two quarters and then regressive again. Clearly the impact of a deviation of the current long-term interest rate is concentrated in the first few quarters. See figure (4.1)

The results for a model in which the lag structure is constructed on the short-term interest rate are an improvement but the shape and length is substantially different.[8a] The best fit was found with a second degree polynomial on six quarters. The relevant equation is listed as 4.3.b. in Table (4.4). Again the polynomial provides a better fit than the simple geometric form embodied in equation [3.9.g] in Table (4.3).

TABLE (4.4)

Modigliani-Sutch Model Of Net Temporary Borrowing: Almon Variables: 1963(III)-1973(III) O. L. S. Estimates

Long-Term Interest Rate

Equation 4.3.a

$$TB_{(t)} = \underset{(1.30)}{98.04} + \underset{(3.68)}{0.61}\ B_{(t)} - \underset{(4.64)}{125.53}\ DQ_t + \underset{(3.22)}{63.16}\ R_{L(t)} + \sum_{i=1}^{9} b_i R_{L(t-i)}$$

$A_1 = -73.25$ (3.86)

$A_2 = 55.48$ (2.93)

$A_3 = -12.152$ (2.51)

$A_4 = 0.795$ (2.29)

$\bar{R}^2 = 0.590$

S.E.E.=65.75

D.W.= 1.66

Lag Distributions

Qtr	Coefficient
t-i	- 73.245
t-2	- 29.126
t-3	- 4.541
t-4	5.280
t.5	5.107
t-6	- 0.290
t-7	- 6.141
t-8	- 7.616
t-9	- 0.125

Short-Term Interest Rate

Equation 4.3.b

$$TB_{(t)} = \underset{(1.71)}{87.36} + \underset{(4.99)}{0.59}\ B_{(t)} - \underset{(5.54)}{130.64}\ DQ_t + \underset{(4.11)}{39.73}\ R_{S(t)} + \sum_{i=1}^{6} b_i\ R_{S(t-i)}$$

$A_1 = -37.90$ (4.86)

$A_2 = 22.48$ (3.47)

$A_3 = -3.01$ (2.93)

$\bar{R}^2 = 0.660$

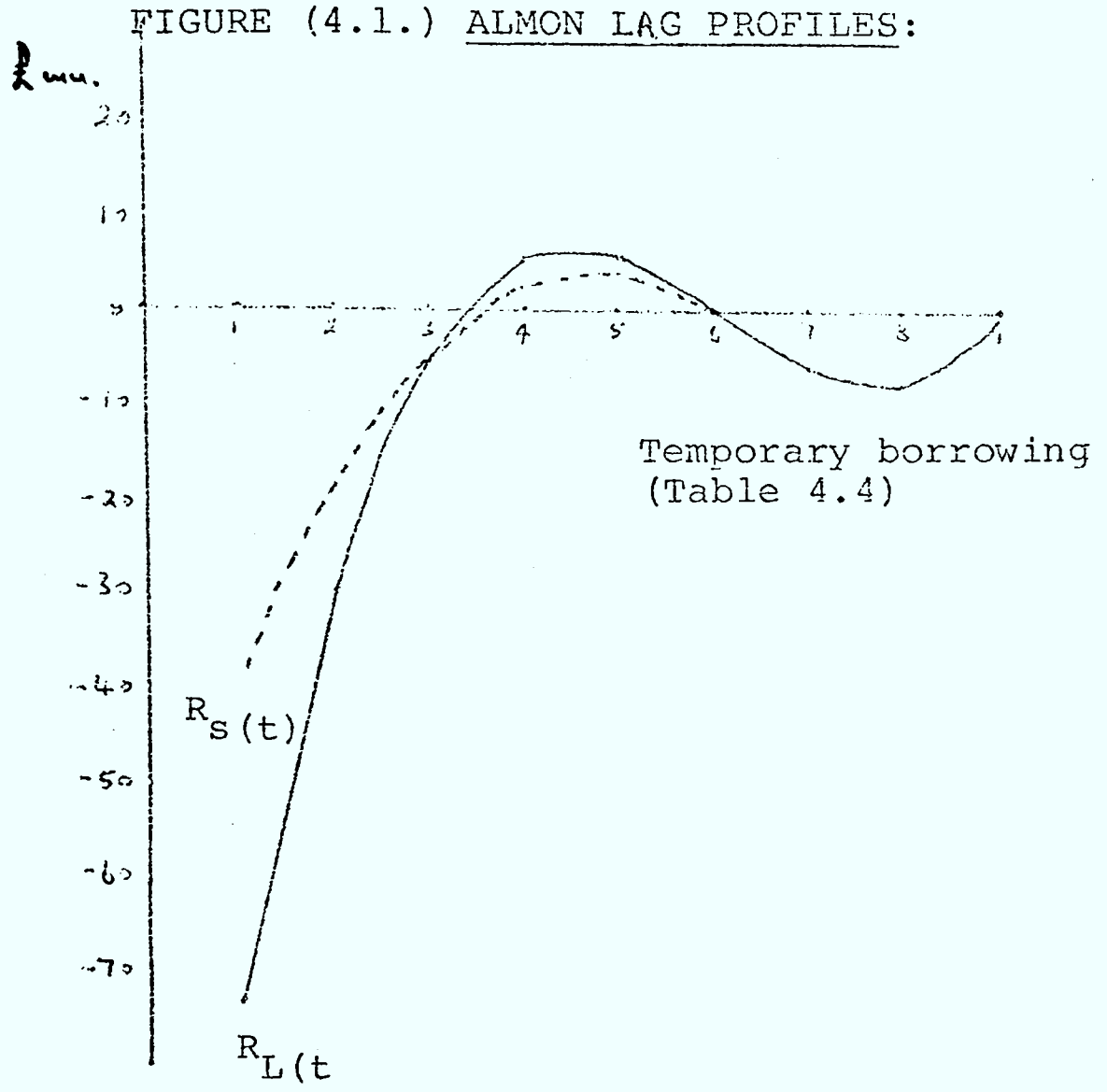
S.E.E.= 59.95

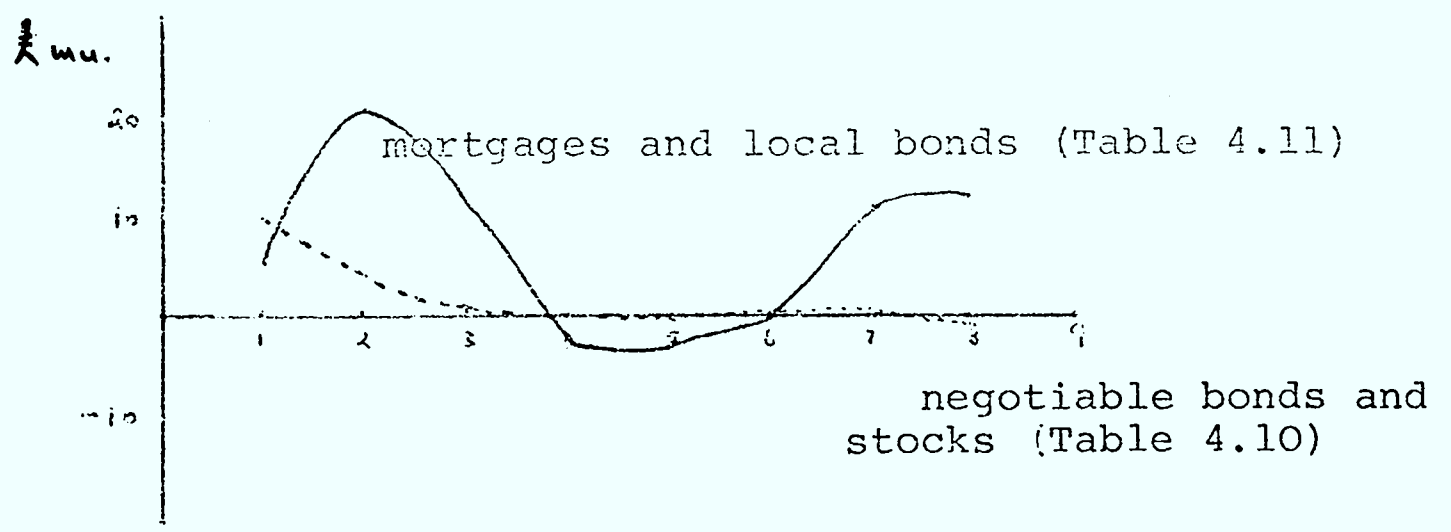
D.W. = 1.87

Lag Distributions

Qtr	Coefficient
t-1	- 37.90
t-2	- 18.43
t-3	- 4.99
t-4	2.42
t-5	3.81
t-6	- 0.83

FIGURE (4.1.) ALMON LAG PROFILES:





The final model suggested by the discussion of theories of the term structure of interest rates in chapter three is that based upon the work of Meiselman. He proposed that revisions in expectations about future one period rates would be correlated with errors in previous forecasts. For this relationship to hold it is a necessary condition that market participants act upon the forecasting error, such that the revision in expectations is embodied in an altered term structure.

It was argued in chapter three (section 3.3.b) that the result of a upward revision in expectations about future interest rates would be that temporary borrowing would be reduced on the understanding that interest rates would be higher in the future. Such a relationship, then, can be represented simply by substituting for $(R_{S(t)} - \dot{R}^{e}_{S(t)})$ in the Malkiel Model based on the short-term interest rate, the forecasting error $({}_{t}R_{t} - {}_{t-1}r_{t})$. Thus:-

$$TB_{(t)} = a_o + a_1 ({}_{t}R_{t} - {}_{t-1}r_{t}) + a_2 B_{(t)} + a_3 DQ_{(t)} \qquad [4.4.a.]$$

Since ${}_{t-1}r_{t}$ is the 'forward' rate implicit in the term structure there are no problems created by the need to approximate the 'expected' rate by past observed rates.

Equally, the independent variable in Meiselman's hypothesis, the actual revision in expectations as revealed by the term structure, could be employed. The use of the latter however, comes up against the difficulties created by the lack of data on the term structure of local authority interest rates and on the maturity structure of local authority net borrowing. In addition, the periods referred to in Meiselman's study, and in most subsequent work which followed his lead, were one year. Although so far in this section all the results reported have been for temporary borrowing defined as that for up to one year, it may well be too long a

decision period for local authorities. Anticipating, therefore, the results of section [4.2.] it is proposed that a one period decision is encompassed by the interest rate on seven day loans; it will be assumed also that the two period rate is that on three month loans. The forward rate, $_{t-1}r_t$, can then be calculated from the formula:

$$t\text{-}1r_t = \frac{(1 + t\text{-}1\ R_2)^2}{(1 + t\text{-}1\ R_1)} - 1 \qquad [4.5.a.]$$

where in this instance R_1 is the seven day loan interest rate (one period rate) and R_2 is the three month loan interest rate (two period rate). If the revision in expectations, $(t^rn - t\text{-}1\ ^r n)$, were used as the independent variable it would be necessary to obtain interest rates on periods up to the 'nth'. For example, the forward rate $t\ ^r n$ can be calculated in principle from the formula:

$$t\ ^r n = \frac{(1 + t\ ^R n)^n}{(1 + t\ ^R n\text{-}1)} - 1 \qquad [4.5.b]$$

But data is not available on the interest rate for the 'nth' and the 'n-1th' period. Since data is available only for the first two periods just one revision in expectations variable can be calculated. This then can be regressed against the equivalent one-period borrowing which is temporary borrowing for up to seven days (for which other results are reported in section 4.2. below). This will be denoted as $TB7_{(t)}$. Table (4.5) contains the results for the Meiselman Model. Equation [4.4.a] embodies the forecasting error as an independent variable while the revision in expectations is embodied in equation [4.4.b.]. Although the coefficients are significant and have similar values to those for the other models the all important coefficient a_1 is of the wrong sign. It is clear that something is wrong. It is possible that the borrowing behaviour underlying the Meiselman hypothesis has been misunderstood. It is also possible that a spurious correlation has been picked up. In equation [4.5.a.] if R_1 and R_2 move closely together, and in practice they

Table (4.5.)

The Meiselman Model of Net Temporary Borrowing : 1961(III) - 1973(III)

O.L.S. Estimates

Equation	Dependent		Variable
(4.4.a)	$TB7_{(t)}$	=	$-5.42 + \underset{(2.74)}{0.31B_{(t)}} + \underset{(4.50)}{55.25}\ (R_{57(t)} - {}_{t}r_{t-1}) - \underset{(4.37)}{133.09}\ DQ_{(t)}$
			$\bar{R}^2 = 0.55 \quad D.W = 2.13$
(4.4.b.)	$TB7_{(t)}$	=	$-9.10 + \underset{(2.37)}{0.27B_{(t)}} + \underset{(4.39)}{54.00}\ ({}_{t}r_{t} - {}_{t-1}r_{t}) - \underset{(4.07)}{126.28}\ DQ_{(t)}$
			$\bar{R}^2 = 0.53 \quad D.W = 2.01$

have done, the forwardrate will approximate closely to the lagged value of the short-term interest rate so that the forecasting error will approximate closely to the first difference in the short-term interest rate, $\Delta R_{S(t)}$, which, as is clear from Table (4.3), is positively correlated with temporary borrowing. No other comments will be made about the Meiselman Model.

In summary, it appears that the best explanation of the pattern of net temporary borrowing is that provided by the Modigliani-Sutch Model using short-term interest rates, which was a marginal improvement on the Malkiel Model using short-term interest rates. Furthermore, the maturity pattern of local authority borrowing is in accordance with at least those theories of the term structure of interest rates that emphasise the role of expectations; establishing, however, that local authorities in the U.K. appear to arrange the maturity structure of their borrowing at least in part according to the premises of those theories of the term structure that emphasise the role of expectations, cannot be interpreted as evidence in favour of the hypothesis that the term structure of interest rates in the U.K. is determined by expectations about the future course of interest rates. It may be the case that local authority borrowing is of insufficient sway in the money and capital markets to out-weigh the influence of non-expectational factors such as those suggested by the Hedging Pressure Theory. This question will be taken up in section (4.4.).

4.2 The consequence of the restrictions on temporary borrowing

The results of the previous section, although encouraging, make no allowance for the restrictions that were imposed on temporary borrowing in 1963 and brought eventually into force in April 1969. This might be a serious mis-specification since the restrictions may have resulted in a major behavioural shift in the relationship between local authority temporary borrowing and expectations about the future course of interest rates.

A test of the hypothesis that the restrictions on temporary borrowing have altered the behavioural relationship raises a number of methodological difficulties. First, there is the problem of deciding from when exactly the restrictions apply. Although they came into force nominally in April 1969 originally they were to have come into force a year earlier. The postponement was made necessary by the failure of a number of local authorities to reduce the ratio of their temporary debt below twenty per cent of total loan debt by the deadline.[9] Most local authorities, on the other hand, had successfully reduced their ratio, if previously it had been in excess of twenty per cent, before April 1968. Moreover, there is the possibility that in the early part of the period under study, in the years after the announcement of the restrictions in 1963, there was a perverse response. Up until 1963 local authorities in Scotland had been subjected to a ceiling on their temporary debt of fifteen per cent of total loan debt. From then until the imposition of the controls in 1969 the Scottish authorities were not subject to any controls and it is possible that they increased their temporary borrowing during the interim over and above twenty per cent. A more serious perverse consequence of the 1963 measures, though it is something that cannot be quantified, is that, as already mentioned in chapter two, they gave official approval to the concept of 'permanent' temporary borrowing; and encouraged some local authorities who hitherto had been reluctant to use temporary funds on a large scale to be more venturesome. Since it is impossible to be clearcut about the 'policy-on' and 'policy-off' periods the choice must be somewhat arbitrary. A test of significance will be employed to decide between the two periods and determine whether a shift in the relationship has occurred. For the reasons given above the division will be made at 1968 (I)/1968 (II).

Having decided upon the sub-periods that are to be compared, the second difficulty concerns specifying, 'a priori', how the relationship is expected to change from one period to the next as a result

of the restrictions.

The reforms may have acted directly upon the expectations generating mechanism. The knowledge that there has existed an upper limit to the amount of total temporary debt that a local authority could incur during the second period, may have been an inducement to fund more rapidly when interest rates fell so as to provide as much slack[10] as possible between the ceiling and the existing ratio when interest rates once more rose. In terms of the adaptive expectations model of chapter three the value of λ after 1968(1) would be expected to be lower than before. This conclusion, however, follows only when interest rates are falling. It has already been noted that the response of temporary borrowing to a change in interest rates will not be necessarily symmetrical. A further source of asymmetry springs from the restrictions on temporary borrowing. Although there is no limit on the extent to which a local authority can fund its temporary debt, other than that provided by the constraints of the money and capital markets, the imposition of an upper limit means that, if a local authority is increasing its temporary debt, for how long the process can go on will depend upon how much slack there is and how quickly it will be taken up. If it is supposed that the amount of slack which a local authority has in the ratio of its temporary to its total debt is equal to the net borrowing requirement in a given financial period, and there is the expectation that the interest rate will fall back to its 'normal' level at the beginning of the next period, then there would exist the opportunity to meet the whole of the current net borrowing requirement on a temporary basis and to fund it after one period when interest rates fall. If, on the other hand, there is some uncertainty as to the likely course of interest rates over the near future there may be a need on the part of the local authority to decide whether the interest rate will rise further at the beginning of the next period. If there is a strong possibility that

this will occur then it will be worthwhile, in the sense of minimising the cost of borrowing, to retain some, if not all, of the slack in the ratio until the following period when it can be employed to ward off the even higher cost of long-term borrowing[11]. Thus in a situation in which extrapolative expectations predominate (in contrast to that situation prior to the controls on temporary borrowing in which a rise in interest rates would stimulate immediate unfunding) a rise in interest rates might not result initially in unfunding because of a desire to retain sufficient scope to react to the even higher interest rates expected in the following period. Equally though, a local authority might choose to hold sufficient slack in its temporary debt to allow the borrowing requirement to be met on a temporary basis for as many periods as there was the expectation that interest rates would remain above the 'normal' level; subject to the qualification that according to the adaptive expectations hypothesis the level of interest rates regarded as being normal would be in the process of being revised upwards.

It is clear that the number of possibilities is large. The actual outcome is of course an empirical question and will depend upon whether expectations are regressive or extrapolative; the probability of a further rise in the interest rate after an initial rise and its extent; and the ratio of the slack to the net borrowing requirement.

Table (4.3) reports the results for the two sub-periods for the Malkiel Model based on short-term interest rates. Only the transformed equation [3.9.g] is reported. Again a coarse search procedure was used to locate the approximate optimal value of for each of the sub-periods. At first sight it appears that for the period during which the restrictions on temporary borrowing are assumed to have been operative, adjustment, as measured by the value of λ, was more rapid. A more rigorous test, however, of the hypothesis that the two relationships, one for the policy-on

TABLE (4.6)

The Malkiel Model Of Net Temporary Borrowing: Short-Term Interest Rate - O.L.S.

1961 (III) - 1968 (I)

Equation	Dependent Variable	
3.9.g	$TB^*_{(t)}$	$-48.83 + 41.06\ \Delta R_{S(t)} - 131.27\ DQ_t + 0.70\ B^*_{(t)}$ $(1.64)\quad (2.86)\qquad\quad (2.64)\qquad\quad (2.65)$

$\bar{R}^2 = 0.376$ S.E.E. = 53.11 D.W. = 1.99 $\lambda = 0.4$

1968(II) - 1973(III)

3.9.g	$TB^*_{(t)}$	$-87.66 + 42.46\ \Delta R_{S(t)} - 145.91\ DQ_t + 0.57\ B^*_{(t)}$ $(1.63)\quad (2.59)\qquad\quad (3.75)\qquad\quad (2.98)$

$\bar{R}^2 = 0.694$ S.E.E. = 70.415 D.W. = 2.56 $\lambda = 0.2$

and one for the policy-off period, are significantly different is provided by the Chow Test[12]. No significant difference was to be found in the estimated functions for the two sub-periods. Table (4.7) reports the results employing the Modigliani-Sutch Model with short-term interest rates. Again the degree of the polynominal and the length of the lag were varied and the equation selected which minimised the standard error of estimate. For both sub-periods the best fit was obtained with a second-degree polynomial over six quarters. As can be seen the lag profiles are very similar. A Chow Test indicated no significant difference between the two sub-periods.

These are surprising results in light of the widespread view that the restrictions on temporary borrowing have been effective, therefore some comments are called for. It would seem that the pattern of net temporary borrowing would have been the same even if the restrictions had not been introduced. There are some difficulties, however, with this interpretation because of the aggregation procedure adopted; it was necessary for the purposes of estimation to take the local authority sector as a whole because disaggregated data for either individual authorities as for groups, such as the County Councils or the Municipal Councils, were not available. This has had the defect of ignoring some of the larger local authorities who prior to the imposition of the controls certainly had well in excess of twenty per cent of their total loan debt on a temporary basis and must almost by definition have been restrained by the restrictions. Apparently the reduction in the proportional temporary borrowing of the larger local authorities has been cancelled out by the greater recourse of smaller local authorities to the temporary money markets. Whether this outcome is to be regarded as an indication of the failure of the measures announced in 1963 to contain local authority temporary borrowing below that level at which it would otherwise have been turns upon what the

TABLE (4.7)

Modigliani-Sutch Model Of Net Temporary Borrowing: Almon Variables: Short-Term Interest Rate: O.L.S.

1961 (III) - 1968 (I)

Equation 4.3.b

$$TB_{(t)} = \underset{(1.37)}{128.59} + \underset{(1.86)}{0.50}\ B_{(t)} - \underset{(2.01)}{97.41}\ DQ_t + \underset{(2.52)}{34.20}\ R_{S(t)}$$

$\sum_{i=1}^{6} b_i R_{S(t-i)}$

t-1	-35.67	$\bar{R}^2 = 0.417$
t-2	-20.03	
t-3	- 8.52	
t-4	- 1.14	S.E.E = 55.21
t-5	2.11	D.W = 1.571
t-6	1.22	

$A_1 = -35.67\ (3.30)$

$A_2 = 17.70\ (2.01)$

$A_3 = -2.07\ (1.47)$

1968 (II) - 1973 (III)

Equation 4.3.b

$$TB_{(t)} = \underset{(0.16)}{-31.75} + \underset{(3.46)}{0.66}\ B_{(t)} - \underset{(3.38)}{135.61}\ DQ_t + \underset{(2.41)}{43.02}\ R_{S(t)}$$

$\sum_{i=1}^{6} b_i R_{S(t-i)}$

t-1	-38.24	$\bar{R}^2 = 0.766$
t-2	-16.63	S.E.E = 72.76
t-3	- 2.01	D.W = 2.482
t-4	5.63	
t-5	6.29	
t-6	- 0.04	

$A_1 = -38.24\ (2.68)$

$A_2 = 25.10\ (2.09)$

$A_3 = -3.49\ (1.80)$

actual aims of the original measures were. If it was the intention to ensure that individual local authorities were not financially imprudent through having too much debt on a short-term basis then this has been achieved. But the 1963 White Paper discussed in chapter two, section 2:5, makes no reference to the risks of insolvency; the case for control of temporary borrowing was phrased solely in terms of the detrimental effects temporary borrowing had for national policy. This means that the total amount of temporary borrowing is of relevance rather than its distribution among local authorities of varying sizes. On these grounds then the Chow Test suggests that the 1963 measures have not been successful. It is possible that the type of temporary debt, that incurred for up to one year, used so far has had the effect of masking some major changes. Apart from the twenty per cent ceiling on temporary debt incurred for up to one year, there has also been a fifteen per cent ceiling on debt incurred for up to three months. It is possible that the restrictions have been effective in limiting the later form of temporary debt but that this only resulted in a switch to temporary debt incurred for between three months and twelve months, so that it would not show up in the regressions run so far. This possibility will be considered in the next section in which temporary debt as defined so far will be disaggregated.

4.3 Disaggregation Of Local Authority Borrowing

As was explained in chapter three, section (3.4), the aggregation of borrowing from one year to as much as twenty years or more into one category may disguise the effect of differing expectational factors on loans of varying maturities. Since, however, data are not available on the maturity structure of net long-term borrowing, but is available on long-term borrowing differentiated by either its source (from the P.W.L.B.) or its type (bond, mortgage or stock) it was proposed that net long-term borrowing be differentiated

according to whether it was from the P.W.L.B.; by the issue of negotiable bonds or stock; or by the sale of mortgages or local bonds. This level of disaggregation accords very vaguely with the maturity structure but it does have the advantage that it focuses attention on the supply of certain forms of debt and on lending by the P.W.L.B.; two aspects of local authority borrowing which have been of considerable interest to the monetary authorities over the years.

Since figures are available which disaggregate net temporary borrowing by term to maturity (up to seven days, seven days to three months, and from three months up to twelve months) a direct examination of the effect of interest rate expectations on very short-term borrowing is possible. Within this latter category it is also possible to separate out borrowing which is made by using overdraft facilities and that which is carried out through the channels of the money market.

4.3.a Disaggregated Long-Term Borrowing

The results reveal some interesting dissimilarities in the response supplies of various types of long-term debt to deviations of the current from the expected interest rate.

So as to limit the number of regressions that need to be reported the results contained in this section are confined to the Malkiel Model and the Modigliani-Sutch Model using short-term interest rates. Furthermore, for the Malkiel Model only the second transformation contained in equation [3.9.b] in Table (4.1) is employed. This requires the calculation of transformed variables of the form:

$$PW^{*}_{(t)} = PW_{(t)} - \lambda PW_{(t-1)}$$

TABLE (4.8)

Local Authority Borrowing From The P.W.L.B 1961(111) - 1973(111)
Short-Term Interest Rate: O.L.S.

Malkiel Model

Equation 3.20.c

$$PW^*_{(t)} = \underset{(1.51)}{-33.43} + \underset{(5.27)}{0.48}\ B^*_{(t)} + \underset{(3.76)}{86.95}\ DQ_t - \underset{(0.52)}{4.99}\ R_{S(t)}$$

$\bar{R}^2 = 0.572$ S.E.E. = 57.47 D.W = 1.97 $\lambda = 0.1$

Modigliani-Sutch Model

Equation 3.20.c

$$PW_{(t)} = \underset{(3.28)}{-169.54} + \underset{(2.20)}{0.31}\ B_t + \underset{(4.16)}{93.63}\ DQ_t - \underset{(0.38)}{4.17}\ R_{S(t)} + \sum_{i=1}^{9} b_i\ R_{S(t-i)}$$

A_1	= 16.27 (1.39)	t-1	16.27	$\bar{R}^2 = 0.66$
A_2	=-29.64 (1.56)	t-2	-1.47	S.E.E = 54.79
A_3	= 14.22 (1.68)	t-3	-3.65	D.W = 1.90
A_4	= -2.45 (1.74)	t-4	-0.29	
A_5	= 0.13 (1.78)	t-5	1.71	
		t-6	-1.43	
		t-7	-10.37	
		t-8	-22.65	
		t-9	-32.69	

$$SB^{*}_{(t)} = SB_{(t)} - \lambda SB_{(t-1)}$$

$$MB^{*}_{(t)} = MB_{(t)} - \lambda MB_{(t-1)}$$

where, again, the value of λ has been varied between 0.1 and 0.9 at intervals of 0.1, and the approximate optimal value of λ selected by the criterion of the minimisation of the standard error of estimate.

Table (4.8) reports the results for long-term borrowing from the Public Works Loan Board. It is interesting to observe that this form of borrowing appears to be insensitive to changes in the rate of interest. The reason for this should be clear from the discussion of P.W.L.B. lending in chapter two, section 2:7. The propensity of local authorities to vary their borrowing from the Board in response to fluctuations in interest rates introduced a element of uncertainty into the affairs of the Board and thus into the borrowing requirement of the Exchequer. This uncertainty was reduced by the phasing scheme which regulated more evenly the times during the year local authorities were allowed to take up their quota entitlements; and therefore the scope local authorities had to fund or to put off borrowing from the Board was limited.

The results for the Modigliani-Sutch Model paint a slightly different picture and suggest that although the initial response to a fall in interest rates is a slight increase in borrowing from the Board it is not a very rapid response and it soon gives way to less borrowing, a perverse response. It may be that a different relationship obtains for the period after 1963, from when the Board was no longer closed to all but the smallest local authority, but to maintain comparability with the other results no such regressions are reported. It is possible also that the gradual increase in the quota of loans available to local authorities may have distorted the lag structure found. Some attempts were made to make allowance for this by including

a number of dummy variables[13]. No significant difference was found and so the results have been excluded.

The results for borrowing by issue of Stock and Negotiable Bond are contained in Tables (4.9) and (4.10). The first, that for the Malkiel Model, indicates that a fall in interest rates brings forward issues of stock and negotiable bonds very quickly. It is possible, however, that this relationship could be strongly influenced by demand factors. Issues are always easier on a rising market and the monetary authorities may be more willing to countenance local authorities entering the market during this period rather than at other times.

The foreign currency borrowing that local authorities pursued during 1973 is classified in the statistics mostly as borrowing by the issue of stock or negotiable bonds. This means that because of the advantageous terms obtainable in the euro-bond market more was borrowed in this form than would have been overwise the case. A dummy variable, $FR_{(t)}$, has, therefore, been included[14]. This is shown as the second regression in Table (4.9). It is not, though, significant at the 5% level.

The results in Table (4.10) for the Modigliani-Sutch Model reinforce those of Table (4.9). Most of the adjustment to a deviation of the current from the expected interest rate occurs in the first two quarters. See figure (4.1)

The response of mortgages and local bonds to deviations of the current from the expected interest rate is somewhat different. As can be seen from Table (4.11) adjustment is much slower. In particular the lag profile indicated by the Almon technique suggests that most of an increase in sales of mortgages and local bonds occurs one to two quarters after a change in interest rates.[14a] The reason for this may lie in the influence of extrapolative expectations.

TABLE (4.9)

Local Authority Borrowing By Issue Of Stock And Negotiable Bonds: 1961(111) - 1973(111) O.L.S.

Malkiel Model

Equation	Dependant Variable		
[3.20.a]	$SB^*_{(t)}$	$5.23 + \underset{(0.57)}{0.12}\ B^*_{(t)} + \underset{(3.05)}{2.87}\ DQ_t - \underset{(0.30)}{18.55}\ \Delta R_{S(t)} \underset{(4.62)}{}$	
		$\bar{R}^2 = 0.351$ S.E.E. = 23.82 D.W = 2.09	$\lambda = 0.1$
[3.20.a]	$SB^*_{(t)}$	$13.53 + \underset{(1.30)}{0.07}\ B^*_{(t)} + \underset{(1.49)}{8.89}\ DQ_t - \underset{(0.87)}{17.81}\ \Delta R_{S(t)} + \underset{(4.47)}{14.59}\ FR_{(t)} \underset{(1.58)}{}$	
		$\bar{R}^2 = 0.369$ S.E.E = 23.44 D.W = 2.11	$\lambda = 0.1$

TABLE (4.10)

Local Authority Borrowing By Issue Of Stock And Negotiable Bonds: 1961(111) - 1973(111) O.L.S.

Modigliani-Sutch Model

$$SB_{(t)} = \underset{(3.41)}{69.27} + \underset{(4.45)}{0.24}\ B_{(t)} - \underset{(0.03)}{0.23}\ DQ_t - \underset{(6.19)}{24.09}\ R_{S(t)} + \sum_{i=1}^{8} b_i\ R_{S(t-i)}$$

A_1	= 11.51 (3.37)	t-1	11.51	$\bar{R}^2 = 0.462$
A_2	= -8.54 (2.12)	t-2	4.76	S.E.E = 21.89
A_3	= 1.93 (1.65)	t-3	1.03	D.W = 2.35
A_4	= -0.14 (1.48)	t-4	-0.52	
		t-5	-0.73	
		t-6	-0.44	
		t-7	-0.49	
		t-8	-1.72	

$$SB_{(t)} = \underset{(3.47)}{69.22} + \underset{(3.09)}{0.19}\ B_{(t)} + \underset{(0.57)}{5.39}\ DQ_t + \underset{(1.60)}{15.40}\ FR_{(t)} - \underset{(5.94)}{23.05}\ R_{S(t)} + \sum_{i=1} R_{S(t-i)}$$

A_1	= 10.23 (2.97)	t-1	10.23	$\bar{R}^2 = 0.483$
A_2	= -7.53 (1.88)	t-2	4.33	S.E.E = 21.48
A_3	= 1.76 (1.53)	t-3	1.17	D.W = 2.203
A_4	= -0.13 (1.42)	t-4	-0.03	
		t-5	-0.05	
		t-6	0.33	
		t-7	0.33	
		t-8	-0.83	

TABLE (4.11)

Local Authority Borrowing By Sale Of Mortgages And Local Bonds: 1961(111) - 1973(111) O.L.S.

Malkiel Model

Equation 3.20.b

$$MB^*_{(t)} = \underset{(1.99)}{38.90} + \underset{(0.74)}{0.08}\ B^*_{(t)} + \underset{(1.22)}{27.97}\ DQ_t - \underset{(2.86)}{26.99}\ \Delta R_{S(t)}$$

$\bar{R}^2 = 0.167$ S.E.E. = 55.08 D.W = 2.04 $\lambda = 0.3$

Modigliani-Sutch Model

Equation 3.20.b

$$MB_{(t)} = \underset{(0.56)}{25.42} - \underset{(0.91)}{0.11}\ B_{(t)} + \underset{(1.90)}{38.03}\ DQ_t - \underset{(1.52)}{14.65}\ R_{S(t)} + \sum_{i=1}^{8} b_i\ R_{S(t-i)}$$

A_1	= 5.76 (0.53)	t-i	5.76	$\bar{R}^2 = 0.417$
A_2	= 37.83 (1.76)	t-2	21.05	S.E.E = 49.05
A_3	=-28.21 (2.49)	t-3	10.75	D.W = 1.93
A_4	= 6.07 (2.81)	t-4	-3.10	
A_5	=-0.40 (2.95)	t-5	-3.01	
		t-6	-1.09	
		t-7	10.98	
		t-8	11.95	

If interest rates fall there may be the expectation that they will fall further so that funding is postponed. It does not seem plausible, on the other hand, to suppose that when interest rates rise local authorities will continue to borrow long-term in the expectation that interest rates are to rise further. From the discussion of both the previous sections and chapter three a more likely course of action would be immediate unfunding in response to a rise in interest rates.

An alternative explanation of the slow response of sales of mortgages and local bonds may be the administrative delays in organising a new batch of issues in response to what appears a more favourable monetary climate. Equally when interest rates rise a number of mortgages and local bonds may still remain on sale at the lower rate of interest. The slow adjustment of those who take up mortgages and bonds to altered monetary conditions may serve to compound these effects. Many local bonds are taken up by the personal sector, the members of which are unlikely to adjust rapidly to changes in relative rates of return on differing assets.

In conclusion, it would seem that the disaggregation of long-term borrowing has uncovered some clear differences in the response of supplies of various kinds of long-term debt to changes in interest rates; and that these differences are due in part to the control that the monetary authorities have exercised and to the influence of demand factors.

4.3.b Disaggregated Short-Term Borrowing

The results for short-term borrowing for up to seven days, $TB7_{(t)}$, are given in Table (4.12). Again a transformed variable of the form:

$$TB7^{*}_{(t)} = TB7_{(t)} - \lambda TB7_{(t-1)}$$

TABLE (4.12)

Local Authority Borrowing For Up To Seven Days: 1961(II) - 1973(III)
O. L. S.

Malkiel Model

$$TB7^*_{(t)} = \underset{(0.17)}{-5.07} + \underset{(2.23)}{0.27}\ B^*_{(t)} - \underset{(4.23)}{131.57}\ DQ_t + \underset{(4.12)}{53.66}\ \Delta\ R_{S(t)}$$

$\bar{R}^2 = 0.498$ S.E.E = 77.27 D.W = 2.133 $\lambda = 0.1$

Modigliani-Sutch Model

$$TB7_{(t)} = \underset{(0.07)}{-4.66} + \underset{(1.83)}{0.31}\ B_{(t)} - \underset{(4.78)}{143.50}\ DQ_t + \underset{(2.88)}{43.24}\ R_{S(t)} + \sum_{i=1}^{7} b_i\ R_{S(t-i)}$$

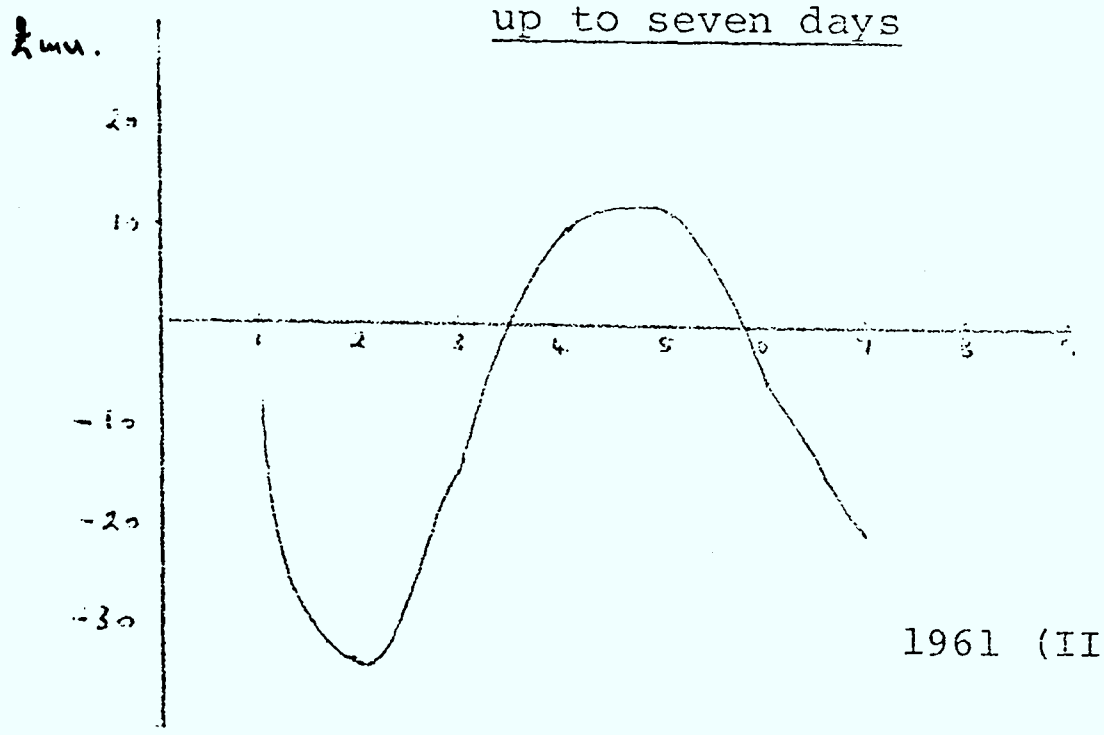
A_1	= - 8.31 (2.46)	t-1	- 8.31	$\bar{R}^2 = 0.547$
A_2	= -69.09 (1.49)	t-2	-33.98	S.E.E = 73.94
A_3	= 55.45 (1.95)	t-3	-13.49	D.W = 2.09
A_4	= -12.96 (2.12)	t-4	8.88	
A_5	= 0.93 (2.21)	t-5	11.17	
		t-6	- 6.26	
		t-7	-20.73	

is used as the dependent variable in equation [4.6.a] in Table (4.12). Although the results for the Malkiel Model are similar to those for temporary borrowing for up to one year as shown in Table (4.3), with the exception that adjustment as indicated by the optimal value of λ is quicker, the results for the Modigliani-Sutch Model are substantially different. While in the earlier results (see Table (4.4)) the best fit was found to be that of a second degree polynomial over six periods, Table (4.12) indicates that a fourth degree polynomial over seven quarters is best. But more significantly it appears that the main response of $TB7_{(t)}$ to changes in interest rates does not occur in the same period. Most is concentrated in the following two periods; which is some evidence in favour of the hypothesis that expectations are extrapolative as well as regressive. See figure (4.2)

The results for the other two components of temporary borrowing, that from seven days up to three months and from three months up to twelve months, are very different. As can be seen from Table (4.13) borrowing for these periods does not reflect the same expectational influences as does seven day borrowing. In fact there is some indication that $TB2_{(t)}$ properly belongs to the category of long-term borrowing in the sense that when interest rates fall $TB2_{(t)}$ is increased and vice versa. Little confidence, however, can be attached to any of these results. The Modigliani-Sutch Model results for $TB3_{(t)}$ were so poor that they have not been included.

In addition to the disaggregation of temporary borrowing according to its term to maturity it has also been proposed that borrowing by overdraft from the banks should be separated out[15]. This has been done and the results are reported in Tables (4.14) and (4.15). Although they are not well determined they do indicate that the extent to which local authorities make use of their overdraft facilities is dependent upon expectations. Since, however,

Figure (4.2) Almon lag profiles: temporary borrowing up to seven days



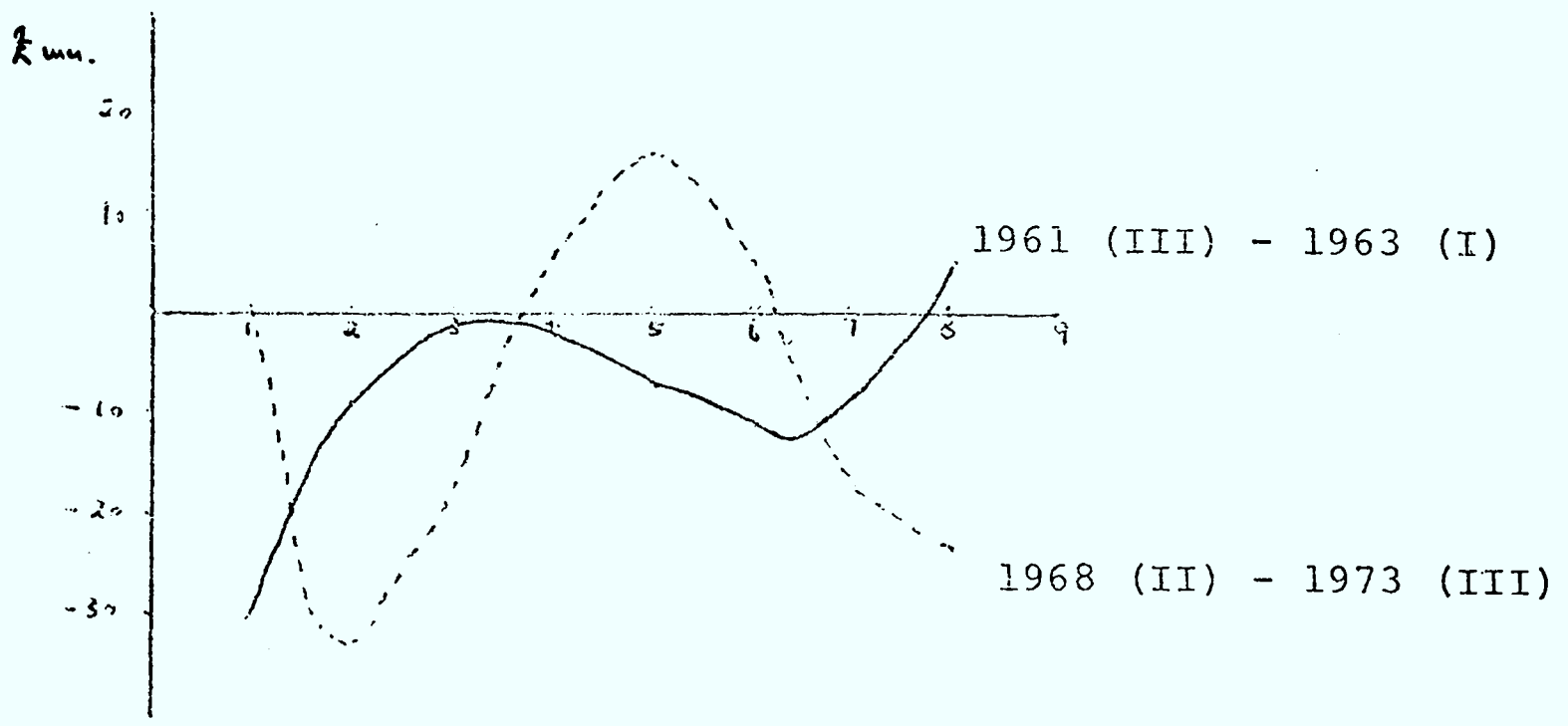


TABLE (4.13)

Local Authority Borrowing Over Seven Days And Up To Three Months; And Over Three Months And Up To Twelve Months: 1961(111)-1973(111)O.L.S

Over Seven Days And Up To Three Months - Malkiel Model

$$TB3^*_{(t)} = \underset{(0.24)}{-2.46} - \underset{(1.24)}{13.31}\ \Delta R_{S(t)} - \underset{(1.67)}{46.33}\ DQ_t + \underset{(2.81)}{0.40}\ B^*_{(t)}$$

$\bar{R}^2 = 0.094$ S. E. E = 62.45 D. W = 2.504 $\lambda = 0.9$

Over Three Months And Up To Twelve Months - Malkiel Model

$$TB2^*_{(t)} = \underset{(0.96)}{-9.67} - \underset{(1.56)}{14.86}\ \Delta R_{S(t)} - \underset{(1.76)}{43.36}\ DQ_t + \underset{(2.74)}{0.35}\ B^*_{(t)}$$

$\bar{R}^2 = 0.091$ S. E. E = 54.88 D. W = 3.10 $\lambda = 0.8$

Over Three Months And Up To Twelve Months - Modigliani-Sutch Model

$$TB2_{(t)} = \underset{(0.10)}{-3.33} + \underset{(0.48)}{0.04}\ B_{(t)} - \underset{(1.20)}{19.29}\ DQ_t - \underset{(1.60)}{10.50}\ R_{S(t)} + \sum_{i=1}^{6} R_{S(t-i)}$$

A_1	= 10.20 (1.92)	t-1	10.20	$\bar{R}^2$ = 0.02
A_2	= -7.42 (1.68)	t-2	3.83	S.E.E = 40.70
A_3	= 1.05 (1.50)	t-3	-0.44	D.W = 2.70
		t-4	-2.61	
		t-5	-2.68	
		t-6	-0.65	

TABLE (4.14)

Local Authority Borrowing By Overdraft: Malkiel Model; 1961(111)-1973(111)
O.L.S.

$$OV^*_{(t)} = \underset{(0.03)}{0.46} - \underset{(0.01)}{0.001}\ B^*_{(t)} - \underset{(0.11)}{1.93}\ DQ_t + \underset{(3.14)}{23.49}\ \Delta R_{S(t)}$$

$$\bar{R}^2 = 0.146 \qquad S.E.E = 44.30 \qquad D.W = 2.81 \qquad \lambda = 0.1$$

$$OV^*_{(t)} = \underset{(1.01)}{-16.08} - \underset{(1.15)}{0.08}\ B^*_{(t)} - \underset{(1.37)}{23.50}\ DQ_{(t)} + \underset{(4.03)}{27.33}\ \Delta R_{S(t)} \underset{[3.41]}{-48.41SP_{(t)}}$$

$$\bar{R}^2 = 0.315 \qquad S.E.E = 39.66 \qquad D.W = 2.70 \qquad \lambda = 0.1$$

TABLE (4.15)

Local Authority Borrowing By Overdraft: Modigliani-Sutch Model
1961(111) - 1973(111) O. L. S.

$$OV_{(t)} = \underset{(0.03)}{1.01} + \underset{(0.86)}{0.07}\ B_{(t)} - \underset{(0.29)}{4.77}\ DQ_t + \underset{(2.94)}{20.77}\ R_{S(t)} + \sum_{i=1}^{5} b_i\ R_{S(t-i)}$$

A_1	= -25.06 (3.72)	t-1	-25.06	$\bar{R}^2$ = 0.166
A_2	= 22.82 (3.39)	t-2	- 6.15	S.E.E = 42.29
A_3	= - 3.91 (3.13)	t-3	4.94	D.W = 2.88
		t-4	8.21	
		t-5	3.66	

$$OV_{(t)} = \underset{(1.80)}{-69.42} + \underset{(0.63)}{0.04}\ B_{(t)} - \underset{(1.51)}{24.86}\ DQ_t - \underset{(3.16)}{55.27}\ SP_{(t)} + \underset{(4.24}{29.76}\ R_{S(t)} + \sum_{i=1}^{5} b_i\ R_{S(t-i)}$$

A_1	= -21.95 (3.55)	t-1	-21.95	$\bar{R}^2$ = 0.315
A_2	= 18.72 (3.00)	t-2	- 6.32	S.E.E = 38.39
A_3	= - 3.09 (2.65)	t-3	3.13	D. W = 2.69
		t-4	6.40	
		t-5	3.49	

overdrafts are substitutes for loans received through the money market some allowance for this has to be made. If what banks charge on overdrafts[16] is greater than interest rates in the money markets local authorites will tend to switch out of overdrafts towards short-term loans from the money markets. The spread, therefore, between the two rates, $SP_{(t)}$, has been included in the regressions[17]. Although the variable is very significant it is of the wrong sign. An anomaly that is difficult to explain[18].

The final issue of this sub-section concerns the restrictions on temporary borrowing considered in section (4.2) above. The hypothesis that they have altered the relationship between temporary borrowing and expectations about the future course of interest rates was rejected on the basis a Chow Test. It was suggested, however, that a fairer test would be that performed on local authority borrowing for up to three months since a separate ceiling of 15 per cent has been applied under the 1963 measures to this category. The results contained in this sub-section suggest that the expectational factors which influence borrowing for up to seven days do not influence borrowing from seven days up to three months in the same way. The comparison of periods has, therefore, been carried out on the basis of borrowing for up to seven days only.

Table (4.16) reports the results for the two sub-periods using the Malkiel Model. Although the values of λ differ between the two periods, to a degree similar to the results in Table (4.6), a Chow Test again indicates that there is no significant difference between the two periods. Table (4.17), the best fit for the early period was obtained from a third degree polynomial over eight quarters with much of the impact concentrated in the first few quarters. For the later period, however, expectations appear to be extrapolative. A rise in interest rates does not increase short-term borrowing immediately; much of the impact is concentrated in the following two quarters, only to give way to further funding of short-term debt in the next

TABLE (4.16)

Local Authority Borrowing For Up To Seven Days: Malkiel Model; O.L.S.

1961(111) - 1968(1)

$$TB7^{*}_{(t)} = \underset{(0.25)}{12.90} + \underset{(0.41)}{0.12}\ B^{*}_{(t)} - \underset{(1.30)}{77.30}\ DQ_t + \underset{(2.84)}{52.12}\ \Delta R_{S(t)}$$

$\bar{R}^2 = 0.194$ S.E.E = 69.01 D.W = 2.303 $\lambda = 0.1$

1968(11) - 1973(111)

$$TB7^{*}_{(t)} = \underset{(0.87)}{53.74} + \underset{(0.42)}{0.11}\ B^{*}_{(t)} - \underset{(3.41)}{167.45}\ DQ_t + \underset{(2.54)}{52.31}\ \Delta R_{S(t)}$$

$\bar{R}^2 = 0.574$ S. E. E = 88.34 D. W = 2.29 $\lambda = 0.1$

TABLE (4.17)

Local Authority Borrowing For Up To Seven Days: Modigliani-Sutch Model: O.L.S.

1961(111) - 1968(1)

$$TB7_{(t)} = \underset{(0.76)}{112.30} - \underset{(0.22)}{0.08}\, B_{(t)} - \underset{(1.27)}{71.44}\, DQ_t + \underset{(3.43)}{62.14}\, R_{S(t)} + \sum_{i=1}^{8} b_i\, R_{S(t-i)}$$

A_1	= -30.46 (2.02)	t-1	-30.46	$\bar{R}^2 = 0.345$
A_2	= 29.85 (1.69)	t-2	- 9.01	S.E.E = 62.78
A_3	= - 9.28 (1.79)	t-3	- 1.32	D.W = 2.27
A_4	= 0.82 (1.94)	t-4	- 2.29	
		t-5	- 7.06	
		t-6	-10.71	
		t-7	- 8.32	
		t-8	5.03	

1968(11) - 1973(111)

$$TB7_{(t)} = \underset{(0.02)}{8.96} + \underset{(0.92)}{0.31}\, B_{(t)} - \underset{(3.18)}{169.31}\, DQ_t + \underset{(0.98)}{36.63}\, R_{S(t)} + \sum_{i=1}^{8} b_i\, R_{S(t-i)}$$

A_1	= 0.54 (0.02	t-1	0.54	$\bar{R}^2 = 0.568$
A_2	=-75.36 (1.30)	t-2	-33.04	S.E.E = 90.96
A_3	= 51.86 (1.69)	t-3	-17.86	D.W = 1.84
A_4	=-10.77 (1.82)	t-4	6.30	
A_5	= 0.69 (1.86)	t-5	16.32	
		t-6	5.24	
		t-7	-16.74	
		t-8	-23.26	

three quarters. The pronounced change in the lag profiles for the two sub-periods points to the possibility that at least for that category of debt with the shortest term to maturity[19] the effect of the ceiling has been to make local authorities more reluctant to borrow short when interest rates rise lest interest rates rise even further and more willing to postpone funding until interest rates fell further.[19a]

4.4 The Effect Of Local Authority Temporary Borrowing On The Term Structure Of Interest Rates.

The question whether the maturity composition of local authority borrowing has altered the relationship between short and the long-term interest rates is of interest for two reasons. First, any joint dependence between temporary borrowing and interest rates will bias the results of previous sections; and second, if the pattern of local authority borrowing does affect interest rates it is germane to a monetary policy which hopes to act upon interest rates as a means of regulating economic activity.

The approach taken here does not attempt to be complete. Only a much more detailed econometric model which incorporated influences such as the demand for local authority debt and supplies of central government debt would be an approximation to that. Two means of testing for the influence of local authority temporary borrowing were suggested by the discussion of chapter three. The first is the reduced-form approach[20] and specifies an equation for either the change in the short-term interest rate or the change in the long-term interest rate. The relevant equation is listed as equation [3.19] in chapter three. The second is suggested by Dodds and Ford[21] who pointed out that if expectations influence the supply of debt then the difference between the long and the short rate will be accentuated at each point in time. They made their comments in the context of Malkiel's Model but here the influence of debt supplies will be tested for by using the Modigliani-Sutch Model.

This means the estimation of an equation of the form:-

$$R_{L(t)} - R_{S(t)} = a_o + a_1 R_{S(t)} + \sum_{i=1}^{n} bi\ R_{S(t-i)} \qquad [4.6]$$

using interest rates on local authority short-term and long-term debt in the U.K. and the calculation of the lag by the Almon technique. Modigliani-Sutch used their model to estimate the magnitude of the effects of changes in the relative maturity composition of the national debt in the U.S.A. on the term structure of interest rates. They did this by including in their estimated form of equation [4.6] for the U.S.A. various proportions of debt differentiated by maturity. The influence of the supply of temporary debt on the term structure has been accordingly tested for by including in equation [4.6] net temporary borrowing. The difficulty is that while it is possible to regard supplies of central government debt as exogenous, net temporary borrowing has been found to be influenced by the difference between the current short-term interest rate and the expected interest rate. This means that net temporary borrowing and the terms on the right hand side of equation [4.6] are collinear. The degree of multicollinearity will depend upon how similar the polynomial which best explains the spread between the long and short-term interest rate is to that which best explains net temporary borrowing.

Table (4.18) contains the 2.S.L.S. estimates for the Reduced-Form model. The first thing to note is the marked improvement in the equation for net temporary borrowing even through the specification is one in which the value of λ is assumed to be zero. Furthermore, while for the earlier results, in section (4.1), the best fit was obtained with short-term interest rates, the results in Table (4.18) suggest that long-term interest rates better explain net temporary borrowing. The last two equations are for the change in the short-term and long-term interest rate respectively. There is no

TABLE (4.18)

The Interdependency Of Interest Rates And Local Authority Temporary Borrowing: The Reduced Form Model; Two-Stage-Least-Squares Estimates. 1961(111)-1973(111)

$$TB_{(t)} = \underset{(2.98)}{-39.94} + \underset{(8.50)}{55.92}\,\Delta R_{S(t)} - \underset{(9.08)}{123.33}\,DQ_t + \underset{(7.74)}{0.38}\,B_{(t)}$$

$$\bar{R}^2 = 0.828 \qquad S.E.E = 34.37 \qquad D.W = 2.11$$

$$TB_{(t)} = \underset{(2.55)}{-28.92} + \underset{(11.08)}{134.92}\,\Delta R_{L(t)} - \underset{(8.01)}{96.01}\,DQ_t + \underset{(6.63)}{0.29}\,B_{(t)}$$

$$\bar{R}^2 = 0.880 \qquad S.E.E = 28.72 \qquad D.W = 2.01$$

$$\Delta R_{S(t)} = \underset{(0.74)}{0.033} - \underset{(0.68)}{0.005}\,\Delta Y_{(t)} + \underset{(6.61)}{0.051}\,\Delta Y_{(t-1)} - \underset{(3.31)}{0.024}\,\Delta Y_{(t-2)} + \underset{(17.10)}{0.50}\,\Delta C_{(t)}$$

$$+ \underset{(6.26)}{0.24}\,\Delta R_{ed(t)} - \underset{(4.32)}{0.11}\,VB_{(t-1)} - \underset{(0.77)}{0.041}\,TB_{(t-1)}$$

$$\bar{R}^2 = 0.948 \qquad S.E.E = 0.177 \qquad D.W = 2.80$$

$$\Delta R_{L(t)} = \underset{(1.41)}{0.012} + \underset{(10.44)}{0.014}\,\Delta Y_{(t)} + \underset{(8.54)}{0.013}\,\Delta Y_{(t-1)} - \underset{(16.27)}{0.023}\,\Delta Y_{(t-2)} + \underset{(19.41)}{0.11}\,\Delta C_{(t)}$$

$$+ \underset{(16.41)}{0.12}\,\Delta R_{ed(t)} - \underset{(17.25)}{0.083}\,VB_{(t-1)} + \underset{(15.29)}{0.153}\,TB_{(t)}$$

$$\bar{R}^2 = 0.993 \qquad S.E.E = 0.03 \qquad D.W = 1.69$$

indication that the pattern of temporary borrowing affects the short-term interest rate. On the other hand, $TB_{(t)}$ appears to be a very significant determinant of the change in the long-term interest rate. Unfortunately the coefficient is of the wrong sign, since it is to be expected that when interest rates rise local authorities will switch away from the long end of the market and the rise in long-term interest rates will be moderated slightly.

Table (4.19) contains estimates for the term structure model of Modigliani-Sutch using interest rates on local authority debt. The best fit was provided by a third degree polynomial over sixteen quarters[22]; a result identical to Modigliani and Sutch's. In addition, the shape of the lag structure has an initial rising segment which provides support for the hypothesis that in the U.K. expectations involve extrapolative as well as regressive elements. Net temporary borrowing was included in equation [4.6.a.] in Table (4.18). Although the coefficient on $TB_{(t)}$ is of the correct sign it is not significant. The presence of multicollinearity, however, may have affected the standard error of the coefficient. To measure the pure correlation between the dependent variable, $R_{L(t)} - R_{S(t)}$, and net temporary borrowing it is necessary to first eliminate the influence of the polynomial terms from both variables. If the unexplained variation of equation [4.6] is regressed on the unexplained variation of a regression of $TB_{(t)}$ on the polynomial terms, it can proved that the simple correlation which results is equal to the partial correlation coefficient between $R_{L(t)} - R_{S(t)}$ and $TB_{(t)}$[23]. This was done but no significant relationship was discernible.

The results of this section provide no support for the hypothesis that the maturity composition of local authority borrowing has accentuated the difference between the long and the short-term interest rate.

TABLE (4.19)

The Interdepency Of Interest Rates And Local Authority Temporary Borrowing: Modigliani-Sutch Model: O.L.S. 1961(III) - 1973(III).

$$R_{L(t)} - R_{S(t)} = \underset{(0.76)}{0.21} - \underset{(9.14)}{0.54}\, R_{S(t)} + \sum^{16} b_i\, R_{S(t-i)}$$

A_1	= -0.0072 (0.16)				
A_2	= 0.0419 (1.51)	t-1	-0.0072	t-9	0.0080
A_3	= -0.0074 (1.75)	t-2	0.0276	t-10	-0.0180
A_4	= 0.0003 (1.91)	t-3	0.0494	t-11	-0.0282
$\bar{R}^2$	= 0.871	t-4	0.0600	t-12	-0.0424
S.E.E	= 0.317	t-5	0.0612	t-13	-0.0516
D.W	= 1.185	t.6	0.0548	t-14	-0.0540
		t-7	0.0426	t-15	-0.0478
		t-8	0.0264	t-16	-0.0312

$$R_{L(t)} - R_{S(t)} = \underset{(0.76)}{0.22} - \underset{(7.93)}{0.55}\, R_{S(t)} + \sum^{16} b_i\, R_{S(t-i)} + \underset{(0.44)}{0.0003}\, TB_{(t)}$$

A_1	= 0.0033 (0.06)	t-1	0.0033	t-9	0.0177
A_2	= 0.0370 (1.23)	t-2	0.0338	t-10	0.0042
A_3	=-0.0068 (1.51)	t-3	0.0525	t-11	-0.0067
A_4	= 0.0003 (1.69)	t-4	0.0612	t-12	-0.0132
$\bar{R}^2$	= 0.871	t-5	0.0617	t-13	-0.0135
S.E.E	= 0.320	t-6	0.0558	t-14	-0.0058
D.W	= 1.213	t-7	0.0453	t-15	0.0117
		t-8	0.0320	t-16	0.0408

CHAPTER FIVE

SOME ASPECTS OF MONETARY POLICY: the role of local authority borrowing.

The theoretical ana lysis and empirical results of the previous two chapters offer a useful framework for a further exploration of the links between monetary policy and local authority borrowing. Chapters 3 and 4 concentrated on the consequences of monetary policy for local authority borrowing; where monetary policy was defined in its widest sense to include the measures that were taken in 1963 to reduce the dependence of local authorities on temporary finance. In this chapter some of the issues that were raised in chapter 2 are taken up again and considered in more detail.

The significance of local authority borrowing for monetary policy comes in part from the scale of capital expenditure that it finances; but also from the slightly ambiguous position of local authorities in the public sector. While in terms of their spending they are an integral part of the public sector they are obliged to obtain usually more than half of their borrowed funds in the open market.

In one sense the consequences of this has been to finance the public sector borrowing requirement on two levels. On the first the Bank of England has sold treasury bills and gilt-edged stock; while on the other, normally at higher rates of return, local authorities have borrowed by selling bonds and mortgages and by accepting short-term deposits. By paying higher rates local authorities have been able to attract

funds into the financing of the public sector borrowing requirement, from both domestic and overseas sources, that otherwise might have gone elsewhere. Of course such an interpretation of events since 1955 begs a number of questions that concern among other things the degree of substitutability of local authority short-term deposits for treasury bills, the role of treasury bills as liquid assets of the banking system, and the distribution of public sector debt between the banks and the non-bank public.

Section 5.1. considers debt management policy before 1971 and the relationship of local authority borrowing to it. In section 5.2. an attempt is made to determine the consequences for the money supply of the way in which local authorities borrow; and how the money supply is related to the public sector borrowing requirement. Section 5.3. deals with competition and credit control and the part local authority debt plays in it. Section 5.4. explores the monetary consequences of short-term capital flows and the part that local authority borrowing has played in their generation. Recent foreign currency borrowing is also considered. The empirical aspects of section 5.4. are the subject of section 5.5. Finally,in section 5.6.,the discussion is summarised briefly.

5.1. Official Management of the National Debt.

As compared with most other industrialised countries the ratio of the national debt to national income in the U.K. is very high.[1] This is a reflection in part of the financing of wars but also of deficit financing

since 1945. The term,national debt,is a slight misnomer however. It amounts to the total liabilities of the National Loans Fund, together with the stocks of the nationalised industries that are guaranteed by the government.[2] But it excludes the debt of local authorities although nationally determined services such as housing and educationare provided on a local basis. Even if the separation of local authority debt from most of that of the rest of the public sector appears superficially anomalous it does highlight a crucial distinction in terms of responsibility and control. The monetary authorities have direct responsibility for the management of national debt but not for local authority debt. Local authority debt has been'managed' until 1974 by almost 1800 individual local authorities; the number as a result of local government reorganisation has since fallen to 547. At the end of March 1973 the national debt stood at £36,526 million as compared with an estimated £19,198 million for local authority debt.[3] The implications of those figures for monetary policy are explored later; but first official management of the national debt will be considered.

5.1.a Objectives of Debt Management.

During most of the post-war period and up until 1971 the monetary authorities in the U.K. have pursued the management of the national debt with a number of aims in mind.[4] First, as a means of acting upon the structure of interest rates in a manner consistant with overall economic policy. Second, to assist credit policy by increasing sales of debt so as to reduce recourse to

the banks, and thereby the banks' scope for lending. And lastly, but most importantly, to strengthen the demand for government stocks by encouraging the widest possible variety of investors, other than banks, to increase their holdings, and to hold longer- rather than shorter-dated stocks.

The stress that has been placed upon this latter objective sprang from a particular official belief concerning the way in which the market in gilt-edged stock worked. According to the official view the market was dominated by investors with short planning periods so that expectations of capital gain or loss depended decisively on forecasts of future changes in asset prices over a short span of time into the future. This meant that if the authorities attempted to pursue a vigorous policy of funding, the consequent fall in prices so weakened confidence in the future level of prices that sales would be lessened in the long run rather than improved. Since a failure to attract and hold sufficient buyers of gilts would mean that the monetary authorities would have to borrow more from the banking system, a direct consequence of an attempt to pursue orthodox monetary policies, that is, policies designed to restrict the money supply by forcing up interest rates through open market operations would have completely the opposite effect to that desired.[5]

It followed from this argument that if sentiment in the market resulted in the selling of gilt-edged stocks, the monetary authorities had to step in and mop up the excess supply; and accept the increase in issues of short-term

debt to the banking sector as a necessary evil in the hope of maintaining the demand for stock in the long run. The overriding consideration, then, was the maintenance of the even keel of the market by the prevention of wide swings of interest rates. Because such a policy inevitably made it difficult to control the credit base of the banking system the authorities were obliged to restrict bank advances to the private sector by ceilings, requests and hire purchase controls.[6]

A policy of 'leaning into the wind' of not attempting to reverse any trend in the market but of simply moderating its amplitude must mean that the authorities are acting directly on the structure of interest rates. And it is at this juncture that the discussion returns to some points which were raised in chapter 3 during a discussion of theories of the term structure of interest rates.

5.1.b The Term Structure of Interest Rates.

Mention was made of a suggestion of Dodds and Ford (1974) that the result of the introduction of expectations to the supply side of the market was to increase the difference between the long and the short interest rate at each point in time. Two ways were suggested of testing for the influence of the supply of local authority debt on the term structure. The first involved the direct estimation of an equation that purported to explain the spread between the long-and the short-term interest rate and included as an explanatory variable local authority net temporary borrowing. This was done and

the results were reported and discussed in chapter 4. No evidence could be found by this means in favour of the Dodds-Ford hypothesis. The second method is more roundabout. It was suggested that the spread between the long- and short-term interest rate in the market for local authority debt should be compared with a market for debt in which a contrary situation prevailed. In other words, compared with a market in which the spread is narrowed at all points in time because debt is supplied so as to moderate the difference between the long and short rates. Clearly from the argument above such a market is that in central government debt. Before this is attempted, however, a number of comments are in order.

Forone thing, according to the expectations theory of the term structure changes in the composition of debt will have no effect on inter-temporal interest rates.[7] This implies that if the conditions of the expectations hypothesis are fulfilled attempts by the monetary authorities to alter the structure of interest rates or even to moderate any changes by leaning into the wind will be unsuccessful. These conditions are very restrictive of course and it is very unlikely that they will be realised in practice. Even so the econometric evidence obtained for the U.S.A. clearly suggests that the composition of the debt does not have a significant effect on the term structure.[8] For the

U.K. evidence is a lot less plentiful; but on the other hand what there is, and in particular that of Dodds and Ford, suggests that changes in central government debt supplies can have effects on the term structure of interest rates.[9]

The second comment refers to the important observation that debt management in the U.K. is supposed to have altered radically since 1971 because of the changeover to Competition and Credit Control. This whole subject is discussed further in a later section. It is sufficient to note here how the changes have affected debt management. It was decided that the Bank of England would restrict its operations in the gilt-edged market by no longer being prepared to buy any stock offered it, with the exception made for stocks with one year or less to run to maturity. The purpose behind this modification in the mode of operation of the Bank in the gilt-edged market was to limit fluctuations in the liquid assets of the banking system which hitherto had arisen from official operations. The lesser degree of intervention was aimed also at allowing greater freedom for the structure of interest rates on government debt to be determined by market conditions.
It follows, therefore, that if any comparison is to be made between the interest rate spreads in the local authority market and the central government market it will have to be confined to the period before the changes of 1971.

The third, and final, remark concerns the relationship between the two markets under study. Theoretically one market is differentiated from another by the substitutability of the goods traded. If a good in one market is a perfect substitute for another then to all intents and purposes the two markets are in fact one. Another way of putting it is that the cross elasticity of demand for the two goods is infinite. Substitutability is of course a matter of degree . In the case of money markets the closer that an asset in one is a substitute for that in another, the greater the effect of a change in one market will be felt in the other. The problem, therefore, is that if the monetary authorities have been successful in altering the structure of interest rates by varying the maturity composition of the debt under their control, the effects will seep into adjacent markets. Depending, therefore, upon the degree to which local authority debt is a substitute for central government debt, a comparison of the two interest rate spreads will not be a completely satisfactory test of the Dodds-Ford hypothesis.[10]

There is also the possibility that events could turn out the other way round. Attempts by the monetary authorities to alter the term structure by shifts in the maturity composition of the national debtmight be frustrated in part by offsetting funding or unfunding by local authorities. For instance, suppose the authorities were to attempt to emulate the monetary authorities in the U.S.A. by trying to lower long term interest rates while

raising short-term rates. In the U.S.A. this came to be known as Operation Twist. The theoretical models of chapter 3 and the results in chapter 4 suggest that local authorities would tend to fund their temporary debt and thereby bring upward pressure on long-term rates and downward pressure on short-term rates.[11] In conclusion, the test proposed is reliant for its validity on the extent to which the market in local authority debt is independent of the market in central government debt.

5.1.c An Empirical Comparison of Two Term Structures.

In chapter 3 a number of competing and complementary theories of the term structure of interest rates were discussed; and in particular with regard to what predictions they generated about the supply side of the market. In this sub-section two variants of the same basic expectations model will be used: that developed by De Leeuw and Modigliani and Sutch; and that developed by Rowan and O'Brien and modified by Hamburger.

The former variant has already been used in chapter 4 for the influence of local authority debt on the interest rate spread; and simply postulates that the interest rate spread can be explained by a polynomial term on short-term interest rates. The latter variant is not a direct explanation of the interest rate spread but was originally directed at testing the distributed lag theory of interest rate expectations. It is to be expected if the authorities are successful in their management of the structure of interest rates that the relationship between current interest rates and expected rates will be weakened while the pattern

of local authority borrowing will tend to strengthen the relationship.[12] The relevant equations are numbered (3.18.c), (3.18.d) and (3.18.e) in chapter 3.

Table (5.1.) contains the results for the Modigliani-Sutch model for the period 1961(111) to 1971(11). The first equation is based on local authority interest rates. The best fit was obtained with a third degree polymial over sixteen quarters. The second equation refers to the spread between the treasury bill rate and the rate on long-dated (twenty years) government stocks.[13] The best fit obtained in this case was with a fourth-degree polynomial over sixteen quarters. The most interesting differences between the two results are first the greater explanatory power of the equation for the local authority market; and secondly, the difference in the lag structures. Although both support the Modigliani-Sutch hypothesis that extra-polative expectations are predominant at first, indicated by the rising values of the lag coefficient in the early quarters, the peak value for the local authority market is much higher than for the central government market. The significance of the results, however, is weakened somewhat by the high standard errors of the coefficients of the Almon variables for the local authority market.

Table (5.2.) contains the results for the Rowan-O'Brien model. They have to be assessed in a particular way. As was explained in chapter 3, Rowan and O'Brien argued that it was a necessary though not sufficient condition for the acceptance of their model that the standard error of equation [3.18.c] was not significantly greater than that of

Table (5.1) Modigliani - Sutch model of the term structure 1961(iii) - 1972(ii)

Local authority market

$$\underset{(2.23)}{0.70} - \underset{(8.94)}{0.60}\, Rs_{(t)} + \sum_{i=1}^{16} Rs_{(t-i)}$$

A1 = 0.037 (0.71)	t-1 0.037	t-9 - 0.008
A2 = 0.022 (0.71)	t-2 0.054	t-10 - 0.008
A3 = -0.005 (1.04)	t-3 0.063	t-11 - 0.023
A4 = 0.0002 (1.20)	t-4 0.065	t-12 - 0.036
$\bar{R}^2$ = 0.838	t-5 0.061	t-13 - 0.045
S.E.E. = 0.279	t-6 0.052	t-14 - 0.049
DW = 1.09	t-7 0.039	t-15 - 0.047
	t-8 0.024	t-16 - 0.038

Central government market

$$\underset{(1.82)}{1.16} - \underset{(5.30)}{1.01}\, R_{tb(t)} + \sum_{i=1} bi\, R_{tb(t-i)}$$

A1 = -0.067 (0.45)	t-1 -0.067	t-9 - 0.126
A2 = 0.275 (1.77)	t-2 0.131	t-10- 0.168
A3 = -0.085 (1.88)	t-3 0.207	t-11- 0.207
A4 = 0.009 (1.83)	t-4 0.202	t-12- 0.261
A5 = -0.0003 (1.76)	t-5 0.148	t-13- 0.353
$\bar{R}^2$ = 0.606	t-6 0.073	t-14- 0.514
S.E.E. = 0.659	t-7 -0.005	t-15- 0.784
DW = 2.44	t-8 -0.073	t-16- 1.207

Table (5.2) Rowan - O'Brien model : 1961(iii) - 1971(ii) ; O.L.S.

Local Authority market

Equation		$\bar{R}^2$	S.E.E.	D.W.
3.18.c	$R_{L(t)} = \underset{(0.75)}{0.19} + \underset{(6.80)}{0.37}\, R_{s(t)} - \underset{(2.91)}{0.22}\, R_{s(t-1)} + \underset{(11.59)}{0.85}\, R_{L(t-1)}$	0.963	0.231	1.67
3.18.d	$\Delta R_{L(t)} = \underset{(2.91)}{0.16} + \underset{(7.04)}{0.37}(R_{s(t)} - R_{L(t-1)}) - \underset{(3.14)}{0.22}(R_{s(t-1)} - R_{L(t-1)})$	0.571	0.232	1.68
3.18.e	$\Delta R_{L(t)} = \underset{(1.33)}{0.05} + \underset{(6.23)}{0.35}\, \Delta R_{s(t)}$	0.493	0.246	1.61

Central government market

3.18.c	$R_{g(t)} = \underset{(1.34)}{0.69} + \underset{(0.97)}{0.16}\, R_{tb(t)} - \underset{(0.54)}{0.10}\, R_{tb(t-1)} + \underset{(7.14)}{0.88}\, R_{g(t-1)}$	0.81	0.573	2.37
3.18.d	$\Delta R_{g(t)} = \underset{(1.43)}{0.23} + \underset{(1.23)}{0.19}(R_{tb(t)} - R_{g(t-1)}) - \underset{(0.63)}{0.12}(R_{tb(t-1)} - R_{g(t-1)})$	0.00	0.574	2.35
3.18.e	$\Delta R_{g(t)} = \underset{(1.57)}{0.14} + \underset{(1.23)}{0.19}\, \Delta R_{tb(t)}$	0.02	0.568	2.37

(3.18.d). Hamburger advanced the additional test that if the model was not to be rejected by the data, equation (3.18.d) must fit the data significantly better than (3.18.e), the first difference relationship.

Hamburger found, on the basis on monthly data for several overlapping periods between January 1946 and March 1968, that the first condition was met. The second condition, however, was not met; and on this basis he concluded that there was no evidence at all in favour of the distributed lag theory of the formation of expectations. That is to say, past interest rates have relatively little influence on investors' expectations of the near future.

In Table (5.2.) those results for central government debt are broadly comparable with Hamburger's even though the data is on a quarterly basis and the time period extends to 1971. For what they are worth they support Hamburger's conclusions.[14] There is a very weak association between quarterly first differences in the rates on short and long-term government securities.

The results for the local authority market tell a different story. There is a strong relationship between quarterly first differences as shown by equation (3.18.e); and more important the results for equation(3.18.d) come down moderately in favour of the distributed lag theory of the formation of expectations.

Although the subject matter of this thesis is not the term structure of interest rates, per se, it is germane in the sense that the pattern of local authority borrowing

is consistent with some of the behavioural tenets of expectational theories of the term structure. The results, moreover, that have been reported above require some explanation. The question is what are the characteristics which make the relationship between the long and the short rate so different as between the two markets. Two have already been suggested: the pattern of local authority borrowing on one side; and the debt management policies of the central government on the other. There is no reason to suppose, of course, that other factors, especially on the local authority market side, have not been of equal importance. The local authority market is not single and distinct from all the other money and capital markets that have grown up in London since the late 1950's. Rates in the local authority temporary money market move closely with those in the inter-bank market and all the other parallel or wholesale markets.[15] This caveat notwithstanding, even if the pattern of local authority borrowing has played no part in determining the spread between the long and short-rates, and no evidence could be found for such a role in chapter 4, the regressions have revealed, if nothing else, that prior to the advent of Competition and Credit Control there was a marked dichotomy between the structure of interest rates over which monetary authorities could exercise direct control and those in the wholesale markets. Since the latter system of interest rates had the most influence on short-term capital flows, from the point of view of monetary policy this must be of some significance. The subject

of short-term capital flows is taken up in a subsequent section.

If this was the state of affairs before Competition and Credit Control, not only does it provide further evidence that some change was necessary it also raises the question to what extent the relationships described above have changed. The regressions, therefore, were rerun for the period 1961 (111) - 1973(111). The small number of observations for after 1971(11) did not allow a separate regression. The results are reported in Tables(5.3.) and (5.4.). Their interpretation depends upon how the new regime is expected to change the relationship. In the first case,that of the central government market, the decision no longer to provide outright support for the gilt-edged market would allow market forces greater influence; and therefore the relationship between interest rates on long and short government securities would improve in the sense that expectations about future short rates would be reflected more in long rates.

It is a little more difficult to establish how the new system would be expected to affect the structure of interest rates in the local authority market. It can be noted, however, in the original consultative document of May 1971, it was made clear that the intention was to use control over liquidity to influence the structure of interest rates. One of the instruments of control was to be the calling of Special Deposits. "By using special deposits . . . we shall be able to exert, when

Table (5.3) Modigliani-Sutch model of the term structure : 1961(iii) - 1973(iii

O.L.S.

Local authority market

$$\underset{(0.86)}{0.21} - \underset{(9.14)}{0.54}\, R_{s(t)} + \sum_{i=1}^{16} b_i\, R_{s(t-i)}$$

A1	= -0.007 (0.16)	t-1	0.007	t-9	0.008
A2	= 0.042 (1.51)	t-2	0.028	t-10	-0.011
A3	= -0.007 (1.75)	t-3	0.049	t-11	-0.028
A4	= 0.0003 (1.91)	t-4	0.060	t-12	-0.042
$\overline{R}^2$	= 0.874	t-5	0.061	t-13	-0.052
S.E.E.	= 0.317	t-6	0.055	t-14	-0.054
D.W.	= 1.19	t-7	0.043	t-15	-0.048
		t-8	0.026	t-16	-0.031

Central government market

$$\underset{(1.73)}{1.17} - \underset{(2.54)}{0.46}\, R_{tb(t)} + \sum_{i=1}^{8} b_i\, R_{tb(t-i)}$$

A1	= 0.186 (0.64)	t-1	0.186
A2	= -0.982 (1.16)	t-2	-0.252
A3	= 0.691 (1.27)	t-3	-0.096
A4	= -0.158 (1.31)	t-4	0.116
A5	= 0.011 (1.34)	t-5	0.120
$\overline{R}^2$	= 0.464	t-6	-0.074
S.E.E.	= 0.885	t-7	-0.184
D.W.	= 1.41	t-8	0.348

Table (5.4) Rowan - O'Brien model : 1961(iii) - 1973(iii) : O.L.S.

		$\bar{R}^2$	S.E.E.	D.W.
Local authority market				
3.18.c	$R_{L(t)} = \underset{(0.19)}{-0.05} + \underset{(9.36)}{0.42}\, R_{s(t)} - \underset{(5.01)}{0.29}\, R_{s(t-1)} + \underset{(15.73)}{0.90}\, R_{L(t-1)}$	0.957	0.278	1.66
3.18.d	$\Delta R_{L(t)} = \underset{(3.02)}{0.18} + \underset{(9.38)}{0.42}\,(R_{s(t)} - R_{L(t-1)}) - \underset{(4.99)}{0.29}\,(R_{s(t-1)} - R_{L(t-1)})$	0.645	0.277	1.60
3.18.e	$\Delta R_{L(t)} = \underset{(.137)}{0.06} + \underset{(8.45)}{0.40}\, \Delta R_{s(t)}$	0.594	0.297	1.60
Central government market				
3.18.c	$R_{g(t)} = \underset{(1.17)}{0.48} + \underset{(2.46)}{0.26}\, R_{tb(t)} - \underset{(1.90)}{0.23}\, R_{tb(t-1)} + \underset{(12.10)}{0.93}\, R_{g(t-1)}$	0.870	0.542	2.32
3.18.d	$\Delta R_{g(t)} = \underset{(.159)}{0.21} + \underset{(2.48)}{0.26}\,(R_{tb(t)} - R_{g(t-1)}) - \underset{(1.79)}{0.20}\,(R_{tb(t-1)} - R_{g(t-1)})$	0.08	0.539	2.31
3.18.e	$\Delta R_{g(t)} = \underset{(1.71)}{0.13} + \underset{(2.40)}{0.24}\, \Delta R_{tb(t)}$	0.09	0.536	2.31

appropriate, upward pressure on interest rates - not only rates in the inter-bank market but also rates in the local authority market and yields on short-term gilt-edged stock.[16]

The results for the Modigliani-Sutch model are contained in Table (5.3.). For the local authority market the results are very much the same. But for the central government market the lag has shortened and suggests that expectations are regressive.[17] The results in Table (5.4.) for the Rowan-O'Brien model are more enlightening. Although the results for the central government market still support Hamburger's conclusions, the association between quarterly changes in the long and short rate has improved. Those for the local authority market are little changed. These results, nevertheless, are not very conclusive. It seems likely that the changes in the financial system would tend to take time to work out properly as a result of the introduction of Competition and Credit Control. Equally the use of monthly observations might be a better means of revealing what kind of difference the introduction of the new monetary policy has made to relative interest rate structures.

5.2. Local Authority Borrowing, the Public Sector Borrowing Requirement and the Money Supply.

The connection between the money supply and the public sector borrowing requirement has been the subject of debate in recent years and with the large borrowing

requirements experienced since 1972 has become a matter of more immediate urgency. In this section the determinants of the money supply will be analysed and their relationship to the public sector borrowing requirement considered. But more important, an attempt will be made to set out as clearly as possible the part that local authorities might play in these processes.[18]

It is common practice to define the money supply in two ways: one narrow and the other broad. The narrow definition M_1, includes notes and coins in circulation with the public plus private sector sterling current accounts. The broad definition, M_3, comprises notes and coins in circulation plus all deposits, whether denominated in sterling or in foreign currency, held by U.K. residents in both the public and private sectors.

If attention is focussed on M_3 it is easier to see why it changes if it is defined in a slightly different way from that above. This is done in Chart (5.1.). The important element from the point of view of this study

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Chart 5.1
Influences on Changes in M_3.

M_3 = Public sector borrowing requirement
minus purchases of public sector debt by the non-bank public
plus bank lending to private sector (excluding lending in foreign currency to U.K. residents for investment overseas plus lending in sterling to overseas residents.)
minus external financing of public sector
plus change in the net position of banks in foreign currencies
minus technical adjustments. 19

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is purchases of public sector debt by the non-bank public. If local authorities increase their borrowing from the banks at the expense of the non-bank public then the money supply increases. It might be argued that since local authorities obtain funds through market channels, whether they borrow from banks, or not is not necessarily at their discretion. Since, however, local authorities can choose to use their overdraft facilities more, to that extent the money supply increases; equally the banks have preferences for certain kinds of local authority debt, particularly negotiable bonds, and it was seen in chapter 4 that supplies of negotiable bonds were responsive to variations in the rate of interest. If in circumstances of monetary constriction interest rates are rising, a fall in the supply of negotiable bonds might reduce bank lending to local authorities unless the banks were willing to increase their short-term deposits with local authorities.

The definition of M_3 in Chart (5.1.) also carries the implication that if for some reason, though this might be unlikely in practice, local authorities increased their borrowing from the P.W.L.B., and this resulted in an equal increase in Exchequer borrowing from the banks, the outcome in terms of the money supply would be unchanged because all that had happened was that one form of public sector debt was being swapped for another. This seemingly plausible influence highlights some shortcomings of analysing a change of money supply in terms of its components. Definitions do not

explain how the money supply is determined or indicate to the monetary authorities how it can be controlled.

At this point some of the arguments considered in chapter 2 can be recalled. It was observed that one of the justifications put forward for forcing local authorities into the open market in 1955 was that the increased borrowing from the P.W.L.B. which occurred during the summer of 1955 had forced the central government to increase the floating debt, i.e. treasury bills, and this had impeded the operation of a restrictive monetary policy. An increase in the supply of treasury bills to the banking system increased their liquid assets and so allowed them to increase their advances.

On the face of it, it would appear that what is important from the point of view of control of the money supply is not just the proportion of the public sector borrowing requirement that is met by borrowing from other than the banks but also the type of public sector debt that is taken up by the banks; or alternatively the type of public sector debt taken up by other than the banks. If local authorities borrow in the open market, then to the extent to which the central government issues fewer treasury bills control over the money supply is made easier.

There is, however, one proviso. The Radcliffe Committee, when it considered the official arguments for allowing local authorities to borrow in the open market, acknowledged that the alternative to local authority temporary

borrowing was an increase in treasury bills which would have made the banks more liquid in the technical sense.[20] The committee, however, did point out that over a period of time this might not be correct because temporary borrowing soon begins to affect the treasury bill market. Holders of treasury bills switch to the local authority market and the result in the end is that the increase in bank holdings of treasury bills is the same as if local authorities had borrowed from the central government in the first place.

The expansionary impact of the public sector borrowing requirement on the money supply differs then according to the precise form of public sector debt acquired by the banks. If the banks take up treasury bills these will be a secondary effect on the money supply by stimulating bank lending; while an increase in short-term lending to local authorities results in a once and for all increase in the deposit base of the banking system.[21] There has been an exception to this since the introduction of Competition and Credit Control and this is considered in the next section.

A move from a description or an analysis of changes in the money supply in terms of definitions or accounting identities to a theory of the determination of changes in the money supply has been tackled in at least two ways. The first is the money multiplier approach and the second the behavioural approach developed by Tobin.

The money multiplier approach, common to most textbooks

of monetary economics, comes in a variety of forms. The first begins with the definition of the money stock (M) as equal to cash in the hands of the non-bank public (C) plus bank deposits (D). Thus

$$M = C + D$$

The need for banks to hold cash for day to day purposes imposes on them a desired or even legally required cash ratio (r). If the banks find that their cash balances make them in excess of the ratio, since cash is a non-interest bearing asset, they will expand their deposits via loans and purchases of interest bearing assets. The banking system will be in equilibrium when bank deposits are equal to $^{1}/r$ times their reserves (R), where the volume of bank reserves, or high-powered money as it is referred to, equals cash in bank tills plus bank balances at the Bank of England.

The sum of cash held by the non-bank public plus bank reserves is usually called the monetary base (B). Given the size of B the greater the public's demand for cash balances the lower the level of reserves available to the banking system. If the public's desire to hold cash is some constant proportion of the money stock (c) the money supply can be expressed as

$$M = \frac{1}{r(1-c) + c} B$$

so that the total money supply is equal to some multiple of the monetary base. By assuming that the two ratios

are constant, changes in the money supply depend only on changes in the monetary base or high powered money. If the monetary authorities control the supply of high powered money then they can determine the total stock of money.[22]

During the 1950's[23] there grew up a view that the monetary authorities could not control the supply of high powered money because of their desire for interest rate stability. Therefore the effective regulatory base of the banking system was not the banks' cash ratio but their liquid assets ratio. The argument was not that a reduction in banks' cash would not force them to reduce their deposits to the extent suggested by the cash ratio theory, but by a smaller amount as suggested by liquid assets ratio; and this was because of the Bank of England's willingness to act as lender of last resort to the discount houses. The policy recommendation, briefly then, was that it was no good selling treasury bills to banks in exchange for cash, since their total liquid assets would remain unchanged. Treasury bills had to be sold to the non-bank public so that the non-bank public in paying for them would draw on their bank deposits and thereby reduce the cash assets of the banks. It was with this rationale in mind that the monetary authorities attached such importance to reducing the supply of treasury bills by obliging the local authorities to borrow in the open market rather than from the Exchequer.

A number of objections were raised against the liquid

assets theory both in terms of its internal logic and its relevancy to the institutional structure of the U.K. financial system.[24] As a policy measure, nevertheless, it was subject to a number of shortcomings. First, with the passage of time alternative liquid assets, in particular commercial bills, became more readily available and so weakened the link between a reduction in treasury bills and a reduction in the liquid assets of the banking system. Second, banks could increase their share of a reduced supply of treasury bills by bidding them away from the non-bank public. And finally, and most important, the objective of managing the gilt-edged market so as to maintain demand for government debt meant that the monetary authorities did not attempt to control seriously the level of bank deposits by manipulating either the the supply of treasury bills or high powered money.

Tobin, among others,[25] has objected to the multiplier approach because it leaves virtually all of the underlying behavioural responses and the processes of portfolio adjustment to changes in relative prices largely hidden. In the case of the U.K., those that favour Tobin's view have criticised the assumption that the supply of high powered money is exogenously determined by the monetary authorities. Goodhart(1973) highlights four main factors influencing the determination of the stock of money in the U.K.: the size of the public sector borrowing requirement; market reactions to the

authorities' open market operations; the elasticity of substitution between domestic and foreign assets; and the interest elasticity of demand for advances. He believes that a proper explanation of the determination of the money supply requires a general equilibrium model of portfolio adjustment by financial intermediaries and the non-bank public. The specification of demand functions for public sector debt by both the banks and the non-bank public would also be an integral part of this model. It should be clear from the discussion that has gone before that some allowance would have to be made also for the supply of local authority debt not only because of its role as a substitute for central government debt in the portfolios of the non-bank public but also because some types of local authority debt act as reserve assets for the banking system under Competition and Credit Control.

5.3. Competition and Credit Control: the role of local authority debt.

The new system of monetary control, Competition and Credit Control (C.C.C.), was discussed in chapter 2 with special emphasis on the effect of the measure on the demand for local authority debt by the banking system. In this section it will be considered more from the opposit direction. How have supplies of local authority debt affected the working of C.C.C.?

While under the previous system no forms of local authority debt counted as part of the liquid assets of

the banks that were obliged to maintain a liquid asset ratio, under C.C.C. local authority revenue bills eligible for rediscount at the Bank of England became one for the banking system. Moreover, under the original scheme the discount houses agreed to keep at least 50 per cent of their borrowed funds in specified categories of public sector debt. Among the categories of public sector debt are local authority bills eligible for rediscount, negotiable bonds and local authority stocks with not more than five years to final maturity.

It was noted in the previous section that under the old system a degree of slippage had crept in because while the volume of treasury bills had been reduced during the 1960 s the volume of commercial bills had increased. Under C.C.C. this form of slippage has been ruled out by the rule that commercial bills only count as reserve assets up to a maximum of 2 per cent of total eligible liabilities.

The question is to what extent the new system is subject to similar uncertainty about the exogeneity of reserve assets; and in particular to what extent local authority debt is under the control of the monetary authorities to a degree sufficient to prevent a restrictionary policy being undermined by the banking system obtaining more local authority debt?[26] The empirical results of chapter 4 may throw some light on this. Although nothing specific can be said about the supply of revenue bills, since

no separate regressions could be run for them, the total volume is constrained by the limits on the maximum amount of bills that a local authority can have outstanding. Nevertheless, it could be supposed that during a period of rising or high interest rates local authorities might be more willing to issue as many revenue bills as they could, even though, ostensibly, they can only be issued in anticipation of revenue. The implication is that a restrictionary monetary policy might be undermined, though admittedly to only a minor degree, by an increase in the supply of revenue bills.

Negotiable bonds and stock with less than five years to run to maturity are a completely different matter. The empirical results that have been reported refer to net issues of stock and negotiable bonds. But it is clear that if the monetary authorities choose to put upward pressure on interest rates, and this results in a deviation of the current from the expected interest rate, the supply of negotiable bonds and stock will be less than otherwise. This will serve to reinforce the monetary contraction because fewer reserve assets will be available to the banking system. On the other hand, the existing volume of stock issues will be coming closer to maturity and some proportion will slip below the point of five years to final maturity. Equally the banking system could attempt to bid negotiable bonds away from the non-bank public and increase the availability that way. There is a limit to this however, because a large proportion of negotiable bonds are held by the banking system anyway.

Since the inception of C.C.C. experience has thrown up one or two anomalies and shortcomings[27] and in an attempt to enhance the efficiency of the system two modifications have been introduced: one minor and one major. The first concerned the requirement that the discount houses maintain at least 50 per cent of borrowed funds in defined categories of public sector debt.[28] It was found that this requirement tended to complicate the Bank of England's task of controlling the credit extended by the discount market, and produced distortions in short-term money markets. With the object of alleviating these difficulties, the public sector ratio was replaced, with effect from July 1973, by a control which limits aggregate holdings of certain assets to a maximum of twenty times a house's capital and reserves. These are all assets other than those previously defined as public sector assets.

The second, and more significant modification was the introduction in December 1973 of Supplementary Credit Control, (S.C.C.).[29] One of the main criticisms levelled at the monetary authorities during 1972 was that the rate of monetary expansion, as measured by M_3, was excessive even after some allowance had been made for the effects of C.C.C. The new scheme is unusual for the U.K. in that it operates on the liabilities of the banks; and in particular on the banks' interest-bearing eligible liabilities so that it excludes such non-interest bearing liabilities as most current accounts.

Briefly, the Bank of England specifies a maximum rate at

which interest-bearing eligible liabilities may grow over a given period. If the increase is in excess of this rate for a bank then a supplementary deposit must be placed with the Bank of England on which no interest will be paid. Under the scheme introduced in December 1973, an excess of one per cent over the allowable rate the penalty amounts to 5 per cent of the excess; for an excess of 1 to 3 per cent, the penalty is 25 per cent; and thereafter 50 per cent. It was the hope that the new scheme would improve control over the money supply and bank lending.

One of the consequences of S.C.C. is the encouragement it has given to a process of disintermediation. This means that some funds, which formerly flowed through the medium of the banks from lenders such as industrial companies to borrowers like local authorities, may flow more directly from companies to local authorities via only the money brokers. This can occur as a result of banks attempting to reduce their interest-bearing liabilities. These liabilities are made up of deposit accounts and certificates of deposit and inter-bank lending, plus net foreign currency deposits. Banks could restrain the growth of these liabilities by bidding less competitively in the wholesale money markets. This involves the sale of certificates of deposit, involving comparatively large sums, and borrowing from other banks in the inter-bank market. The funds that a bank acquires in this way are then lent on, at a turn, often to local authorities, or else to finance houses. If a bank, then, reduces its bid for wholesale funds it can swiftly reduce its liabilities. If say, one bank

reduces its inter-bank borrowing this reduces its liabilities; but the reduction in the liabilities of one bank is a reduction in the assets of another, or group of others, which reduces the 'deductibles' and puts pressure on the other banks to reduce their liabilities in the inter-bank market and a chain-reaction is set in motion. Interest rates in the inter-bank market would spiral downwards without the total of interest bearing eligible liabilities in the form of net borrowing from other banks actually changing. Of course, this partial analysis ignores the inter-connectiveness of the wholesale money markets. Non-bank lenders such as large companies of overseas depositors are important sources of funds and local authorities are important borrowers. Since lending to local authorities is not deductible for the purposes of calculating eligible liabilities, banks would have an incentive to reduce their lending to local authorities and to lend instead in the inter-bank market or buy the certificates of deposit of other banks. On the other hand, the fall in interest rates in the inter-bank market would tend to divert funds from the non-bank sources directly into the local authority market. The total interest-bearing eligible liabilities of the banking system are thereby reduced along with a general lowering of interest rates. The process of disintermediation can run contrary to monetary policy in the sense that monetary control is improved the more funds tend to flow through financial intermediaries such as banks that are normally regulated, rather than through other channels.[30]

5.4.a Monetary Effects of Short-Term Capital Flows.[31]

Attention will be concentrated on inflows that arise from the switching of foreign currencies into sterling by banks

in the U.K. Since London has been the main centre for the Euro-dollar market the banks there have received large foreign currency deposits and these have normally been employed by lending them on in the euro-dollar market;so that at no point do these deposits become part of domestic liquidity in the U.K. These funds come into this category only when the banks switch into sterling and employ the proceeds in some security in London.

The actual process of switching entails the sale of the foreign exchange in exchange for sterling. Most transactions in foreign currencies in London are married off daily between the banks; but if there is a surplus this would tend to force the exchange rate upwards which, under a regime of fixed exchange rates, brings the Monetary Authorities into the market. Through the offices of the Exchange Equalisation Account (E.E.A.) the surplus of foreign exchange is absorbed and the official exchange rate is maintained.

The E.E.A., an Exchequer financed government account, has payments in sterling made on its behalf by the Bank of England. The effect of these transactions is that the banks have an increase in their total liabilities to foreigners, matched by an equal increase in cash balances at the Bank of England. Only a small part of these increased cash balances are retained in the form of cash; the remainder is deposited at call or in the form of a short-term asset. Let it be supposed, for the moment, that the short-term asset is a treasury bill. The result is that the deposits of the banking system have been increased by the amount of

the inflow.

The sterling payment made on behalf of the E.E.A. by the Bank of England has to financed. This is done by the Exchequer borrowing through the issue of treasury bills. The net result is that there will be an increase in the total of government debt equal to the inflow of foreign currency. The reserves will be larger but so will the volume of government debt held in the portfolios of the public.

The increase in the deposits of the banking system, under a fractional reserve mechnanism, will result in a multiple expansion in deposits and to an increased money supply. A capital inflow then increases the domestic money supply. The monetary authorities may choose, and in practice they have done so, to try to 'neutralise' the expansionary consequences of an inflow, other than by direct exchange controls, by selling the extra amount of treasury bills, which were made necessary by the E.E.A. transactions, to the non-bank public who would pay for them by drawing upon their deposits with the banks. This would counteract the expansionary effect of the inflow. The monetary authorities have the capacity to finance any inflow as long as they can sell debt to the non-bank public and are willing to allow the reserves to increase by the same amount.

If the inflow occurs not as a result of a bank making the decision to switch a foreign currency deposit into sterling but because the foreign owner instructs the bank to make the switch into sterling on his behalf and to invest the proceeds

in treasury bills, the inflow is self-financing because a purchase of treasury bills is matched by an equal and opposite sale of treasury bills by the Exchequer.

It is clear that whether or not an inflow results in an expansion in domestic liquidity will depend on how the increased volume of government debt is distributed between the banks and the non-bank public.

5.4.b Flows into Alternative Short-term Assets to Treasury Bills.

The simplified argument of the previous section glossed over some important institutional detail which does not actually alter the final conclusion but does make the possibility of its occurrence more unlikely. For instance reference was made to the banking system but this disguises some very significant differences, at least before 1971, between the clearing banks and the merchant, overseas and foreign banks. The later group were instrumental in the evolution of the euro-dollar market and because they were outside of the Cartel arrangements which prevented the clearing banks from competing, they were able to attract significant foreign currency deposits. Because also, these banks abide by rules on the composition of their liquid assets they tended to favour assets, other than call money with the Discount Houses and treasury bills, which gave a much higher yield.

If, then, it is supposed that the only form of switching which occurs is that carried out by the non-clearing banks,some major amendments to the above arguments are required. If one of the merchant, overseas or foreign banks

makes the decision to switch into sterling and to invest the proceeds in some short-term asset it will have to be one that held out the prospect of gain after the cost of forward cover has been taken into consideration. As it has already been noted in Chapter 2 one such likely asset has been deposits in the local authority temporary money market. Because of the concern of this study it will be supposed that switching into sterling is only carried out for the purposes of depositing the proceeds with local authorities. In practice funds were also deposited with hire purchase finance houses.

If a straight switch is made of a foreign currency deposit into sterling and the proceeds deposited on a short-term basis with a local authority the borrowing requirement of the government is still increased by the amount of the inflow. The question whether an inflow will increase the money supply then turns upon whether, and to what extent, the increased demand for local authority debt results in changes in relative yields and consequential shifts in the composition of domestic portfolios towards a larger demand for central government debt.

Cramp (1971)[34] has distinguished two channels through which the effects of a flow of short-term funds to local authorities might have been transmitted to the market in treasury bills so as to relieve the situation of excess supply created by the transactions of the E.E.A. For one thing, if local authorities do not increase their temporary borrowing the tendency for yields to decline

might induce switching into treasury bills. Secondly, if local authorities do borrow more on a temporary basis, they might as a result borrow less from the central government via the Public Works Loan Board and thus reduce the borrowing requirement of the central government.

Regarding the first channel, the degree to which an increase in funds coming into the local authority's temporary money market will result in a subsequent shift into treasury bills is dependent upon a number of elasticities: the cross-elasticity of demand for treasury bills and local authority short-term deposits, assuming that no other assets enter into the relevant portfolios, of the banks and the non-bank public; and the elasticity of supply of local authority short-term securities. The results of chapters 3 and 4 are relevant to this final elasticity. It was supposed by Clendenning (1970)[35] in a discussion of the same issues raised by Cramp, that because local authority spending and borrowing requirements are determined primarily by long-term policy considerations and not by the availability and cost of money local authorities would react to borrowing more from the banks, which had switched into sterling, by borrowing less from other sources. Whether the elasticity of supply of local authority short-term debt will be high or low depends upon the monetary conditions that have given rise to the short-term capital inflow. If the monetary authorities have chosen to generate capital inflows by raising domestic interest rates this is likely to be associated with an increase in temporary borrowing as local authorities attempt to ward off the

high costs of long-term borrowing. An inflow, then, into the local authority market in these circumstances would be met by an increase in supply; and the possibility of a shift occurring into the treasury bill market accordingly lessened. This, however, is likely to be not altogether to the disadvantage of the monetary authorities since circumstances in which they were concerned to encourage inflows of short-term capital into the U.K. would usually be those in which there was a need to finance a deficit on the balance of trade. The contraction in the money supply as a result of the trade deficit would be offset by capital inflows. The eventual extent to which an inflow would be matched by an increase in local authority temporary borrowing would also depend upon the speed of adjustment of foreign portfolios to a change in the differential between interest rates in the euro-dollar market and those in the U.K., and on the speed of adjustment of local authority borrowing to a deviation of the current from the expected interest rate.

If, on the other hand, the short-term capital inflow arises because of a decline of interest rates in the euro-dollar market while monetary conditions in the U.K. are unchanged, there will not be a concurrent rise in local authority borrowing; and in fact if the monetary authorities consider it necessary to allow domestic interest rates to fall temporary borrowing may decline.

Apart from the elasticity of supply of local authority short-term debt the cross-elasticity of treasury bills

and local authority short-term deposits is also relevant. The division of the banking system into those banks which agreed among themselves on interest rates and were subject to a liquid assets ratio, and those that were outside of the cartel arrangements that prevailed until 1971,coincides with important differences in the structure of banks' assets and liabilities. The requirement that one group of banks have had to hold some proportion of their assets in defined liquid assets and that these have included treasury bills, while the remainder were not so prescribed, has meant that the market for treasury bills has been quite narrow. The merchant, overseas and foreign banks have preferred, because of the generally higher return to be earned, to hold whatever amount of liquid assets they considered expedient in the form of deposits with local authorities rather than treasury bills. Non-bank holders have also had a preference for short-term deposits with local authorities. All of which suggests that the cross elasticities are likely to have been low.

As for the second channel delineated by Cramp, the empirical results of chapter 4 are relevant also. If because of the monetary climate associated with short-term capital inflows local authorities reduce their long-term borrowing the question is whether they will achieve this by a reduction in calls on the P.W.L.B. The results reported in Table (4.8) suggest that this will not be so. Because of the phasing arrangements for P.W.L.B. lending local authorities appear to prefer to carry out their unfunding operations by a reduction in demands

on the mortgage, bonds and stock market. If some effect of an increase in temporary borrowing is to be transmitted to the markets in central government debt it will have to be via the markets in local authority stock and negotiable bonds since mortgages and local bonds are not very close substitutes for gilt-edged stock or treasury bills.

Clendenning in a more detailed analysis of the consequences of short-term capital flows for monetary policy and the ways in which the euro-dollar market has altered these flows, argues that " . . . there are three basic factors determining the effectiveness of monetary policy in an open economy operating under fixed exchange rates: (1) the freedom with which capital can move internationally; (2) the elasticity of supply of arbitrage funds in both the country concerned and the rest of the world; and (3) the elasticity of demand for arbitrage funds in the rest of the world."[36] He takes the view that the main consequence of the euro-dollar market for the international financial system has been to increase the elasticity of supply of arbitrage funds; and for the U.K. financial system to divert short-term capital flows from traditional channels, such as that between U.K. and U.S. treasury bills, to new channels such as that between the euro-dollar market and the local authority temporary money market.

It can be asked whether in the absence of local authority temporary borrowing and the network of money markets that grew up to accommodate it short-term capital flows into and

out of the U.K. would have been smaller. In other words, has local authority temporary borrowing increased the elasticity of demand for arbitrage funds? The answer depends upon the availability of some alternative short-term asset to local authority short-term deposits with similar characteristics of high yield and security. Deposits with hire purchase finance houses might have filled some of the room left by the absence of local authority borrowing. More treasury bills might have been taken up by the merchant, overseas and foreign banks as a liquid asset in place of local authority deposits. But in all it seems reasonable to suppose that if local authorities had been restrained from borrowing on a temporary basis or if the monetary authorities had not forced local authorities to borrow in the open market from 1955 onwards, short-term capital flows into and out of the U.K. would have been in some measure lower.

These issues, however, have become of only academic interest because as was noted in chapter 2 the relationship between local authority borrowing and short-term capital flows weakened progressively after 1967. The empirical aspects are considered in section 5.5. below. Recently, however, local authority borrowing in foreign currencies has revived the debate about the monetary implications of capital inflows and this is the subject of the next section.

5.4.c Foreign Currency Borrowing by Local Authorities: the monetary implications.

The period during which local authorities borrowed funds on

a temporary basis that originated abroad differs in some very important respects from the period after the beginning of 1973 during which local authorities have borrowed foreign currency. In the first place, although in the early period most of the funds of foreign origin placed with local authorities were contingent liabilities likely to be withdrawn on very short notice in the event of uncertainty about the future value of the exchange rate or because of the prospect of a higher yield being obtainable elsewhere, foreign currency borrowing for which exchange cover is available must be for a minimum of five years.[37] Second, the value of sterling has been allowed to float since June 1972, even though the monetary authorities have considered it expedient on numerous occasions to 'manage' the float. And finally the introduction of 'Competition and Credit Control' om September 1971 has blurred the distinction between the clearing banks and the other banks, and imposed a common reserve ratio on them all.

To put the role of local authority borrowing in the financing of a balance of payments deficit in its proper context some of the alternative means of financing will be considered in conjunction. When there occurs a balance of payments deficit on current account the shortfall has to be financed. Payment for imports if it has to be made in foreign currency, other things being equal, results in an excess supply of sterling and to a depreciation of the exchange rate. The process of adjustment as a result of cheaper exports and more expensive imports eventually results in a return to equilibrium in the balance of payments. This adjustment is

assisted by the fall in domestic money supply arising from the deficit.

If the process of adjustment is slow or if it is exacerbated by something like the oil crisis the monetary authorities may prefer that the exchange rate does not adjust immediately to that value which will clear the foreign exchange market. This can be achieved by borrowing overseas and taking steps to correct the deficit by appropriate fiscal and monetary policies. In practice the monetary authorities have been instrumental through the E.E.A., in dealings in foreign currencies. For instance, loans have been negotiated with the banks by the central government.[38] These serve to augment the reserves directly without there being any payments made in sterling. The foreign currency assets and liabilities of the banks are increased by equal amounts, which leaves their net foreign currency position, and therefore their reserve ratios, unchanged.

If, instead, local authorities or for that matter the public corporations borrow foreign currency, under the exchange cover scheme they are obliged to sell the proceeds for sterling to the E.E.A. If the foreign currency borrowing had to be sold in the foreign exchange market this would tend to offset the downward pressure on the exchange rate resulting from the current account deficit. Since, however, the foreign currency is used to augment the reserves the borrowing requirement of the central government is increased by the equivalent value in sterling. Whether this increased borrowing requirement results in a larger borrowing by the central

government from the banking system and, thereby an expansion in their reserve assets, depends upon the form in which local authorities and public corporations would have borrowed otherwise.

Taking public corporations first, if they borrow overseas this will be as an alternative to borrowing from the central government through the National Loans Fund. The borrowing requirement will then be reduced by an amount equal to the increased borrowing requirement created by the sterling payments made on behalf of the E.E.A. The domestic monetary consequences are identical to those that arise from foreign currency borrowing by the central government.

The results for local authority currency borrowing are less clear-cut. They are the corollary of those results noted in the previous section when the ability of the monetary authorities to neutralise short-term inflows was being considered. The question is from which source and in what form will local authorities reduce their domestic borrowing as a consequence of their borrowing in foreign currencies. From the point of view of the monetary authorities, if they are concerned to maintain the depressing effect on the money supply of the balance of payments deficit, the best possible outcome would be a reduction in borrowing from the Public Works Loan Board. The empirical results of chapter 3 cannot provide a categorical answer but it was noted there that most foreign currency borrowing has been denominated in the form of negotiable bonds. Because of the generally favourable interest rates charged for loans

from the P.W.L.B. it is probable that local authorities would choose to substitute foreign currency borrowing for loans other than from the Board. If the reduction was achieved by fewer negotiable bonds being issued to domestic holders then the effect on domestic monetary conditions will depend on how the funds which local authorities no longer require are disposed of. There are a number of possibilities which depend upon the particular sector that would otherwise have purchased negotiable bonds from local authorities and upon how this sector disposes of the funds which are not now employed in negotiable bonds.

If the sector is that of banking a reduction in borrowing by local authorities does nothing to reduce the increased borrowing requirement of the central government that has arisen from the need to purchase through the E.E.A. the foreign currency borrowed by the local authorities. There is an exception to this, however, if it is supposed that foreign currency borrowing reduces the availability of negotiable bonds to the banking system. Under 'Competition and Credit Control' negotiable bonds are counted as public sector debt for the discount houses. Other things being equal, fewer negotiable bonds will restrain the discount market's ability to accept money at call from the banks. The effect on the reserve assets of the banking system is not, however, likely to be sufficient to offset completely the expansionary consequences of the increased borrowing of the central government.

If, as a result of foreign currency borrowing. local authorities borrow less from the non-bank public the monetary

consequences depend upon how the funds local authorities no longer require are disposed of. If the funds all flow into central government debt there occurs no increase in the reserve assets of the banks and therefore no expansion in the money supply. If on the other hand the funds are deposited with the banks, the banks' reserve assets rise by the full amount of the increased central government borrowing requirement. The contractionary effects on the money supply of a deficit on the balance of payments will be lessened the more the non-bank public replaces holdings of local authority debt by bank deposits rather than by central government debt.

5.5. Local Authority Borrowing and Short-term Capital Flows: the empirical evidence.

The role that local authority borrowing has played in short-term capital flows between the euro-dollar market and the U.K. will be considered on the empirical level in this sub-section. More specifically an attempt will be made to establish the relationship between lending to local authorities by banks in the U.K. and borrowing and lending by these banks in the euro-dollar market. Since flows between the euro-dollar market and U.K. financial markets are an important component of total short-term capital flows, the determinants of the total flow are probably important determinants of flows between the euro-dollar market and a financial market such as that dealing in local authority short-term deposits. For this reason some attention must be paid to the factors which have influenced capital flows.

5.5.a The Determinants of Short-term Capital Flows.

Although considerable work has been done on the short-term capital flows into and out of the U.S.A. and Canada[39] there is only one published study of short-term capital movements of the U.K., that of Hodjera (1971). There is also, however an unpublished study by Hutton (1972), which emphasises the interdependence of capital flows, forward exchange rates and interest rates.

Hodjera draws upon the methodology developed in econometric studies of short-term capital movements in the U.S.A. and Canada and modifies it to make allowance for the influence of speculative factors. A stock adjustment model is used in which short-term capital flows respond to interest-rate differentials and to speculative forces. The inadequacy of the data and the problems caused by destabilising speculation after 1967 compelled him to confine the empirical work to the period 1963 to 1967. It was also argued that the various exchange controls on external capital transactions of U.K. residents have resulted in various components of short-term capital flows being responsive to different variables. For this reason he disaggregated flows into (a) transactions in non-sterling area currencies; (b) transactions in sterling with the non-sterling area; and (c) transactions in sterling with the overseas sterling area.

Transactions in non-sterling area currencies are carried out almost entirely via the euro-dollar market and so this component flow is of relevance to the subject of this section Ignoring his other results, Hodjera found that flows to and

from the euro-dollar market were very responsive to changes in the uncovered differential between the interest rates on euro-dollar deposits and local authority deposits as well as to speculative influences which were proxied by lagged and current changes in selected trade balances and by a dummy variable that took account of periods during which speculation against sterling was very strong. When allowance was made for the cost of forward cover, that is by using the change in the covered interest rate differential, the results were not as good. Thus:

Uncovered Differential

$$NP_{(t)} = \underset{(1.53)}{14.95} + \underset{(3.72)}{64.36}\ \Delta I_{(t)} + \underset{(3.11)}{49.61}\ \Delta I_{(t-1)} - \underset{(2.13)}{0.269}\ \Delta NS_t\ BT_t + \underset{(2.54)}{0.213}\ BT_{(t-1)} - \underset{(2.57)}{40.23}\ D_t$$

$R^2 = 0.699$ DW = 2.257

('t' - statistic is in parenthesis)

Covered Differential

$$NP_{(t)} = \underset{(0.53)}{-7.42} + \underset{(2.96)}{190.80}\ \Delta \hat{I}_{(t)} + \underset{(2.45)}{170.50}\ \Delta \hat{I}_{(t-1)} + \underset{(0.22)}{0.04}\ \Delta BT_{(t)} + \underset{(1.83)}{0.22}\ \Delta BT_{(t-1)} + \underset{(1.45)}{42.0}\ D_t$$

$R^2 = 0.407$ DW = 1.308

Where $NP_{(t)}$ is the change in the net position of banks in

foreign currencies; $\Delta I_{(t)}$ is the change in the uncovered differential; $\Delta \hat{I}_{(t)}$ the change in the covered differential; $\Delta NS_t\ BT_t$, the change in the U.K. trade balance with the non-sterling area; $\Delta BT_{(t)}$, the change in the total U.K. trade balance; and D_t a dummy variable for speculative periods.

Hutton's approach and his results are substantially different. He started from the basic theoretical proposition of all studies of capital flows, the interest parity condition, which states that if the explicit interest-rate differential is just equal to the implicit interest rate on the use of forward exchange, i.e. whenever

$$R_d - R_f = (X_t - X_o)/X_o \ \frac{360}{T} \qquad [5.1.]$$

there is interest parity. Where R_d and R_f are domestic and foreign interest rates respectively, X_t is the forward rate of exchange; X_o is the spot rate; and T is the time to maturity of the forward contract. When there is interest parity there is no incentive to move funds.

Flows, however, respond to changes in interest-rate differentials so that short-term capital flows, $SC_{(t)}$, are dependent upon the change in the covered differential. Thus:

$$SC_{(t)} = a_o\ \Delta(R_d - R_f - c) \qquad [5.2.]$$

Where c, the forward discount/premium per cent per annum, is equal to the right-hand side of equation [5.1.]

There are, however, limitations on the extent to which banks are permitted to offer forward cover for the exchange risks involved in borrowing in foreign currencies and switching into sterling. It is therefore possible that flows will depend upon the uncovered differential plus or minus expectations about the future spot rate that are based on factors other than those determining the forward rate. Thus:

$$SC_{(t)} = a_o \Delta (R_d - R_f - c) + a_1 \Delta (R_d - R_f - S^e) \qquad [5.3.a]$$

where S^e is an implicit forward premium/discount per cent per annum. Since this is unobservable, Hutton suggests two proxies: the lagged trade balance which is considered as an indicator of confidence in the pound; and a dummy variable for periods of speculation.

There is a problem that neither the forward rate nor the domestic rate is exogenous. Short-term flows tend to move the market towards a state of interest parity. Hutton dealt with this by specifying a model in which R_d and $c_{(t)}$ are determined in addition to $SC_{(t)}$. His O.L.S. and two-stage least squares estimates were very similar, on the other hand, so the single equation approach is adopted in this section.[40] Rearranging equation [5.3.] yields:

$$SC_{(t)} = (a_o + a_1) \Delta (R_d - R_f) - a_o \Delta c_{(t)} + a_1 \Delta S^e \qquad [5.3.b]$$

The addition of seasonal dummies and the proxies for S^e produced the following estimated equation, using O.L.S., for the period 1963(I) to 1971(VI):

$$SC_{(t)} = \underset{(3.60)}{1.038} + \underset{(6.05)}{5.57}\Delta I_{(t)} - \underset{(5.07)}{2.728}\Delta C_{(t)} + \underset{(2.84)}{1.172}DQ_1$$

$$+ \underset{(2.40)}{1.113}DQ_2 - \underset{(3.50)}{1.433}DQ_3 + \underset{(6.48)}{1.063}BT_{(t-1)} + \underset{(10.0)}{1.873}D_t$$

$$R^2 = 0.93 \qquad DW = 1.871$$

5.5.b <u>The Relationship between Lending to Local Authorities by Banks and Short-term Capital Flows.</u>

The aim, in this sub-section, is to use Hodjera's and Hutton's specifications to link short-term capital flows to lending to local authorities by banks. This will be attempted in two ways: First, directly, by relating lending to local authorities by banks to the banks' foreign currency transactions; and second, by regressing lending to local authorities on the variables which determine capital flows.

It is necessary, beforehand, to make a number of assumptions about and adjustments to various types of data to make this possible. The growth of Merchant Banks and Overseas and Foreign Banks (here after referred to as MBOF) have been closely connected. The clearing banks and the discount houses have until recently played little if any part in this development. Therefore any flows between U.K. financial markets and the euro-dollar market are likely to be reflected in the portfolio behaviour of the MBOF rather than that of the traditional banking sector. It will therefore be assumed that the traditional banking sector does not switch foreign currencies into sterling for lending in

the domestic financial markets. It is necessary to assume this because there is only data for switching into sterling for the banking system as a whole. There exists data for lending to local authorities by the MBOF but it aggregates long term and short term lending. To arrive at an estimate of short term lending by the MBOF, as opposed to that for the banks as a whole, it is assumed that short-term lending by overdraft is confined to the traditional banking sector; so that the remaining short-term lending is that of the MBOF.

A further problem is raised by the estimate of funds which are switched into sterling from the Euro-dollar market. Hodjera used the change in the net positions in U.K. banks' transactions in non-sterling area currencies from period to period. For most of the period he studied this makes little difference. But since 1966 there has been a larger and larger amount of switching into sterling to finance long term U.K. investment overseas.[41] For the longer period it is necessary to use data on other foreign currency borrowing or lending (net) by U.K. banks, which Hutton uses. In the results which are reported both estimates are used.

Measuring the direct relationship between currency switching and lending to local authorities is subject to a number of distortions. Switching on the part of the MBOF is part of a complex adjustment process in their portfolios which can take a variety of forms. Any change in lending to local authorities might reflect the use

of sterling deposits without a corresponding switch from the Euro-dollar market. Equally funds switched into sterling may well be lent to other domestic sectors. Funds previously switched into sterling and lent to local authorities may well be redeployed in other sectors without there being a corresponding capital outflow. Equally funds employed in other sectors may be moved to local authorities.

The difficulties this creates can only be properly handled in a complete model of the banks' portfolio behaviour. Such a model has recently been developed by Knight.[42] His model is concerned with all commercial banks in the U.K., and their behaviour in both the domestic financial markets and the Euro-dollar market. He attempts to test the proposition that the close inte gration of foreign and domestic markets has weakened monetary policy by causing an inflow of short-term capital whenever domestic interest rates are raised. He isolated two possible channels between foreign and domestic markets. First, a direct link between the Euro-dollar market and the local authority temporary money market; and second, the possibility that the U.K. monetary authorities respond to changes in foreign interest rates or in spot and forward exchange rates by altering domestic monetary variables. Knight concentrates on the direct link in his econometric model. He included the local authority money market in his model in order to determine whether it had significant links with the Euro-dollar market. It was assumed that the supply of temporary

debt was unresponsive to the interest rate at least in the short run. He, therefore claimed that since the clearing banks and the overseas and foreign banks were substantial holders of local authority temporary debt, the market rate of interest is assumed to adjust primarily to their excess demand for debt. If banks' holdings of temporary debt are related to their Euro-dollar liabilities and claims,euro-dollar interest rates and the forward discount on sterling should be significant explanatory variables in their desired demand function for local authority debt through the bank' adjustments function.

His results indicated that although the Euro-dollar interest rate was a significant determinant of the local authority rate in some versions of the estimated model, it was not found to be significant in the version for which the results were presented. This suggested that neither the Euro-dollar rate nor the forward premium were significant determinants of either the U.K. banking sector's demand for local authority or the yield. Thus the results do not appear to provide strong support for the hypothesis that yields and holdings in the U.K. financial markets are related to those in the Euro-dollar market as a result of the banks' portfolio behaviour

Knights' model is by far the most sophisticated econometric model of U.K. banks' portfolio behaviour. It does have, however, a number of shortcomings which call into doubt his admittedly tentative conclusions. First, as Knight admits the aggregation of the domestic and overseas and

foreign banks into one sector tends to mask possible substitutions. By and large the clearing banks have lent to local authorities by overdraft and local authoritieshave switched between overdrafts and short term advances made by the MBOF as relative rates alter. Credit restrictions imposed by the monetary authorities on the clearing banks have been circumvented in the past by local authorities because they simply borrowed more from the MBOF. In the same manner, on occasions when the MBOF have had to repatriate funds because of a sterling crisis local authorities have been able to fall back on their overdraft facilities with the clearing banks.

Second, Knight assumed that because the banking sector has been a substantial holder of local authority debt, the market rate of interest adjusted primarily to its excess demand. However, for a large part of the period that was covered, if overdrafts are excluded this sector was always the larger holder.

Third, it was assumed that the supply of temporary debt in the short run is inelastic with respect to the short-term interest rate. Local authority temporary debt, however, appears to be responsive to the market rate of interest, as has been shown in the previous chapter. This introduces a possibly serious bias. A rise in the temporary money market rate of interest as a result of actions by the monetary authorities may well stimulate portfolio adjustment on the part of the banks so that Euro-dollar deposits are switched into sterling in order

to invest in the local authority market. This inflow may not depress the market rate of interest because local authorities, as discussed in the previous section, may well increase the supply of temporary debt. Thus a substantial inflow could occur without it markedly affecting the domestic interest rate.

5.5.c Empirical Results.

Regressions have been run for the three overlapping periods: 1962(iii)-1967(iii); 1967(iv)-1972(ii); and 1962(iii)-1972(ii). Before, however, the link between the euro-dollar market and the local authority market is explored, some regressions are reported, using Hodjera's and Hutton's specifications, for short-term capital flows between the U.K. and the euro-dollar market where this component flow is measured by (a) the change in the net position of banks in foreign currencies, NP; and (b) other foreign currency borrowing or lending (net) by U.K. banks, O.F.C.B. This latter category excludes foreign currency borrowing to finance u.k. investment overseas.

Table (5.5) details results for the change in the net position of banks in foreign currencies, for 1962(iii) to 1967(iii). Equation 5.1.a.is for Hodjera's uncovered differential specification; Equation [5.1.b.], Hodjera's covered differential specification; and Equation [5.1.c.] Hutton's specification.[43] The equations have also been estimated with and without seasonal dummy variables. The best fit was obtained from Hodjera's uncovered specification without seasonal dummies. The results of Table (5.6.), for other foreign currency borrowing or

Table (5.5)

1962(iii) - 1967(iii)'

Short-term Capital Flows: Change in the net position of banks in Foreign Currencies

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\Delta \hat{I}_t$	$\Delta \hat{I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	8.94	0.27	79.93	33.60				39.45	26.86	18.34	21.60	0.74	2.31
	(0.34)	(1.52)	(3.28)	(1.53)				(1.68)	(0.73)	(0.65)	(0.55)		
5.1.b	16.00	-0.24			155.22	94.95		0.41	-4.66	-23.42	64.56	0.56	1.89
	(0.60)	(1.13)			(2.32)	(1.36)		(0.02)	(0.13)	(0.58)	(1.78)		
5.1.c	24.54	0.14	103.36					-15.05	55.80	-16.50	0.77	-1.99	0.71	2.36
	(0.94)	(0.72)	(1.99)					(0.24)	(2.17)	(0.56)	(0.02)	(0.05)		
5.1.a	24.81	0.23	88.61	22.84					47.70				0.73	2.37
	(2.25)	(1.70)	(5.61)	(1.67)					(2.92)					
5.1.b	2.70	-0.09			138.81	98.98			19.64				0.35	2.00
	(0.16)	(0.43)			(2.27)	(1.54)			(0.83)					
5.1.c	21.24	0.17	99.46					- 9.38	55.70				0.69	2.38
	(1.79)	(1.19)	(2.43)					(0.20)	(3.11)					

Table (5.6)

1962(i..i) - 1967(iii)

Short-term Capital Flows: Other foreign currency borrowing or lending (net) by U.K. Banks

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\Delta\hat{I}_t$	$\Delta\hat{I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	3.63	0.29	73.52	30.28				32.51	25.23	16.20	24.80	0.72	2.23
	(0.14)	(1.64)	(2.98)	(1.37)				(1.31)	(0.67)	(0.57)	(0.63)		
5.1.b	-19.87	-0.17			139.36	85.92		3.26	-2.59	-20.86	65.11	0.55	1.90
	(0.76)	(0.81)			(2.13)	(1.25)		(0.14)	(0.07)	(0.52)	(1.83)		
5.1.c	17.80	0.18	92.01				-9.91	48.08	-13.29	1.20	3.06	0.68	2.33
	(0.63)	(0.94)	(1.78)				(0.16)	(1.87)	(0.46)	(0.04)	(0.08)		
5.1.a	20.29	0.27	83.87	20.00				42.02				0.71	2.31
	(1.83)	(1.96)	(5.26)	(1.45)				(2.54)					
5.1.b	-0.14	-0.03			125.22	88.15		15.47				0.32	2.00
	(0.13)	(0.13)			(2.09)	(1.43)		(0.66)					
5.1.c	17.40	0.22	88.83				-2.25	49.83				0.67	2.32
	(1.48)	(1.53)	(2.19)				(0.06)	(2.80)					

Table (5.7)

1962(iii) - 1972(ii)

Short-term Capital flows: Change in the net position of banks in foreign currencies

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\hat{\Delta I}_t$	$\hat{\Delta I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	17.70	0.24	37.70	23.98				52.73	39.33	20.92	27.87	0.59	2.00
	(0.75)	(2.44)	(2.53)	(1.74)				(4.25)	(1.09)	(0.65)	(0.81)		
5.1.b	25.89	0.15			7.49	2.40		44.12	-18.31	-0.91	37.73	0.46	1.74
	(1.10)	(1.18)			(0.73)	(0.24)		(3.24)	(0.56)	(0.03)	(1.18)		
5.1.c	42.07	0.17	30.75				-3.82	50.71	-25.54	-18.45	2.81	0.52	1.97
	(1.74)	(1.42)	(1.86)				(0.39)	(3.75)	(0.82)	(0.56)	(0.08)		
5.1.a	37.55	0.24	28.94	27.49				54.43				0.58	2.04
	(3.49)	(2.33)	(2.73)	(2.59)				(4.75)					
5.1.b	31.51	0.17			7.00			47.09				0.41	1.82
	(2.48)	(1.31)			(0.74)			(3.54)					
5.1.c	32.94	0.19	30.48				-0.09	50.95				0.49	2.00
	(2.93)	(1.68)	(2.35)				(0.01)	(4.10)					

lending (net) by U.K. banks are very similar to those in Table (5.5.). Both sets of results indicate that short-term capital flows between the euro-dollar market and the U.K. are sensitive to speculative influences and uncovered interest rate differentials. When, on the other hand, the same equations are run for the extended period, 1962(iii) to 1972(ii), some substantial differences are noticeable. Short-term flows are much less sensitive to the uncovered differential while speculative factors become much more influential. In particular Table (5.8) indicates that when foreign currency borrowing for investment overseas is excluded from the flow neither of Hodjera's specifications explain actual flows into the U.K. domestic economy. Duly Hutton's equation suggests some influence for interest-rate differentials. It is clear that the relationship after the devaluation of sterling is substantially different from that before.

The next step is to employ the above models, which attempt to explain short-term capital flows, to account for lending to local authorities by the merchant, overseas and foreign banks. If foreign currency switched into sterling by the MBOF were only lent to local authorities and to no other borrowers in the U.K., and if these switched funds were the only funds that the MBOF lent to local authorities, such a step would be superfluous. Since, however, there is not this one-to-one correspondence other variables will also influence lending to local authorities. Table (5.9.) gives the results for a regression of lending to local authorities both short-term

Table (5.8)

1962(iii) - 1972(ii)

	Short-term Capital flows:				Other foreign currency borrowing or lending (net) by U.K. Banks								
	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\hat{\Delta I}_t$	$\hat{\Delta I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	-14.88	0.21	18.04	13.68				51.97	28.79	22.00	35.95	0.41	1.48
	(0.51)	(1.49)	(0.98)	(0.80)				(3.37)	(0.64)	(0.55)	(0.84)		
5.1.b	-9.12	0.13			8.73	0.34		47.65	-4.52	7.81	39.9	0.40	1.49
	(0.35)	(0.96)			(0.77)	(0.03)		(3.17)	(0.12)	(0.22)	(1.13)		
5.1.c	-1.07	0.14	20.56				-6.99	51.04	-7.59	-1.33	21.99	0.40	1.47
	(0.04)	(1.04)	(1.09)				(0.62)	(3.29)	(0.21)	(0.04)	(0.53)		
5.1.a	5.78	0.19	21.55	11.40				55.25				0.40	1.44
	(0.44)	(1.51)	(1.65)	(0.87)				(3.91)					
5.1.b	2.32				9.66	4.01		50.95				0.35	1.57
	(0.17)				(0.94)	(0.39)		(3.53)					
5.1.c	3.15	0.16	25.56				-5.13	53.56				0.38	1.48
	(0.24)	(1.22)	(1.73)				(0.50)	(3.79)					

Table (5.9)

1962(iii) - 1967(iii)

Lending by the MBOF to Local Authorities : Short and long term

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\Delta \hat{I}_t$	$\Delta \hat{I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	26.11	0.14	13.59	9.01				52.32	23.39	-9.81	20.17	0.53	2.15
	(0.73)	(0.57)	(0.41)	(0.30)				(1.63)	(0.46)	(0.26)	(0.56)		
5.1.b	33.66	-0.09			137.94	100.14		32.72	7.26	-58.74	-17.07	0.67	2.83
	(1.43)	(0.50)			(2.36)	(1.63)		(1.58)	(0.23)	(1.65)	(0.54)		
5.1.c	26.89	-0.06	105.05				-122.23	29.70	-5.98	-41.24	39.07	0.62	2.18
	(0.90)	(0.25)	(1.77)				(1.69)	(1.01)	(0.18)	(1.12)	(0.87)		
5.1.a	39.64	0.14	27.74	-3.77				69.59				0.50	2.16
	(2.60)	(0.73)	(1.27)	(0.20)				(3.07)					
5.1.b	33.34	0.03			85.71	44.22		52.71				0.53	2.37
	(2.30)	(0.17)			(1.63)	(0.82)		(2.57)					
5.1.c	37.98	0.11	71.32				-54.99	60.16				0.53	2.13
	(2.57)	(0.62)	(1.40)				(0.95)	(2.70)					

and long-term, on the determinants of short-term capital flows, for the pre-devaluation period. The results are rather uneven but it does appear that lending to local authorities by the MBOF is responsive to the covered interest-rate differential. For the extended period the relationship is much weaker, as the results of Table (5.10) indicate. If the regressions are run for short-term lending only, as shown in Table (5.11), again the change in the differential is of influence before devaluation but disappears afterwards (Table 5.12). Tables (5.13) and (5.14), however, for long-term lending only, point to a very different conclusion. While before devaluation the change in the covered interest rate differential does not act as a significant determinant of long-term lending by MBOF to local authorities, for the extended period, 1962(iii) to 1972(ii), the covered differential becomes significant.

The results for lending to local authorities by MBOF offer some slight support for the hypothesis that the differential between the euro-dollar market and the local authority three month deposit interest rate has been significant. There are some substantial differences, however, between long- and short-term lending. It is interesting to note that flows into the local authority market although classified as a short-term capital inflow are invested on a long-term basis.

The alternative method or establishing the link between

Table (5.10)

1962(iii) - 1972(ii)

Lending by the MBOF to Local Authorities : Short and long term

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\Delta \hat{I}_t$	$\Delta \hat{I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	2.91	-0.05	28.26	17.32				14.68	42.47	-3.95	101.45	0.41	1.54
	(0.09)	(0.35)	(1.36)	(0.90)				(0.84)	(0.84)	(0.09)	(2.10)		
5.1.b	45.10	-0.23			28.32	8.66		19.76	-33.45	-75.90	38.37	0.46	1.27
	(1.64)	(1.53)			(2.37)	(0.73)		(1.25)	(0.87)	(1.99)	(1.03)		
5.1.c	32.47		6.89				-30.03	13.34	-34.24	-57.09	72.30	0.48	1.24
	(1.12)		(0.35)				(2.53)	(0.82)	(0.92)	(1.45)	(1.65)		
5.1.a	37.64	-0.06	4.46	23.99				23.71				0.25	1.76
	(2.27)	(0.38)	(0.27)	(1.46)				(1.34)					
5.1.b	28.95	0.19			21.95	10.48		20.06				0.27	1.66
	(1.77)	(1.21)			(1.75)	(0.86)		(1.17)					
5.1.c	30.81	-0.16	18.89				-19.86	19.70				0.26	1.57
	(1.88)	(1.00)	(1.03)				(1.58)	(1.13)					

Table (5.11)

1962(iii) - 1967(iii)

Lending by the MBOF to Local Authorities : Short term only

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\hat{\Delta I}_t$	$\hat{\Delta I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	4.45	-0.09	0.61	13.19				38.24	4.49	-9.33	7.65	0.32	2.35
	(0.15)	(0.46)	(0.03)	(0.49)				(1.48)	(0.11)	(0.30)	(0.18)		
5.1.b	8.33	-0.23			102.74	47.83		20.40	-5.52	-40.95	3.86	0.48	2.63
	(0.44)	(1.44)			(2.08)	(0.92)		(1.17)	(0.21)	(1.36)	(0.14)		
5.1.c	1.74	-0.23	88.50				-104.20	14.79	-11.89	-33.13	20.62	0.46	2.45
	(0.07)	(1.32)	(1.88)				(1.82)	(0.63)	(0.45)	(1.14)	(0.58)		
5.1.a	6.35	-0.08	17.13	-2.82				43.99				0.30	2.35
	(0.53)	(0.57)	(1.0)	(0.19)				(2.47)					
5.1.b	2.78	-0.14			66.25	18.21		32.23				0.36	2.39
	(0.25)	(0.98)			(1.62)	(0.43)		(2.03)					
5.1.c	4.57	-0.11	60.43				-54.46	35.03				0.36	2.35
	(0.40)	(0.79)	(1.53)				(1.22)	(2.03)					

Table (5.12)

1962(iii) - 1972(ii)

Lending by the MBOF to Local Authorities : Short term only

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\Delta \hat{I}_t$	$\Delta \hat{I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	9.69	-0.11	12.71	2.15				19.32	-18.20	-48.81	14.76	0.31	2.17
	(0.43)	(1.09)	(0.91)	(0.17)				(1.66)	(0.54)	(1.62)	(0.46)		
5.1.b	20.45	-0.14			6.20	-8.55		17.74	-51.45	-62.27	9.05	0.34	1.97
	(1.08)	(1.38)			(0.75)	(1.05)		(1.62)	(1.94)	(2.40)	(0.35)		
5.1.c	20.25	-0.17	8.58				-7.18	18.68	-46.16	-67.21	4.06	0.31	2.09
	(0.98)	(1.62)	(0.61)				(0.85)	(1.61)	(1.74)	(2.39)	(0.13)		
5.1.a	-1.92	-0.10	4.69	21.53				20.23				0.18	2.27
	(0.18)	(0.92)	(0.44)	(2.01)				(1.75)					
5.1.b	-4.34	-0.11			-1.21	-5.52		16.62				0.08	2.11
	(0.38)	(0.97)			(0.14)	(0.65)		(1.38)					
5.1.c	-5.30	-0.13	4.83				1.54	17.59					2.21
	(0.47)	(1.18)	(0.38)				(0.18)	(1.45)					

Table (5.13)

1962(iii) - 1967(iii)

Lending by the MBOF to Local Authorities : Long term only

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\hat{\Delta I}_t$	$\hat{\Delta I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	21.66	0.23	0.40	8.41				14.08	18.90	-0.48	22.51	0.64	1.30
	(1.23)	(1.93)	(0.02)	(0.57)				(0.89)	(0.76)	(0.03)	(0.86)		
5.1.b	25.32	0.13			35.21	52.31		12.32	12.78	-17.79	13.22	0.69	1.80
	(1.99)	(1.33)			(1.11)	(1.58)		(1.10)	(0.74)	(0.92)	(0.77)		
5.1.c	25.15	0.18	16.54				-18.03	14.91	5.91	-8.10	-18.45	0.64	1.21
	(1.55)	(1.46)	(0.51)				(0.46)	(0.93)	(0.33)	(0.41)	(0.76)		
5.1.a	33.29	0.22	10.61	-0.95				25.60				0.61	1.29
	(4.39)	(2.37)	(0.97)	(0.10)				(2.27)					
5.1.b	30.56	0.18			19.47	26.01		20.47				0.61	1.68
	(4.12)	(1.82)			(0.72)	(0.94)		(1.95)					
5.1.c	33.41	0.22	10.89				-0.53	25.13				0.61	1.31
	(4.41)	(2.41)	(0.42)				(0.02)	(2.20)					

Table (5.14)

1962(iii) - 1972(ii)

Lending by the MBOF to Local Authorities : Long term only

	Const	BT_{t-1}	ΔI_t	ΔI_{t-1}	$\hat{\Delta I}_t$	$\hat{\Delta I}_{t-1}$	ΔC_t	D	DQ_1	DQ_2	DQ_3	R^2	DW
5.1.a	-6.67	0.06	15.55	-19.46				-4.64	60.67	44.86	86.89	0.36	1.12
	(0.25)	(0.47)	(0.91)	(1.23)				(0.33)	(1.47)	(1.21)	(2.19)		
5.1.b	24.66	-0.09			22.12	17.20		2.03	18.00	-12.64	29.33	0.45	0.81
	(1.13)	(0.72)			(2.32)	(1.83)		(0.16)	(0.59)	(0.42)	(0.99)		
5.1.c	12.22	-0.05	-1.69				-22.85	-5.34	11.92	10.12	68.24	0.44	0.99
	(0.51)	(0.41)	(0.10)				(2.34)	(0.40)	(0.39)	(0.31)	(1.90)		
5.1.a	39.56	0.04	2.46	-0.23				3.47				0.25	
	(3.03)	(0.28)	(0.19)	(0.02)				(0.25)					
5.1.b	33.29	-0.09			22.55	16.00		3.44				0.40	1.01
	(2.85)	(0.74)			(2.58)	(1.83)		(0.25)					
5.1.c	36.11	-0.03	14.06				-21.40	2.11				0.35	1.11
	(2.99)	(0.25)	(1.05)				(2.31)	(0.16)					

capital flows and lending to local authorities is the direct one. This, of course, is subject to the same qualifications noted above with regard to the domestic influences on lending. The main results are confined to the period 1962(iii) to 1972(ii), to enable comparison with the other results. Some simple regressions were also run of lending, both long- and short-term, to local authorities by the MBOF for other periods. These were:

1955(ii) - 1967(iii)

$$LA_{(t)} = \underset{(2.36)}{14.69} + \underset{(4.90)}{0.62}\ NP_{(t)} \qquad R^2 = 0.46 \quad DW = 2.10$$

1961(i) - 1967(iii)

$$LA_{(t)} = \underset{(2.53)}{21.10} + \underset{(4.57)}{0.65}\ NP_{(t)} \qquad R^2 = 0.53 \quad DW = 1.98$$

1961(i) - 1970(iv)

$$LA_{(t)} = \underset{(3.45)}{34.52} + \underset{(3.49)}{0.50}\ NP_{(t)} \qquad R^2 = 0.44 \quad DW = 1.89$$

Where $LA_{(t)}$ is lending to local authorities by the MBOF, both long- and short-term. These results should be compared with figure (2.1) in Chapter 2.

The main results are embodied in Tables (5.15) to (5.17) for the three time periods: 1962(iii) - 1972(ii); 1962(iii) - 1967(iii); and 1967(iv) - 1972(ii); and for long-term lending, short-term lending and for the two combined. They reinforce the conclusions suggested

Table (5.15)

Lending by MBOF to Local Authorities: The Direct Link

1962(iii) - 1967(iii)

Const	NP	OFCB	R^2	DW
Long and Short-term Lending				
21.23	0.64		0.50	2.02
(2.09)	(3.88)			
24.70		0.65	0.49	2.06
(2.37)		(3.70)		
Short-term Lending				
4.10	0.36		0.30	2.37
(0.51)	(2.81)			
6.09		0.37	0.29	2.52
(0.75)		(2.70)		
Long-term Lending				
17.13	0.27		0.46	1.50
(2.91)	(2.85)			
18.61		0.28	0.46	1.35
(3.11)		(2.75)		

Table (5.16)

Lending by MBOF to Local Authorities: The Direct Link

1962(iii) - 1972(ii)

Const	NP	OFCB	R^2	DW
Long and Short-term Lending				
31.04	0.38		0.27	1.62
(2.25)	(2.28)			
42.12		0.45	0.33	1.76
(3.32)		(2.99)		
Short-term Lending				
-3.13	0.23		0.09	1.92
(0.33)	(1.91)			
3.61		0.29	0.17	2.01
(0.41)		(2.75)		
Long-term Lending				
34.17	0.15		0.27	1.24
(3.20)	(1.17)			
38.51		0.16	0.28	1.27
(3.73)		(1.32)		

Table (5.17)

Lending by MBOF to Local Authorities: The Direct Link

1967(iv) - 1972(ii)

Const	NP	OFCB	R^2	DW
Long and Short-term Lending				
50.28	0.18		0.25	1.45
(1.79)	(0.64)			
61.87		0.39	0.35	1.71
(2.60)		(1.72)		
Short-term Lending				
-9.83	0.19		0.06	1.81
(0.51)	(0.99)			
1.04		0.26	0.13	1.85
(0.06)		(1.61)		
Long-term Lending				
60.10	-0.01		0.34	1.17
(2.69)	(0.05)			
60.83		0.13	0.36	1.37
(3.05)		(0.69)		

by the previous approach that the relationship between switching from foreign currencies into sterling and lending to local authorities has weakened considerably since 1967. Before devaluation the results suggest that about 65 per cent of any sum switched in sterling was deposited with local authorities. While after 1967 it is difficult to find any significant correlation. In the later period the relevant independent variable is other foreign currency borrowing or lending (net) by banks.

A number of tentative conclusions can be drawn from these results:

(a) a small part of what are usually regarded as short-ter capital flows appear in fact to be held on a long-term basis with local authorities. However, it is possible, though no evidence can be presented to support it, that the long term debt is stock or negotiable bondswhich means it can be sold and funds which have been switched can be repatriated.

(b) A strong direct relationship between lending to local authorities and switching into sterling by banks from the Euro-dollar market is discernible for the period before the devaluation of the pound in 1967. This relationship can be traced back to the mid-fifties. The link, however, weakens progressively after 1967. A number of reasons may explain this. First,

the upheaval in foreign exchange markets and the bouts of speculation which attended the five years after 1967 probably made banks reluctant to switch into sterling in response to nominal interest rate differentials. The importance of speculation in influencing banks' lending to local authorities, expecially on a short term basis, confirms this. Second, the ceiling on local authority temporary borrowing which came into force in April 1969 plus the steady decline in interest rates during 1970 and 1971 as the balance of payments improved meant that Banks tended not to lend any switched funds to local authorities but rather to lend them to the industrial and corporate sector which was experiencing a severe squeeze on its liquidity during 1970. This sectors' borrowing, effectively in the Euro-dollar market, was, however, curtailed in January 1971 by Treasury order. In addition, the development of the inter-bank money market has largely usurped the local authority market in its former role as the central and most important money market. Thirdly, the introduction of 'Competition and Credit Control', in September 1971, has meant that the MBOF, now subject to a 12½ per cent reserve ratio, have reduced their holdings of local authority short term debt because it does not classify as an admissable reserve asset.

(c) The severing of the link between the Euro-dollar market and the local authority market made most of the

propositions which were analysed in the theoretical section largely redundant. Short-term capital flows, at least those from and to the Euro-dollar market, are no longer lodged initially with local authorities. Therefore the sorts of portfolio adjustment which were discussed that might or might not result in the non-bank public taking up an increase of treasury bills, a condition necessary if the monetary authorities were successfully to neutralise an inflow, no longer apply.

(d) The results reported do not support

Knight's conclusion that "....the Euro-currency yield and the forward premium on foreign exchange did not appear to be significant determinants of either the U.K. bank's demand for local authority loans, or the yield on those securities".[44] They suggest that there is a significant relationship, even though the level of significance is only marginally at 5%, between lending to local authorities by the MBOF and the covered differential. Although it is not possible to judge on the basis of the evidence of this section whether yields are related or not, it should be recalled that if an inflow coincides with an increase in temporary borrowing the local authority interest rate may not fall in response. Some further comments can be made. Knight's sample period was 1962(iv) - 1969(iv); and it is quite possible that his inclusion of over-

drafts of the clearing banks and his exclusion by assumption of there being a relationship between holdings of local authority long term debt and the Euro-dollar market, plus the weakening of the link in 1968 and 1969 between the local authority market and the Euro-dollar market, may well have been sufficient to hide what relationship there was before the devaluation. Re-estimation of the model for 1963 to 1967 is the only way of testing this possibility.

Knight goes on to argue that his "..... estimation results appear to provide strong support for the hypothesis that yields and holdings in U.K. financial markets and related to those in the international, Euro-currencies market as a result of the banks' portfolio behaviour."[45] From what has been said above it is clear that using the local authority market is not perhaps the best means of testing this hypothesis particularly since 1967.

(e) The regressions run have concentrated on switching into sterling from foreign currencies, since this component of short-term capital flows is of significance for the attempts of the monetary authorities to pursue a neutralization policy. However, banks also accept on deposit sterling from overseas residents which can be placed directly with local authorities without any matching transaction with the Exchange Equalisation Account. The inclusion of changes in the sterling deposits of the MBOF owned by overseas residents may well

improve the results.

5.6. Summary.

The discussion of this chapter has ranged over a number of areas in which local authority borrowing is thought to have been important for monetary policy. It was in part historical in the sense that it referred to arrangements that no longer prevail and to circumstances that have now changed. Nevertheless, there are many aspects that are still relevant. Local authority foreign currency borrowing, although it has fallen off considerably since the middle of 1974, still has a large role to play in the financing of the balance of payments deficit. It is possible, however, that the monetary authorities now look less favourably on local authority foreign currency borrowing, and prefer instead that the deficit be financed, in part at least, by public corporations. The reason for this is that local authority borrowing tends to increase the central government borrowing requirement to the extent of the augmented foreign currency reserves without any completely offsetting reduction in either borrowing from the P.W.L.B. or matching increase in sales of government debt. Public Corporations, on the other hand, reduce their borrowing from the National Loans Fund to the extent of their foreign currency borrowing and leave the central government borrowing requirement unchanged.[46]

Sales of local authority debt, as a form of public sector debt, can still have an impact on the ability of the Exchequer to sell debt to the non-bank public. Equally, as eligible reserve assets and specified public sector debt, certain forms of local authority debt are directly relevant to the

determination of the reserve base of the banking system.

CHAPTER SIX

CONCLUSIONS

In this final chapter, an attempt will be made to pull together the main strands scattered through the foregoing study, and to draw some brief conclusions.

In Chapter 2, the reciprocal relation of local authority borrowing and monetary policy since the war was described and the various policy changes, that the monetary authorities found it expedient to introduce from time to time, were examined. Possibly the most important change, and the one that is still in force today, was that announced in 1963 by which local authorities regained some access to the Public Works Loan Board while at the same time they accepted statutory limitations on the ratio of their temporary to total debt. In the White Paper the necessity for these limitations was justified on the grounds that the scale of local authority temporary borrowing affected not only the Government's own borrowing operations but monetary conditions generally. Temporary borrowing, according to the White Paper, was insensitive to Bank Rate, it tended to run counter to the policy of managing public sector debt, and also caused an ebb and flow of short-term foreign funds. This rationalisation is borne out by the analysis of chapter 5. What has been disputed, however, is the appropriateness of limiting the ratio of temporary to total debt as a means of preventing the

consequences, as just described, of local authority borrowing for the exercise of monetary policy. The fact that the controls were not actually to come into force until five years after their announcement, and even then they were postponed another year, does not suggest that need for action was considered urgent.

In chapters 4 and 5 the growth of temporary borrowing was considered in a different light. Borrowing on a short-term basis was explained as simply rational behaviour by local authorities when faced with interest rates that fluctuated about a normal level. Given the risks and uncertainties about the future, and the possibility that local authorities would adjust themselves slowly to changes in monetary conditions, some optimum level of short-term borrowing would be found that would fluctuate with changes in interest rates. Whether the restrictions actually reduced the level of temporary borrowing was taken as an empirical question and some attempt at an answer advanced in chapter 4. If the restrictions are to be considered successful then the level of temporary borrowing should be less, during the period to which the restrictions apply, than it otherwise would have been By this criteria it was found that, in fact, no significant differences could be detected between the policy-on and the policy-off periods. A finding which suggests that in the absence of the restrictions the level of short-term borrowing would have been no more than it actually was.

I t might be objected, and quite legitimately, that there are

numerous local authorities who can point to a clear fall in their temporary borrowing as a direct result of the imposition of controls in April 1969. The results reported here,however, refer to aggregate data and nothing can be construed about the distributional effects. All that can be said is that the reduction in the temporary borrowing of some authorities must have been offset by an increase in that of others. Moreover, it may well be the case that the econometric approach taken has failed to capture behavioural changes that reflect the evolution of the money markets, the greater dissemination of information about the advantages of short-term borrowing and the growth of experience of borrowing among smaller local authorities.

It was argued in chapter 3 that by altering the maturity composition of their borrowing local authorities act in a way consistant with the behavioural axioms of expectations theories of the term structure of interest rates. This allowed the construction of a number of models of temporary borrowing and these were tested against the data in chapter 4. It was found that the best results were obtained if the Modigliani-Sutch model was used with short-term interest rates When temporary borrowing was disaggregated it turned out that practically all of the sensitivity to interest rate changes was confined to borrowing for up to seven days. With disaggregated long-term debt different rates of response were very noticeable. While issues of negotiable bonds and stocks responded very rapidly to a change in interest rates,

sales of mortgages and local bonds respond much slower. Lending by the P.W.L.B., on the other hand, appears to have been largely unresponsive to changes in interest rates.

The possibility that the pattern of local authority borrowing has affected the structure of interest rates was also considered. No relationship could be detected, however. This question was raised again in chapter 5 but an answer to it approached from a different angle. It was found that there was, at least before 1971, a significant difference between a term structure constructed on local authority interest rates and one constructed on central government interest rates. It is possible that one of the factors responsible for this has been local authority borrowing but a number of other factors were also considered important.

On the other side of this study, that concerned with the impact of local authority borrowing on the exercise of monetary policy, the conclusions are a little less firm. Nevertheless, in chapter 5 it was argued that local authority borrowing plays an important role in the way in which the public sector borrowing requirement is met, either from domestic or foreign sources, and therefore affects the extent to which a public sector deficit results in a monetary expansion.

In this study the borrowing behaviour of local authorities, has been treated in a way that is

in accordance with much recent work, both theoretical and empirical, on the behaviour of economic units. Moreover, since theoretical model-building and the testing of single equations is often the precursor to the construction of large-scale econometric models this study provides one step towards the specification of an econometric model of the monetary system that will provide some clearer answers to the questions raised in chapter 5.

Appendix A

The Impact Of Monetary Policy On State And Local Governments In The U.S.A.

The subject of local authority borrowing and monetary policy has an interesting corollary in the U.S.A. A considerable amount of research has been done there into the effects of a changing monetary climate on State and Local Governments and in particular into the impact of changing interest rates on their borrowing and capital spending behaviour.

In this study the relationship between local authority borrowing and the exercise of monetary policy has been found to be two-fold: the ways in which local authorities have chosen to borrow, by altering financial flows between different sectors, has impinged upon the efforts of the monetary authorities; while the varying credit conditions brought about by the actions of the monetary authorities has affected the ways in which local authorities have borrowed and especially the periods for which they have issued debt. The possibility, however, that by increasing the cost of borrowing the monetary authorities could reduce local authority borrowing and thereby the scale of their capital spending, has been ruled out by assumption.

One of the channels through which monetary effects can be transmitted to the real sector is that of the cost of capital. It is asserted that a decrease in the money supply as a result of open market operations would lower the price and raise the yield on short-term financial assets, cause in turn a change at the long end of the market and bring about a divergence between the cost of capital and the return on capital. This in turn would result in a fall in capital expenditure. A hypothetical situation can be envisaged in which a rise in the rate of interest would result at the margin in a divergence of the cost of capital from the return

andtherefore a fall in the capital expenditure of local authorities in the U.K. It might then be conceivable, depending upon the maturity composition of local authority net borrowing, that less would be borrowed from the P.W.L.B., with the result that the monetary contraction that brought about the rise in interest rates would be reinforced by the smaller Exchequer borrowing requirement. Some of the reasons why this situation is thought to be improbable have been discussed in chapter two[1]. Some other reasons are suggested by the survey of the American literature which now follows.

In the most recent studies of state and local governments in the U.S.A., those carried out by the Federal Reserve Board[2], (F.R.B.) an important distinction has been drawn between borrowing and capital spending decisions because of a possible differential impact of monetary policy. State and local governments can insulate their capital spending from the consequences of rising interest rates by not borrowing long term and by financing capital expenditure either by running down previously accumulated liquid assets or by short-term borrowing. The degree to which this can be done will determine, along with other things, the responsiveness of capital spending to monetary conditions. Some of the American studies, apart from those of the F.R.B., have concentrated almost entirely on the impact of interest rates on long term bond issues[3]; while others have placed most stress on the direct effects on capital spending, making the assumption that a postponement of a bond issue implies a reasonably equal decrease in capital expenditure[4].

The F.R.B. were interested in gathering information about future borrowing intentions, the extent to which such plans were realised under various monetary climates, and the links between borrowing and spending decisions.

A.1 Impact of Monetary Conditions on Borrowing

In the F.R.B. survey of anticipated borrowings for the 1970 fiscal year[5], state and local governments indicated that they planned long-term borrowing of an estimated $23 billion (see Table A.1). Some $15 billion in borrowing had already been authorised. The remainder represented as yet unauthorised borrowings and which required authorisation before they could be marketed. Some $2 billion of the 1970 anticipated borrowings represented previously deferred bond issues reflecting the tight monetary conditions at the time. In the event conditions remained restrictive through most of fiscal 1970 with the consequence that only $13.2 billions was actually borrowed long-term. Of the net shortfall[6] of almost $10 billion some $5.2 billion was due to high interest rates while a further $2.2 billion in borrowing represented bond sales that were postponed for interest rate reasons earlier in the fiscal year but were subsequently sold before the fiscal year was completed. In total the restrictive monetary conditions were responsible for delays and shortfalls in anticipated long-term borrowing amounting to $7.4 billion.

Table A.1

Anticipated And Actual Long-Term Borrowing By State And Local Governments In The U.S.A. 1970 - 1972 In Billions Of Dollars.

	1970	1971	1972
Anticipated	23.13	23.80	25.4
Net Shortfall	9.88	0.74	3.0
Actual Borrowing	13.25	23.06	22.4

Source: Federal Reserve Bulletin, March 1971, December 1971, April 1973

In the following fiscal year, 1971 (see Table A.1) the relatively favourable monetary climate resulted in the issue of a record volume of bonds[7]. Governments were able to place an amount equal to 97 per cent of their planned borrowings. During the 1972 fiscal year governments were expected to borrow $25.4 billion, but only $17.4 billion of planned issues were sold[8]. Actual borrowing only reached $22.4 billion, as shown in Table (A.1) because borrowing not anticipated at the time the report was made to the F.R.B. amounted to $5 billion. The reasons for the large shortfall in anticipated borrowing were mainly administrative and legal; only 5 per cent of the total shortfall was due to interest rate factors. The unplanned borrowing occurred partly because governments accelerated their borrowing in response to falling interest rates.

An increase in interest rates may reduce long-term borrowing for a number of reasons. First, in the short run, the current cost of debt servicing would be raised and if current revenues are inflexible borrowing would become difficult. Secondly, borrowers may wait for periods of lower interest rates in the hope of lowering the burden of future debt servicing. Thirdly, many governments in the U.S.A. have been, and are, subject to legal limits on the interest rate that could pay. Thus if interest rates in the market rise above the legal limit, as they did in many cases during the 1971 fiscal year, borrowing long-term becomes prohibited.

Tanzer (1964) in a study of the factors affecting the volume and timing of state and local government long term borrowing during the 1950's found that interest rates were important but that the interest elasticity attributed to state and local governments as a whole was accounted for largely by the high interest elasticity of state issues. In the 1966 pilot survey of the F.R.B. large states were separated from small states and local governments and it was

found that the larger units were more sensitive in their long-term borrowing to interest rates.

A.2 Impact Of Monetary Conditions On Capital Expenditure

Although it has been found that long-term borrowing is sensitive to interest rates it does not follow automatically that there will be an equal and matching change in the scale of capital spending. Any shortfall in long-term borrowing could be made up in a number of ways.

(a) A greater allocation for capital expenditure could be made from current revenues.

(b) As with local authorities in the U.K., state and local governments could shift from long-term to short-term borrowing in order to postpone funding until interest rates are lower.

(c) Current expenditures and new outlay commitments could be reduced.

(d) Liquid assets could be drawn down; or governments which ordinarily borrow well in advance of actual capital spending could postpone borrowing. This would result in a gap between actual and previously desired liquid assets.

The F.R.B. attempted to determine by which means governments insulated their capital spending from any shortfalls in long-term borrowing. Their findings are set out in Table (A.2). For the 1970 fiscal year, during which there was a major shortfall in anticipated borrowing, some $4.48 billion was obtained by alternative means. This meant that the net shortfall in capital spending amounted to approximately $2.90 billion. Of the alternative means of financing capital expenditure by far the most important was short-term borrowing. Much of this was obtained from the commercial banks because of the high effective yields to banks on

obligations paying tax exempt interest.

Table (A.2)

Alternative Means Of Financing Long-Term Borrowing Shortfalls In The U.S.A. In Billions Of Dollars

	1970	%	1971	%	1972	%
Short-term borrowing	2.68	59.8	2.03	56.3	1.0	20.0
Liquid assets	0.65	14.5	0.78	21.7	0.5	10.0
Postponement of other cash outlays	0.03	0.7	0.34	9.5	0.9	18.0
Other*	1.12	25.0	0.45	12.5	2.6	52.0
Total	4.48		3.60		5.0	

*includes governmental loans and funds that were not needed immediately.

Source: Federal Reserve Bulletin

Although the use of liquid assets was of less importance as an alternative to long-term borrowing it was given some emphasis in the F.R.B. surveys because of the light it shed on the channels of monetary policy[10]. States tended to experience a weak link between borrowing shortfalls and shortfalls in capital spending because of a tendency to borrow well in advance of actual spending and to hold the funds in liquid assets. Thus if borrowing difficulties were being experienced liquid asset balances could be drawn down to finance capital spending. This was considered to have anumber of implications for the linkages between monetary policy and financial and real flows. First, causation runs not only from changes in borrowing to changes in liquidity, but in the opposite direction as well. States and local governments because of their high liquidity are more apt to postpone borrowing in response to

rising interest rates, in the expectation that interest rates will fall, while still maintaining capital spending. Secondly, the degree of liquidity of borrowers will affect the length and character of lagged responses to monetary policy. If a restrictive monetary policy follows a long period of monetary ease during which liquid assets have been built up, then the effect on spending will be less than if monetary restrictiveness was continued for a long period.

It is clear that liquid assets and short-term borrowing act as buffers between the state of the financial market and capital spending by state and local governments in the U.S.A. In another early study, Netzer (1960) investigated the various institutional obstacles that hindered state and local governments' ability to respond to higher interest rates. He found that in the 1950s state and local governments were particularly vulnerable to a changing monetary climate. First, because the range of borrowing instruments available to them was limited. Most capital was raised by sales of bonds, and because of the need to acquire powers from state legislatures to be able to use temporary internal financing, it was difficult to respond sensitively to market conditions. Short-term borrowing, moreover, was circumscribed severely so that most governments had little choice but to borrow at prevailing long-term interest rates. Secondly, there were institutional obstacles which placed restrictions on the volume, terms and conditions of borrowing and made it difficult to ward off the impact of higher interest rates. In addition, limits on the interest rates which could be paid on loans, restrictions on the maturity of bond issues and on the volume of outstanding indebtedness were also found.

Morris (1960) in an empirical study of the same period found that state and local governments' bond sales were moderately sensitive to monetary policy; following a roughly consistent contra-cyclical pattern. A contra-cyclical pattern was also found for capital

expenditure but with a much smaller amplitude than for bond sales; mainly because a large proportion of capital expenditure was not financed by borrowing.

Charlotte Phelps (1969) in a study of state and local government highway investment has taken a slightly different approach to the questions raised in this appendix but her findings are in agreement with those already discussed. She postulated that highway investment would be sensitive to interest rate changes because the timing of capital expenditure depended upon the difference between the actual and the expected interest rate. The close resemblance of this hypothesis to the models of chapter three should not go unnoticed. She also stated that "unexpected changes in interest rates affect the timing of investment expenditures by affecting the timing of bond sales[11]". But since highway investment has not been financed by long-term borrowing to any great extent, amounting to only about 18 per cent on average, it is not likely to have been particularly sensitive to interest rates. If, it was argued, a government delays a bond sale because the market is believed to be unfavourable capital programmes about to be started may be postponed unless an alternative source of finance can be found such as cash balances. For they "...cushion the impact of tightening credit by providing a temporary alternative to the bond sale proceeds[12]". She found, in addition to the fact that unexpected changes in interest rates altered the timing of capital expenditures, that monetary policy appeared to have a greater impact on local governments than on state governments because the former relied more heavily on debt finance and had greater difficulty in securing short-term finance.

The broad conclusion of the evidence on the borrowing and capital spending of state and local governments in the U.S.A. is that whether monetary policy will affect borrowing depends upon how

flexibly governments can respond by resort to short-term borrowing or internal funds. If borrowing is inflexible in the sense that if it is carried out it must be on a long-term basis whatever the rate of interest, then it is possible that governments will postpone or cancel capital expenditure rather than accept the high debt charges that it entails. The extent to which this occurs will depend, moreover, on what proportion of capital expenditure is normally financed by borrowing. From the point of view of monetary policy, Mayer (1972) has argued that the marginal impact of increased interest rates on capital expenditure is precisely the sort of impact that is desired; a small percentage of spending is curtailed without it having too detrimental a consequence for the provision of services in the public sector.

A.3. A Comparison With The Experience Of Local Authorities In The U.K.

Apart from its intrinsic interest the American literature does provide some illuminating insights into the links between local authority borrowing and the exercise of monetary policy.

The setting in which local authorities borrow in the U.K. differs in a number of important respects from that in which state and local governments borrow in the U.S.A. The institutional obstacles that hinder the borrowing of governments in the U.S.A. do not trouble local authorities in the U.K. There are no legal limits to the interest rates local authorities are allowed to pay; Treasury departments are much freer from control over the pattern of day to day borrowing; and decisions about the terms and timing of borrowing within the confines of statutory regulations, are usually left to the discretion of the local authority Treasurer. Capital expenditure programmes and the method of financing do not have to be authorised by referenda; there are no legal limits on the total indebtedness of a local authority.

In addition, local authorites in the U.K. have available a much wider range of borrowing instruments which enable them to tap a much wider range of lenders than is the case in the U.S.A. The range, however, is much wider now than it was between 1955 and 1964. The reduction of the role of the P.W.L.B. to that virtually of 'lender of last resort' meant that local authorities were forced to rely on the sale of stock and mortgages for almost all of their long-term finance. The close control the monetary authorities exercised over stock issues made the stock market an uncertain source of funds. Mortgages, on the other hand had limited appeal to investors; so it was hardly surprising that in the face of rising interest rates local authorities chose to borrow short-term. This is the basic difference between the U.S.A. and the U.K. Local authorities in the U.K., with the except in Scotland, faced no statutory limitation on the extent of their short-term borrowing until 1969. Furthermore, there has developed in the London money markets a specialised market that supplied funds, on a short-term basis, from a wide variety of sources which were ready to lend to local authorities because of their security which was considered second only to that of the central government.

The restrictions on the use of temporary funds, that were announced in 1963, were tempered by the reopening of the P.W.L.B. A number of new borrowing instruments were also introduced; the negotiable bond and the revenue bill both extended the appeal of local authority debt to more portfolio holders. In responding to changing monetary conditions local authorities have at their disposal a number of different borrowing instruments which appeal to a wide range of lenders. They are able also to raise short-term borrowing in response to rising interest rates, even though there is a ceiling.

At present there is no evidence to suggest that local authorities alter the timing or the volume of their net borrowing in response

to rising interest rates, of course this does not establish local authorities do not act in this way. If U.K. experience is compared directly with that of the U.S.A. it is reasonably clear that long-term borrowing is sensitive to changing interest rates, or at least according to the evidence of chapter four. It has already been noted that long-term borrowing in the U.S.A. appears to be sensitive to changing interest rates as well.

If total borrowing is unresponsive to interest rate changes it is unlikely that capital spending would be. Very little empirical investigation has been carried out into the interest elasticity of local authority capital expenditure. Nicholson and Topham (1971) have studied the determinants of housing investment by local authorities; and since about half of all capital expenditure by local authorites since the early 1960s has been on housing the results can be generalised. The authors used a number of variables to explain variations in average capital payments per head on housing by 82 county boroughs over the years 1962 to 1968. Total interest payments and the average rate of interest charged to spending committees were introduced as variables but no significant relationship was observable. The inelasticity of local authority capital expenditure is usually accounted for by the largely mandatory nature of many capital expenditure programmes; a point of view which was expressed strongly in the submissions to the Radcliffe Committee.

Since, however, not all the capital spending of local authorities is mandatory, the question can be posed in what circumstances would capital spending on projects of marginal value be postponed or even cancelled as a result of a rise in interest rates. Suppose that local authorities had little recourse to short-term funds, because either markets were relatively undeveloped or the credit rating of many local authorities were uncertain, then a rise in interest rates might face local authorities with the choice of either finding an

alternative means of financing capital expenditure or postponing some capital spending until interest rates fell again[13]. Some of the alternatives might be in the form of a greater use of current revenues; or local authorities might adopt a policy of accumulating liquid assets during periods when interest rates were low as a buffer against a rise in interest rates.

The unresponsiveness of both local authority total borrowing and capital expenditure to monetary policy means that local authorities are subject to the vagaries of fiscal management since the central government is forced to use the loan sanction or exhortation as the only means of regulating local authority capital expenditure. The availability, at a price, of short-term funds has enabled local authorities to finance their capital projects without the need to postpone their execution until long-term funds become available at a lower rate of interest.

Appendix B

Definition Of Variables And Sources Of Data

$TB_{(t)}$ Net temporary borrowing defined as including all loans raised for less than 365 days. Although for purposes of General Consent relating to the restrictions on temporary borrowing it does not include money bills issued in anticipation of revenue, the volume of money bills has been included for purposes of estimation. Financial Statistics

$TB7_{(t)}$ Net borrowing for up to seven days; includes inter-authority borrowing. Financial Statistics

$TB3_{t}$ Net borrowing over seven days and up to three months; includes inter-authority borrowing. Financial Statistics.

$B_{(t)}$ Total net borrowing, seasonally unadjusted. Financial Statistics

$OV_{(t)}$ The change in total bank overdrafts. From the 3rd quarter 1965 total bank overdrafts were measured net, that is, authorities were asked to report the net overdraft on all accounts; in the figures for before bank overdrafts were on a gross basis, that is, the sum of all overdrafts on all accounts showing an overdraft. From the 2nd quarter of 1972 the figures reverted to the gross basis; estimated by reference to the net figures reported and series for local authority bank deposits supplied by the banking sector. Financial Statistics

$MB_{(t)}$ Net sales of mortgages and local bonds. Financial Statistics

$SB_{(t)}$ Net issues of negotiable bonds and stock. Financial Statistics

$PW_{(t)}$ Net lending from the Public Works Loan Board. Financial Statistics

$R_{L(t)}$ The average rate of interest on local authority mortgages for ten years or more. Calculated as the quarterly average of mid-month observations. The figures for 1959 and 1960 were obtained from various copies of Local Government Finance, the remainder come from Financial Statistics.

$R_{S(t)}$ The rate of interest on local authority loans taken for a minimum term of three months and thereafter at seven days notice. Calculated as the quarterly average of mid-month observations. Bank of England Statistical Abstract, Vol.1, 1970; thereafter Bank of England Quarterly Bulletin, Table 28.

DQ_t A dummy variable. Takes the value of 1 for 1965(1), 1967(1), 1968(1), 1968(IV), 1969(IV), 1970(IV), 1971(IV), 1972(IV); zero values in all other quarters.

$R_{S7(t)}$ Rate of interest on seven day local authority deposits. Quarterly average of mid-month observations. Financial Statistics

$C_{(t)}$ Forward premium/discount, three months, per cent per annum. Statistical Abstract, Table 28; thereafter B.E.Q.B.

$R_{ed(t)}$ Rate of interest on three month euro-dollar deposits in London. Statistical Abstract, Table 28; thereafter B.E.Q.B.

$VB_{(t-1)}$ The visible trade balance, revised and seasonally adjusted. Statistical Abstract, Table 19; thereafter B.E.Q.B.

$SP_{(t)}$ The spread between the local authority short-term rate and the rate charged on bank overdrafts. The later is estimated as being Bank rate plus $\frac{1}{2}$ per cent up to October 1972. Thereafter it is Base rate plus $\frac{1}{2}$ per cent. Statistical Abstract, Table 29; thereafter B.E.Q.B.

$FR_{(t)}$ A dummy variable for the effect of foreign currency borrowing from 1973. Takes a value of 1 for 1973(1), 1973(11), and 1973(111); and a value of zero in all other quarters.

$LA_{(t)}$ Net lending to local authorities by the Merchant, Overseas and Foreign Banks. Statistical Abstract, Table 10; thereafter B.E.Q.B.

$OFCB_{(t)}$ Foreign currency transactions of U.K. banks. Excludes U. K residents' foreign currency borrowing from London banks for investment overseas, and trade credit transactions. Statistical Abstract, Table 19; thereafter B.E.Q.B.

D A dummy variable for periods of speculation against sterling. Takes a value of -2 in 1964(IV) 1 in 1965(1); -1 in 1966(11), 1966(111) and 1967(IV); 1 in 1968(1); -1 in 1969(111) and 1970(11); 1 in 1970(IV), 1971(11) and 1971(111); 3 in 1971(IV); and -2 in 1972(11). A value of zero in all other quarters.

$R_{tb(t)}$ U.K. three months Treasury Bill rate. Quarterly average of mid-month observations. Statistical Abstract, Table 28, thereafter B.E.Q.B.

$Rg_{(t)}$ The rate of interest on British government long-dated stocks. Quarterly average of mid-month observations. Statistical Abstract, Table 30, thereafter B.E.Q.B.

FOOTNOTES

Chapter One

1. For a detailed discussion of the part played by local authorities in public expenditure, see Holmans (1970).

2. The Committee is expected to report at the end of 1975.

3. See Hepworth (1972) for a comprehensive introduction to the finance of local government.

4. Tobin and Brainard (1967), pp. v-vi.

5. A number of econometric models of the monetary sector that have been constructed in the last five years have omitted local authority behaviour, subsumed it under the public sector, or it has been assumed that the supply of local authority debt is exogenous. Although this is very likely correct in aggregate, it will be argued in subsequent chapters that relative supplies of short and long term debt are endogenous and that this has a differential impact on markets and on the structure of interest rates.

6. For some recent accounts and analysis of monetary policy, see Goodhart (1974), Crockett (1973) and Pierce and Shaw (1974).

7. The change-over to block sanctions was introduced to take effect from April 1st, 1971. A detailed explanation is contained in Hepworth (1972), Supplementary appendix, pp. 330-333.

FOOTNOTES - CHAPTER TWO

1. The Public Works Loan Board, its history and the extent of its power are described in A General Note On The Constitution, Powers, And Duties Of The Commissioners And Other Matters issued by the Board, September, 1971.

2. Op. cit., pp. 1-5, for a much fuller account.

3. In fact the Public Works Loans Act, 1975 consolidated all previous legislation regulating the operations of the Commissioners.

4. The actual arrangements were a little more complex. Parliament annually passed an Act which set limits on the sum which the P.W.L.B. could lend. From 1887 the Board's funds were provided by the National Debt Commissioners who managed the Local Loans Fund. The requirements of this fund were met by issues of stocks, bonds and temporary borrowings. The Fund was taken out of the National budget because it was not financed by the Exchequer with the intention that it charge for loans so as to be self-financing. The responsibility for fixing interest rates was passed to the Treasury in 1897 with a consequent loss of independence. This arrangement between 1887 and 1897 has similarities, in many respects, to the sort of central borrowing agency advocated in more recent times. c.p. Yannopoulos (1972).

5. See I.G. Gibson (1928, 1936) W. Riley (1930), J. E. Jarratt (1930) M. E. A. Bowley (1941-42)

6. The Local Government Act, 1933, c.p. J. Mitchell (1935)

7. Superceded by the 1972 Act, the financial provisions of which took effect from April 1974.

8. See J. D. Imrie (1940), Midland Bank Review (1950)

9. There were, in fact, some exceptions. Local authorities could borrow from internal funds and also from outside sources within the limit of the highest figure of mortgage and bond debt outstanding at any time between 1939 and 1945. All this meant in practice was that when existing debt came up for redemption it could be replaced in the same form without the authority having to go to the P.W.L.B.

10. Bank Rate had been set at 2 per cent in October 1939 and was kept at that level when the war finished. c.p. R. S. Sayers (1956).

10a. See I.M.T.A. (1957) ch.XV. for more details.

11. J. C. R. Dow (1964), p.227.

12. Quoted in The Economist: February 16th, 1952.

13. For a discussion of why monetary policy was revived: c.p. Report of the Committee on the Working of the Monetary System (Radcliffe Report) CMND 827, para. 399-405.

14. The Economist: o.p. cit.

14a See the Radcliffe Report, para.429 for an explanation.

15. The Economist, August 2nd, 1952.

16. For a detailed discussion of these points see Hansard, 12 November 1952, for the Debate on the P.W.L.B. Bill.

17. The Economist, November 8th, 1952.

18. The Financial Times, 10 November "The Critics (of the government)... hint that if local authorities were forced to go to the market for loans they require they would be constrained to reduce their capital expenditure". "...the first step has been taken towards bringing housing under the compulsion of the capital market along with all other schemes of capital development".

19. The Times, November 7th. "It is always open to the Treasury, however, to keep the rate at such a level relative to open market rates, that an incentive exists, and also to redirect applicants to the open market if suitable cases and suitable circumstances arise". Financial Times, o.p. cit., "The speed of transfer will depend upon the rate of interest charged on P.W.L.B. loans, and this is, no doubt, the instrument the Treasury will use to control the diversion of local government borrowing into new channels".

20. Local Authority Stock is a negotiable instrument and is issued through and quoted on the stock exchange. It is secured formally on the rates and revenues of the local authority. Because it is negotiable and competes with gilt-edged stock, the terms and timing of any issue are controlled by the Bank of England.

21. The mortgage is a particularly antediluvian mode of borrowing little favoured by the more go-ahead authority. In the 1950's, however, it was one of the few means by which local authorities were empowered to borrow. Originally specific properties were mortgaged, now it is the rates and revenues. C.p. Hepworth (1970) pp. 144-147.

22. Under the 1933 Act local authorities may borrow by way of temporary loan or overdraft to defray expenditure pending the receipt of revenue, or in anticipation of raising a long-term loan.

23. A loan sanction is a consent granted by a Ministry (it was usually that of Housing and Local Government) to raise a loan over and above borrowing powers conferred by Statute. It is used now primarily as a means of regulating local authority capital expenditure. Originally it was a way of scrutinising the purpose of certain programmes and the financial resources of local authorities. For a fuller account, c.p. Hepworth (1970), pp.134-138.

24. The Economist, September, 1954, p.178.

25. This followed from the pledge which the Financial Secretary made not to set P.W.L.B. rates at a level which would drive the local authorities into the open market. c.p. Midland Bank Review (1953).

26. See R. F. Harrod (1956)

27. Quoted in the Radcliffe Report, para. 409.

28. See R. Bird (1956)

29. A figure quoted in Rose (1957), p.410

30. The Economist, September 1, 1956, p.732

31. H. R. Page (1962), p.15

31a For some notes on this see Appendix B.

32. It is possible that because local authorities considered interest rates to be too high, they felt that the P.W.L.B. should not have 'confirmed' any rise in market rates by raising its rates, while when market rates were falling it should have led the market down further by reducing its rates ahead of the fall. For some comment on P.W.L.B. rates during 1960 see **Local Government Finance, sept. 1960.**

33. Treasury Minute dated 3rd May 1957, quoted in introduction to the Report.

34. Committee On The Working Of The Monetary System, CMND 827 H.M.S.O. 1959.

35. O.p cit., para. 596-600.

36. The Economist (August 22nd 1959 p.557) in its comment on the Radcliffe Report claimed that the Committee's idea, that local authorities' reliance on short-term debt was a reversal of funding policy, was a "mechanistic absurdity".

Local authority short-term borrowings "...are not technical liquid assets... and do not expand the crédit base". But if the monetary authorities are obliged to sell more treasury bills to banks because either fewer treasury bills can be sold to the non-bank public who prefer local authority short-term deposits or less can be raised by sales of gilt-edged stock to investors who prefer to hold more local authority mortgages, then the credit base can expand. Only if it is assumed that the forms of debt sold by local authorities are not substitutes for the forms of debt sold by the central government can the Economist's arguments hold.

37. Hansard, 26 November 1959, Debate on the Monetary System.

38. ibid, col.698.

39. This precise difficulty was to reappear when local authorities were granted limited access to the Board in 1964. See section 2.6 below.

40. Memoranda of Evidence, Committee on the Working of the Monetary System, 1960. pp.167-177

41. ibid., p.177

42. This was paralleled in the Minutes of Evidence, Qs.8211-8569.

43. D. S. Lees (1961) p.34

44. For a survey of the period before the Radcliffe Report and the recommendations it made, see Local Government Finance, jan.1960

45. The first survey was as a result of a Treasur Circular dated the 27th August 1958. This attempt to monitor the composition of local authority loan debt was at first regarded as ominous. Cp. Local Government Finance (1958), pp.237-240

46. H. Cowen (1960) pp. 18-33

47. The Economist, October 20th 1962 p.286

48. ibid, October 13th 1962, p.285

49. "Local Authority Borrowing" A White Paper, CMND 2162 October 1963.

50. Before the White Paper was published there had been some confusion over the definition of temporary debt. The broadest definition would cover all debt repayable within one year irrespective of its original maturity, its source or the purpose it was issued for. The narrower definition, which was adopted for the purposes of the White Paper, only included debt with an original maturity of one year or less, and excluded borrowing in anticipation of revenue and from internal sources. The figures which were reported at the beginning of Section 2.5 are for the broader definition. This in part can explain the rapid growth of this form of borrowing before 1963. Mortgages issued for a period of two years, within one year become classified as temporary borrowing. The large volume of short-term mortgages issued in the late 1950's swelled the figures for temporary borrowing in the early 1960's.

51. White Paper, pp.4-5

52. In a speech to the Institute of Municipal Treasurers and Accountants. Reported in The Economist, November 17th 1962, p.710.

53. ibid, p.710

54. See H. Page (1966), p.31

55. These bonds could be for one to five years, but soon they were nicknames 'yearlings' by the stockmarket because of the possibility that those issued for 365 days would be just outside the limits imposed on temporary borrowing. See The Economist, February 29th 1964 p.819, Bank of England Quarterly Bulletin (B.E.Q.B.) 1964 p.90.

56. B.E.Q.B. op.cit., p.178.

56a See The Economist, July 11th, 1964, pp.175-176.

57. The first bills were issued by Manchester in 1965 to the tune of £3mn. Although Manchester, along with some other local authorities, had had powers to issue both revenue and capital bills since 1933, they were without the necessary Treasury permission until 1965.

58. Announced in a letter to the Local Authority Association, 31st January 1969.

59. They have also been called 'secondary' and 'complementary'. For a survey see H. McRae (1970), and Midland Bank Review (1969)

60. The Economist, September 1st, 1956, pp. 731-733

61 This lack of concensus is reflected in the conflicting views of Friedman (1969) and Swoboda (1968).

62. See the Bank of England Quarterly Bulletin (B.E.Q.B.) (1961, 1968).

63. This was to change further after September 1971 when 'Competition and Credit Control' was introduced.

64. The Economist, June 30th, 1962, p.1331.

65. B.E.Q.B., 1964, p.175.

66. Clendenning (1970) ch.6, 7, 8.

67. The theoretical basis of this proposition was first worked out by Mundell (1960, 1961, 1962) and developed by Swoboda (1972, 1974). Its detailed consideration is left to chapter 5.

68. Under exchange control regulations banks are obliged to cover most of their switching into sterling by the purchase of forward exchange so

that the cost of this cover has to be taken into account when comparing yields in the Euro-dollar market and in the U.K. money markets.

69. See the Midland Bank Review (August 1973).

70. See B.E.Q.B. (1972) p.487.

71. See McRae (1970) p.36.

72. Ninetieth Annual Report of the Public Works Loan Board, 1964-65, H.M.S.O., pp.3-5. will be referrred to as the P.W.L.B. Annual Report. This section draws heavily on these reports.

73. See H. Page (1966) p.29.

74. For a discussion of the ramifications of the sterling crisis for the "...whole interlocking pattern of sector finance, and not least on the local authority markets". See B.E.Q.B. (1965), pp.20-21.

75. Actually only the interest rates on loans within the quotas remained unchanged. The rates ruling on non-quota loans were increased. Non-quota loans, however, are a very small proportion of total loans and can be safely ignored.

76. Annual Report, op. cit., p.5.

77. CMND 2162, op. cit., para.17.

78. The 'less prosperous areas' were Scotland, Wales, Cheshire, Cornwall, (and Isles of Scilly), Cumberland, Devon, Durham, Lancashire, Northumberland, Westmorland; and parts of Nottinghamshire, Derbyshire and Yorkshire. In 1970 the intermediate areas were included which were comprised of the rest of Notts and Derbyshire, and the East and West Ridings of Yorkshire.

79. B.E.Q.B. (1965), p.216.

80. P.W.L.B. Annual Report, 1965-66, p.4.

81 CMND 2162, op.cit., para.18.

82. Local authorities were granted a quota based on how much funding of temporary debt they carried out as progress towards the level prescribed by the Treasury. They were all supposed to have reached this level by April 1968. The modified arrangements governing loans from the P.W.L.B. meant, however, that local authorities would not be allowed a quota of 50 per cent by this time it was therefore decided to extend the deadline by one year to April 1969. Some 300 local authorities by April 1968 were still above the limits. See The Economist, January 25th 1969, p.80.

83. Many of these mortgages containing break clauses were held by the Building Societies who had a statutory obligation to ensure that their assets were almost immediately realisable in cash.

84. Annual Report, op.cit., 1966-67, p.4.

85. These quota was 40per cent of funding for local authorities in less prosperous areas and 30 per cent for all others.

86. The 1966-67 Annual Report, p.5., is not completely clear whether this is really what is implied. It may well be that it was to include all borrowings, perhaps in the last few weeks of the financial year, not just those which had not previously been anticipated.

87. Annual Report, 1968-69, p.4.

88. Unless the loan sanction granted was for a shorter period the minimum period for which the Board could make loans was ten years.

89. The Economist, May 15th 1971, 'Banking Supplement', p.XXVI-XXIX.

89a. 'Risk' in this context refers solely to the possibility of insolvency.

90. This part draws heavily on L.Boyle (1973) Long, Till and Colvin (1972) and I.M.T.A. (1971).

91. Moreover, in 1970, because of the high demand for funds in the German money market the German banking authorities ruled that loans by foreign local authorities would require in future a guarantee by the respective government of the loan and not just a guarantee against the risk of exchange rate fluctuation as was the British Government's policy. See Long, Till and Colvin (1972), section 7.

92. See The Times, March 6, 1973, p.4.

93. As from October 1973 the relevant date is 31 March 1973. In addition because smaller local authorities could borrow in foreign currencies though without exchange cover a considerable number attempted to take advantage of this facility. To avoid saturation of the market it was decided that henceforth foreign borrowing covered or uncovered will be restricted to those authorities with total loan debt exceeding £100 million. See Boyle, op.cit., p.57.

94. This was soon after extended to other currencies. See Boyle, op.cit., p.53.

95. See the speech by the Governor of the Bank of England to the International Banking Conference, 28th May, 1971, reported in B.E.Q.B. (September 1971).

96. The new arrangements were foreshadowed in the budget speech of March 1971. Outside of official circles, however, the banking cartel and the lack of competition had been criticised by the National Board for Prices and Incomes (see N.B.P.I., 1967) in The Monopolies Commission Report (1968); by B. Griffiths, (1970a, 1970b) Pressnell (1970). For a criticism

which was published after the announcement of C.C.C. see Hodgman (1971). See also Griffiths (1973), Rowan (1973), Nobay (1973), Morgan and Harrington (1973), and Harrington (1974).

97. The other eligible reserve assets are (i) tax reserve certificates, (ii) government stocks with one year or less to run to maturity, (iii) commercial bills eligible for rediscount at the Bank of England up to a maximum of two per cent of eligible liabilities.

98. For a careful analysis of this policy, see Goodhart (1974).

99. See Long, Till and Colvin (1972), Section 6.

CHAPTER THREE

1. Tobin and Hester (1967) introduction, p.vi.

2. ibid, they also point to the problem of defining optimal behaviour in situations involving market imperfections, transactions costs and other frictions; and in particular the inventory theoretic approach developed by Tobin (1956) and Banmol (1952). From one point of view temporary borrowing of local authorities can be interpreted in this way. Although strictly local authorities distinguish between capital and current accounts, modern techniques of accounting mean that temporary borrowing is used as a residual or balancing item. Nevertheless in what follows no explicit allowance will be made for the 'transactionary' features of short-term borrowing; something which may be a serious shortcoming.

3. Up to now this anthropomorphism has gone uncommented on. Decisions about which forms of debt to incur and for which maturities are actually made in the Treasurers Department of the

local authority. While general borrowing policy is the responsibility of the Treasurer himself day to day contact with both the money brokers and the P.W.L.B. is left in the hands of a few individuals within the Department. Probably because of its esoteric nature rarely is borrowing policy the subject of debate in Council.

4. Again this is not quite correct since local authorities, or rather the Treasurer's Department, manage the superannuation rights of local government employees. The investment of these funds will either be in the consolidated loans funds of the local authority itself or in other securities or property. Notwithstanding this qualification, there is no actual overlap in the sense that the assets of the superannuation fund have to bear any relationship to the external liabilities of the authority incurred by borrowing to finance capital expenditure. See Hepworth (1971), ch.x.

5. This is perhaps a controversial assumption. As was recorded in chapter 2, section 2:7, there was some suggestion that local authorities considered the possibility of curtailing capital spending as a result of high interest rates. The only empirical work for the U.K. is that of Nicolson and Topham (1971). Some evidence for the U.S.A. is considered in Appendix A.

6. Radcliffe Report, para.93.

7. Keynes (1936) pp. 201-204. Keynes never actually spoke of a normal-rate but he refers to the 'safe' level of the interest rate.

8. See Ackley (1961), pp.6-8. for a discussion of the differences between stocks and flows.

9. The use of a compound interest formula is, of course, a simplification. The actual cost of a sum borrowed over 'n '

periods will vary with the different ways in which provision is made for repayment of principal and payment of interest. The formula used implies that both principal and compounded interest are paid in full after 'n' periods. Even so because a local authority usually uses a Sinking Fund or a Consolidated Loans Fund as a convenient means of managing debt, sums which are put aside regularly so as to build up enough to repay the loan at maturity will be used to defer other borrowings. Nevertheless little is likely to be lost by using the simple formula.

9.a Strictly, local authorities are only empowered to borrow short-term pending the receipt of revenue or to defray capital expenditure pending the raising of a longer term loan.

10. Nerlove attributes this distinction to Arrow and Enthosen(1956).

11. Rutledge (1974) p.47.

12. Muth (1961) p.316.

13. This view has been disputed by Leijonhufund (1968), Ch.V, section 3. There is also a discussion of Tobin's contribution. See also Crouch (1971).

14. These assumptions are really just an enlargement of those made at the beginning of section 3:1.

15. Because most of local authority temporary debt is actually on a seven day basis the amount of gross borrowing this gives rise to within a financial quarter is very large. This difficulty has been avoided by making the period for which a short-term deposit is taken equal to the 'decision-period' of the model.

16. This deliberate omission can only be excused by stating that there appears to be no way in which one of the basic premises of the Liquidity Premium Theory can be reconciled with the apparent behaviour of local authorities. The basic premise is that while lenders have a preference for lending short-term, borrowers prefer to borrow on a long-term basis. This according to Hicks (1946), p.146, means that "..the forward market for loans..may be expected to have a constitutional weakness on one side..". The readiness with which, however, local authorities choose to borrow short-term belies the assumption.

17. Cmnd 2162, p.3.

18. The aim of national debt management is usually directed towards the task of funding as much as is possible because of the role that short-term government debt plays as reserve assets for the banking system.

19. Dodds and Ford (1974), p.171, footnote 17, refer to the existence of a paper by Malkiel published in 1967 in which he attempts to rectify the omission of borrowers from his theory. They were, however, unable to find any trace of it.

20. It seems that for the equalisation theorem to hold it is a sufficient condition for investors to behave according to the tenets of the expectations hypothesis but it is not necessary borrowing behaviour will do equally as well.

21. See Hickman (1943), Walker (1954), and Culbertson (1957). All three contributions are discussed in Dodds and Ford, pp.51-57

22. Johnson (1971) p.91.

23. Meiselman (1962) p.19.

24. Some of the technical and methodological issues that this raises are discussed by Dodds and Ford, pp.82-87. See also Buse (1967), Grant (1964) and Fisher (1966).

25. Malkiel pointed out that the hypothesis could be formulated equally as well by using short-term interest rates.

26. Malkiel (1962), p.216.

27. op.cit., pp.166-168.

28. ibid., p.167.

29. Goodhart (1972), p.458.

30. Malkiel (1966) pp.129-35.

31. The evidence he cites for municipal bond being issued this way refers to that produced by Morris (1960) and Phelps (1960). More recent evidence is discussed in Appendix A.

32. Malkiel, op.cit.,p.135.

33. Ibid p.154.

34. This is in fact an approximation. For a discussion of this point see Modigliani and Sutch (1966) p.185, footnote 4.

35. There were nine variables of the form:

$$R_{L(t)} - \left[\frac{(1-\lambda)}{(1-\lambda^{11})}\sum_{i=1}^{11}\lambda^{i-1}R_{L(t-i)}\right]$$

where λ took on the values 0.15, 0.25, ...0.95.

36. Their purpose in drawing upon De Leeuw's work was to investigate the success or lack of it, of 'Operation Twist'. See Modigliani and Sutch (1966,67) and Rowan (1974).

37. See Almon (1965).

38. The problem was that if there was any autocorrelation in the error term the estimates of the coefficients would be biased and this would tend to mask the actual effectiveness of 'Operation Twist'

39. op.cit.,1966, p.188.

40. The concept of extrapolative expectations may have some bearing on the discussion of section 3:1 of Rational Expectations. The possibility that market participants are aware a rise in interest rates may presage a further rise suggests that they are aware of the cyclical movement of interest rates and of the underlying economic processes that generate cycles.

41. Rowan and O'Brien's work also attempts to incorporate the effects of supplies of government debt, transactions costs and the variances and covariances of expected interest income and expected capital gains. The variation actually reported here is that which they call a truncated linear approximation. op.cit., pp.293-297.

42. Again the model he tested was the truncated linear approximation of Rowan and O'Brien. It is possible that the exclusion of the other variables may be a sufficient mis-specification to render his conclusions invalid.

43. It is of interest to note that Hamburger explored the possibility that the negative performance of the expectations hypothesis was owing to the use of the treasury bill rate as the short-term rate instead of some other rate such as the rate on local authority three months deposits. He found, however, that its inclusion made no significant difference to the results. It might well be argued that the consol rate should have been replaced by the long-term rate on local authority debt. This issue is pursued in chapter 5.

44. This model is considered more fully in chapter 5.

45. The variables that have been dropped were generally insignificant

46. It is an assumption of 2.S.L.S. that the specification is correct.

47. Under 'Competition and Credit Control' the monetary authorities have retained their control over stock and negotiable bonds because they play a part in the new system as reserve assets of the banking system.

48. This condition is due to Tobin and Brainard (1968).

49. See Parkin (1970), Parkin, Gray, and Barett (1970). Parkin and Ghosh (1972).

50. Parkin (1970), op.cit., p.469.

51. This was due mainly to the fact that the estimation period was up to 1968. It was only later that local authority securities began to play a greater role in the portfolios of clearing banks and discount houses.

52. Parkin and Ghosh, op.cit.,Ghosh (1974).

53. Ghosh (1974), ch.5., tables 5.1., 5.3., 5.5.

54. Clayton, Dodds, Ford, Ghosh (1974).

55. See ch.6. section 5.

CHAPTER FOUR

1. The models are named in this way for convenience and to identify the basic source. All the results that follow are for linear equations; some logarithmic transformations were tried but they were no improvement over the linearised forms.

2. Its precise nature is described in appendix B.

3. If we take just the second term in eq. [3.8] , since none of the other terms are affected, and carry out a Koyck transformation we are left with:

$$a_1 R_{L(t)} - \lambda a_1 R_{L(t-1)} - a_1 (1-\lambda) R_{L(t-1)}$$

which when the last term is expanded reduces to

$$a_1 [R_{L(t)} - R_{L(t-1)}]$$

4. This transformation amounts to the application of generalised least squares (G.L.S.) to a single equation. More sophisticated ways of assigning a value to λ have been suggested by Zellner and Geisel (1968).

5. Because the coefficient b_1 is equal to a_1 of equation [3.8] and since λ does not appear transformation is unnecessary.

6. The argument of Modigliani and Sutch that whichever interest rate is used is purely a pragmatic and empirical issue has already been mentioned in chapter two, section (3.3.c).

7. The technique for estimating the parameters of lagged exogenous variables proposed by Almon (1965) is now widely used in empirical work. The original general Almon scheme is computationally cumbersome so a simplified version is used here. This simplification is explained in Johnston(1972), pp.289-293.

8. No longer lags were used because of some difficulties in

obtaining sufficient data for the early part of the period on long-term rates.

8.a. See figure (4.1)

9. These difficulties sprang from the reluctance on the part of some local authorities (estimated to be about 300 in number, see The Economist, January 25th 1969, p.80) to fund while interest rates were high.

10. The term slack refers to the difference between the maximum permitted ratio of temporary debt to total loan debt and the ratio that a local authority actually maintains over time. Since net borrowing is rarely more than a small percentage of total loan debt, in the same way that investment is only a small addition to the total capital stock, if a local authority maintains at any one time slack amounting to 5% of total loan debt this may well be more than equal to the total net borrowing in any quarter.

11. A simple numerical example may help to make this point clearer. It will be assumed that no debt is retired during the two periods and that total loan debt in the first period amounts to 1000. 150 is held on a temporary basis and 850 on a long-term basis.

Case (a)	1st Period	2nd Period
Total loan debt	1000	1050
Short-term debt	150	200
Long-term debt	850	850
Net borrowing require.	50	50
Rate of interest	9%	7%

It is assumed also that the interest rate in the first period is above the 'normal' interest rate and that this normal rate

is 7% and is expected to prevail in the second period. The slack amounts to five per cent of total loan debt and is just sufficient to cover the net borrowing requirement of 50. In the next period this is funded along with the second period net borrowing requirement of 50.

Case (b)	1st Period	2nd Period
Total loan debt	1000	1050
Short-term debt	150	170
Long-term debt	850	880
Net borrowing require.	50	50
Rate of interest	9%	10%

In the second case expectations are extrapolative and the rate of interest is expected to rise to 10% in the second period. In this case only 20 of net borrowing requirement in the first period is met on a temporary basis even though the rate of interest is above the normal level. In the second period, at the even higher rate of interest, all the net borrowing requirement can be met on a temporary basis bringing the ratio of temporary to total loan debt up to twenty per cent. This does of course beg the question why so much temporary debt is held in the first place.

12. See Chow (1960). This method involves the application of an 'F' test to the two sub-periods and to the complete period and a comparison of the residual variation.

13. These took into account the gradual raising of the quota entitlement from twenty per cent to forty per cent.

14. See appendix B for details.

14.a See figure (4.1)

15. There are a number of definitional problems that have been glossed over. See appendix B. for details.

16. The rate charged by the banks to local authorities was taken as Bank Rate plus 0.5 per cent up to the last quarter 1972. For September 1971 Bank Rate was replaced by Base Rate. The information that this 'blue-chip' rate has been charged to local authorities was obtained from National Board For Prices and Incomes (1967).

17. $SP_{(t)}$ has been transformed as before. Thus:

$$SP^*_{(t)} = (R_{S(t)} - R_{B(t)} + 0.5) - \lambda (R_{S(t-1)} - R_{B(t-1)} + 0.5)$$

where $R_{B(t)}$ is Bank Rate.

18. Switching by local authorities between the money markets and the Clearing Banks, something which has been described as 'soft arbitrage', became of considerable importance during 1973. To prevent this the clearing banks announced in December 1973 that advances to local authorities, along with those to finance houses, companies and other banks, were to be related in future to market rates instead of to base rates. See B.E.Q.B. (1974), March, p.21.

19. Or rather that category of debt with the shortest term to maturity for which data is available. In practice local authorities also borrow on an overnight basis.

19.a See figure (4.2)

20. In particular the work of Hutton (1972) have been drawn on to obtain the equation eventually estimated.

21. See Dodds and Ford (1974), p.167, and the discussion of

chapter three. This hypothesis will be approached from a different angle in chapter five.

22. It should be noticed that the beta-coefficients differ from those of Modigliani and Sutch in that they imposed the restriction that the lag structure should assume a zero value at a finite lag.

23. For the formal proof, see Johnston (1972), pp.61-62.

Chapter 5

1. A brief comparison of the size of the debt in the UK and in seven other main countries is contained in the B.E.Q.B., March 1970.

2. For a more detailed breakdown of the various components of the national debt and an analysis by holder, see B.E.Q.B., December 1974.

3. It should be noted that these are gross figures. Before a true picture of public sector debt can be obtained the assets that the central government hold in the form of loans to local authorities through the P.W.L.B. should be subtracted. See Midland Bank Review(1972), p. 6, also Financial Statistics.

4. See B.E.Q.B., June 1966, pp. 141-8.

5. For a more detailed explanation of this policy, see Goodhart (1974).

6. The consequences of these restrictive measures for the efficiency of the banking system are discussed in Pressnell (1970), Johnson (1968) and Griffiths (1970).

7. See the discussion of term structure theory in chapter 3.

8. The evidence to the contrary is provided by Terrell and Frazer (1972) and Hamburger (1971) among others.

9. Rowan and O'Brien (1972) produce very equivocal evidence in favour of changes in the debt structure influencing the term structure. They themselves think this to be a very tentative conclusion.

10. If capital and money markets were perfect the only difference between a term structure constructed on government debt and one constructed on local authority debt would be a reflection of differences in liquidity and in credit-worthiness.

11. The Radcliffe Committee thought that the increase in the temporary debt of local authorities in the late 1950s was clear contrary to the funding operations of the monetary authorities.

12. For instance, if interest rates are rising in general, perhaps because of increases in foreign rates, the short rate tends to move up towards the long rate. In these circumstances local authorities switch towards the short end of the market which may well drive the short rate above the long rate. The monetary authorities may well attempt

to moderate the rise in long rates by buying in stock while replacing it with increased sales of treasury bills.

13. The variables are explained in appendix B.

14. In fact, Hamburger's long rate was that on 2½ per cent consols.

15. Goodhart and Crockett (1970) in a study of the demand for money in the UK, settled upon the local authority short-term rate in preference to the treasury bill rate "on the grounds that in recent years the local authority market has attracted a wider range of active participants and has been less dominated by the direct influence of the authorities than has the treasury bill market."

16. See B.E.Q.B. (June 1971). Text of an address by the Governor given in Munich, may 1971.

17. Modigliani has attempted to improve his term structure equation recently by including the expected rate of change of prices and some measure of the risk premium involved in holding long-term bonds. See Modigliani (1971).

18. This section draws on Kern (1972, 1973), Pringle and Parker (1975) and Pierce and Shaw (1974), ch. 5.

19. These are Bank non-deposit liabilities; bank lending in sterling to overseas residents; lending to UK residents in foreign currency for investment overseas. See B.E.Q.B., March 1975, Table 12/3.

20. On the assumption that the gilt-edged market was unable to absorb more government debt.

21. If the banks were fully loaned up, they would only be able to increase their lending to local authorities by reducing their lending to other sectors. Holdings of local authority debt, with some exceptions that are explained in the next section, are not eligible reserve assets under the present system, and cannot be used to support an increase in the deposits of the banking system.

22. This exposition perhaps does not do justice to the cash ratio theory. Many attempts have been made to relax the assumption that r and c are constants by specifying variables that influence the ratios such as relative yields, income, substitutes for currency. See Johnson (1971), ch. 18; Crouch (1967). Also Pierce and Shaw (1974), ch. 5.

23. This view came to be known as the new orthodoxy and was developed by Manning-Dacey (1956, King (1956) and Sayers (1955) and was a noticeable theme of the Radcliffe Report.

24. During the 1960s there was a debate about the relative merits of the two theories. It all started with a counter-attack by the advocates of the cash ratio theory who became known as 'neo-orthodox', on the new orthodoxy. See Crouch (1964), Newlyn (1964); and for the reply see Cramp (1967).

25. See Tobin (1967); and Goodhart (1973) for the application of these ideas to the UK.

26. For a discussion of the other reserve assets that the monetary authorities may not have adequate control over see Morgan. and Harrington (1973).

27. For a more general discussion of the working of Competition and Credit Control, both its success and its failures, see: Lomax (1973); Davis and Yeomans (1973); Morgan and Richards (1973) and Christelow (1974).

28. See B.E.Q.B. (1973), for a detailed explanation of the reasons behind the modification.

29. See B.E.Q.B. (1974), p. 37; and Midland Bank Review (1974).

30. The supplementary credit control scheme was put back into cold storage in February 1975. See B.E.Q.B. (1975.a).

31. This section draws heavily on B.E.Q.B. (1962) and B.E.Q.B. (March 1975).

33. For a detailed account of the history and workings of the E.E.A., see B.E.Q.B. (1968).

34. Cramp (1971), ch. 4.

35. Clendenning (1970), ch. 7 and 8.

36. ibid., p. 140.

37. Local authorities can, if they wish, and possess the powers, borrow in foreign currencies without Treasury cover; and carry the exchange risk themselves. For the risks that this entails see Boyle (1974).

38. The UK Government negotiated a $2.5 billion facility in 1974 with a consortium of banks.

39. See Branson (1969), Rhomberg (1964) and Stein (1965) for some examples.

40. See Hutton, (1972) op. cit., p. 14.

41. For a discussion of this point, see Chalmers (1971).

42. Knight (1972).

43. There are some discrepencies between the data Hodjera used and that used here. It appears that Hodjera used unrevised data for 1964(ii) to 1965(iv). See Hodjera (1971), Table B.4. as compared with Bank of England Statistical Abstract, vol. 1, 1970, Table 20(i).

44. Knight, op.cit., p. 289.

45. ibid.,

46. This conclusion is based on the assumption that borrowing by the public corporations is completely interest inelastic.

Appendix A

1. See particularly Section 2.4 of the Radcliffe Report.

2. The F.R.B. have embarked on an annual survey of state and local governments in an attempt to monitor the impact of changing monetary conditions on capital spending. The pilot survey was for the 1966 fiscal year, where this refers to the period July 1 1965 through June 30 1966. The results are reported in McGouldrick and Petersen (1968a, 1968b).

3. See, for instance, Gottlieb (1961), Tanzer (1964), Morris (1960), and Netzer (1960).

4. See Phelps (1961, 1969).

5. See Petersen (1971). The results for 1966 are not included because of lack of comparability.

6. The net shortfall excludes borrowing displaced from the quarter in which it was originally planned but still within the fiscal year.

7. See Schneiderman (1971).

8. See Pruitt (1973).

9. Gottlieb, op. cit., places great emphasis on the cyclical timing of bond issues.

10. Petersen and McGouldrick, op. cit., pp. 566-569.

11. Phelps (1969), p. 510.

12. ibid.

13. Morris and Surrey (1970), pp. 131-132, in a recent discussion of the limited financial options open to state and local governments, pointed out that "if the municipal bond market is unreceptive, state and local governments have only the options of financing through short-term notes or postponing the project" but that the short-term note market is a rather limited option which often forces governments to postpone capital spending.

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