The U.K. and U.S. Treasury bill markets

An article in the September 1964 *Bulletin* discussed the U.K. Treasury bill and the ways in which it is issued. The present article compares the markets in Treasury bills in the United Kingdom and the United States, considers the part such bills play in the two countries in public finance, and discusses the extent to which this form of debt is held outside the banking sector.

In comparing U.K. and U.S. Treasury bills, it soon becomes clear that, although the two instruments have the same name and are basically similar, the two bill markets are in fact distinctly different in structure and operation. In the first place, the London bill market tends to be more specialist than its counterpart in New York. It is essentially a market in money for which bills are convenient collateral; it provides the banks with liquid assets and with the means of converting liquid assets rapidly into cash. The banks find it convenient to deal with specialist firms which will supply them with Treasury bills and with which they can deal in day-to-day money. At the same time, these specialist firms, or discount houses, run a substantial inventory of bills and look to the banks as their main outlet; indeed, they must give the banks first call on their portfolios if they are to stay in business. Before the growth of the Treasury bill issue the houses met the banks' requirements by running commercial bills, but for many years now the Treasury bill has supplanted the commercial bill as the prime liquid asset. By contrast, the houses dealing in bills in New York are general security dealers with a network of branches and representatives in financial centres throughout the country. Dealing in bills is not a predominant part of their business; they do not aim to carry a large inventory, nor are they money dealers in the sense that the London discount houses are. They are not nearly so dependent on the banks or any other single source for their funds, and they do not reckon to provide bills primarily to the banking system; their business is with the general public to whom they sell a wide range of securities, including bills. The banks tender for bills for their own account, and so actually compete with the dealers in the Treasury bill market.

Another important difference between the two markets is that in the United Kingdom the Treasury bill has to meet much stronger competition from within the public sector. This competition comes from the short-term debt of local authorities, which gives a higher return, and which has grown so much in recent years. In the United States, state and local governments are financed largely through long-term bonds. There are of course many alternative outlets for short-term funds in the United States; but they are mostly not in public-sector debt, and in general are not so competitive in yield as local authority debt in the United Kingdom.

A third important difference is that U.K. Treasury bills normally have a life of no more than three months, whereas U.S. Treasury bills are issued either for three months, six months, or a year.

These differences alone—without mentioning others which will appear later—are enough to suggest that the distribution of Treasury bills in the two markets among the various holders may be dissimilar. None the less the instruments themselves are fundamentally alike. In both countries they fulfil the same function : they are the principal means through which the central government obtains short-term finance from the market, and their yield is the standard indicator

of short-term interest rates. In both countries too, Treasury bills not only offer the highest security but can be immediately discounted in the market for cash; for this reason they are the prime instrument in which foreign central banks and other foreign official institutions invest their dollar or sterling holdings. It may also be noted that, in spite of the very different structure of government, the proportion of public-sector debt (taking into account both central and local authorities) raised in the form of Treasury bills is much the same in the United States as in the United Kingdom.

Role in public finance

The Treasury bill issue can first be related to total issues of securities by the public sector, that is by the central government and other public authorities (local authorities in the United Kingdom; federal agencies, state and local governments, in the United States).

Estimates of market holdings of different kinds of public-sector securities in the two countries are shown in Table I. In the United Kingdom, with its more centralised form of government, nearly 80% of the public-sector debt is issued by the central government compared with less than 70% in the United States. But in spite of this, as the table shows, the value of Treasury bills outstanding in the market forms a slightly lower proportion of total public-sector debt in the United Kingdom (11%) than in the United States (14%).

Since 1960 the Treasury bill issues in the two countries have moved in different directions. The U.S. Treasury have been expanding their use of Treasury bills in preference to bonds,

Most of the U.S. figures given for purposes of comparison in this article are estimates, calculated from a variety of sources (particularly the Federal Reserve Board's Flow of Funds Accounts, *and the U.S. Treasury's* Survey of Ownership *covering federal government and federal agency securities).*

Table I

Public-sector securities held in the market[a]

	United Kingdom 30th Sept. 1964[b]		United States 31st Dec. 1964	
	£ *millions*	%	£ *millions*	%
Central government:				
Treasury bills	2,978	*11*	16,034	*14*
Tax reserve certificates (U.K.) or tax anticipation bills (U.S.) ...	383	*1*	1,352	*1*
Marketable government stocks (including government guaranteed) ...	14,288	*51*	41,150	*35*
National savings securities (U.K.) or savings bonds (U.S.)	3,767	*13*	17,759	*15*
Other non-marketable government debt	580	*2*	2,668	*2*
Federal agencies			4,327	*4*
State and local governments	6,038	*22*	33,679	*29*
	28,034	*100*	116,969	*100*

(a) *i.e.*, outside the Bank of England and the Federal Reserve Banks, the U.S. and U.K. central governments and (in the United States) federal government agencies and trust funds.

(b) 30th September 1964 has been chosen for the United Kingdom here and elsewhere in the article because it is halfway through the financial year, before the seasonal build-up in Treasury bill holdings has reached its peak. Seasonal fluctuations in Treasury bills in the United States are not so marked, and the end-year is a convenient date.

both to support short-term interest rates for balance of payments reasons and to hold down long-term rates in the interests of domestic expansion. From December 1960 to December 1964 Treasury bills in the market rose by £5,800 million[1] (though at the same time the average maturity of government debt was gradually raised by advance refunding techniques). On the other hand the U.K. Government, through their policy of selling other securities, have steadily reduced the value of bills in the market—from £3,387 million in September 1960 to £2,978 million in September 1964. Since then there has been a further sharp fall (the figure for September 1965 was down to £2,484 million) but this reduction was largely due to the external situation.

Treasury bills can be related to the total of short-term public-sector debt as well as to the total debt of all maturities. This is done in Table II, which is limited to debt with an original life of no more than one year (except tax reserve certificates, which earn interest for a maximum of two years but can be used for paying taxes at any time).

A comparison of Tables I and II shows that the proportions of short-term debt to total debt are almost identical in the two countries: 18% in the United Kingdom and 19% in the United States. Within the totals of short-term debt, however, the proportion of debt in the form of Treasury bills is 59% in the United Kingdom against 73% in the United States. This is largely because in the United Kingdom the much more highly developed market in the short-term debt of local authorities accounts for as much as a third of the total. In the United States the state and local governments can usually attract long-term money easily because the interest on it is free of federal income tax. About 95% of their debt is therefore in the form of long-term bonds, and they issue short-term debt only in small amounts in anticipation either of revenue or of sales of such bonds; these issues seem to fluctuate rather erratically. On the other hand, certain U.S. federal government agencies, particularly the Federal Home Loan Banks and the Federal Intermediate Credit Banks, issue fairly large amounts of short-term debt, accounting for 11% of the above total. To these there is no counterpart in the United Kingdom.

It should be noted that in the United Kingdom the public sector is more extensive and at the same time more homogeneous than in the United States. It includes, for example, a fair-sized portion of U.K. industry; since the mid-1950's these nationalised industries have not borrowed from the market, but have looked to the Exchequer to finance that part of their capital development which they cannot finance from internal resources. As a result, there is a relationship between the borrowing needs of these industries and the size of the Treasury bill issue (which, in the United Kingdom, as explained in the earlier article in September 1964, is the residual means of financing the Exchequer). The local authorities too, since

Table II

Short-term public-sector securities held in the market

	United Kingdom 30th Sept. 1964		United States 31st Dec. 1964	
	£ millions	*%*	*£ millions*	*%*
Treasury bills	2,978	*59*	16,034	*73*
Tax reserve certificates (U.K.) or tax anticipation bills (U.S.)	383	*8*	1,352	*6*
Non-marketable debt	—	—	409	*2*
Federal agency securities			2,442	*11*
State and local government debt	1,654	*33*	1,763	*8*
	5,015	*100*	22,000	*100*

[1] This figure, however, includes £3,200 million of Treasury bills which, in effect, replaced market holdings of U.S. Treasury certificates of indebtedness, a somewhat similar instrument with a maturity not exceeding one year whose issue had been discontinued by the end of 1964.

April 1964, have been finding more of their capital finance from the Exchequer and less from the market. The more the Exchequer is used as a source of finance, the more the Exchequer itself is likely to have to borrow from the market on Treasury bills. In the United States the federal agencies, state and local governments borrow very little from the federal government; they are more autonomous so far as capital finance is concerned, and their borrowing needs have little or no effect upon the Treasury bill issue.

Alternative outlets for short-term funds It has been seen that in both countries Treasury bills are especially suited to the needs of domestic banks and overseas official institutions. They are also acquired by a variety of other institutional holders at home and abroad, in particular by domestic industrial and commercial companies, financial institutions, foreign companies and, in the United States, by state and local governments. For all these other holders Treasury bills are only one of a number of alternative outlets for short-term funds, and it is of interest to examine these various outlets and try to assess the relative importance among them of Treasury bills. Table III shows the different kinds of short-term debt held by these other institutions. Failing more direct information, many of the figures have had to be estimated by taking total market holdings and deducting from them estimated holdings of the domestic commercial banks (including, in the United Kingdom, the discount houses), foreign official bodies, and, where possible, individuals.

It is clear that a much smaller proportion of short-term funds, of the type described above, is attracted to Treasury bills and other forms of government debt in the United Kingdom. As can be seen, the proportions for Treasury bills are : United Kingdom, 7%; United States, 32%. If all public-sector debt with a year or less to run is compared, the proportions are: United Kingdom, 34% (including half of the tax reserve certificates which are, in effect, a two-year security); United States, 53%.

A number of differences in the structure of the short-term markets in the two countries stand out. The absence of a market in the United States in state and local governments' short-term debt comparable in size to the U.K. local authority market is one obvious difference. On the other hand, some federal agencies issue their own securities, for which there is nothing comparable in the United Kingdom. Next, although tax anticipation bills have been grouped with tax reserve certificates, they are not quite the same type of security. In some

Table III

Short-term holdings of "other institutions"
(see text)

	United Kingdom 30th Sept. 1964		United States 31st Dec. 1964	
	£ *millions*	%	£ *millions*	%
Central government debt:				
Treasury bills	355	*7*	9,400	*32*
Tax reserve certificates (U.K.) or tax anticipation bills (U.S.)	310	*6*	1,000	*3*
Marketable stocks maturing within a year	350	*6*	3,250	*11*
Federal agency securities maturing within a year			1,340	*5*
State and local government short-term debt	990	*18*	470	*2*
Finance company deposits (U.K.) or paper (U.S.)	340	*6*	1,320	*4*
Time deposits with commercial banks:				
Time certificates of deposit			4,090	*14*
Other time deposits	3,000	*55*	8,400	*28*
Discount houses' call money from non-bank private sector (U.K.) or security dealers' repurchase agreements with non-financial corporations (U.S.)	110	*2*	380	*1*
	5,455	*100*	29,650	*100*

ways tax anticipation bills are more like Treasury bills; although they meet the same tax reserve demand as tax reserve certificates, their use is not confined to paying taxes, and unlike their U.K. counterparts they are negotiable, they are not issued 'on tap', and interest on them is subject to tax.

In the United Kingdom over half the institutional funds shown in the table are placed in time deposits with commercial banks (including the accepting houses and overseas banks in London). The attraction of a time deposit with a bank lies in its extreme liquidity. Money can be deposited with other institutions at higher rates of interest but withdrawals are subject to longer periods of notice; indeed, banks often allow depositors to withdraw without giving full notice, though the depositor would then have to forgo some interest. In the United States, the introduction in 1961 of negotiable time certificates of deposit (which are described later) has helped to popularise the time deposit as an outlet for institutional funds; despite this the proportion in time deposits is only about two-fifths.

Interest rates One important reason why Treasury bills do not attract such a high proportion of institutional and company funds in the United Kingdom as in the United States is that the margin between Treasury bill rates and other short-term rates is greater here than in the United States. In September 1965, to take one recent month, the average yield on Treasury bills in London was about 5½%, while a three-month deposit with a local authority earned about 6½% and with certain finance houses up to 7%. In New York, by contrast, the spread of rates on three-month paper is narrow; the rate for finance company paper is usually no more than ½% above the Treasury bill rate. Recently the difference has been even narrower: in September U.S. Treasury bills were yielding just under 4%, finance company paper 4¼% and time certificates of deposit 4⅜% (all at three months).

There are two main reasons why U.K. local authorities must pay more for their short-term money than the Government. Firstly, a temporary deposit is a deposit for a fixed term and may not normally be withdrawn without the requisite notice; it is therefore less liquid than a Treasury bill. Secondly, the local authorities are competing for institutional and company funds not only against the Government but also against the finance houses and against each other.

Institutional habits It will already have become apparent that institutions and companies in the United Kingdom are in general likely to hold a smaller proportion of their liquid assets in Treasury bills than are their counterparts in the United States. The next section of this article looks at their liquid assets in a little more detail.

1. Financial institutions (other than banks) U.S. insurance companies and, even more, corporation pension funds have a larger proportion of their short-term assets in Treasury bills than similar institutions in this country. Last year U.S. insurance companies held about 9% of their short-term assets in Treasury bills, compared with only 2% for U.K. insurance companies. For private-sector pension funds the proportions were some 40% in the United States, against 3% here. For U.S. savings and loan associations the proportion was 12%, and for mutual savings banks 18%; both have similarities to U.K. building societies whose holdings of Treasury bills were less than 2%. Even given the greater predominance of the Treasury bill in the United States (as shown in Table III), these disparities are surprisingly large; statutory regulations on the composition of institutional portfolios (where applicable) may be a factor on the U.S. side.

On 30th September 1964 the holdings of U.K. insurance companies, pension funds and building societies, together with investment and unit trusts, totalled only £10 million whereas their holdings of local authority temporary money were about £175 million and of government stocks of 0-5 years about £240 million. The yield factor in this has already been mentioned; perhaps also they were looking for a slightly longer-term asset than the U.K. Treasury bill.

2. Industrial and commercial companies In recent years U.S. companies have been considerably more liquid than their U.K. counterparts. The proportion of liquid assets (cash and

marketable securities) to net current assets in 1964 was 40%, compared with 23% in the United Kingdom (according to Board of Trade figures of quoted companies). American companies therefore had more funds available for investment in Treasury bills and other short-term assets.

A few of the larger British companies told the Radcliffe Committee in 1958 that they kept part of their liquid funds in Treasury bills. But they were probably exceptional because the evidence of the Federation of British Industries was that companies at that time showed little inclination to hold bills, although it might have paid them to do so. This could have been partly a matter of habit : it may not have occurred to them that they might hold Treasury bills. Since then many companies have become accustomed to placing their surplus cash in the local authority market, so that they are perhaps even less likely now to take up Treasury bills.

Distribution Estimates of the distribution of Treasury bills in the two markets among the main groups of holder are given in Table IV. The U.K. commercial banks and discount houses are grouped together in the table : not only are they at the centre of the market but they are also so closely related that, for the present purpose, it makes no difference whether, at any given time, the banks themselves hold bills or advance call money to the discount houses to enable them to do so. In the United States, on the other hand, there is not this close interrelationship, even though the security dealers (some of which are themselves banks) are largely responsible for making the market in bills. Furthermore, the holdings of those security dealers which are not banks are not separately known and are therefore included with " other holders ". The figures for the two countries are not therefore exactly comparable, but after making all allowances it is safe to say that in the United Kingdom a much higher proportion of the total outstanding is in the hands of the banking system than it is in the United States. This is of course the obverse of the fact that other domestic holdings are comparatively unimportant in the United Kingdom, whereas in the United States they amount to half the total issue.

The different proportions held by the banking system appear to be influenced by the different way in which the banks in the two countries deploy their assets. In the United Kingdom, the London clearing banks maintain liquid assets, among which Treasury bills form an important part, equal to at least 28% of deposits. There is no conventional liquidity ratio in the United States, but member banks of the Federal Reserve System have a statutory obligation to hold reserves in cash and deposits with the Federal Reserve Banks (these deposits being known as federal funds). Beyond this they hold

Table IV

Distribution of Treasury bills in the market

	United Kingdom 30th Sept. 1964		United States[a] 31st Dec. 1964	
	£ *millions*	%	£ *millions*	%
Commercial banks and discount houses	1,482	*50*	4,216	*26*
Foreign holders:				
Official	1,140	*38*	2,916	*18*
Identified other	110	*4*		
Other holders	246	*8*	8,902	*56*
	2,978	*100*	16,034	*100*

[a] Excluding tax anticipation bills.

[b] Including security dealers other than banks.

other liquid reserves, the constitution and size in relation to deposits varying considerably from bank to bank. U.S. banks in the aggregate, however, hold fewer bills in proportion to their gross deposits than do U.K. banks. The existence in the United States of a market in federal funds has probably made it less necessary for banks to hold Treasury bills as liquid reserves; for this market enables an individual bank to obtain funds, which it may need to make up its statutory reserve, by taking short-term loans from other banks which may temporarily have more than sufficient reserves.

Because sterling and the dollar are the two major reserve currencies, it is not surprising that foreign holdings of both U.K. and U.S. bills are sizable. The Treasury bill is an obviously suitable investment for foreign official institutions, which must of necessity keep a large proportion of their currency holdings in highly liquid form. In both countries Treasury bills constitute just under half of the country's total liabilities in its own currency to foreign official holders (excluding international organisations). These official holdings of Treasury bills naturally fluctuate with the degree of confidence that foreigners have in the currency and with the country's balance of payments. Unofficial holdings are less important in the United Kingdom, again because the market in local authority temporary money has provided foreign as well as domestic investors with an attractive alternative to the Treasury bill. In recent years the local authority rate for temporary money (after allowing for the cost of forward exchange cover) has been one of the principal arbiters, along with the Treasury bill rate, of whether short-term funds move into or out of London.

The remaining holders consist chiefly of the domestic financial institutions (apart from the banks), industrial and commercial companies and, in the United States, state and local governments. Table IV showed that the holdings of all these bodies amounted to 8% in the United Kingdom against 56% in the United States. It is worth looking a little more closely at this disparity. Table V gives an estimated sub-division for these other domestic holders.

Unlike local authorities in the United Kingdom, state and local governments in the United States invest considerable amounts in Treasury bills. Funds available for such investment are mainly the proceeds of long-term bond issues by such governments where these are not immediately spent—during 1964 these govern-

Table V

Distribution of Treasury bills among domestic holders other than banks

United Kingdom 30th Sept. 1964	£ *millions*	% *of market*
Local authorities	3	*0·1*
Insurance companies	2	—
Trustee savings banks (special investment departments) ...	—	—
Private-sector pension funds ...	3	*0·1*
Other non-bank financial institutions	5	*0·2*
Identified non-corporate bodies (Public Trustee and others) ...	4	*0·1*
Industrial and commercial companies and others	229	*7·7*
	246	*8·3*

United States 31st Dec. 1964	£ *millions*	% *of market*
State and local governments ...	1,940	*12*
Insurance companies	181	*1*
Mutual savings banks	120	*1*
Savings and loan associations	240	*1*
Corporation pension trust funds	290	*2*
Non-financial corporations ...	2,570	*16*
Miscellaneous[a]	3,561	*22*
	8,902	*56*

[a] Including security dealers other than banks, charitable institutions and individuals.

ments could raise money at an interest cost of about 3%-3½% and reinvest it, until needed, in Treasury bills at 3½%-4%. U.S. financial institutions, like those in this country, do not appear to be big holders, though each of the four types of institution for which separate figures have been estimated holds a higher proportion of market bills than all those in the United Kingdom combined; and this is consistent with the higher proportion of their liquid assets which they hold in bills. What is left amounts to 38% of market holdings in the United States, against 8% here. Much of this difference reflects the relatively larger holdings of U.S. industrial and commercial corporations.

The banking system and overseas official bodies are likely to continue to be the main holders of U.K. Treasury bills, and holdings of industrial and commercial companies are unlikely to attain the proportions that they have in the United States. Many of the reasons for this have already been touched on. The discount houses in the United Kingdom are mainly geared to supply the needs of the banks, whereas the security dealers in the United States seek a much wider clientele. The growth of the temporary money market at higher rates of interest has made a fundamental change in the structure of the U.K. market in short-term funds and has probably been an important additional factor in companies' lack of interest in Treasury bills. Moreover, the U.K. Government's policy of funding short-term debt when conditions are favourable and thus reducing the supply of bills, in contrast to the U.S. Government's expansion of the bill issue, has worked in the same general direction. The higher proportion of market bills held by companies in the United States can also be attributed to conventional practice: as already explained, U.S. companies, while keeping themselves generally more liquid than companies in this country, appear to make less use of time deposits; this gives the U.S. Treasury bill a more dominant position in the market for corporation funds.

Types of bill

Other differences between the markets may result from differing denominations and maturities and from different methods of issue. In London, for example, all Treasury bills now have a maximum life of 91 days (though bills up to 365 days are allowed by the Treasury Bills Act of 1877); but, as Table VI shows, there is a much wider spread of maturities in New York.

At the end of 1964 only 30% of outstanding U.S. Treasury bills were three-month bills, no less than 47% being six-month and 23% one-year bills. Investors have been given a much greater choice of maturities by the introduction of six-month bills in December 1958 and of one-year bills (which have now entirely superseded one-year Treasury certificates of indebtedness) in 1959, as well as by the monthly auctions; these have replaced the quarterly auctions since August 1963. These longer-dated bills have slightly better yields and have evidently proved attractive both to the banks and to other holders. One-year bills have proved specially popular with commercial banks, which held something like 45% of those in the market at the end of 1964 (compared with 26% of all Treasury bills); corporations have also acquired them and held virtually the same proportion of one-year as of all bills.

There is also a wider range of denominations in the United States; and the lower minimum denomination may make the Treasury bill more attractive to the smaller firms, institutions, and even to individuals, than is the case here.

Table VI

Maturities and denominations

	United Kingdom	United States[a]
Issued weekly ...	91 days[b]	91 days 182 days
Issued monthly ...	—	365 days
Lowest denomination	£5,000	$1,000 (£357)
Highest denomination	£100,000	$1,000,000 (£357,000)

[a] Excluding tax anticipation bills.

[b] Also temporary and seasonal issue of 63-day bills each winter, 1955-62.

Methods of issue

In the United Kingdom, Treasury bills are issued to the highest bidders at weekly tenders. The weekly tender is held each Friday for bills dated on any business day in the following

week. Tenders, for a minimum of £50,000, may only be lodged by a London banker, discount house or money broker, but individuals or companies can always arrange for their bank to tender on their behalf, subject perhaps to a small charge for the service. The clearing banks do not tender on their own behalf, but obtain their bills by subsequent purchase in the market. The twelve discount houses which are members of the London Discount Market Association undertake to cover the tender—that is to bid between them for at least the total amount of bills on offer—and they bid at a price agreed amongst themselves.

In practice, it is virtually unheard of for bids from tenderers other than the discount houses to be large enough to cover the tender; thus the price at which the discount houses bid is regularly the lowest accepted price and, as there are always some bids at higher prices, only a proportion of applications are allotted at that price. In order, therefore, to be sure of obtaining bills at the tender, tenderers other than the discount houses must bid at the same or a higher price, and in the latter case they may prove to have paid more than they need have done. There are, however, many weeks when it is not difficult for them to predict the price at which the discount houses will tender, and as a result to outbid them by the smallest margin. Indeed the houses on occasions have been allotted as little as 10% or less of the bills they applied for, and during 1965 for six weeks running they obtained less than one-third of their applications.

In the United States, Treasury bills are also issued to the highest bidders at weekly auctions, except that for one-year bills there are monthly auctions. The tender takes place on a Monday for bills dated the following Thursday, the only issue day. Anyone can bid, including individuals and corporations, and bodies outside the market make considerable use of this facility. Each tenderer has an option to bid, up to a limit of $200,000, at the average price of accepted bids, and this enables a tenderer to be sure of obtaining at least some bills without having to outbid his competitors. The primary dealers in government securities—specialist firms and the dealer departments of a few banks (about twenty in all)—generally submit a fairly wide range of tenders, including sizable bids at non-competitive prices which they do not expect to be accepted. Although dealers usually bid for more bills than they really want, and the auction always disposes of all the bills offered for tender, there is no undertaking or obligation requiring the dealers to cover the whole tender. Because of the range of prices at which the primary dealers tender, it is possibly rather more difficult than in the United Kingdom for the other tenderers to select a price which will be just, but only just, high enough to obtain acceptance.

The main difference of practice between the two countries is that in the United States the banks acquire most of their bills by direct tender, whereas in the United Kingdom the London clearing banks do not tender on their own behalf, but only on behalf of customers. Moreover the tender in the United States is open to anyone, whereas in the United Kingdom it is confined to banks, discount houses and money brokers; others wishing to bid can ask a bank or broker to do so on their behalf either at a fixed price or at a price left to the discretion of the bank or broker. In practice the majority of tenders in the United States are submitted through banks, so that this difference is more apparent than real. The New York facility for the issue of a small amount of bills at the average rate seems to offer the small non-professional investor an attraction in the bill market which has no counterpart in London. Tenders at the average price are a steady and significant factor in the United States; at weekly auctions in 1964, for instance, such non-competitive bids amounted to 17% of accepted bids.

In both countries, of course, unsuccessful tenderers and others (including those who wish to acquire bills of a shorter maturity than those available at the tender) can buy bills in the market; but this has some disadvantages over acquisition at the tender because the purchase price will reflect a ' turn ' for the seller of the bills and perhaps a small commission charge if the purchase is made through a bank.

It is fair to conclude that the slightly different methods of issue in the two countries are probably not of great significance in explaining the different pattern of distribution today. When conditions have been favourable in the United Kingdom, holders other than banks and brokers

have not been inhibited from increasing their holdings of bills.

Recent developments in the United States The proportion of corporate and institutional funds invested in U.S. Treasury bills has remained much the same over the last four years, even though there has been, as in the United Kingdom, an increase in alternative outlets outside the public sector. But for this growth, the proportion invested in Treasury bills would be even greater than it is. It should be noted, however, that the replacement of Treasury certificates of indebtedness by the six-month and one-year Treasury bill has been an important factor both in the absolute increase in the Treasury bill issue and in the stable proportion of institutional funds invested in Treasury bills. Though the Treasury bill still dominates the market for short-term funds in the United States, public-sector debt as a whole has lost ground in recent years to time certificates of deposit.

Until the introduction in 1961 of these certificates of deposit, the popularity of the Treasury bill with U.S. companies was partly due to the unpopularity of time deposits : by law 30 days' notice to withdraw a time deposit was (and still is) required, and there was, until November 1964, a ceiling of 1% on the interest payable on time deposits for less than 90 days. Thus while earning less than Treasury bills, they were also much less liquid. Indeed, in the past ten years or so rates on deposits for less than 90 days have compared favourably with Treasury bills only in the recession of 1954, when the bill rate fell below 1%, and since November 1964, when the maximum rate on such deposits was raised from 1% to 4%.

The banks themselves, during the mid-1950's, had not generally been interested in attracting corporation funds for periods over 90 days because it was difficult to employ them profitably. At that time, the banks were earning only about $3\frac{3}{4}$% on loans and $2\frac{1}{2}$% tax free on high-grade municipal bonds, while the maximum rate on time deposits from 90 days to six months was $2\frac{1}{2}$%, and for longer periods 3%. By 1960, however, many interest rates had risen and the banks could obtain much higher returns—$5\frac{1}{4}$% on loans and $3\frac{3}{4}$% tax free on municipal bonds. Moreover, the development of the euro-dollar market in the late 1950's provided the banks with a new outlet offering, as a rule, about 4%. Maximum rates on time deposits, however, remained unchanged and the banks therefore had an interest in attracting such deposits from corporations.

In order to overcome the reluctance of corporations to hold time deposits, certain big New York banks introduced negotiable time certificates of deposit, and dealers in government securities began to operate a market in these instruments.(1) Because the certificates generally had an original maturity of more than 90 days they escaped the very low interest limit of 1% and enabled corporations to acquire an asset which gave a more generous yield than Treasury bills yet was, in practice, almost as liquid—the most popular certificates were those maturing in 6-9 months (offering a maximum of 3% interest against about $2\frac{1}{4}$%-$2\frac{1}{2}$% on Treasury bills in 1961). Growth of time certificates was helped by the growth of corporate cash flows at this time and, by the end of 1964, they had attracted about $8·7 billion (£3,100 million) of business corporations' funds, part of this being at the expense of demand deposits as well as of Treasury bills.(2) Incidentally, the popularity of time certificates has also had an effect on the banks' holdings of Treasury bills. Major money-market banks have individually come to rely, when they need to improve their liquid position, on their ability to issue time certificates and so tap funds which may have been deposited elsewhere; as a result some of these banks have actually liquidated their holdings of Treasury bills.

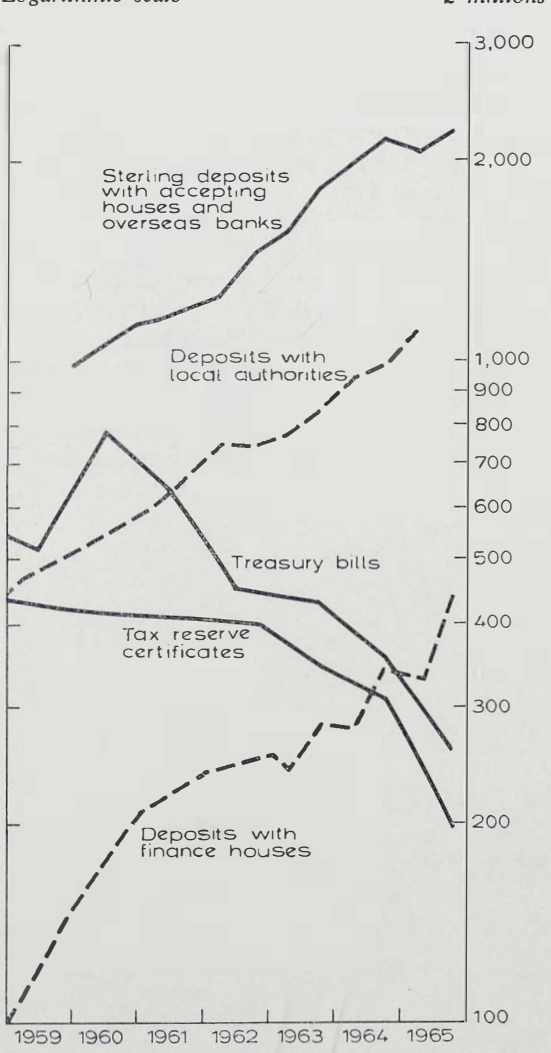
The amount of finance company paper has recently grown considerably. Business corporations, for instance, have added £1,040 million to their holdings in the past three years, and this also may have reduced their appetite for Treasury bills. Both time certificates and finance company paper have the advantage that the investor can generally select the maturity date.

(1) Time certificates had existed for many years on a small scale, but were often not negotiable.
(2) Recently a number of banks have made issues of another new investment, unsecured notes, of which some $200-300 million are believed to be outstanding. Those issued in New York are not negotiable.

Recent developments in the United Kingdom

Despite the professed reluctance of most U.K. companies at the time of the Radcliffe Committee to invest in Treasury bills, the proportion of market bills held by companies and financial institutions (other than banks) at home and abroad increased fairly steadily during the 1950's, encouraged, no doubt, by the rise in the Treasury bill rate that occurred after 1951. The proportion reached a peak of 23% (£770 million) in 1960, but thereafter it declined to as little as 12% (£356 million) in September 1964. The chart illustrates the decline in these holdings of bills, while similar holdings of other forms of short-term debt expanded. It is not practicable to give a series of figures for time deposits corresponding to the 1964 figure in Table III, and total sterling deposits with the accepting houses and overseas banks (which are assumed to be mainly interest-bearing) have been chosen to illustrate the trend in this type of asset. These deposits customarily yield more than deposits with the clearing banks. Although deposits with the accepting houses and overseas banks include deposits by persons, which are excluded from Table III, most of the increase in recent years has come from companies and financial institutions. Between 1960, when company and institutional holdings of Treasury bills began to decline, and 1964 total deposits with the accepting houses and overseas banks nearly doubled, rising by £1,044 million. Much of this money came from abroad, but some £450 million was from home sources, mainly companies and institutions. Short-term lending by companies and institutions to local authorities went up by £462 million (87%) in the four years and deposits with finance houses by £132 million (63%). In contrast, company and institutional holdings of Treasury bills fell by £415 million (54%).

Holdings of companies and financial institutions
(see text)



In the twelve months to September 1965 the sterling crisis affected some of these trends. Sterling deposits with accepting houses and overseas banks rose only by another £50 million because, while deposits by U.K. residents continued to increase, some of those by overseas residents were withdrawn. Deposits with finance houses, which are largely those of domestic companies and institutions, rose very sharply between March and September. Though no September figure is yet available for deposits with local authorities, the trend during the early part of the period was also upward; these too are mainly domestic deposits. (The withdrawal of overseas money from the local authorities was mainly through the overseas banks and, in the chart, is therefore reflected in deposits with these banks rather than in deposits with local authorities) The fall in holdings of Treasury bills continued—unofficial overseas holdings fell by £39 million and holdings of domestic companies and institutions by £58 million—and there was a parallel fall in companies' holdings of tax reserve certificates.

Summary Though there are important differences in the history, traditions and organisation of the London and New York markets, the Treasury bill in both markets is a basically similar security which might be expected to attract the same type of buyer. The value of bills outstanding in relation to the total debt of the public sector is about the same in each case; but in relation to the short-term part of the debt the proportion is rather lower in the United Kingdom. In both markets, Treasury bills are particularly suited to the needs of banks and foreign official holders.

Nevertheless, there are wide differences in the distribution of bills among the various holders in the two markets. U.S. banks hold fewer Treasury bills in proportion to their deposits than do U.K. domestic banks, largely because in the United States Treasury bills do not form part of a bank's statutory reserves, whereas in the United Kingdom they form an important part of a bank's conventional reserve of liquid assets. But the main difference is that holdings are much more widely distributed in the United States among industrial and commercial firms and financial institutions (other than banks). One of the main reasons for this is that there are more lucrative alternative outlets in the United Kingdom, particularly the highly developed market in local authorities' short-term debt.

There are also other reasons for the wider distribution of Treasury bills in the United States. The government security dealers there actively seek customers for Treasury bills and have a wide network of branches throughout the country; and these dealers have had more opportunities to promote sales in recent years, as a result of the expansion of the Treasury bill issue. The more specialist discount houses in the United Kingdom are traditionally geared to supply primarily the needs of the banks. U.S. financial institutions, partly perhaps because of legal requirements, invest more of their short-term funds in Treasury bills than do their U.K. counterparts, and U.S. corporations are generally more liquid than U.K. companies but appear to make less use of time deposits. Bills may be more popular with institutions and companies in the United States because of the smaller denominations and the wider spread of maturities; non-competitive tendering for small quantities at the average accepted price may also attract some of the smaller companies.