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The return of inflation

But what is the UK's inflation rate?

Rising inflation worldwide

Early 2000 has seen a return to mild inflation across the industrial world, apart from Japan. In the USA consumer prices in May were 3.1% up on a year earlier and producer prices were 3.9% higher; in the same period Euro-zone consumer prices increased by 1.9% and producer prices by 5.7%. Further deterioration will be reported in the figures for June, because of the latest jump in oil prices. The UK has shared in these trends, but it has a most unusual problem.

UK inflation appears to be both the lowest in Europe

Strangely, the precise meaning of "inflation" is unclear in the UK context. The UK participated in many of the organizational preliminaries for European economic and monetary union, including the preparation of consumer prices indices on a harmonized basis. In the year to May the UK's HICP increased by 0.5%, the lowest figure in the European Union and notably less than the Euro-zone average. This was logical, as the pound had been strong against the euro since early 1999. In fact, the increase in the UK's producer price index in the year to May was 2.3%, under half the Euro-zone average. The power of the exchange rate over pricing decisions is demonstrated even more clearly by business surveys. The Confederation of British Industry's latest monthly survey still reports more companies planning to cut prices than to raise them, whereas in the Euro-zone the balance of companies planning to raise prices is the highest for five years. So the HICP, producer price indices and business surveys all suggest that the British economy is the least inflationary in Europe. Unfortunately, the analytical waters become much murkier when the UK's own preferred measure of consumer inflation - the annual increase in the retail price index, excluding mortgage interest costs (or RPIX) - is introduced into the discussion. In the year to May RPIX was up by 2.0%, a shade above the Euro-zone average. The comparison is yet more adverse with the "headline" RPI. This was hit by rising interest rates and mortgage costs, and even by the Government's decision to end tax relief on mortgage interest. It rose by 3.1% in the year to May, one of the highest consumer inflation rates in Europe.

.... and among the highest

UK does *not* need to abandon its currency in order to quell inflation

The question "how does the UK's inflation compare with that in the rest of Europe?" therefore has no simple answer. Most of the statistical measures argue that inflation pressure in the UK is the weakest in Europe, but the big gap between the increase in UK consumer prices on the HICP and RPI bases qualifies any statement in this area. (Incidentally, no other European economy has such a wide divergence between two well-known consumer inflation indicators.) At any rate, the old argument of the late 1980s - that the UK has to abandon its currency to keep its inflation rate under control - has been refuted by its satisfactory, if rather ambiguous inflation performance since early 1999.

Professor Tim Congdon

30th June, 2000

Summary of paper on

“Money and asset prices in the UK’s boom-bust cycles: some history”

Purpose of the paper

Volatile asset prices were a powerful causative influence on the UK’s boom-bust cycles in the 1970s and 1980s. The paper applies the theoretical ideas developed in the May *Monthly Economic Review* to consider how far the volatility in asset prices can be attributed to fluctuations in money supply growth.

Main points

- * **Substantial changes occurred in the relative sizes of different sectors’ money holdings in the UK in the three-and-a-half decades from 1963, when comprehensive monetary data were first prepared. The financial sector’s money grew much more rapidly than aggregate money and GDP. (See pp. 3 - 4.)**
- * **The household sector’s money holdings - by far the largest of the three sectors - were “stable”, in the sense that they can be readily explained by a money-demand function, in the period under review. (See pp. 7 - 8.) The ratio of household money to income rose sharply because of its increased attractiveness as an asset.**
- * **The instability in the aggregate money demand function stems from the monetary behaviour of the corporate and financial sectors. The corporate sector’s money demand is generally regarded as less stable than the household sector’s. (See p. 7.)**
- * **But the most serious source of instability in money demand was the financial sector. Analysis of money-holding behaviour can usefully proceed by distinguishing between, on the one hand, life assurance companies and pension funds (LAPFs), and, on the other, the rest of the financial sector.**
- * **LAPFs’ money-holding behaviour experienced a major structural change in the early 1970s, as they responded to inflation. But since the early 1970s they have kept total liquidity (i.e., money and near-money assets) surprisingly stable relative to total assets.**
- * **Fluctuations in money growth - partly via the effect on financial sector money and asset prices - were a powerful causal influence on the boom-bust cycles of the 1970s and 1980s.**

This paper was written by Professor Tim Congdon, with help from his colleagues in Lombard Street Research’s UK Service.

Money and asset prices in the UK's boom-bust cycles: some contemporary history

UK asset price swings *caused* by volatile money growth

Fundamental nature of debate about the role of broad money in the economy

The relationship between, on the one hand, the quantity of (broad) money and, on the other, asset prices and macro-economic outcomes is fundamental to economic theory; it is also at the heart of the debates about British economic policy in the post-war period. The first part of the current analysis of this topic was set out in the May issue of Lombard Street Research's *Monthly Economic Review*. Loosely theoretical in approach, it criticized attempts to determine national income based on the textbook concept of "the circular flow of income". It argued instead that in the real world payments for goods and services are not in a separate compartment from payments for assets, and that significant money balances are held to support transactions in capital assets. In particular, the bulk of companies' and financial institutions' money balances are intended to improve the timing of asset transactions, not transactions in goods and services. It therefore suggested that changes in the relative importance of companies' and financial institutions' money holdings might be associated with substantial changes in the ratio of money to gross domestic product, even if agents' underlying demand-for-money behaviours were stable. The second part of the analysis - in the present issue of the *Monthly Economic Review* - looks in more detail at the facts of the relationship between money, asset prices and national income in the UK over the last 40 years.

**Part III:
Different sectors' demand-for-money behaviours: an examination of the UK data**

The pie-charts on p.4 show the size of the money holdings of the household sector, private non-financial corporations and other (i.e., non-bank) financial corporations at four dates, end-1963, the third quarter 1971, mid-1997, and end-1999. The third quarter of 1971 has been chosen because it was the date of the Competition and Credit Control reforms which were followed by twenty years of macroeconomic instability; mid-1997 marks a major discontinuity in the data following the adoption of the European system of national accounts ("the ESA").(1) Plainly, the relative importance of the different sectors' money holdings altered dramatically over the period. At the start of the period personal sector money represented over 80% of total money, but by the end the figure was only slightly above 60%. The significance of corporate sector money varied, but was at all four dates between a sixth and quarter as large as the personal sector's. The big change was in the financial sector's position. In 1963 its money balances were less than 2% of the total; by the end of the period they amounted to almost a quarter.

Big increase in relative importance of financial sector money

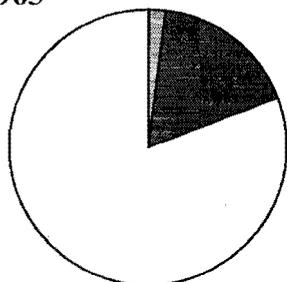
Financial sector consists of, first, life offices and pension funds, which must balance money holdings against other assets,

Why did the personal sector's money holdings decline so sharply, in relative terms, compared with the financial sector's? It is useful here to distinguish between two types of organization in the financial sector. The first group are life assurance companies (usually called "long-term insurance companies" in the data sources) and pension funds. Although life companies are somewhat different from pension funds in their investment objectives and, hence, in their portfolio structures, both maintain substantial asset portfolios in order to secure long-term wealth objectives for their beneficiaries. All LAFs also share the characteristic that, constantly, they have to judge the

Sectoral composition of UK money holdings

The charts show the sizes of the three non-bank private sectors' M4 holdings. They are based on seasonally adjusted data.

1. At Q4 1963

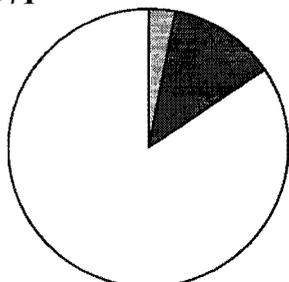


Total M4 £14.8b.

% of total represented by:

Households	80.9
Non-financial corporations	17.2
Other financial corporations	1.9

2. At Q3 1971

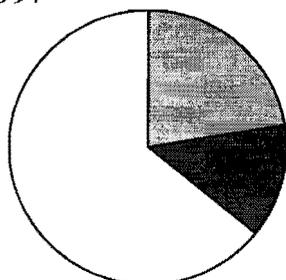


Total M4 £29.4b.

% of total represented by:

Households	84.5
Non-financial corporations	12.5
Other financial corporations	2.9

3. At Q2 1997

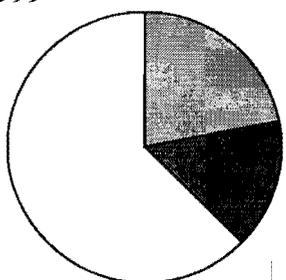


Total M4 £726.6b.

% of total represented by:

Households	64.1
Non-financial corporations	13.5
Other financial corporations	22.4

4. At Q4 1999



Total M4 £812.9b.

% of total represented by:

Households	62.5
Non-financial corporations	15.5
Other financial corporations	22.0

■ OFC ■ PNFC □ Households

Sources: Data for 1963 and 1971 from p.103 of part 2 of 1999 edition of Bank of England's *Statistical Abstract*, data for 1997 and 1999 from T20 of May 2000 issue of Bank of England's *Monetary and Financial Statistics*.

right proportion of their assets to be held in “cash” (i.e., somewhat confusingly, in bank deposits and other assets with liquidity comparable with bank deposits).

and, secondly, a miscellany of other “other financial institutions” (or OOFIs)

The second group is very miscellaneous and includes securities dealers, stockbrokers, gold dealers, hire purchase companies, debt collection agencies and many others. In the UK discussions, the life assurance companies and pension funds have been regarded as the characteristic financial institutions, while the remaining organizations have been lumped together as “other” institutions. Indeed, when the financial sector was known as the OFI sector, the non-LAPFs were collectively consigned to the category of OOFIs or “other” other financial institutions. Unit trusts do not fall neatly into either the LAPF or OOFI groups, but – in view of the long-term nature of their products – they are more naturally seen as cognate to LAPFs than to OOFIs.

LAPF assets and money holdings growing faster than GDP from 1960s to 1990s

The whole of the period from 1963 to 1999 experienced an institutionalization of savings, as people reduced the proportion of their assets directly held in their own names and instead channelled their savings towards life insurance policies, pension funds and unit trusts. The dominant motives here were tax, as savings in institutional form were more tax efficient than those held in savers’ own names, and a quest for the diversification benefits and professional management given by institutional products. LAPF assets grew much faster than gross domestic product. Whereas at the end of 1963 they amounted to £12,064m., roughly 40% of GDP at market prices, 36 years later they have been estimated at £1,791,014m. or about twice GDP.(2) Given the rapid growth of LAPF assets, it is altogether logical that their money holdings should also have risen at a higher rate than nominal GDP. In fact, the compound annual growth rate of the LAPFs’ “cash and balances with banks” from end-1963 to end-1996 was 20.9%, compared with 12.3% for total M4.(3)

OOFI money holdings rising rapidly in 1970s and 1980s

Good and comprehensive data are available for LAPF total assets, their portfolio structures, and their cash and near-cash balances. These data are discussed in more detail in the next section. The OOFIs are a quite different matter. In the 1960s the UK had tight controls over its financial sector and exchange restrictions on international transactions, as well as an extensive nationalized sector. The Competition and Credit Control reforms were a considerable liberalization, encouraging the formation of new types of financial organization. Later the abolition of exchange controls in 1979 encouraged securities dealers and institutions such as American investment banks to locate a major part of their international activities in the UK. Finally, the privatization of major industries from 1984 onwards raised the proportion of the capital stock in private hands, and so expanded both equity portfolios in general and the balance sheets of intermediaries (such as stockbrokers) who manage personal sector assets. Against this background it was hardly surprising that OOFIs’ money holdings – like the LAPFs’ – rose at a higher rate than GDP. At end-1971 the OOFIs’ M4 holdings were a modest £841m.; at end-1996 they had reached £93,143m. The compound growth rate over the 25 years was 20.7%, compared with 13.2% for total M4.(4)

OOFIs very miscellaneous and resist easy generalizations

Unfortunately, the portfolio structures of the OOFI institutions are very miscellaneous and not readily amenable to an integrated analysis. They cannot be discussed in any great detail in this paper. Two points need to be highlighted before moving on. First, OOFI money balances not only grew rapidly in the period under review, but were also markedly volatile during the boom-bust cycles. Secondly, one important component of the OOFI group were institutions with deposit-type liabilities in the Channel Islands and the Isle of Man. These deposits grew at a faster rate than the UK's GDP for many years. In September 1997, as a by-product of introducing the ESA, they were excluded from the UK monetary sector. The result was a large, once-for-all drop – of a purely statistical nature – in the UK financial sector's money holdings.⁽⁵⁾ This drop needs to be remembered when analysing the data.

Frequent data re-definitions and reclassifications obstruct economic interpretation

The arbitrariness of the definitions, the complexities of the reclassifications and the rather tangled nature of the financial sector's data in general may already serve as a warning: it is all too easy for discussions of the link between money holdings and other macroeconomic variables to become unhistorical. More polemically, the published figures for aggregate M4 reflect dozens of decisions by official statisticians which can be difficult to recall years later. These decisions – even though sensible in themselves – are bound to disrupt the economic meaning of the data, and to frustrate attempts to find simple relationships between money and macroeconomic outcomes.

**Clear patterns emerge of
i. Gradually rising ratio of household money to GDP,**

Nevertheless, some fairly definite patterns have emerged. Household sector money – by far the dominant element in money in 1963 – grew faster than GDP and household incomes over the period, but the divergence was not marked. Household sector money rose at a compound annual rate of 11.5% from the second quarter (Q2) of 1963 to Q4 1999, compared with a 9.9% compound annual rate for gross household disposable income and a 9.5% compound annual rate for GDP at market prices.⁽⁶⁾ Sceptics about the importance of money sometimes emphasize the rise in the ratio of broad money balances to GDP – or, in an alternative terminology, a decline in “the income-velocity of money” – in this period as partial evidence for instability in the demand for money. But a sense of proportion is needed. The principal holders of money in the early 1960s – namely, people as such – had a ratio of money to their incomes which rose by under 1 1/2% a year over the next three-and-a-half decades, much less than the growth rates of either money or incomes. The upward trend in the household sector's money-to-income ratio was the largest single influence on the rise in the ratio of aggregate money to GDP. But also important was the explosion in financial sector money. At the end of Q2 1963 the financial sector's M4 holdings were under 1% of GDP; at the end of 1999 they were over 22% of GDP. This explosion is readily understood as a by-product of the institutionalization of savings and financial deregulation, while a close relationship between financial sector money and GDP would not necessarily be expected on theoretical grounds.

**and
ii. Explosive growth of financial sector money**

Sectoral demand-for-money functions: statistical work and its implications

A naïve, but surprisingly common view in this field is that changes in the ratio of money to GDP (or some other income concept) are a symptom of instability in the demand for money. Of course, this is not so. Well-specified demand-for-money functions include variables other than income, notably measures of the opportunity cost of holding money rather than other assets. In the UK the period from 1963 onwards saw almost constant institutional upheaval in the banking system, with major impacts on the attractiveness of bank and building society deposits relative to other financial instruments. An increasing proportion of deposits paid interest, as competition between banks intensified after the 1971 reforms. Moreover, negative real returns on interest-bearing deposits during the high-inflation mid- and late 1970s were succeeded by positive real returns on such deposits in the moderate inflation from the early 1980s onwards. The rise in the proportion of interest-bearing deposits to total deposits and the change from negative to positive real interest rates ought to have increased the ratio of money to income for an extended period from the mid-1970s. Some allowance for these developments is essential in demand-for-money estimation.

Stability found in household sector's demand for money

The econometric evidence is that the rise in the ratio of persons' money to their income is consistent with underlying stability in their demand for money. An equation has been estimated for the household sector's demand for M4 over the period and is reported in an appendix. (The appendix is not published here, but is available from the author.) The equation is of good quality and "passes" most of the usual statistical tests. The charts on p.8 show the income-velocity of household sector money, and compares it with, first, a chart of the *actual* household sector money growth rate and the growth rate *estimated from the equation*, and, secondly, a chart of the differences (or "residuals") between the actual and estimated growth rates. Evidently, the sharpest rise in the income-velocity occurred in the early 1980s, a period of major liberalisation in the banking system, but the residuals are not noticeably higher in these years than at other dates. The stability of the residuals in the liberalisation period challenges the claim that financial deregulation undermined the stability of money demand. As far as the vitally important household sector is concerned, it seems that this claim cannot be substantiated. Several studies have shown that the personal sector's demand for broad money was stable, according to the usual statistical tests, over nearly all the period under review.(7)

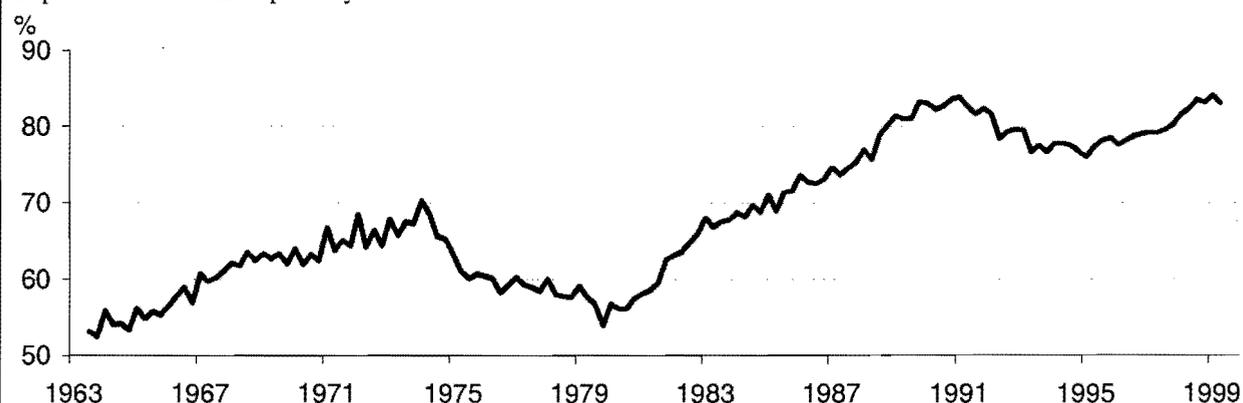
If personal sector money demand was stable, aggregate instability has to be explained elsewhere in the economy

This finding is of fundamental importance. To repeat, the demand for broad money of the most important type of money-holding agent (i.e., the individuals who form most of the household sector) was stable in the three-and-a-half decades from 1963, a period in which the stability of the aggregate demand for broad money is generally thought to have broken down. Clearly, the alleged instability in the aggregate demand for broad money must have been due to the money-holding behaviours of the two other sectors, the corporate and financial sectors. As noted above, the corporate sector's money balances varied in size over the period, but were generally much smaller than the personal sector's and showed no long-run tendency to expand or contract relative to the personal sector's. Studies of the corporate sector's demand for money are mixed, with some finding relatively stable money-holding experience.(8)

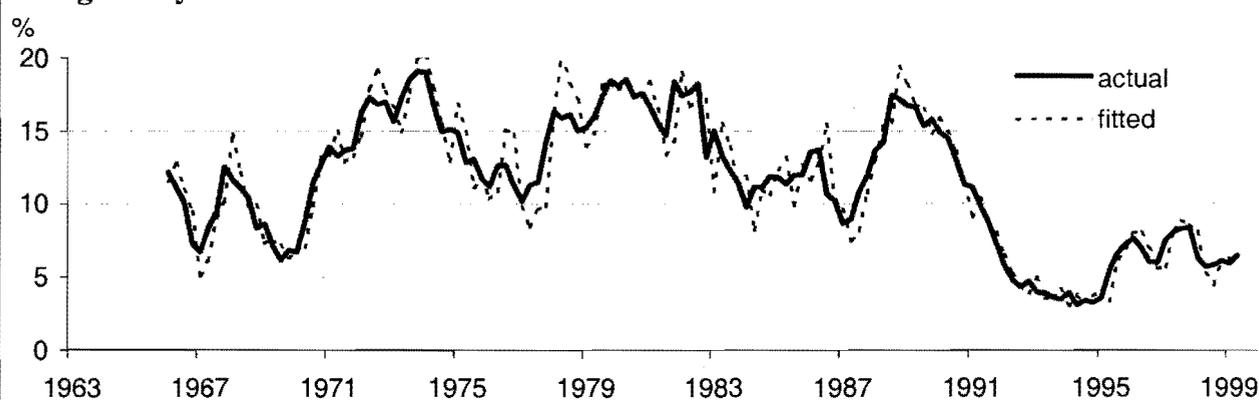
The household sector's demand for money

Charts are based on seasonally adjusted data. For explanation, see discussion on p.7. The key analytical point is that the residuals in chart 3 are not that much different in the early 1980s - a period of financial de-regulation associated with a sharp rise in the money/income ratio (see chart 1) - from their values at other times in the almost 40-year period.

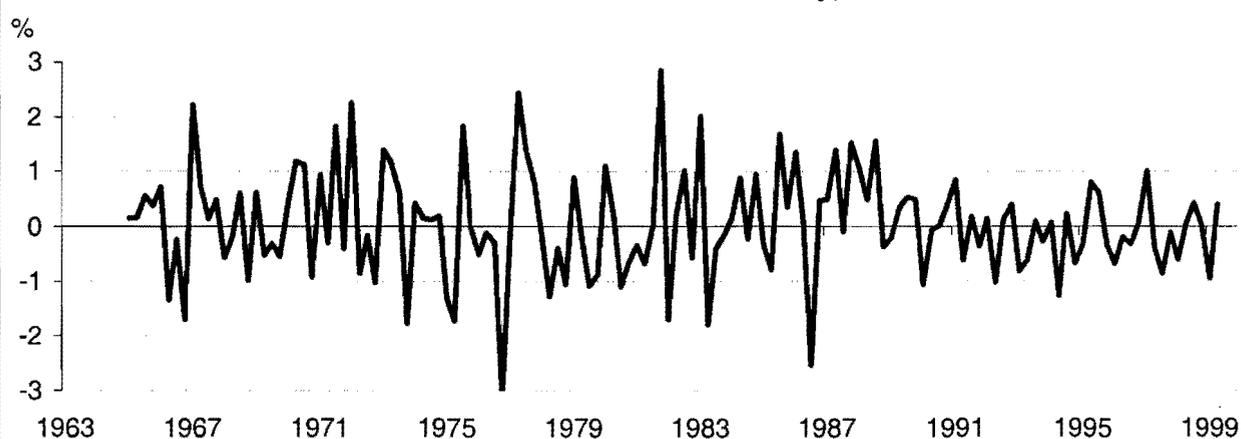
1. The ratio of household money to income Chart shows ratio of household M4 to quarterly gross disposable income multiplied by four



2. Actual annual household money growth, compared with growth rate estimated by best-fitting money demand function



3. Residuals between actual and estimated household money, as % of actual



Sources: Bank of England, National Statistics, Lombard Street Research estimates

Was the financial sector the monetary jinx of the UK economy?

By implication, the instability in the aggregate demand for broad money must be attributable to the instability in the demand for money of the financial sector. The facts surveyed in the preceding section already hint that this was indeed the source of the trouble. In principle, it might be possible for an aggregate demand-for-money function to exhibit instability, while the best-fitting demand-for-money equations of the economy's different sectors all showed stability. The arguments in the aggregate demand-for-money function would be different from those in the sectoral demand-for-money functions, to reflect the sectors' disparate money-holding motives, but this would remain compatible with stability in their underlying behaviour. Unhappily, studies of the demand for money for the financial sector, viewed as a single entity, fail to identify any stability.⁽⁹⁾ The financial sector appears to be the jinx of British monetary economics. To Keynes – who agonized over vagaries of the “financial circulation” in the *Treatise of Money* and the “speculative demand for money” in *The General Theory* – this result might not come as a great surprise.

The LAPFs: the underlying stability of their liquidity preferences

But pessimism about the stability of financial institutions' demand for money should not be taken too far. The difficulties stem largely from the OOFI group, where the statistical issues of definition and classification combine with the diversity of the organizations and their money-holding objectives to hinder analysis and interpretation. Reasonably tight analysis is possible for the LAPFs, where consistent data is available over long periods.

The LAPFs in the 1960s

In the early 1960s life insurance companies were much larger than pension funds. Their total assets at end-1963 were £7,425m., compared with the pension funds' £4,639m. Fixed-interest assets – government stock, corporate bonds and mortgages – represented the bulk of life companies' assets, reflecting their need to cover liabilities (pay-outs on death and survivor benefits) fixed in money terms. The dominance of fixed-interest assets and known nominal liabilities facilitated actuarial calculations of life companies' solvency and reduced investment decisions to the routine matching of assets with liabilities. The life companies' “cash ratios” were low by later standards, being under 1½% of assets most of the time. Pension funds – which had a higher weighting in equities – typically had higher “cash ratios”, but again these were low by their own later standards.

Need to distinguish between LAPFs' M4 holdings and their holding of liquid assets as a whole

An important aspect of LAPFs' portfolio selection is the need to differentiate between the institutions' holdings of monetary assets inside M4 and their total liquid holdings. Unlike individuals in the personal sector, who do not usually have the time or knowledge to justify switching between alternative liquid assets in order to capture small yield differentials, financial institutions choose actively between different liquid assets as part of their return maximization. As a result, life offices and pension funds in the 1960s and 1970s held much of their liquidity in such instruments as local authority deposits, Treasury bills and commercial paper. Their liquidity did not consist exclusively of bank deposits. This feature requires the calculation of two “money-to-asset ratios”, the ratio of cash, bank balances and CDs (i.e., M4 holdings) to total assets and the ratio of net short-term assets to total assets. The first of these might be termed the “cash ratio” as such and the second the “liquidity ratio”. Given

the ease of substitution between deposits and liquid short-term instruments, and the closeness of the returns on them, the wider concept of the liquidity ratio almost certainly was the more prominent in the institutions' asset allocation thinking. At the end of 1963 life insurance companies' "cash and balances with banks" were £33m. (0.4% of assets) and their net short-term assets were £55m. (0.7% of assets); at the same date pension funds' "cash and balances with banks" were £52m. (1.1% of assets) and their net short-term assets were £78m. (1.7% of assets).⁽¹⁰⁾

Changes in liquidity preferences partly due to changing asset structures

In the late 1960s LAPFs' investment perspectives were altered radically by the emergence of inflation of about 10% a year and the associated entrenchment of inflation expectations. Life companies began to emphasize the variable with-profit element in their returns, in the belief that fixed nominal redemption values could be misleading to their customers in a high-inflation environment. They increased the proportion of their assets in equities and property. A similar re-appraisal occurred in the pension fund industry, whose assets began to grow at a faster rate than the life companies' because of their particularly advantageous fiscal position. With LAPFs' equity and property holdings growing quickly relative to fixed-interest assets, investment decisions became less mechanical than in the 1950s and early 1960s. In particular, decisions about asset allocation and investment timing were deemed of greater importance, and both cash ratios began to increase. At the end of 1970 life companies' "cash and balances with banks" were £108m. (0.8% of assets) and their net short-term assets were £231m. (1.7% of assets); at the same date pension funds' "cash and bank balances" were £160m. (1.9% of assets) and their net short-term assets were £316m. (3.7% of assets).

The financial turmoil of the 1970s

The early 1970s were a period of financial turmoil in the UK, with drastic effects on LAPF behaviour. Following the Competition and Credit Control reforms in September 1971, broad money growth was exceptionally fast. Rapid asset price inflation emerged quickly and by late 1972 the economy was booming. The boom was so vigorous that in 1973 GDP increased by over 7%, the highest figure in the post-war period. Pressure on resources was intense, while the current account of the balance of payments slid into heavy deficit and the pound's external value fell sharply. Strong upward pressures on inflation were obvious, causing a marked deterioration in inflation expectations and a collapse in gilt-edged prices. The rise in gilt yields and growing macro-economic instability undermined financial confidence. In the early stages of the boom, in 1972 and early 1973, the LAPFs allowed their cash and liquidity to rise relative to their assets, but not markedly so. Extremely large increases in their money holdings were therefore associated with big gains in equity prices and commercial property values. Later, as confidence weakened in late 1973 and 1974, a general "retreat into cash" coincided with a slowdown in aggregate money growth and a collapse in the stock market.

LAPFs' retreat into cash in 1974 aggravated asset price weakness

Between end-1970 and end-1973 LAPFs' "cash and balances with banks", plus their certificates of deposit, more than trebled from £268m. to £985m. The implied compound annual growth rate was almost 55%, a by-product of the explosion in aggregate money growth and far ahead of the LAPFs' previous peace-time experience. In 1974 they wanted more liquidity, to protect them against the stock market tumble. Between end-1973 and end-1974 their cash, bank balances and certificates of deposit rose by another 50% to £1,479m., even though the six-month annualized growth rate of M4 slowed from over 20% in 1973 to under 10% in the middle quarters of 1974. The ratio of LAPFs' short-term assets to total assets at end-1974 was 9.3%, the highest in the post-war period. The financial institutions' increased demand for money - a clear and significant shift in liquidity preferences - aggravated the liquidity squeeze in the corporate sector. Fortunately, a degree of financial confidence returned, with share prices doubling in the one month of January 1975. A spate of rights issues in early 1975 relieved companies' financial strains.

LAPFs' concern to protect their portfolios against inflation

The events of 1971 to 1974 left a deep inflationary scar on UK financial institutions' investment constitution and asset preferences. Despite the share price collapse in 1974, equities and property were regarded even more emphatically as the appropriate hedges against inflation, and took up an increasing proportion of portfolios. This characteristic of UK institutional portfolios persisted into the 1980s and 1990s, and differentiated the UK from other industrial countries, where bonds had greater relative importance. Moreover, the LAPFs did not return to the investment habits of the early 1960s, with high bond weightings, mechanical matching of assets to liabilities and low cash ratios. As inflation fell and asset yields declined, the assets under their control grew quickly. Over the 25 years to end-1998 the LAPFs short-term assets rose from £1,551m. to £73,746m. or at a compound annual rate of 16.7%; in the same period their total assets increased from £32,070m. to £1,475,331m. or at a compound annual rate of 16.5%. The ratio of their liquid short-term assets to total assets was 4.8% at end-1973; it was 5.0% at end-1998.

LAPF's liquidity ratio almost identical at end 1973 and end-1998

The finding that LAPFs' liquidity ratio was virtually the same at end-1998 as it has been at end-1973 suggests that these financial institutions' attitudes towards liquid assets, as compared with other assets, had changed little over the 25-year period. When taken in conjunction with the other evidence surveyed in the previous section, it seems reasonable to propose that their underlying "liquidity preferences" (to adopt one of Keynes' phrases) were stable. Their job throughout the period was to manage large, rapidly growing portfolios of diverse and complex assets. Yet the size, diversity and complexity of these portfolios, as well as immense changes in financial regulation and the economic background, did not prevent their net short-term assets being between 3% and 6% of total assets for almost 90% of the time.(11)

But structural shifts in LAPFs' money-holding behaviour did occur

This is not to deny that changes in liquidity and money-holding behaviour occurred. The contrast between the early 1960s, with investment dominated by actuarially straightforward purchases of fixed-interest instruments, and later decades, with greater discretion in investment decisions, was associated with a step change in the ratio of both money and liquidity to assets. Also salient is a change in the composition in liquidity between the 1970s and 1990s. In the 1970s bank deposits were the largest single component of liquidity, but holdings of local authority deposits and Treasury bills were substantial. By the 1990s reductions in the supply of short-dated public sector paper had increased the institutions' reliance on the banking system for the provision of liquidity. Whereas at the end of 1973 "cash and balances with banks" were 44.2% of total LAPF liquidity, at the end of 1998 the figure was 88.8%. The change in the ratio of LAPFs' M4 assets to total liquidity (and so in the cash ratio) was, however, a minor matter compared with the growth of their M4 assets, total liquidity and total assets. In the 25 years to end-1998 LAPFs' liquidity and assets both grew at an annual compound rate of 17%, while their M4 assets climbed at a compound annual rate of 18.2% and the cash ratio by about 1½% a year.(12)

Rising importance of M4 assets in institutional liquidity relevant to increase in ratio of M4 to GDP

The increase in the ratio of LAPFs' M4 holdings to their liquidity is interesting and needs emphasis. It goes some way to reconcile the divergence between M4 growth and the increase in nominal GDP over these decades with underlying stability in LAPF portfolio preferences. An insistence on the stability of such preferences in the UK over the period under review – and of demand-for-money behaviours in all three private non-bank sectors of the economy – is one of the central themes of this paper. However, the first part of the paper suggested that the stability of demand-for-money behaviours over the long run might be accompanied by phases, perhaps lasting several years, in which the demand to hold money balances differed from the actual quantity of money in existence (i.e., the demand for money differed from the supply of money, creating a "monetary disequilibrium"). It was further proposed that the drastic changes in national income seen in the three boom-bust cycles were caused by agents' attempts to eliminate such disequilibria. How can the earlier discussion of monetary disequilibrium be linked to the evidence on different sectors' demand-for-money patterns?

**Part IV
The working-out of monetary disequilibrium in the business cycle**

Residuals in money demand function a measure of disequilibrium?

As is well-known, demand-for-money estimation suffers from the drawback that the demand to hold money balances cannot be precisely observed. The practice of estimating demand-for-money equations from real-world data is a simplification which improperly assumes that the demand for money is equal to the money supply at all times.(13) But a plausible extension of demand-for-money work is that the size of the residuals derived from the best-fitting equations (i.e., the differences between the level of money balances predicted by the best-fitting equations and the observed level) is a measure of the extent of monetary disequilibrium. This thought can be readily applied and extended to the sectoral demand-for-money evidence in the UK in the final decades of the 20th century. The key idea becomes that the relative stability of the personal sector demand-for-money equations reflected individuals' keenness to maintain money balances close to the desired level and the success of

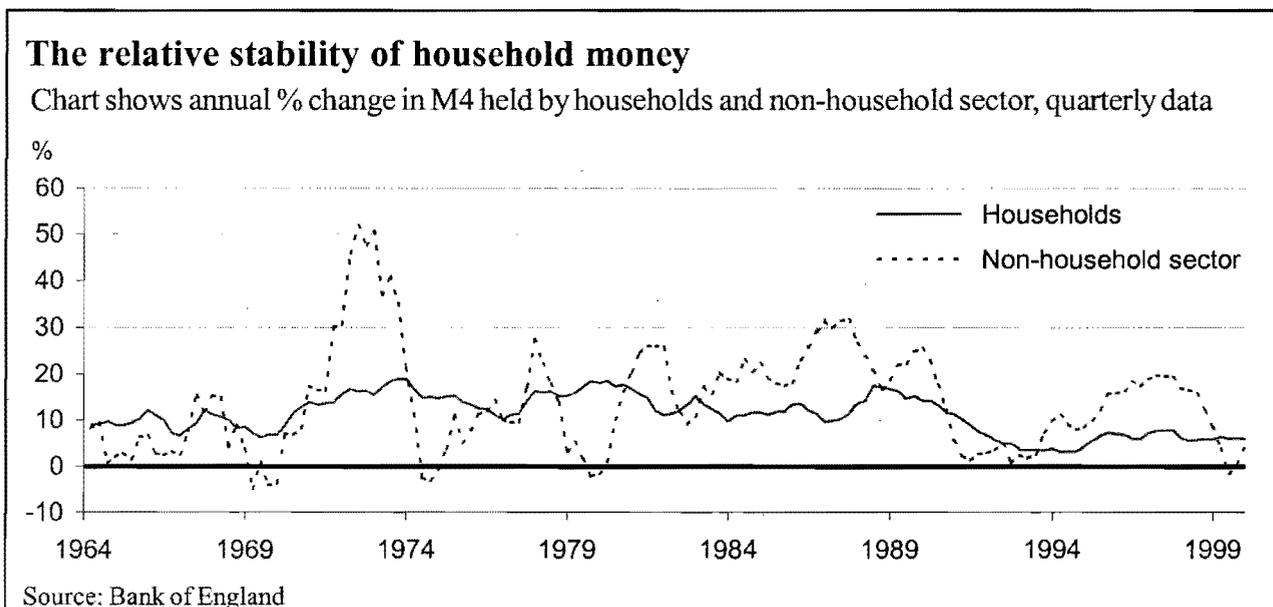
their efforts in this direction. By contrast, companies and financial institutions were either less concerned about significant differences between their demand to hold money and their actual money balances or less able to remedy such differences in a short space of time.

Sharp changes in money growth associated with more severe monetary disequilibria in corporate and financial sectors

In other words, when monetary disequilibrium arose because of a sharp change in money supply growth, the disequilibrium was more severe in the corporate and financial sectors than in the personal sector. The reason for this divergence is not entirely clear, but it may be related to the rationale of company formation. Companies have limited liability and are therefore better able to withstand financial shocks than the individuals who own them, while financial institutions have far more varied portfolios than individuals which again reduces the variance of their returns and their vulnerability to shocks. Companies and financial institutions – like banks – may be set up, at least in part, with the deliberate purpose of absorbing financial upsets. If so, it would not be surprising that in the real world they cope routinely with greater financial instability, and greater departures from equilibrium, than the personal sector.

Same pattern of sectoral monetary disequilibria in successive cycles

The different threads in the discussion may now be sewn together. At five points in the 1963 – 99 period the growth rate of M4 accelerated perceptibly and for a sustained period of more than a few months. These points were in mid-1967, late 1970, late 1977, late 1985 and early 1995. A characteristic sequence of events, conditioned by the different demand-for-money behaviours of the three private non-bank sectors of the economy, then followed. Because the personal sector keeps closer to monetary equilibrium than the corporate and financial sectors, the growth rate of its money holdings did not increase as much as that of the non-personal sectors. Indeed, as the personal sector's money balances constituted such a high proportion of all money, the increase in the growth rate of non-personal money was unavoidably much more pronounced than the increase in the growth rate of aggregate M4. The volatility in money growth was particularly severe in the financial sector.



Financial sector's money holdings intended to improve timing of asset purchases

The preponderant motive in the financial sector's money holding is to improve the timing of asset purchases, particularly purchases of financial assets; it has no direct and immediate connection with the demand for goods and services which enter into national income. The monetary disequilibrium in the financial sector therefore implied excess demand for paper claims on capital assets. This excess demand put upward pressure on the prices of equities and commercial property. By the 1980s the institutionalization of savings had proceeded so far in the UK that life offices and pensions funds were the most important holders of UK equities. When one institution had excess demand for equities, its purchases were commonly the sales of another institution. The excess supply of money would be passed on to the selling institution, which in turn would try to get rid of the excess money balances by purchasing equities. To the extent that purchases and sales of equities were within a closed circuit (i.e., between different LAPFs), the excess supply of LAPF M4 holdings could be eliminated only by a rise in equity prices. If LAPFs in the aggregate wanted to maintain a stable cash ratio, the result of the huge volume of securities transactions between them would be for the rate of increase in their asset values to equal the rate of increase in their M4 holdings.

LAPF's securities transactions *not* part of "circular flow of income", but - because of impact on asset prices - they were of huge macroeconomic importance

Of course, the transactions in securities between LAPFs were not part of any "circular flow of income" in the textbook sense and they did not impact by themselves on national income. But the fluctuations in equity prices which reflected LAPFs' attempts to rid themselves of excess money balances (or to rebuild such balances at other times) were of great importance to asset price determination in general. Further, fluctuations in asset prices had a crucial bearing on the macroeconomic situation. As outlined in part one (i.e., the May 2000 issue of Lombard Street Research's *Monthly Economic Review*), arbitrage between asset markets – motivated by the equilibrium condition that the market price, economic value and replacement cost of an asset must be the same – caused changes in the value of quoted equities to be communicated widely throughout the economy.

"Arbitrage" between asset markets communicated equity price movements to house prices,

Substitution between different types of asset was also important, with shifts of wealth between equities and houses being central to the transmission mechanism from excess (or deficient) money to asset prices and then to economic activity. Typically, an acceleration in M4 growth – and especially in the M4 holdings of the financial sector – would lead to almost concurrent surges in equity prices and the price of London houses. (Wealthy share-owning individuals would sell some of their equity portfolios and purchase London houses.) Arbitrage between the London and regional housing markets would ensue, spreading the house price increases throughout the nation. Conversely, a deceleration in M4 growth would dampen equity markets or even, as in 1974, be a powerful influence on a stock market collapse. Again, the London housing market would feel the negative impact of the deterioration in the equity market, with national repercussions in due course.

**with broader
“wealth effects” on
consumption and
investment**

Once excess money – finding vents in payments for capital assets and paper claims on capital assets, as well as in payments for goods and services – had affected the general level of asset values, “wealth effects” on consumption and investment would lead to an upturn in spending on goods and services. Above-trend growth in output would take output above its trend level, stimulating an increase in the rate of inflation. Ultimately the rate of inflation would rise sufficiently for the rate of increase in real money growth to be reduced once again, more or less, to the trend rate of increase in real output. In practice each of the cycles had its own idiosyncratic features. Sometimes the asset price strength due to excess money would be most evident in the stock market, while at other times it would emerge more clearly in residential and commercial property, or in the demand for foreign assets (i.e., leading to a depreciation in the exchange rate).

**Narrow money
irrelevant to these
processes**

But – throughout the period – the different sectors jostled to achieve monetary equilibrium, with effects on asset prices as well as the prices of goods and services, and yet with powerful interactions between asset price levels and fluctuations in economic activity. In the sectors’ efforts to maintain monetary equilibrium it was the quantity of all their money balances (i.e., broad money), not a subset of money holdings (i.e., narrow money), which mattered. Narrow money cannot realistically be said to have had any role in the extreme asset price swings, and associated macroeconomic instability, which characterized the boom-bust cycles of the 1970s and 1980s.

**LAPFs not the only
holders of UK
equities, but all
relevant agents
would balance
money holdings
against total assets**

This account begs many questions. It has to be conceded that LAPFs were not the only holders of UK equities in the period, even if - taken together - they were the largest single category of holder. The argument has implied that, as a rough-and-ready approximation, the change in UK share prices could be seen as the product of changes in LAPFs’ cash ratio and their M4 holdings, while the increase in their M4 holdings was determined as a residual after the personal sector had absorbed its share of M4 growth. But other parties interested in the UK equity market – in the personal and corporate sectors, in the rest of the world, and in the financial sector outside the LAPFs – could also buy and sell shares, if the general level of share prices were deemed inappropriate. The involvement of these other parties would depend to some extent on their balance-sheet positions, including their money balances. Of course, if in the real world LAPFs tended to have excess money balances at the same time as other agents, and if LAPFs’ excess demand for equities coincided with abundant liquidity and asset price optimism throughout the economy, the role of money growth in asset price determination and the boom-bust cycle would be reinforced, not weakened.

An important qualification is that towards the end of the period the rest-of-the-world’s holdings of UK equities became larger than that of any individual UK sector, including either the life offices or the pension funds taken separately.⁽¹⁴⁾ The internationalization of asset-holding was a marked feature of the world economy in the 1980s and 1990s, and plainly undermined the realism of the notion that purchases

Growing internationalization of UK equity holdings does not invalidate the emphasis on domestic monetary disequilibrium as cause of business cycle

and sales of UK equities were “within a closed circuit”; it also demonstrates the limitations of the concept of domestic monetary disequilibrium which has been the analytical fulcrum of this paper. However, a case can be made that nothing of great value is lost by acknowledging the international background to UK asset price determination. No doubt arbitrage occurred between the UK equity market and equity markets in other countries, but agents all over the world were influenced by the adequacy or inadequacy of their money holdings. It need hardly be added that, despite the parochialism of describing payment flows in any one nation as “a closed circuit”, payments in the world as a whole are most certainly within a closed circuit. Moreover, the emphasis here on domestic monetary influences on UK asset price movements, and so on cyclical fluctuations in the economy, may have served a mild but useful polemical purpose. This purpose has been due to question the prominence in the academic literature of the many studies which claim that the impact of money on the UK was exerted particularly through the exchange rate.(15) The exchange rate is an important asset price, but it is not the only one relevant to the economy’s behaviour.

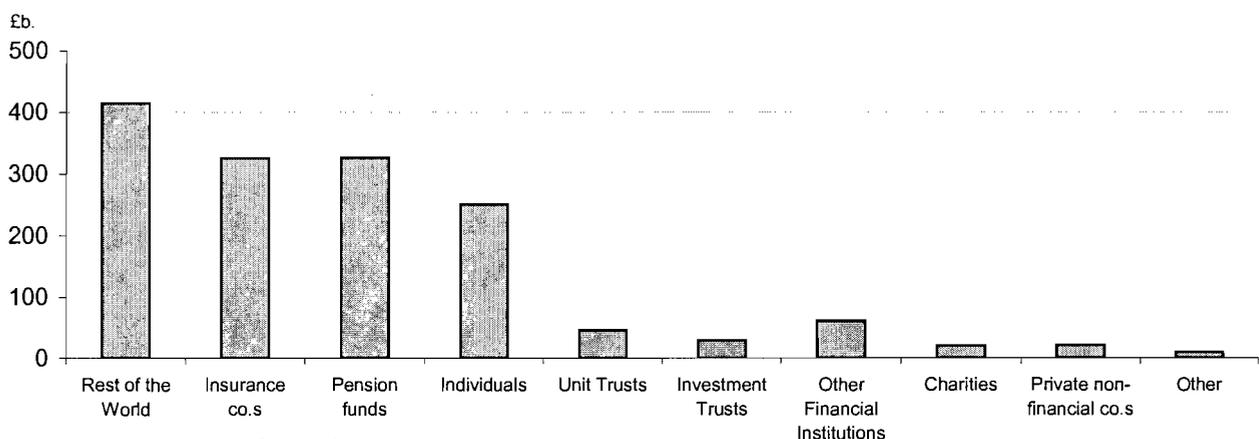
Conclusion

Friedman’s “game of musical chairs”, monetary equilibration and national income

In Congressional testimony in 1959 Friedman explained the essence of the monetary approach to national income. As he noted, any one person may think that he can control the amount in his bank account, but “For all individuals combined... the appearance that they control their money balances is an optical illusion. One individual can reduce or increase his money balance only because another or several others are induced to increase or reduce theirs... If individuals as a whole were to try to reduce the number of dollars they held, they could not all do so, they would simply be playing a game of musical chairs.” In other words, if real money balances differ from the demand to hold them, expenditures (and national income) keep on changing until the price level adjusts sufficiently to bring the supply of and demand for money bank into balance.(16)

UK share ownership in 1998

The chart shows the holdings of UK equities, by sector, in £b. at the end of 1988. UK financial institutions - insurance companies, pension funds, unit trusts, investment trusts and others - owned £787.0b. or or 52.3% of the total



Source: *Economic Trends*, April 2000

The sectorization of money holdings allows fresh insights into the processes of monetary equilibration

Until now some crucial details of Friedman's macroeconomic "game of musical chairs" have been missing. Ample information has been available in many countries about the aggregate quantity of money, on a variety of definitions, and hundreds of studies have been done estimating *aggregate* demand-for-money functions. But statistics on the flows of payments between sectors, and on the effect of net payment flows on different sectors' money holdings, have been less extensive and not so closely studied. Since 1963 the UK's monetary statistics have been presented for the main sectors of the economy, allowing *sectoral* demand-for-money studies to be conducted. The statistics have generated fascinating new insights into the economy's response to sharp changes in money supply growth. A consistent finding is that the non-personal demand for money departs further from equilibrium than the personal. In particular, the financial sector's money holdings – which in the UK were growing rapidly and were particularly volatile in the closing decades of the 20th century – have proved difficult to model. Despite these difficulties, the principal form of financial institutions – such long-term savings institutions as life insurance companies and pension funds – have had reasonably stable liquidity preferences. Indeed, the long-run stability of the ratios of cash and liquidity to their total assets suggests that their attempts to maintain monetary equilibrium – by the incessant game of musical chairs which takes place in the stock exchange – were a vital part of the transmission mechanism from money to asset prices and so to wider macroeconomic outcomes.

Conventional wisdom on (in)stability of UK money demand misleading

One part of the conventional wisdom of British monetary economics – that the demand for broad money became unstable in the 1980s – is misleading. The largest group of M4 holders, namely individuals in the household sector, have had a stable demand-for-money function throughout the period since 1963. The money holdings of other sectors may have been unstable, according to the usual statistical tests, but a legitimate interpretation is that their money holdings were much further from equilibrium than the personal sector's. The disequilibrium in financial sector money balances was associated with instability in asset prices, while the asset price instability contributed to the wider macroeconomic turmoil suffered in the boom-bust cycles.

Broad money, not narrow money, crucial to asset price swings which were so important in the boom-bust cycles

One final point needs to be reiterated. Analysis of the type pursued in this paper demonstrates that, if money matters at all, it is only broad money that can matter. In the UK over these years the undoubted stability of the demand for narrow money was trivial, a consequence of the ease of transferring sums between different accounts in the efficient and flexible banking system. The portfolio decisions of companies and financial institutions were vital influences on asset prices in the boom-bust cycles of the 1970s and 1980s, yet their holdings of narrow money were small to the point of irrelevance. Instead it was the large fluctuations in their broad money holdings – a by-product of the wide swings in aggregate broad money growth – which gave companies and financial institutions so much trouble in maintaining desired portfolio structures, and hence played such a major part in motivating the business cycles.

Notes

- (1) Nowadays the major source of historical data on the sectoral composition of M4 holdings is the Bank of England's annual *Statistical Abstract*. Note that the presentation of the data has changed considerably over time, partly because of revisions to the numbers and changes in the way they are compiled, but also because of changes in the emphases of official policy. In the late 1980s data were published on the sectoral composition of sterling M3 holdings, but these have disappeared from recent publications because sterling M3 itself is no longer regarded as of great interest to policy-makers. The Bank of England published its first *Long Runs of Monetary Data 1963 – 89* in 1989.
- (2) The data on the total assets and asset composition of the main types of UK financial institution is compiled separately from the monetary data, but they also started in the early 1960s. Sometimes (as with investment trusts and unit trusts) they have been collected by the Bank of England, working with the relevant trade association; the data for "long-term business" insurance companies (predominantly life assurance companies) and pension funds are prepared by the Department of Trade and Industry. As explained in successive issues of the *Explanatory Handbook* to the Government Statistical Service's monthly publication *Financial Statistics*, figures are available on the net acquisition of assets from a quarterly survey, whereas those on holdings are derived from an annual enquiry and relate to the end of the year. The 2000 edition of the *Explanatory Handbook* says, "Response to the annual balance sheet enquiry is very high and the holdings data are therefore very reliable." There is quite a long lag before figures on the end-year holdings are published. The figure for LAPF assets at end-1999 given in the text is a Lombard Street Research estimate (by Mr. Brendan Baker), using the quarterly net acquisition data and revaluation factors based on market movements.
- (3) The end-1996 date is chosen because of the major series break in September 1997. Note that – because the monetary data are compiled by the Bank of England and the long-run asset composition data by the DTI – it would be a mistake to assume that the numbers for LAPFs' "cash and balances with banks" (or the totals of "cash and balances with banks" and certificates of deposit after 1972) in the DTI series correspond exactly to the LAPF assets included in M4 by the Bank of England. The Bank of England does *not* publish a long-run series on LAPFs' M4 balances. It began to publish a series on their bank deposits, as part of a new "Industrial analysis of bank deposits", in February 1998. For those recent dates when both series have been published, the numbers in the Bank of England series do *not* match up precisely with the data on "cash and balances with banks" plus CDs published by the DTI. However, they do move together and plainly relate to much the same underlying economic reality.
- (4) Note the comments in the three preceding footnotes. No official long-run series for the OOFIs' M4 holdings is published. It has been derived by Lombard Street Research by deducting LAPFs' cash, bank deposits and CDs from total M4. This is unsatisfactory in several respects, but it seems unlikely that a more refined series would yield a different economic interpretation of OOFIs' monetary behaviour in the period under review.
- (5) Hilary Brown 'Impact of the review of banking statistics: changes and additions to the published data', pp. 1 - 6 of the February 1998 issue of the Bank of England's monthly publication, *Monetary and Financial Statistics*.

- (6) Note that the introduction of the ESA led to the reclassification of unlimited liability partnerships from the personal to the corporate sector and the re-naming of the personal sector as “the household sector”. A minor series break also occurred. See Brown in February 1998 *Monetary and Financial Statistics*, p. 3.
- (7) Tim Congdon and Simon Ward ‘Note on the personal sector’s demand for M4 balances’, Lombard Street Research mimeo, December 1991. See also P. G. Fisher and J. L. Vega *An Empirical Analysis of M4 in the United Kingdom* (London: Bank of England, 1993), pp. 15 – 37, and Ryland Thomas *The Demand for M4 - a Sectoral Analysis: Part 1 – The Personal Sector* (London: Bank of England, 1997)..
- (8) “Overall the corporate sector equations are not quite as reliable as the personal sector.” Fisher and Vega *An Empirical Analysis*, p. 46. See also Ryland Thomas *The demand for M4 - a Sectoral Analysis: Part 2 – The Corporate Sector* (London: Bank of England, 1997), pp.13 – 38. In the USA the Federal Reserve began to compile flow-of-funds data for the economy’s different sectors in the immediate post-war years. According to Goldsmith and Lipsey, “partial annual balance sheets for the period since 1945, limited to claims and liabilities, form part of the Federal Reserve’s flow-of-funds statistics; similar quarterly statements are available in Federal Reserve worksheets beginning in 1953.” (Raymond W. Goldsmith and Robert E. Lipsey *Studies in the National Balance Sheet of the United States*, vol. I [Princeton: Princeton University Press for the National Bureau of Economic Research, 1963], p. 13.) These balance-sheet data included figures for the money holdings of persons, companies and so on. The data were used in one of the earliest sectoral money demand analyses by M. H. Miller and D. Orr ‘A model of the demand for money by firms’, *Quarterly Journal of Economics*, 1966.
- (9) See pp. 39 – 56 of Thomas *The Demand for M4: Part 2*. Thomas conducts statistical analysis of the financial sector’s M4 in the aggregate, despite the heterogeneity of the institutions which constitute it. The analysis concludes, “The model for OFIs illustrates the interaction between the banking system’s management of its liabilities with the portfolio allocation decisions of OFIs. But it is not indicative of any particular role for OFIs’ deposits in the transmission mechanism.” The current paper rejects these conclusions, by distinguishing between different categories of money-holder in the financial sector (i.e., LAPFs and others), and arguing that LAPFs’ money holdings and their behaviour towards their money holdings have a clear and powerful impact on asset price determination.
- (10) Note that certificates of deposit did not exist in 1963. So “cash and balances with banks” ought to correspond quite closely to the M4 assets held by LAPFs.
- (11) The LAPFs’ liquidity ratio was above 6% at end-1974 and end-1990, and beneath 3% at end-1985. These are the only three observations outside the 3% - 6% range in the 26 years from 1973 to 1998 inclusive. Note, however, that the liquidity ratio of life companies in 1998 was significantly different from that in 1973, as also was that of the pension funds. The rough equivalence of the liquidity ratio applies only to LAPFs combined.
- (12) A further complication is that by the 1980s LAPFs began to hold significant quantities of foreign currency deposits. This point – although important – is not explored in the paper.

- (13) The problem was noted by Goodhart on p. 270 of his *Monetary Theory and Practice: the UK Experience* (London: Macmillan, 1984). "...[H]ow is the 'underlying' demand for money to be modelled, when no single observation of the actual money stock may be a point of equilibrium between the monetary (sic) supply and the 'underlying' demand?"
- (14) Ian Hill and Shane Duffield 'Ownership of United Kingdom quoted companies at the end of 1998', pp. 85 – 7, in April 2000 issue of *Economic Trends* (London: The Stationery Office).
- (15) The connection between money growth and the exchange rate was emphasized by London Business School economists – notably Professor Sir James Ball, Sir Alan Budd and Lord Burns – in the late 1970s, and was one reason that they became known as "monetarists" in the policy debates in those years. See, for example, pp. 206 –7 of R. J. Ball *Money and Employment* (London: Macmillan, 1982). The LBS economists were strongly influenced by work on money in small, open economies carried out at the Manchester Inflation Workshop by David Laidler and Michael Parkin. See, for example, M. Parkin and George Zis (eds.) *Inflation in Open Economies* (Manchester: Manchester University Press, 1976).
- (16) See M. Friedman, 'Statement on monetary theory and policy' given in Congressional hearings in 1959, reprinted on pp. 136–45 of R.J. Ball and Peter Doyle (eds), *Inflation* (Harmondsworth: Penguin Books, 1969). The quotation is from p. 141.